SECOND BIENNIAL UPDATE REPORT OF THE REPUBLIC OF MOLDOVA

UNDER THE UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE

December, 2018

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Coordinators:	Valentina TAPIS, State Secretary, Ministry of Agriculture, Regional Development and Environment Suzanne LEKOYIET, Programme Manager, United Nations Environment Programme
Synthesis Team:	Vasile SCORPAN, Project Manager, Climate Change Office, Ministry of Agriculture, Regional Development and Environment Marius TARANU, Coordinator of National GHG Inventory, Climate Change Office, Ministry of Agriculture, Regional Development and Environment Ion COMENDANT, Coordinator of the Climate Change Mitigation and MRV Working Group, Climate Change Office, Ministry of Agriculture, Regional Development and Environment
Internet Version:	This document is available at: <http://www.clima.md>
Comments:	Comments on this document can be addressed to: Vasile SCORPAN, Project Manager, Climate Change Office, Ministry of Agriculture, Regional Development and Environment of the Republic of Moldova, 156A Mitropolit Dosoftei St., of. 37, MD-2004, Chisinau, Republic of Moldova, tel./fax: +373 22 232247, E-mail: <clima@clima.md>

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Ministry of Agriculture, Regional Development and Environment
Address:
9 Constantin Tanase St,
MD 2005, Chisinau, Republic of Moldova
Tel.: +373 22 200547
Fax: +373 22 226858
e-mail: <madrm@madrm.gov.md>
Website: <http://www.madrm.gov.md>

United Nations Environment Programme (UN Environment)
Address:
United Nations Avenue, Gigiri,
P.O. Box 30552, Nairobi, Kenya
Tel.: +254 (0) 20 762 1234
Fax: +254 (0) 20 762 3718
e-mail: <unepinfo@un.org>
Website: <https://www.unenvironment.org>

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CONTRIBUTORS

Ministry of Agriculture, Regional Development and Environment
Valentina Tapis, Veronica Lopotenco

Climate Change Office, Ministry of Agriculture, Regional Development and Environment
Vasile Scorpan, Marius Taranu, Ion Comendant, Lilia Taranu, Igor Bercu, Aliona Solomon

Ozone Office, Ministry of Agriculture, Regional Development and Environment
Anatolie Tarita

Environmental Pollution Prevention Office, Ministry of Agriculture, Regional Development and Environment
Tatiana Tugui, Natalia Efros

National Bureau of Statistics
Svetlana Bulgac, Natalia Gridneva, Elena Orlova, Ludmila Lungu, Tatiana Isac, Maria Chiperi, Rodica Boistean

National Institute for Economic Research of the ASM and the Ministry of Economy and Infrastructure
Tatiana Gutium

National Agency for Energy Regulation
Andrei Sula

Forestry Management and Research Institute
Ion Talmaci, Aliona Miron, Liliana Spitoc

Institute of Ecology and Geography of the ASM
Anatolie Tarita, Vladimir Brega

Institute of Power Engineering of the ASM
Mihai Tirsu, Elena Bicova, Tatiana Kirillova, Larisa Moraru, Irina Vasiliev, Serghei Burtev, Sergiu Robu

Institute of Scientific and Practical Animal Husbandry and Veterinary Medicine in Biotechnology
Sergiu Cosman

Institute of Pedology, Agrochemistry and Soil Protection „Nicolae Dimo" of the Academy of Sciences of Moldova
Valerian Cerbari, Tamara Leah

Agribusiness and Rural Development Management Institute
Nicolae Bucataru

State Agrarian University of Moldova
Victor Sfecla

Technical University of Moldova
Ion Sobor, Larisa Tcaci

„RED UNION FENOSA" J.S.C.
Sergiu Codreanu

Translator: *Svetlana Chirita*
Photos on the cover page: *Alecu Renita*

FOREWORD

It is indisputable that climate change phenomenon can endanger sustainable development of the humanity. It can have diverse negative impact such as world ocean level rise, increased frequency of natural disasters (floods, droughts, heat waves, hurricanes and tornadoes), higher vulnerability of natural and artificial ecosystems to new climate conditions, etc. This requires from the world's nations to undertake actions aimed both to minimize the climate change process as well as to mitigate its potential consequence.

The Second Biennial Update Report of the Republic of Moldova under the United Nations Framework Convention on Climate Change has been developed with the financial assistance of the Global Environment Facility through the Project "Republic of Moldova: Enabling Activities for the Preparation of the Second Biennial Update Report under the United Nations Framework Convention on Climate Change", initiated on February 20, 2017 and completed by January 31, 2019; managed by the United Nations Environment Programme and implemented by the Climate Change Office of the Ministry of Agriculture, Regional Development and Environment of the Republic of Moldova.

In comparison to the Fourth National Communication of the Republic of Moldova under the United Nations Framework Convention on Climate Change (2018), this Report presents an updated overview of the state of work in the Republic of Moldova for the main issues covered by the Convention. They affect the assessment of greenhouse gas emissions pace and dynamics at national and sectoral level, the mitigation measures adopted at national level, respectively the capacity support and needs in order to decrease these emissions at a larger scale.

It is important to note that these assessments could be used in order to update the mitigation targets included in the Intended Nationally Determined Contribution of the Republic of Moldova, prepared in accordance with Decisions 1/CP.19 and 1/CP.20 for the Paris Agreement (2015) – an agreed outcome with legal force under the Convention, applicable to all Parties, in line with keeping global warming by 2100 below 2oC, as compared to the preindustrial period.

To be noted, the Paris Agreement was signed by the Prime Minister of the Republic of Moldova in New York on September 21, 2016, and was subsequently ratified by the Parliament through Law No. 78 from 04.05.2017 for the ratification of the Paris Agreement (Official Monitor No. 162-170 from 26.05.2017), and the GHG reduction targets set out in the Intended Nationally Determined Contribution of the Republic of Moldova were subsequently officially approved at national level by the Government Decision No. 1470 from 30.12.2016 regarding the approval of the Low Emissions Development Strategy of the Republic of Moldova by 2030 and the Action Plan for its implementation (Official Monitor No. 85-91 from 24.03.2017).

According to its INDC, the Republic of Moldova intends to achieve an economy-wide unconditional target of reducing its greenhouse gas emissions by 64-67 per cent below its 1990 level in 2030 and to make best efforts to reduce its emissions by 67 per cent. The reduction commitment expressed above could be increased up to 78 per cent below 1990 level conditional to, a global agreement addressing important topics including low-cost financial resources, technology transfer, and technical cooperation, accessible to all at a scale commensurate to the challenge of global climate change. GHG emissions reduction targets have been set in an emission budget covering the period from January 1, 2021 to December 31, 2030.

The development of the Report as well as the subsequent implementation of the Low Emissions Development Strategy of the Republic of Moldova until 2030 and the Action Plan for its implementation, represent an essential contribution of our country to addressing climate change both nationally and globally.

Valentina TAPIS,
Secretary of State, Ministry of Agriculture, Regional Development and Environment

LIST OF ACRONYMS, ABBREVIATIONS AND UNITS

AA EU-RM	Association Agreement EU-Republic of Moldova
A&A ROSC	Accounting and Auditing Reports on the Observance of Standards and Codes
AC	Air Conditioning
AEE	Agency on Energy Efficiency
AEZ	Agro-Ecological Zone
AFOLU	Agriculture, Forestry and Other Land Uses
AIPA	Agency for Intervention and Payments in Agriculture
AITT	Agency for Innovation and Technology Transfer
AGeoM	Agency for Geological Production and Exploration
AGEPI	State Agency for Intellectual Property
AMP	External Assistance Management Platform
ANCDI	National Agency for Research, Development and Innovation
ANSA	National Agency for Food Safety
ANRE	National Agency for Energy Regulation
ApaSan	Water and Health
AR4	IPCC Forth Assessment Report
AR5	IPCC Fifth Assessment Report
Art.	Article
a.s.	Active substance
ASM	Academy of Science of Moldova
ATU	Administrative-Territorial Unit
ATULBD	Administrative-Territorial Units on the Left Bank of Dniester
bil.	Billion
BAU	Business as Usual Scenario
BMZ	Federal Ministry for Economic Cooperation and Development, Germany
BOD	Biochemical Oxygen Demand
BSP	Budget Support Programme
BUR	Biennial Update Report
°C	Celsius degrees
C	Carbon
¢	cents
CAA	Central Administrative Authorities
CCl_4	Carbon tetrachloride
COD	Chemical Oxygen Demand
CCO	Climate Change Office
CCPP	Combined Cycle Power Plant
CDM	Clean Development Mechanism
CE	Council of Europe
CEA	Central Environment Authority
CEF	Wind and photovoltaic power plants
CER	Certified Emission Reductions
CETD	Distributed district heating (small capacity)
C_2F_6	Perfluorethane
C_3F_8	Perfluorpropane
C_4F_{10}	Perfluorbutan
$c\text{-}C_4F_8$	Perfluorciclobutan
C_5F_{12}	Perfluorpenthan
C_6F_{14}	Perfluorhexan
CFC	Chlorofluorocarbons
C.I.F.	Cost, Insurance and Freight
CIS	Commonwealth of Independent States
CH_4	Methane
CHE	Hydro Power Plant
CHEAP	Hydro pumped storage power plant
CHP	Combined Heat Power Plant
CHPD	Distributed (Small Capacity) Combined Heat and Power Plant
CHP J.S.C.	Combined Heat Power Plant Joint-Stock Company
Cl^-	Ions of chlorine
CMEIMI	Integrated Ecological Monitoring and Information Management Centre
CNAA	National Accreditation and Attestation Council
CNG	Compressed natural gas
CO	Carbon monoxide
CO_2	Carbon dioxide
COD	Chemical Oxygen Demand
COP	Conference of the Parties
CORINAIR	European Emissions Inventory Guidebook developed by European Environment Agency
CNG	Compressed natural gas
CPA	Central Public Authorities
CPA	Cooperation and Partnership Agreement with the European Union
CPS	Country Partnership Strategy
cm	Centimeter
cm^2	Square centimeter
CS	Country Specific
CSCT	Carbon Storage and Capture Technology
CSSDT	Supreme Council for Science and Technology Development
CTEM	Moldovan Central Heating Plant
D	Default
dal	dekaliter
DCFTA	Deep and Comprehensive Free Trade Agreement
DCFTZ	Deep and Comprehensive Free Trade Zone
DEPA	Danish Environment Protection Agency
DFID	Department for International Development
DN	Distribution Networks
DNA	Designated National Authority
DOC	Degradable Organic Carbon
DOC_F	Dissimilated DOC fraction
dm	Decimeter
d.m.	Dry matter
E	East
ESP	Eastern Europe Energy Efficiency and Environmental Partnership
EaP	Eastern Partnership
EaPIC	Eastern Partnership Integration and Cooperation Programme
EB	Energy Balances
EBM	Efficient Business Management
EBRD	European Bank for Reconstruction and Development

EC	Council of Europe
EEA	Energy Efficiency Agency
EEA	European Environment Agency
EEC	European Economic Community
EEE	Electrical and Electronic Equipment
EEF	Energy Efficiency Fund
EEN	Enterprise Europe Network
EF	Emission Factor
EFRC	Environmental Fiscal Reform Commission
EHGeoM	Hydrogeological Expedition of Moldova
EIB	European Investment Bank
EIC	Environmental Information Centre
EMEP	Programme on Observations and Assessment of Long-Range Transboundary Air Pollution in Europe
EnMS	Energy Management System
ENPARD	European Neighborhood Program for Agriculture and Rural Development
ENPEP	Energy and Power Evaluation Program
ENPI	European Neighborhood and Partnership Instrument
ENTSO-E	The European Network of Transmission System Operators for Electricity
ENVSEC	Environment and Security Initiative
ESCO	Energy Service Company
ETCU	Electricity Transport Coordination Union (fr.: Union pour la Coordination du Transport de l'Electricité)
EV	Emissions Volume
EU	European Union
EUA	European Union Allowances
EU ETS	European Union Emission Trading Scheme
EU FP7	EU's 7th Framework Programme for Research and Development
EUR	Euro
EUREM	European Energy Manager Training
EXP	Export
eq.	Equivalent
FAO	United Nations Food and Agriculture Organization
FEEF-MO	EU Energy Efficiency Financing for the Republic of Moldova
FEN	National Environmental Fund
FES	Emission factor in the national power system
FNC	First National Communication
FNDAMR	National Fund for Agricultural and Rural Development
F.O.B.	Free on Board
FOD	First Order Decay Method
GASFOR	Modelling Carbon Sequestration in Forested Landscapes
g	Grams
g.c.e.	Grams of coal equivalent
Gcal	Gigacalory
GCF	Green Climate Fund
GGF TAF	Green Growth Fund Technical Assistance Facility
GD	Government Decision
GDP	Gross Domestic Product
GEF	Global Environmental Facilities
GEFS	Grid Emission Factor of National Power System
GHG	Greenhouse Gases
GPG	Good Practice Guidance
Gt	Gigatonne (10^9 tons)
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
GJ	Gigajoule (1gigajoul = 10^9 joules)
GNI	Gross National Income
GoM	Government of the Republic of Moldova
GOST	Regional Standardization System used by the Euro-Asiatic Council for Standardization, Metrology and Certification
GSTI	Gas-Steam Turbine Installations
Gt	Gigaton (10^9 tons)
GWP	Global Warming Potential
h	Hour
ha	hectare
HFC	Hydrofluorcarbons
hl	hectoliter
H_2O	Water
HP	Heat Plant
HPP	Hydro Power Plant
JICA	Japan International Cooperation Agency
J.S.C.	Joint-Stock Company
IAAE	International Agency for Atomic Energy
IBRD	International Bank for Reconstruction and Development
ICA	International Consultation and Analysis
ICAS	Institute for Forestry Research and Development
ICSID	International Centre for Settlement of Investment Disputes
ICT	Information and Communication Technologies
IDA	International Development Association
IDC	International Development Cooperation
IE	Included Elsewhere
IE ASM	Power Institute of the Academy of Sciences of Moldova
IFAD	International Fund for Agricultural Development
IFC	International Finance Corporation
ILO	International Labor Organization
IMF	International Monetary Fund
IMP	Import
IMPACT	Emission calculation model, from ENPEP software package
INDC	Intended National Determined Contribution
INOGATE	EU-funded regional energy cooperation program supporting energy priorities in the framework of the Eastern Partnership – Interstate Oil and Gas Transportation to Europe
INTAS	International Association for the promotion of cooperation with scientists from the independent states of the former Soviet Union
IOM	International Organization for Migration
IPA	Instrument for Pre-Accession Assistance
IPCC	Intergovernmental Panel for Climate Change
IPE ASM	Institute of Power Engineering of the Academy of Science of Moldova
IPNA	National Public Broadcasting Regulatory Agency
IPPU	Industrial Processes and Product Use
ISO	International Organization for Standardization
ITC	Information Technologies and Communication
ITP	Individual Thermal Points
ITTA	Innovation and Technology Transfer Agency
IWM	Integrated Water Management
JICA	Japan International Cooperation Agency
JSC	Joint Stock Company
K^+	Ions of potassium
KC	Key Categories
KfV	Kreditanstalt Für Wiederaufbau: German Development Bank
kg	Kilogram
kg c.c.	Kilograms coal conventional
km	Kilometer
km^2	Square kilometer
KMS	Knowledge Management Strategy
KMP	Knowledge Management Plan
kPa	Kilopascal
kt	Kiloton
ktoe	kiloton of oil equivalent
kV	Kilovolt

kW	Kilowatt
kWh	Kilowatt-hour
l	Liter
L	Level
LEAP	Long range Energy Alternatives Planning System
LECB	Low Emission Capacity Building Programme
LED	Light-emitting diode
LEDS	State Hydrometeorological Service
LEF	Local Environmental Fund
LNG	Liquefied Petroleum Gases
LPA	Local Public Authorities
LPG	Liquefied Petroleum Gases
Ltd.	Limited responsibility company
LULUCF	Land Use, Land-Use Change and Forest
m	Meter
m^2	Square meter
m^3	Cubic meter
MACP	The project „Competitive Agriculture in Moldova"
MAED	Model for Analysis of the Energy Demand
MAFI	Ministry of Agriculture and Food Industry
MARCAL	Market Allocation Model
MARDE	Ministry of Agriculture, Regional Development and Environment
MBT	Mechanical-Biological Treatment
MCC	Millennium Challenge Corporation
MCDA	Multicriteria Decision Analysis Method
MD	Moldova
MoD	Ministry of Defense
MDB	Multilateral Development Bank
MDG	Millennium Development Goals
MDL	Moldovan Lei
MEI	Ministry of Economy and Infrastructure
MECR	Ministry of Education, Culture and Research
MF	Ministry of Finance
MFAEI	Ministry of Foreign Affairs and European Integration
MJ	Ministry of Justice
Mg^{++}	Ions of magnesium
mg	Milligram
MHLSP	Ministry of Health, Labor and Social Protection
MIA	Ministry of Internal Affairs
MIGA	Multilateral Investment Guarantee Agency
mil.	Million
ml	Milliliter
MJ	Megajoule (10^6 joule)
mm	Millimeters
MOP	Meeting of the Parties to the Kyoto Protocol
MOST	Moldovan Office for Science and Technology
MoREFF	Moldovan Residential Energy Efficiency Financing Facility
MoSEFF	Moldovan Sustainable Energy Financing Facility
MRV	Monitoring, Reporting and Verification
MHLSP	Ministry of Health, Labor and Social Protection
MSAU	Moldovan State Agrarian University
MSCP	Moldova Soil Conservation Project
MSIF	Moldova Social Investment Fund
MSU	Moldova State University
MSW	Municipal Solid Wastes
Mt	Megatonne (10^6 tons)
MTTP	Moldovan Thermal Power Plant
MTU	Moldova Technical University
MW	Megawatt (10^6 watt)
MWh	Megawatt hour
Na^+	Ions of sodium
NA	Non-Applicable
NAER	National Agency for Energy Regulation
NaOH	Sodium Hydroxide
NAMA	National Appropriate Mitigation Actions
NAPEE	National Action Plan on Energy Efficiency
NARDI	National Agency for Research, Development and Innovation
NATO	North Atlantic Treaty Organization
NBM	National Bank of Moldova
NBS	National Bureau of Statistics
NC	National Communications
NC4	Fourth National Communication
NCAA	National Council for Accreditation and Attestation
NCCAS	National Commission for Environmental Fiscal Reform
NDC	National Determined Contribution
NE	Not Estimated
NEEAP	National Energy Efficiency Action Plan
NEEG	Norwegian Energy Efficiency Group
NCEFR	National Commission for Environmental Fiscal Reform
NECP	National Energy Conservation Programme
NEF	National Environment Fund
NGEF	National Grid Emission Factors
NGO	Non-Governmental Organization
NH_3	Ammonia
NH_4^+	Ammonium
NHDR	National Human Development Reports
NIF	Neighbourhood Investment Facility
NIR	National Inventory Report
NMVOC	Non-Methane Volatile Organic Compounds
NO	Not Occurring
NO_x	Nitrogen Oxide
NO_3^-	Nitrate
N_2O	Nitrous Oxide
No.	Number
NPEEY	National Programme for Economic Empowerment of Youth
NSPCPM	National Scientific and Practice Centre for Preventive Medicine
NYEEP	National Youth Economic Empowerment Program
O_3	Tropospheric Ozone
ODA	Technical Assistance and Cooperation between Republic of Moldova and Czech Republic on Implementing Environment Protection Projects
ODA	Official Development Assistance
ODP	Ozone Depleting Potential
ODS	Ozone Depleting Substances
ODIMM	Organization for Small and Medium Enterprises Sector Development
OECD	Organization for Economic Cooperation and Development
OHVL	Overhead High Voltage Line
OP5	Operational stage five of SGP
OSCE	Organization for Security and Cooperation in Europe
OSME	Organization for Development of Small and Medium Enterprises
Page	Page
PC7	Seventh Framework Programme of the European Union
PD	Parliament Decision
PDD	Project Design Document
PDN	Power Distribution Network
PDO	Potential for the destruction of the ozone layer in the atmosphere
PDSFCM	Moldova Communal Forestry Sector Development Project
PFC	Perfluorcarbons
PIN	Project Identification Note
PJ	Petajoule (10^{15} joule)

PM10	10 μm fraction particulate matter
PPP	Purchasing Power Parity
POP	Persistent Organic Pollutants
ppb	Parts per billion of volume
ppm	Parts per million of volume
ppt	Parts per trillion of volume
PPP	Purchasing Power Parity
PST	Pre-Service Training
q	quintals
QA	Quality Assurance
QC	Quality Control
R^2	Coefficient of Determination
RBEC	UNDP Bratislava Regional Center
RDA	Regional Development Agency
REC	Regional Environment Center
RED	Electrical Distribution Networks
RES	Renewable Energy Source
RM	Republic of Moldova
RTEC	Chisinau Electrical Transport Administration
RTTM	Moldovan Technology Transfer Network
s	Second
SACET	CET JSC
SAICM	Strategic Approach to International Chemicals Management
SAIP	State Agency for Intellectual Property
SAR	IPCC Second Assessment Report
SAUM	State Agrarian University of Moldova
SCSTD	Supreme Council for Science and Technological Development
SDC	Swiss Agency for Development and Cooperation
SE	State Enterprise
SEI	State Ecological Inspectorate
SEV	Specific Emissions Values
SF_6	Sulphur Hexafluoride
SGP	Small Grant Program
SHS	State Hydrometeorological Service
SIDA	Swedish International Development Cooperation Agency
SIGMA	Support for Improvement in Governance and Management
SME	Small and Medium Enterprises
SMS	Standardization and Metrology Service
SNC	Second National Communication
SO_2	Sulphur Dioxide
SRL	Limited Liability Company
STDSC	Science and Technological Development Supreme Council
SUM	State University of Moldova
SWOT	Analysis of Strengths, Weaknesses, Opportunities and Threats
$	Dollars
t	tons
T1	Tier 1
T2	Tier 2
TA	Technical assistance
TACIS	Technical Aid to the Commonwealth of Independent States
TAIEX	Technical Assistance and Information Exchange
TAR	IPCC Third Assessment Report
t.c.e.	tons of coal equivalent
TEMPUS	Trans-European Mobility Scheme for University Studies
TI	Total investments
t.o.e.	tons of oil equivalent
TG	Teragram (10^{12} grams)
TJ	Terajoule (10^{12} joule)
TI	Total Investments
TNA	Technology Needs Assessment
TNC	Third National Communications of the Republic of Moldova under the UNFCCC
TRACECA	Transport Corridor Europe-Caucasus-Asia
TSU	Tiraspol State University
TTE	Team of Technical Experts
TTNM	Technology Transfer Network of Moldova
TUE	Total Updated Expenditures
TUM	Technical University of Moldova
TV	Television
UCTE	Union pour la Coordination du Transport de l'Electricité
UN	United Nations
UNECE	United Nations Economic Commission for Europe
UNDP	United Nations Environment Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNDAF	United Nations Development Action Framework
UNFCCC	United Nations Framework Convention on Climate Change
UNIDO	United Nations Program for Industrial Development
USA	United States of America
US AID	United States Agency for International Development)
US EPA	United States Environment Protection Agency
USD	$ US Dollar
USSR	Union of Soviet Socialist Republics
UTA	Autonomous Territorial Unit
VAT	Value Added Tax
WAM	With Additional Measures Scenario
WASP	Wien Automatic System Planning
WB	World Bank
WM	With Measures Scenario
WMO	World Meteorological Organization
WPP	Wind power and photovoltaic plants
WPS	Wind Power Source
WS	Wind Source
x	Mean
	Mean Annual Sum of Precipitation
	Projected Value of the Average Annual Runoff
Σ	Sum
Δ	Difference
ΔP	Projected Total Season Precipitation Changes
ΔT	Projected Season Temperature Changes
σ	Standard Deviation
°	Celsius degrees
′	Seconds
%	Per cent
‰	Promile

CONTENTS

EXECUTIVE SUMMARY

ES.1. Introduction

ES.1.1. Convention's Ultimate Objective

The ultimate objective of the United Nations Framework Convention on Climate Change (UNFCCC) is aimed to achieve stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. To-date 196 countries are Parties to the Convention. Republic of Moldova signed the UNFCCC on June 12, 1992 and it was ratified by the Parliament on March 16, 1995.

Article 4, paragraph 1(a) and Article 12, paragraph 1(a) of the UNFCCC stipulate that each Party has to make available to the Conference of the Parties (COP) a "*national inventory of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, to the extent its capacities permit, using comparable methodologies to be agreed upon by the Conference of the Parties; also a general description of steps taken or envisaged by the Party to implement the Convention; and any other information that the Party considers relevant to the achievement of the objective of the Convention and suitable for inclusion in its communication, including, if feasible, material relevant for calculations of global emission trends*".

ES.1.2. Reporting under the Convention

The main mechanism for making this information available is National Communications. COP 2 (Geneva, 1996) adopted the Guidelines on national communications for non-Annex I Parties (Decision 10/CP 2). In conformity with the respective Guidelines, in 1998-2000, under the *UNDP-GEF Project "Enabling Activities for the preparation of the First National Communication under the UNFCCC"*, Republic of Moldova developed its FNC to UNFCCC (including a national GHG inventory for a time series from 1990 through 1998), submitted to the COP 6 (Hague, 2000).

The COP 8 (New Delhi, 2002) adopted new Guidelines on national communications for non-Annex I Parties (Decision 17/CP 8). In conformity with these Guidelines, in 2005-2009 Republic of Moldova developed its Second National Communication under the UNFCCC (2010), in 2010-2013, the Third National Communication under the UNFCCC (2014), and in 2014-2017, respectively the Fourth National Communication under the UNFCCC (2018).

The COP 3 (Kyoto, 1997) adopted the Kyoto Protocol, representing an instrument setting binding targets for the Parties under Convention, by committing industrialized countries and economies in transition included in Annex I to Convention, to reduce total emissions of direct GHG by at least 5 per cent, against 1990 levels over the five-year period 2008-2012. The Republic of Moldova ratified the Kyoto Protocol on February 13, 2003. As a non-Annex I Party, the Republic of Moldova had no commitments to reduce GHG emissions under the first commitment period of the Kyoto Protocol.

In January 2010, the Republic of Moldova associated itself with the Copenhagen Accord and submitted an emissions reduction target that is specified in Annex II of this Agreement "National Appropriate Mitigation Actions in Developing Countries." The target of mitigation actions for Republic of Moldova under this Agreement is "*to reduce, to not less than 25% compared to the base year (1990), the total national level of greenhouse gas emissions by 2020, by implementing economic mechanisms focused on global climate change mitigation, in accordance with the principles and provisions of the Convention*". This target is presented without indicating specific national appropriate mitigation actions, identified and quantified, and without further clarification of the necessary support to achieve it. Simultaneously, it is recognized that achieving this target will require significant financial, technological and capacity-building support, which can be provided through the UNFCCC mechanisms.

The COP 18 (Doha, 2012) adopted the Doha Amendment to the Kyoto Protocol which establishes a second commitment period (January 1, 2013 – December 31, 2020) for the Parties included in Annex I to the Kyoto Protocol; adds a revised list of greenhouse gases to be reported; and a series of amendments to several articles of the Kyoto Protocol regarding the first commitment period which were to be reviewed in order to remain valid during second commitment period. Under Doha Amendment, within the second commitment period, the developed countries should reduce their greenhouse gas emissions by at least 18 per cent compared to 1990 levels. By 28 September 2018, only 117 Parties had ratified the Doha Amendment to the KP, most of which are non-Annex I Parties to the UNFCCC and the KP.

At COP 19 (Warsaw, 2013), the Parties agreed to communicate their intended nationally determined contributions (INDC) (Decision 1/CP.19), in order to include them in the new Climate Agreement 2015 to be considered and adopted by the COP 21 in 2015, in Paris. The new climate agreement establishes a new commitment period (1st of January 2021 – 31st of December 2030) for reducing the GHG emissions. Also, COP 19 adopted *General guidelines for domestic measurement, reporting and verification of domestically supported nationally appropriate mitigation actions by developing country Parties* (Decision 21/CP.19). This document provides a solid foundation for the new Climate Agreement 2015.

At COP 20 (Lima, 2014) the Parties agreed over *Lima Call for Climate Action* and were repeatedly invited (Decision 1/CP.20) to communicate to the Secretariat their intended nationally determined contributions towards achieving the objective of the Convention as set out in its Article 2. In order to facilitate clarity, transparency and understanding, the INDC may include, as appropriate, inter alia: (i) quantifiable information on the reference point; (ii) time frames and/or periods for implementation; (iii) scope and coverage; (iv) planning processes; (v) assumptions and methodological approaches including those for estimating and accounting for anthropogenic greenhouse gas emissions and, as

appropriate, removals; and (vi) how the Party considers that its national circumstances, and how it contributes towards achieving the objective of the Convention as set out in its Article 2.

According to *Lima Call for Climate Action*, countries were invited to communicate their intended nationally determined contributions by March 31, 2015, the deadline for the presentation being September 30, 2015. The request to the Secretariat was to prepare by 1st of November 2015 a synthesis report on the aggregate effect of the INDC communicated by Parties. The Republic of Moldova was fully committed to the UNFCCC negotiation process towards adopting at COP 21 the Paris Agreement – a document with legal force under the Convention, applicable to all Parties, in line with keeping global warming below 2°C by 2100 compared to the preindustrial era.

The Paris Agreement was signed by the Prime Minister of the Republic of Moldova in New York on September 21, 2016 and was subsequently ratified by the Parliament through Law No. 78 from 04.05.2017 for the ratification of the Paris Agreement (Official Monitor No. 162-170 from 26.05.2017).

At 25th of September 2015, the Republic of Moldova communicated its Intended Nationally Determined Contribution (INDC) and the accompanying information to facilitate clarity, transparency, and understanding, with reference to decisions 1/CP.19 and 1/CP.20. According to its NDC, the Republic of Moldova intends to achieve an economy-wide unconditional target of reducing its greenhouse gas emissions by 64-67 per cent below its 1990 level in 2030 and to make best efforts to reduce its emissions by 67 per cent. The reduction commitment expressed above could be increased up to 78 per cent below 1990 level conditional to, a global agreement addressing important topics including low-cost financial resources, technology transfer, and technical cooperation, accessible to all at a scale commensurate to the challenge of global climate change. GHG emissions reduction targets have been set in an emission budget covering the period from January 1, 2021 to December 31, 2030.

The GHG emission reduction targets set out in the national contribution intentionally determined of the Republic of Moldova were subsequently officially approved at national level by the Government Decision No. 1470 from 30.12.2016 regarding the approval of the Low Emissions Development Strategy of the Republic of Moldova by 2030 and the Action Plan for its implementation (Official Monitor No. 85-91 from 24.03.2017).

ES.2. National Circumstances Relevant to the Greenhouse Gas Emissions and Removals

ES.2.1. Institutional Arrangements

On behalf of the Government of the Republic of Moldova, the Ministry of Agriculture, Regional Development and Environment (MARDE) is responsible for the implementation of international environment treaties to which RM is a Part (including the UNFCCC). Representatives of the MARDE also perform the function of the UNFCCC Focal Point. The Climate Change Office under the MARDE is totally responsible for the activities related to preparation of National Communications, Biennial Update Reports, National Inventory Reports and GHG Inventories.

ES.2.2. Administrative-Territorial Organization, Population Profile and Demographic Situation

Administrative-territorial organization. The Republic of Moldova is administratively divided into 32 districts (rayons) (Anenii Noi, Basarabeasca, Briceni, Cahul, Cantemir, Calarasi, Causeni, Cimislia, Criuleni, Donduseni, Drochia, Dubasari, Edinet, Falesti, Floresti, Glodeni, Hincesti, Ialoveni, Leova, Nisporeni, Ocnita, Orhei, Rezina, Riscani, Singerei, Soroca, Straseni, Soldanesti, Stefan Voda, Taraclia, Telenesti, Ungheni), 5 municipalities (Chisinau, Balti, Comrat, Tiraspol and Bender) and 2 administrative-territorial units: Administrative-Territorial Unit Gagauzia (ATU Gagauzia) and the administrative-territorial units on the left bank of the Dniester (ATULBD).

Population profile. As of 01.01.2017, Moldova's population represented 3827.4 thousand people, with the density of approximately 113.1 persons per square kilometer. In the nation's population, females prevail – 52.1 per cent, as opposed to only 47.9 per cent of males in the total population. The majority of the population is concentrated in the rural areas, the existing 2118.1 thousand residents or 55.3 per cent of the total, on average circa 1400 residents per settlement. The urban population is 1709.3 thousand residents or 44.7 per cent, on average 27 thousand residents per settlement. According to the data of the latest, 2014 population census (held separately in the areas on the right bank of the Dniester and in the administrative-territorial units on the left bank of the Dniester), Moldovans/Romanians accounted for about – 73.1 per cent, Ukrainians – 8.8 per cent, Russians – 7.6 per cent, Gagauz – 4.0 per cent, Bulgarians – 1.9 per cent, Gypsies – 0.3 per cent, other nationalities – 0.7 per cent and those who did not declare their ethnicity – 3.5 per cent.

Demographic situation. During 1990-2016 the demographic processes featured a negative development pattern, which showed itself in the general instability of demographic indicators and phenomena as well as falling birth rate, growing mortality, demographic ageing, depopulation, etc. In 2016, the birth rate was 10.5‰ (17.7‰ in 1990), slightly lower the mortality rate (10.8‰ in 2016, respectively 9.7‰ in 1990); the infant mortality rate was 9.4‰ (19.0‰ in 1990); the share of population aged under 15 decreased down to 17.0 per cent (27.9 per cent in 1990), and the age group of persons above 57/62 years increased to 18.5 per cent (12.6 per cent in 1990); the 'average life expectancy at birth' indicator represented circa 72.2 (68.0 years in 1990), 68.1 years for males (63.9 years in 1990) and 76.2 years for females (71.9 years in 1990).

ES.2.3. Geographic Profile and Natural Resources

Geographical location. Covering an area of 33,846 square km, Republic of Moldova is located in Central Europe, in the north-western Balkans. The country borders on Ukraine in the North, East and South and on Romania in the West, with the Western border line going along the river Prut. The Republic of Moldova is a Black Sea region country. Its southern border extends almost as far as the Black Sea coast, and the access to the Black Sea is open for the Republic of Moldova through the Dniester estuary and the Danube.

Relief. The relief of the Republic of Moldova is represented by hills and flatland areas, with uplands mostly in the central part of the country. The absolute altitudes are within the range of 429 m (Balanesti Hills) and 4 m above the sea level in the Dniester flood land (Palanca village).

Land resources. Republic of Moldova has unique land resources characterized by predominant black earth soils (~75 per cent) with high productivity potential, very high utilization rate (>75 per cent); and rugged topography (above 80 per cent of the total arable land are located on hill slopes).

Water resources. The hydrographical network accounts for circa 2.7 per cent of the country's territory and has a total length of circa 16 thousand km. The main rivers are Dniester and Prut, with a small opening to the Danube in the South. Moldova's hydrographical network density is 0.48 km per square kilometer on the average, varying between 0.84 km/km^2 in the northern regions and 0.12 km/km^2 in the regions on the left bank of the Dniester. There are approximately 60 natural lakes and more than 4.25 thousand water storage reservoirs. There are also about 7 thousand boreholes, circa 179 thousand water-wells and circa 3 thousand springs, estimated at 1.8 million m^3/day.

Biological resources. Currently the flora of the Republic of Moldova comprises about 5638 plant species (superior plants – 2014 species while inferior plants – 3624 species). The ecosystems which have the richest flora composition include: the forest (above 850 species), steppe (above 600 species), high-water basin (approximately 650 species), petrophyte (about 250 species), water and swamp (about 160 species) systems. The Republic of Moldova's fauna is relatively rich and manifold. There are above 15.0 thousand species of animals in the Republic of Moldova, including 461 species of vertebrates and above 14 thousand species of non-vertebrates. The vertebrates include 70 species of mammals, 281 bird species, 14 reptile species, 14 amphibian species and 82 fish species. Birds are highest in number among the vertebrates (281 species and subspecies), and insects - among non-vertebrates (above 12 thousand species). There are five natural reservations established for scientific research purposes (Codrii, Iagorlic, Padurea Domneasca, Plaiul Fagului, Prutul de Jos) with the total area of 19.2 thousand ha in the RM.

Mineral resources. In the RM mineral resources are extracted from 415 deposits, the most important being limestone, granite, bentonite clay and sandy clay, diatomite, gypsum and chalk stone. Most of the minerals are extracted from open mines, and only certain limestone varieties are mined from stone quarries (underground galleries).

ES.2.4. Climate Profile

The climate of the Republic of Moldova is moderately continental, characterized by relatively mild winters with little snow, long warm summers and low humidity. The country is located in the interference region of the Atlantic air masses in Western Europe, Continental in North-East and Mediterranean in South-West. There are several distinct particularities in the territorial distribution of climate elements: (i) temperate increase in the southern direction, from an annual average of 8.7°C in North to 10.5°C in the South; (ii) a regional distribution of annual average precipitations with a decrease from North to South: from an annual average of 597.9 mm in the northern region to 518.8 mm in the southern region of the country; and (iii) an increase by circa 100 mm of the multiannual average precipitations in the high plain regions, compared to the neighboring plains. Over the last 130 years, the RM has experienced changes in average temperature and precipitation. The country has become warmer, with the average temperature increase greater than 1.2°C; while the increase in precipitations constituted only around 55.6 mm.

ES.2.5. Economical Profile

Gross Domestic Product. In 2017, the share of Industry in the GDP structure was 11.8 per cent, Agriculture – 12.2 per cent, Transport and Communications – 4.9 per cent, Constructions – 3.3 per cent, Wholesale and Retail Trade – 14.4 per cent, Financial Activities – 5.1 per cent, Other Sectors – 30.9 per cent, Net Product and Import Taxes – 15.9 per cent.

The country's economy was in decline even before 1991, but the separation from the USSR has accelerated that process considerably. Gross Domestic Product levels were decreasing continuously during the period from 1990 to 1999 inclusively, when it fell down to as little as 34 per cent of the 1990 level. The only exception was year 1997, when a slight increase by 1.6 per cent versus the previous year was registered due to the excellent agricultural yields as result of the very favorable weather. The reasons for the economic collapse were multiple. First, the Republic of Moldova had been integrated completely in the USSR economic system, and the independence resulted, among other things, in the cessation of any subsidies or cash transfers from the centralized government. Second, the end of the Soviet Era with its well stablished commercial links has resulted in the emergence of multiple obstacles for free movement of products, and in access restrictions introduced by the emerging markets. Third, the lack of domestic energy resources and raw materials in the RM has contributed considerably to the nation's strong dependence on other former Soviet Republics. Certain internal reasons should be mentioned as well, such as: transition from a centralized economy to a market economy; loss of the industries located in Transnistria (separatist region on the left bank of Dniester River); frequent droughts; and the civil conflict. The considerable GDP growth achieved since 2000 seems to indicate that the economy is finally developing in the correct direction, although it should be remembered that in 2017 the GDP reached only 75.8 per cent of the 1990 level (Figure ES-1).

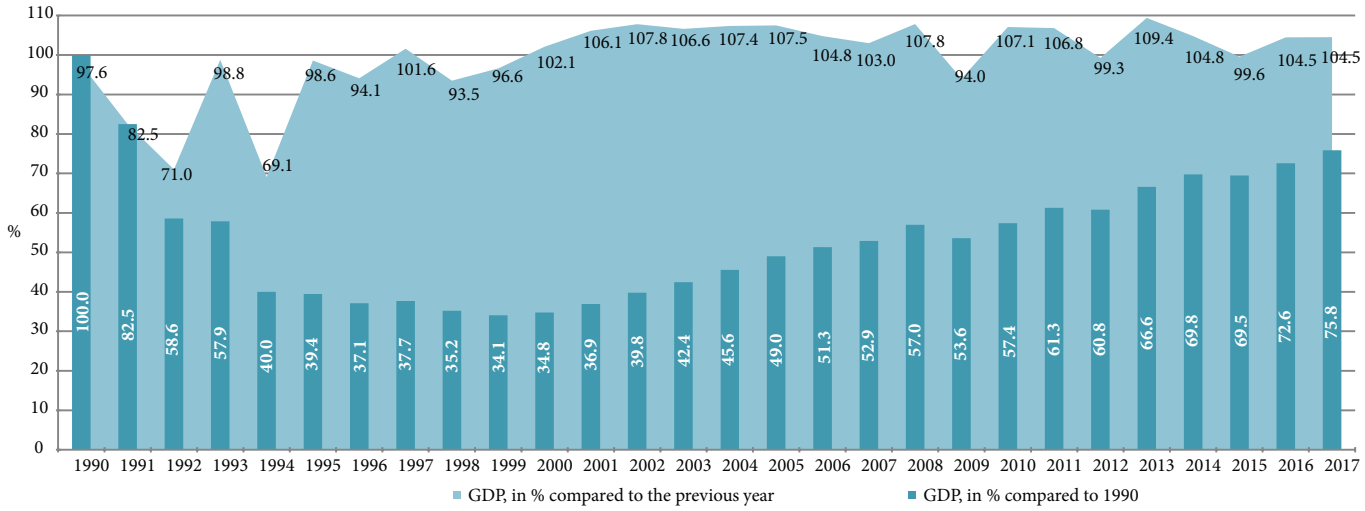


Figure ES-1: Gross Domestic Product in the Republic of Moldova during 1990-2017 time series, in % compared to 1990 and respectively, to the previous year.

Trade Balance Deficit. Moldova's import expenses exceed considerably the nation's proceeds from its exports, thus indicating a serious problem in terms of the nation's trade balance deficit. That deficit increased from 23.7 per cent of the GDP in 2000, up to 29.6 per cent of the GDP in 2017. The above reflects the nation's dependence on the imports of energy resources and the growing demand for the imported products. The imports growth is driven by the massive inflow of cash transfers from abroad, which are channeled in domestic consumption.

Cash Transfers and Remittances. In 2017, the total net inflow of foreign currency from the Moldovans employed abroad represented approximately 1.585 billion USD or circa 19.5 per cent of the GDP. Cash transfers from outside the country, and in particular cash inflows from the Moldovans working abroad are of major importance for the economy of the Republic of Moldova. Globally, the RM is among the leaders regarding the share of remittances in GDP.

Investments. Investments play an essential role in the economic growth of the country, increasing significantly over the last years. In 2017, investments in the national economy represented about 20.997 billion MDL, equivalent of circa 1.136 billion USD (14.0 per cent of the GDP). At the same time, in 2017 the direct foreign investments attracted to the national economy (net values) accounted for 208.5 million USD (2.6 per cent of the GDP), well below the level of 2008, when foreign direct investments attracted by the national economy represented 726.6 million USD (12.0 per cent of the GDP). The international investment position represented at 31.12.2017, remained net debtor and accounted -3.95 billion USD, the negative balance increasing by 30.3 per cent compared to the end of 2016. The stock of liabilities to foreign direct investments represented 3.70 billion USD (an increase by 21.9 per cent from the beginning of the year) and accounted for 41.4 per cent of the total foreign liabilities. During 2017, the stock of official reserve assets was reinforced, thus, at 31.12.2017, it increased by 27.1 per cent compared to the end of 2016, reaching to 2.80 billion USD. The country's gross external debt as of December 31, 2017 recorded 6.97 billion USD, increasing by 11.8 per cent compared to the beginning of the year.

Social Sphere. In 2017, the average monthly gross nominal salary of an employee in the national economy was MDL 5,697.1, a 14.0 per cent increase compared to 2016, while real income (adjusted to the consumer price index) – increased by 5.2 per cent. The average monthly old-age pension as of January 1, 2018 represented MDL 1,527.9, an increase compared to its level as of January 1, 2017 (1,275.2 MDL). The number of pensioners registered by the social security authorities as of January 1, 2018 represented 716 thousand people, or with 24.8 thousand more compared to January 1, 2017 (691.2 thousand people). In 2017, the number of unemployed, estimated according to the standards of the International Labor Organization was 51.6 thousand people. The unemployment rate (unemployed persons as a percentage of the total economically active population) recorded at the country level represented 4.1 per cent (4.8 per cent for males and 3.3 per cent for females).

ES.2.6. Current State of the National Economy

Industry. In 2017, the industrial production reached only circa 63.8 per cent of the 1990 level (Figure ES-2). During 1990-2017, the industrial production featured certain fluctuations, showing the best performance in 2001, 2003 and 2011, and the worst performance respectively, in 1992, 1994, 1998, 1999 and 2009. The situation in the manufacturing industry was determined mainly by the processing industry which account for circa 87.6 per cent of the total production of the large enterprises whose main business was manufacturing. Food and drinks industry accounted for the highest share in the processing industry performance (processing and canning of meat and meat products, fruit and vegetables, production of dairy products, pastry, fodder, bread and baked products, sugar, confectionary, cocoa, chocolate, confectionary, alcoholic drinks, wine, beer, etc.) as well as production of other products of non-ferrous minerals (manufacturing of glass and glass products; fritted bricks and tiles; cement; lime; gypsum and concrete elements).

Energy. Total energy consumption in 2016 in the RM accounted for as little as circa 26.5 per cent compared to 1990 (Figure ES-2) (electricity consumption - circa 45.7 per cent, and heat consumption, respectively only circa 17.3 per cent). The main power generation facilities in the RM are: Moldovan Thermal Power Plant (MTPP) in Dnestrovsk (ATULBD) with the installed capacity of 2520 MW (available output of around 950 MW); Combined Heat Power Plant No. 1 (CHP-1) in Chisinau with the installed electricity generation capacity of 46 MW (available output of about 40 MW) and installed heat generation capacity of 455 MW; Combined Heat Power Plant No. 2 (CHP-2) in Chisinau with the installed electricity generation

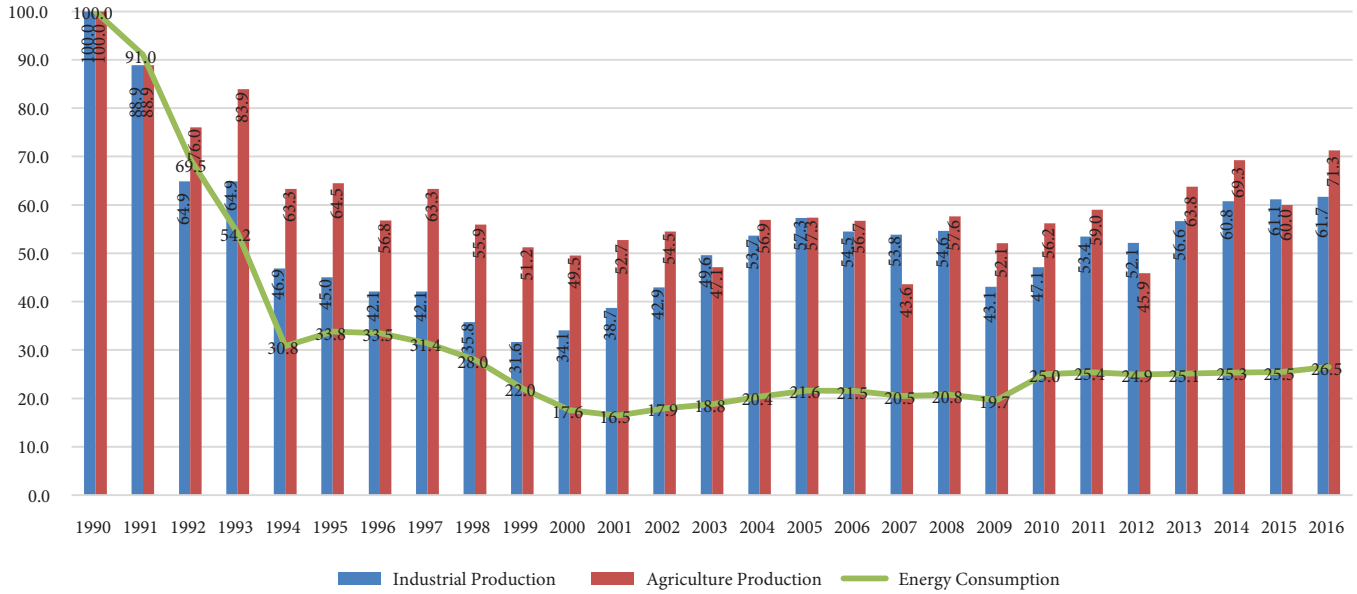


Figure ES-2: The Main Economic Indicators of the Republic of Moldova during 1990-2016 time series, in % compared to 1990.

capacity of 240 MW (available output of around 210 MW) and installed heat generation capacity of 1425 MW; Combined Heat Power Plant North (CHP-North) in Balti with the installed electricity generation capacity of 28.5 MW (available output of about 24 MW) and installed heat generation capacity of 610 MW; CHPs of the sugar mills with the total installed capacity of 98 MW (available output of around 20 MW), Dubasari Hydro-Power Plant (HPP) with the installed capacity of 48 MW (available output of about 30 MW) and Costesti HPP with the installed capacity of 16 MW (available output of about 10 MW). During 2017, the total amount of electricity produced from renewable sources (photovoltaic, wind, biogas and hydroelectric) accounted for circa 30.2 GWh. The respective amount of electricity produced increased by circa 69.4 per cent compared to 2016 (respectively by circa 15.8 times compared to 2013).

Agriculture. In 2016, the agriculture production by all categories of producers accounted for only circa 71.3 per cent of the 1990 level (Figure ES-2) (in 2017, an increase up to 77.4 per cent of the 1990 level was recorded). During 1991-2017, the agricultural production was characterized by fluctuations, with the best performance reported in 1993, 1997, 2004, 2008, 2010, 2011, 2013, 2014 and 2017, and with poor results – respectively in 1992, 1994, 1996, 1998, 2003, 2007, 2012 and 2015, in most cases being caused by unfavorable climate conditions (severe droughts in 2003, 2007, 2012 and 2015). Within 1990-2016 time series the sowing areas of certain crops have been significantly reduced (areas sown with tobacco decreased by 98.1 per cent, fodder crops – by 87.8 per cent, sugar beet – by 74.4 per cent, leguminous crops – by 63.8 per cent, legumes – by 57.1 per cent, potatoes – by 49.2 per cent, etc.). A decreasing trend was recorded regarding the average yield per hectare for certain crops (perennial grasses for green fodder, silage and fodder – by 87.9 per cent, root crops for fodder – by 68.5 per cent, annual grasses for green fodder – by 56.1 per cent, legumes – by 36.6 per cent, tobacco – by 27.3 per cent, wheat – by 27.3 per cent, barley – by 22.2 per cent, grain maize – by 10.9 per cent, etc.). At the same time, within the respective period, increased significantly areas sown with sun flower (by 210.3 per cent), grain maize (by 88.2 per cent), wheat (by 58.6 per cent) and soybeans (by 56.2 per cent). Also, there was also recorded an increased average yield per hectare for crops such as: melons and gourds (by 135.4 per cent), potatoes (by 46.8 per cent), winter rye (by 37.0 per cent), leguminous crops (by 28.5 per cent), soybeans (by 17.9 per cent), rapeseed (by 17.3 per cent), oat (by 11.6 per cent) and sugar beet (by 9.2 per cent). Compared to 1990, the amount of synthetic and organic fertilizer applied to soil has reduced significantly: in 2016, 58.8 kt of synthetic fertilizers and 75 kt of organic fertilizers were applied or by 74.7 per cent and respectively 99.2 per cent less than in 1990 (232.4 kt of synthetic fertilizers and 9.74 Mt of organic fertilizers). Also, the number of domestic livestock and poultry has reduced considerably compared to 1990 (standing by the end of the year): cattle – by 81.2 per cent (1060.7 thousand in 1990, 199.8 thousand in 2016), sheep – by 42.6 per cent (1244.8 thousand in 1990, 714.8 thousand in 2016), swine – by 74.6 per cent (1850.1 thousand in 1990, 469.7 thousand in 2016) and poultry – by 46.5 per cent (24.625 million in 1990, 13.172 million in 2016), horses – by 20.8 per cent (47.2 thousand in 1990, 37.4 thousand in 2016); at the same time, it increased the number of goats – by 350.1 per cent (37.1 thousand in 1990, 167.0 thousand in 2016), rabbits – by 29.6 per cent (283.0 thousand in 1990, 366.7 thousand in 2016) and asses and mules – by 82.4 per cent (1.7 thousand in 1990, 3.1 thousand in 2016).

Transport. RM's transport sector is comprised of the following segments: road transportation, railway transport, air transportation and naval transportation. The national network of roads has a total length of 10 897 km (including 9386 km – on the right bank of Dniester, 1511 km – on the left bank of Dniester; hard-surface roads: 8894 km – on the right bank of Dniester and 1470 km – on the left bank of Dniester). The network of roads is sufficiently developed (the public roads density represents circa 322 km/1000 km^2, while the hard-surface roads – circa 306 km/1000 km^2), but the state of the roads and the infrastructure in general is deplorable, though in the last ten years repairs and restoration of the national road network are being widely performed. Between 1990 and 2016, the number of road vehicles in the RM has significantly increased: trucks - by 119.7 per cent (from 76.909 thousand to 168.963 thousand), buses and minibuses - by 89.3 per cent (from 11.305 thousand to 21.399 thousand) and cars - by 213.0 per cent (from 208.984 thousand to 654.108 thousand). The total length of railway lines is 1,157 km, while the density per 1,000 km^2 is circa 34.0 km. RM's river transport is in the process of development and growth in terms of both the number of ships and the number of river ports. The length of waterways for general use is currently about 624 km (including 558 km on the right bank of Dniester, respectively 66 km on the left bank of Dniester). There are 4 airports in the RM: in Chisinau, Balti, Cahul and Marculesti, of which only the Chisinau airport offers regular scheduled flights. The airports in Cahul and Marculesti are still in the process of obtaining the required statutory approvals and certificates. The Balti Airport is certified, but it offers only charter flights. In comparison with 1990 the freight transportation has reduced considerably, both in terms of the freight transportation turnover (by 88.8 per cent: from 331.1 mil. tons in 1990 to 37.0 mill. tons in 2016), as well as freight transportation distance (by 74.7 per cent: from 21,648 mil. tons-km in 1990 to 5,484 mil. tons-km in 2016). The same period of time witnessed the significant reduction in number of passengers (by 66.7 per cent: from 757.7 mil. passengers in 1990 to 252.0 mil. passengers in 2016), as well as in passengers transportation distance (by 46.6 per cent: from 10,102 mil. passengers-km in 1990 to 5,397 mil. passengers-km in 2016).

Dwellings Sector. On January 1, 2018, the dwelling stock of the Republic of Moldova represented 1,287.3 thousand units with a total area of 87.3 million m^2 (by 0.6 per cent more than in the previous year, respectively by circa 12.1 per cent more compared to 1990). In territorial aspects, 539.0 thousand units were recorded in urban areas - a total area of 38.3 million m^2, representing 41.9 per cent of the total registered dwelling stock. In rural settlements there are 748.3 thousand units with a total area of 49.0 million m^2 or 58.1 per cent of the total. According to the number of rooms, in 2017 only 10.0 per cent of the total number of registered dwellings were one-room units (in comparison to 21.7 per cent in 1990), 32.2 per cent – with two rooms (47.6 per cent in 1990), 36.5 per cent – with three rooms (30.7 per cent in 1990), respectively 21.2 per cent – with four rooms and more. On January 1, 2018, circa 98.5 per cent of the total dwelling stock in the RM was privately owned (69.2 per cent in 1990), respectively circa 1.5 per cent was public property (30.8 per cent in 1990). Within 1990-2016 period, indicative energy consumption per m^2 of total area decreased in the residential sector from circa 26.0 kg c.c./m^2 in 1990 to circa 20.7 kg c.c./m^2 in 2016. During 1990-2016, the gasification of the country has been successfully accomplished. This has made possible to considerably reduce the consumption of solid and liquid fuels in favor of natural gas and, after 2010 also in favor of renewable energy sources (in particular biomass). Thus, the length of the natural gas networks increased between 1990 and 2016 by circa 12.3 times (from 1.8734 thousand km in 1990 to 22.9810 thousand km in 2016), including by circa 6.5 times in urban areas (from 1.072 thousand km in 1990 to 6.990 thousand km in 2016) and by 20 times in rural areas (from

0.8014 thousand km in 1990 to 15.9910 thousand km in 2016). In the same context, the total number of flats (houses) fueld from the gas networks in the RM increased in the respective period by circa 1.6 times in urban areas (from 281.8 thousand in 1990 to 456.4 thousand in 2016) and by circa 10.2 times in rural areas (from 21.5 thousand in 1990 to 218.8 thousand in 2016).

ES.3. National Greenhouse Gases Inventory

ES.3.1. Republic of Moldova's Contribution to Global Warming

RM's historical responsibility regarding GHG emissions is small. In 2016, the country's contribution accounted for circa 14.58 Mt CO_2 equivalent (without LULUCF) and 13.68 Mt CO_2 equivalent (with LULUCF), under 0.04 per cent of total global GHG emissions.

Total and net emissions per capita were two times lower than the global average (3.8 t CO_2 equivalent/per capita compared to 6.4 t CO_2 equivalent/per capita, respectively 3.6 t CO_2 equivalent/per capita compared to 6.8 t CO_2 equivalent/per capita). Also, RM's contribution recorded since 1990 remains small, under 0.05 per cent of total global GHG emissions (without LULUCF) and under 0.04 per cent of total global GHG emissions (with LULUCF).

Within the 1990-2016, time series, the total national GHG emissions decreased by circa 67.5 per cent: from 44.9 to 14.6 Mt CO_2 equivalent.

ES.3.2. Institutional Arrangements

Within the Ministry of Agriculture, Regional Development and Environment, the Climate Change Office is totally responsible for the activities related to preparation of National Communications (NCs), Biennial Update Reports (BURs) National Inventory Reports (NIRs) and Greenhouse Gas (GHG) Inventories.

ES.3.3. Methodological Issues

The national inventory is structured to match the reporting requirement of the UNFCCC and is divided into five main sectors (energy, IPPU, agriculture, LULUCF and waste), and each of these sectors is further subdivided within the inventory into source categories. Emissions of direct (CO_2, CH_4, N_2O, HFC, PFC and SF_6) (no NF_3 emissions have been registered in the RM so far) greenhouse gases were estimated based on methodologies contained in the 2006 IPCC Guidelines, while the indirect emissions (NOx, CO, NMVOC and SO_2) were estimated based on methodologies according to the EEA/EMEP Air Pollutant Emission Inventory Guidebook (2016).

ES.3.4. Key Categories

In order to prioritize efforts aimed at improving the overall quality of the inventory, based on recommendations set forth in the 2006 IPCC Guidelines, the key categories were identified for the time series 1990 through 2016, without LULUCF – based on the Tier 1 approach – 14 key categories by level (L) and 16 key categories by trend (T): based on a Tier 2 approach – 13 key categories by level (L) and 13 key categories by trend (T); with LULUCF, based on the Tier 1 approach – 20 key categories by level (L) and 20 key categories by trend (T), respective, based on a Tier 2 approach – 18 key categories by level (L) and 17 key categories by trend (T).

ES.3.5. Quality Assurance and Quality Control

The basic Quality Assurance (QA) and Quality Control (QC) activities carried out in the RM included detailed specific procedures implied by Tier 1 approach (general procedures) and Tier 2 approach (source-specific), also, technical review (audit) carried out by experts who were not directly involved in the national inventory compilation/development process; activity data quality check, including by comparing data obtained from different sources; inventory planning and coordination at an inter-institutional level; as well as the continuous documentation and archiving of all materials used in inventory preparation process. As the entity responsible for the national inventory development, the CCO holds all documentation used for its compilation.

ES.3.6. Recalculations

The GHG inventory team revised and recalculated GHG emissions and removals for each calendar year covered by the NC4 of the RM under the UNFCCC (2018) (it contains the GHG Inventory for the period from 1990 through 2015). The respective activities were carried out during the on-going process of improving the quality of the National GHG Inventory (including: considering updated activity data, use of higher methodological approaches and emission factors available in the 2006 IPCC Guidelines, and by correcting identified errors). In comparison with the results reported under the NC4 of the RM under the UNFCCC (2018), the changes performed during the development of the current inventory, resulted in an increase of total direct GHG emissions for 1990-1993, 1995 and 1999-2015 years, respectively in a decrease of GHG emissions in 1994 and 1996-1998 years.

ES.3.7. Uncertainty Assessment

In the Republic of Moldova, the GHG emissions were estimated with the highest possible accuracy; however, the obtained results have a certain degree of uncertainty. Some emissions estimates, such as for example, CO_2 emissions from fossil fuels combustion, or CO_2 emissions from cement production, are considered to have minimal uncertainty. For other source categories, because of the poor quality of activity data, the use of default emission factors, as well as a consequence of limited understanding of the emissions generation process, the uncertainty is quite high. The overall inventory uncertainty was estimated for the period 1990-2016 using a Tier 1 approach, representing ±7.27 per cent uncertainty by level, and ±2.23 per cent uncertainty by trend.

ES.3.8. Completeness Assessment

Republic of Moldova's National GHG Inventory is, mostly, a complete inventory of the following direct GHG – CO_2, CH_4, N_2O, HFC, PFC, SF_6 and NF_3. The national inventory includes also the indirect GHGs such as: CO, NO_x, NMVOC and SO_2. Despite the effort to cover all existent sources and sinks, the inventory still has some gaps, most being determined by lack of activity data needed to estimate certain emissions and removals.

ES.3.9. Reporting Direct Greenhouse Gas Emissions

Carbon dioxide continues to contribute most to the total direct GHG emissions in the Republic of Moldova (Figure ES-3).

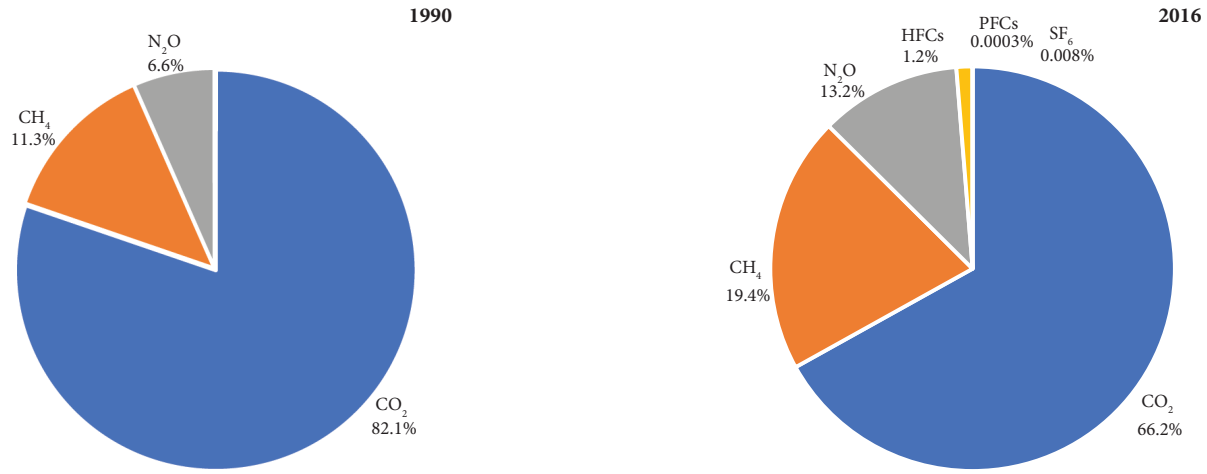


Figure ES-3: Republic of Moldova's Total Direct GHG Emissions by Gas, 1990 and 2016.

In the time series from 1990 through 2016, the total CO_2 emissions (without LULUCF) decreased by circa 73.8 per cent (from 36.9 Mt in 1990 to 9.6 Mt in 2016). CH_4 and N_2O emissions decreased by circa 44.1 per cent (from 5.1 Mt CO_2 equivalent in 1990 to 2.8 Mt CO_2 equivalent in 2016), respectively by 35.5 per cent (from 3.0 Mt CO_2 equivalent in 1990 to 1.9 Mt CO_2 equivalent in 2016) (Table ES-1). Evolutions of F-gases emissions show a steady trend towards increase in recent years, though their share in the total national GHG emissions structure is insignificant for now.

Table ES-1: Direct GHG Emission Trends in the RM within 1990-2016, Mt CO_2 equivalent

	1990	1991	1992	1993	1994	1995	1996	1997	1998
CO_2 (without LULUCF)	36.8708	32.9724	25.8671	18.0917	14.9511	11.8367	11.6817	10.6765	9.1782
CO_2 (with LULUCF)	35.1701	30.1962	23.6888	15.8652	12.8119	9.7140	9.1348	8.5282	7.0007
CH_4 (without LULUCF)	5.0725	5.0001	4.7216	4.3607	4.2749	4.0442	3.9842	3.5956	3.4538
CH_4 (with LULUCF)	5.0752	5.0025	4.7238	4.3636	4.2766	4.0464	3.9857	3.5983	3.4563
N_2O (without LULUCF)	2.9754	2.8038	2.3118	2.2884	1.8122	1.9207	1.8522	1.8911	1.7134
N_2O (with LULUCF)	3.1458	2.9877	2.5164	2.5110	2.0487	2.1722	2.1144	2.1633	1.9978
HFCs	NO	NO	NO	NO	NO	0.0040	0.0043	0.0051	0.0061
PFCs	NO	NO	NO	NO	NO	NO	NO	NO	NO
SF_6	NO	NO	NO	NO	NO	NO	NO	NO	NO
Total (without LULUCF)	**44.9188**	**40.7762**	**32.9006**	**24.7408**	**21.0382**	**17.8055**	**17.5224**	**16.1683**	**14.3515**
Total (with LULUCF)	**43.3912**	**38.1864**	**30.9290**	**22.7398**	**19.1372**	**15.9366**	**15.2393**	**14.2949**	**12.4608**
	1999	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
CO_2 (without LULUCF)	7.6797	6.9073	7.5065	7.1902	7.8726	8.6153	8.8852	8.1810	8.6850
CO_2 (with LULUCF)	5.7861	4.7293	5.6925	5.2897	6.0450	6.6226	7.1875	6.3674	6.6783
CH_4 (without LULUCF)	3.3443	3.2629	3.2477	3.3012	3.2065	3.1722	3.1798	3.0564	2.8926
CH_4 (with LULUCF)	3.3467	3.2639	3.2490	3.3015	3.2065	3.1724	3.1801	3.0567	2.8941
N_2O (without LULUCF)	1.5605	1.4471	1.6378	1.6912	1.4503	1.7227	1.7419	1.6553	1.0642
N_2O (with LULUCF)	1.8544	1.7434	1.9343	1.9881	1.7446	2.0129	2.0285	1.9379	1.3423
HFCs	0.0068	0.0083	0.0105	0.0145	0.0208	0.0292	0.0408	0.0536	0.0678
PFCs	NO	NO	NO	NO	NO	NO	NO	0.0000	0.0000
SF_6	NO	NO	NO	NO	0.0000	0.0000	0.0001	0.0003	0.0004
Total (without LULUCF)	**12.5913**	**11.6256**	**12.4024**	**12.1971**	**12.5502**	**13.5394**	**13.8478**	**12.9467**	**12.7101**
Total (with LULUCF)	**10.9940**	**9.7449**	**10.8863**	**10.5938**	**11.0170**	**11.8371**	**12.4369**	**11.4159**	**10.9829**
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
CO_2 (without LULUCF)	9.2429	9.6332	9.9495	10.2529	9.8055	8.8651	9.4851	9.8737	9.6455
CO_2 (with LULUCF)	7.5496	8.3344	8.7292	9.0928	8.6313	7.8442	8.8289	8.7806	8.5458
CH_4 (without LULUCF)	2.8743	2.8064	2.8209	2.8784	2.8205	2.7464	2.8143	2.7589	2.8351
CH_4 (with LULUCF)	2.8751	2.8067	2.8210	2.8786	2.8217	2.7472	2.8144	2.7596	2.8355
N_2O (without LULUCF)	1.6695	1.8905	1.6517	1.6547	1.2496	1.7354	1.9375	1.5688	1.9205
N_2O (with LULUCF)	1.9415	2.1558	1.9099	1.9067	1.4830	1.9527	2.1399	1.7591	2.0997
HFCs	0.0821	0.0914	0.1029	0.1165	0.1242	0.1306	0.1421	0.1678	0.1756
PFCs	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SF_6	0.0005	0.0006	0.0007	0.0007	0.0008	0.0010	0.0011	0.0011	0.0011
Total (without LULUCF)	**13.8693**	**14.4220**	**14.5256**	**14.9033**	**14.0006**	**13.4784**	**14.3801**	**14.3705**	**14.5778**
Total (with LULUCF)	**12.4489**	**13.3888**	**13.5637**	**13.9953**	**13.0611**	**12.6757**	**13.9265**	**13.4683**	**13.6578**

Abbreviations: NA – Not Applicable; NO – Not Occurring.

Energy Sector is the most important source of national direct GHG emissions, its share varying over the time series from 1990 through 2016 from 81.5 per cent to 68.1 per cent. Other relevant sources are represented by the Agriculture Sector, Waste Sector and Industrial Processes and Product Use Sector (Figure ES-4). During the entire period under review, the LULUCF Sector represented a net source of carbon removals. With the decrease of direct GHG emissions at national level, the relevance of this sector in the structure of net national GHG emissions increased: in 1990 – the removals represented circa 3.4 per cent of the total national GHG emissions, while in 2016 it represented circa 6.3 per cent of the total.

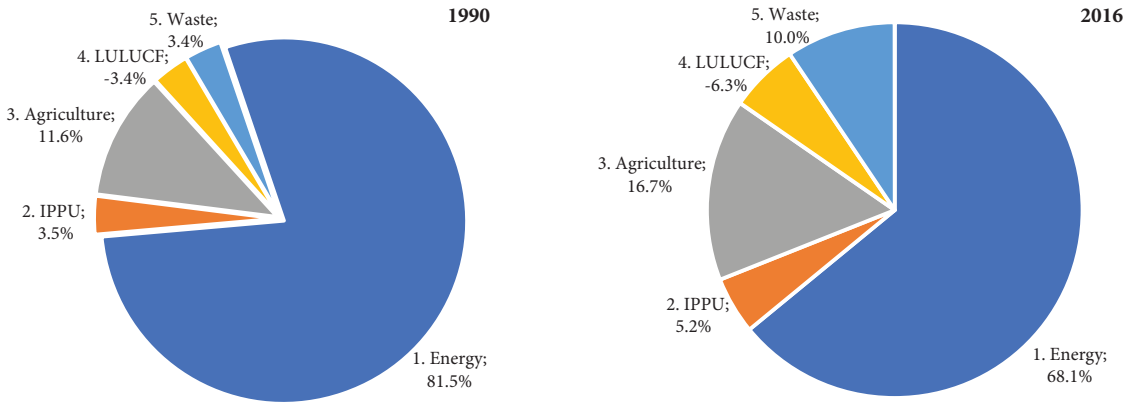


Figure ES-4: Sectoral Breakdown of the Republic of Moldova's total GHG Emissions in 1990 and 2016.

Within 1990-2016 time series, total GHG emissions in the Republic of Moldova tended to decrease, thus emissions under Energy Sector decreased by circa 72.9 per cent, Industrial Processes and Product Use – by 51.5 per cent, Agriculture – by 53.5 per cent, LULUCF – by 39.8 per cent, while from Waste Sector – by 3.6 per cent (Table ES-2).

Table ES-2: Direct Greenhouse Gas Emissions in the Republic of Moldova by Sector within 1990-2016, Mt CO_2 equivalent

	1990	1991	1992	1993	1994	1995	1996	1997	1998
1. Energy	36.6105	32.9696	26.1405	18.1730	15.1473	12.1574	12.1291	10.9364	9.4505
2. Industrial Processes and Product Use	1.5723	1.3947	0.8089	0.7249	0.5488	0.4505	0.4097	0.4514	0.3771
3. Agriculture	5.2206	4.8628	4.4000	4.2297	3.7460	3.6029	3.3846	3.1852	2.9525
4. LULUCF	-1.5276	-2.5899	-1.9715	-2.0010	-1.9010	-1.8689	-2.2831	-1.8735	-1.8907
5. Waste	1.5154	1.5491	1.5512	1.6132	1.5962	1.5947	1.5990	1.5953	1.5714
	1999	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
1. Energy	7.9883	7.2889	7.8927	7.5977	8.2968	9.0248	9.2488	8.3586	8.6524
2. Industrial Processes and Product Use	0.3410	0.3141	0.3190	0.3723	0.4065	0.4854	0.5919	0.7020	0.9616
3. Agriculture	2.6962	2.4808	2.6761	2.7449	2.3999	2.5926	2.5784	2.4664	1.6768
4. LULUCF	-1.5973	-1.8807	-1.5162	-1.6033	-1.5332	-1.7023	-1.4109	-1.5308	-1.7272
5. Waste	1.5658	1.5418	1.5146	1.4823	1.4471	1.4366	1.4288	1.4196	1.4194
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
1. Energy	9.1322	9.9117	10.1950	10.4985	10.0362	9.0257	9.6569	10.0638	9.9272
2. Industrial Processes and Product Use	1.0553	0.5558	0.5923	0.6960	0.7132	0.7626	0.7949	0.7842	0.7619
3. Agriculture	2.2434	2.5018	2.2550	2.2079	1.7601	2.2526	2.4923	2.0912	2.4285
4. LULUCF	-1.4205	-1.0332	-0.9619	-0.9080	-0.9396	-0.8027	-0.4536	-0.9022	-0.9200
5. Waste	1.4385	1.4527	1.4833	1.5009	1.4911	1.4376	1.4361	1.4313	1.4603

ES.3.10. Reporting Ozone and Aerosol Precursors Emissions

Photochemically active gases, such as carbon monoxide (CO), nitrogen oxides (NO_x) and non-methane volatile organic compounds (NMVOC) are not regarded as greenhouse gases; however they contribute to greenhouse effect in an indirect way. These gases are considered to be ozone precursors influencing formation and disintegration of ozone in the atmosphere. Mainly, they persist in the exhaust gases from the vehicles, result from fossil fuel combustion in stationary sources, from solvents and other products use etc. Thus, the national GHG inventory of the Republic of Moldova includes emissions of the following ozone and aerosol precursors: NOx, CO, NMVOC and SO_2.

Between 1990 and 2016, total nitrogen oxides emissions decreased by circa 74.7 per cent: from 94.9 kt in 1990, to 24.0 kt in 2016; total carbon monoxide emissions decreased by circa 68.1 per cent: from 279.8 kt in 1990, to 89.3 kt in 2016; non-methane volatile organic compounds emissions – by circa 62.6 per cent: from 141.4 kt in 1990, to 52.9 kt in 2016; while sulphur dioxide emissions – by circa 92.3 per cent: from 157.1 kt in 1990, to 12.0 kt in 2016 (Table ES-3).

Table ES-3: Ozone and Aerosol Precursors (NO_x, CO and NMVOC) and SO_2 Emission Trends in the RM within 1990-2016 periods, kt

	1990	1991	1992	1993	1994	1995	1996	1997	1998
NO_x	94.8503	83.6784	61.5984	49.3910	37.5579	31.7755	29.6012	26.5722	22.3525
CO	279.8219	262.9974	144.6734	67.9779	73.8756	63.8267	77.1933	71.0192	54.7183
NMVOC	141.4089	120.3062	91.5110	70.7995	52.0801	48.9688	47.0827	32.2721	28.2124
SO_2	157.0987	142.3319	102.2872	75.3756	59.9048	34.4348	34.2863	19.0834	14.3869
	1999	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
NO_x	17.2357	15.9945	17.3397	18.1234	19.0540	20.3723	21.1615	20.2740	21.1621
CO	42.4575	40.5859	39.6065	45.7546	55.7082	52.6429	54.3501	55.0501	49.5847
NMVOC	22.3883	21.9813	23.3836	26.0647	28.5055	40.4511	43.0595	48.1839	48.3704
SO_2	11.4081	9.8641	9.3435	10.3207	11.8437	11.1920	10.9930	10.9383	9.7668
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
NO_x	22.0226	21.1854	22.8056	23.3555	21.9438	20.9647	22.0749	23.4640	24.0397
CO	52.3105	50.4097	52.0155	55.6497	53.3805	55.3389	80.7555	86.4182	89.2990
NMVOC	42.1097	36.3792	40.8325	44.0445	45.6689	45.2815	57.7562	55.4304	52.8600
SO_2	11.5680	13.7619	12.8153	13.0829	11.4909	14.5122	12.0378	13.0690	12.0308

ES.4. Climate Change Mitigation Policies and Measures

ES.4.1. Quantitative Emission Reduction Targets at National Level

In September 2015, the RM submitted to the COP 21, its ambitious targets for reducing GHG emissions by 2030, expressed in its National Determined Contribution (NDC). The Republic of Moldova signed the Paris Agreement on 21 September 2016 at the 71st session of the UN General Assembly and ratified it on 4 May 2017 (Law no. 78)[1]. Aiming at accomplishing the NDC, the Low Emissions Development Strategy (LEDS) of the Republic of Moldova until 2030 and the Action Plan for its implementation, were published and came into force on 24 March 2017[2]. The global objective of the LEDS matches the one set out in the NDC for the Paris Agreement[3]. According to its NDC, the Republic of Moldova commits to unconditionally reduce its GHG emissions by 64-67 per cent below the reference year level (1990) by 2030. The GHG reduction commitment could be increased up to 78 per cent conditionally to donor support. The global target by 2030 is supported by intermediate targets set for 2020 and 2025, including by sectors, as shown in Table ES-4.

Table ES-4: GHG reduction targets by sector, %[4]

Sectors	Until 2020		Until 2025		Until 2030	
	unconditional	conditional	unconditional	conditional	unconditional	conditional
Energy	78	82	76	82	71-74	82
Transport	49	56	41	48	30	40
Buildings	78	79	79	81	77	80
Industry	58	62	51	59	45	56
Agriculture	48	50	43	45	37	41
LULUCF	12	18	43	54	62	76
Waste	23	26	46	51	38	47
TOTAL	**65**	**71**	**69**	**76**	**64-67**	**78**

The LEDS will enable the Republic of Moldova to adjust its development path towards a low-carbon economy and achieve green sustainable development based on the country's socio-economic and development priorities.

ES.4.2. Nationally Appropriate Mitigation Actions Related Activities

Aiming at achieving global and specific targets of the LEDS, nationally appropriate mitigation actions (NAMAs) have been identified for each sector (Energy, Transport, Buildings, Industry, Agriculture, LULUCF and Waste), and prioritized using the Multi Criteria Decision Analysis method. According to the LEDS, the NDC unconditional target can be achieved by implementing 44 NAMAs, while the conditional one will require implementation of 22 NAMAs, 12 of which are registered in the UNFCCC's NAMA Register[5]. In an aggregated form, the measures identified to achieve the NDC targets are outlined in Annex 2 to this Report.

The largest contribution towards the NDC's conditional target is expected to be achieved by means of the Paris Agreement financial mechanisms, including the Green Climate Fund (GCF). Since February 2018, the RM started the process of GCF Country Program development.

[1] <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=370323>
[2] The Low-Emission Development Strategy of the Republic of Moldova until 2030 and the Action Plan for its implementation. GD no. 1470 of 30 December 2016. Official Gazette 2017, no. 85-91.
[3] <www.clima.md>
[4] According to LEDS.
[5] <http://www4.unfccc.int/sites/nama/SitePages/NamaImplementation.aspx>

ES.4.3. Clean Development Mechanism of the Kyoto Protocol

The GHG reduction targets can also be achieved through the Kyoto Protocol's Clean Development Mechanism. To date, 10 CDM projects applications were submitted, of which eight were registered by the CDM Executive Committee[6].

ES.4.4. Economic Instruments

The content of this chapter has not been changed versus the same chapter of the Fourth National Communication (NC4) of the RM under the UNFCCC (2018). However, in order to support the ecologically clean vehicles with a hybrid engine, the Fiscal Code was amended to decrease the excise tax for hybrid motor cars by 50% starting 01.01.2017.

ES.4.5. Climate Change Mitigation Policies and Measures at Sector Level

Climate change mitigation policies and measures are reflected in strategies, programs and action plans mentioned in chapters on respective sectors, so further only key elements thereof will be disclosed.

Energy

Most of the policies of this sector, set out in the NC4 of the RM to the UNFCCC (2018), are still current. Given the 74.6% energy dependence on imported energy, the energy policies of the state are geared towards increasing energy security in two ways: in terms of energy production – by attracting renewable energy sources in the energy balance, and in terms of energy demand – by promoting energy efficiency. Thus, by 2020, 10% of energy demand is expected to be covered from own renewable sources, and energy efficiency is expected to improve by 8.2%. Achieving these targets will obviously result in imminent corresponding GHG emissions reduction. The current legal framework aimed at achieving the set-out objectives covers mostly the whole range of regulations needed in this respect: from laws to action plans.

Industry

Over the last twenty years, a number of policies related to monitoring and reduction of GHG emissions in the industrial sector have been approved and are being developed. These include policies promoting energy efficiency and green economy which also have an impact on the industrial sector and which have recently been identified in a new piece of legislation: "The Green Economy Promotion Program in the Republic of Moldova for 2018-2020 and the Action Plan for its implementation", GD no.160/2018.

Agriculture

In 2018, policies approved in the Republic of Moldova and explicitly geared towards reducing greenhouse gas emissions from agriculture (covering plant growing, soil resources, and animal husbandry) are the Environmental Strategy for 2014-2023 and the Action Plan for its implementation, and the Low-Emission Development Strategy of the Republic of Moldova until 2030 and the Action Plan for its implementation.

In the agriculture the target will be to reduce nitrogen mineralization in soil, i.e. to promote sustainable agriculture, including by using green manure in parallel with the implementation of a conservation agriculture tillage system based on "No-Till" and "Mini- Till" technologies, increasing the share of organic fertilizer in the soil, leaving the main crop residues in the field to form the mulch,

[6] <https://cdm.unfccc.int/Projects/projsearch.html> (click "Database for PAs and PoAs")

etc. Aiming at achieving the goal to raise livestock productivity, programs and strategies improving the genetic pool of livestock and poultry are being implemented. At the same time, animal manure will be used to produce biogas for energy purposes and increase soil fertility, which will also help reduce GHG emissions. These policies are reflected in strategies, programs and action plans presented in the respective chapter.

Forestry

The legislative framework underlying the state policy promoted in the "Land Use, Land Use Change and Forestry" (LULUCF) sector includes the Constitution of the Republic of Moldova, more than 30 laws and a set of Government Decisions that refer, directly or indirectly, to forestry and land use. Policies used to develop mitigation scenarios in the forestry sector are aimed at expanding the afforested areas to up to 15% of the country's territory by 2030, with subsequent increase in wood mass remaining after harvesting; diminishing the fire-prone areas; gradual expansion of forest protection belts, trees and shrub groves, orchards and vineyards, improving the quality of plantations. However, grasslands areas are not expected to increase. Moreover, they will follow a downward trend, as the number of livestock is continuously reducing.

Waste

In the Republic of Moldova, the legal framework related to environmental protection is being updated in line with the National Action Plan for the implementation of the Moldova-EU Association Agreement. GHG emissions mitigation measures in the waste sector include: development of regional waste disposal infrastructure by construction of regional solid waste disposal sites and transfer stations in accordance with the Waste Management Strategy for the Republic of Moldova for 2013-2027, and application EU and national standards; extending the current system of primary collection and storage from urban to rural waste; improving the water supply and sanitation infrastructure.

ES.5. GHG Emissions Projections and Overall Impacts of Climate Change Mitigation Policies and Measures

ES.5.1. Methods and Tools Used to Access the Mitigation Potential

In BUR2, the GHG emission projections were made for two scenarios: (1) with measures (WM) scenario and (2) with additional measurement (WAM) scenario. The need to develop the Business as Usual (BAU) scenario has been dropped due to the fact that when identifying the mitigation targets in the context of the National Determined Contribution, the RM has chosen the emissions target relative to the 1990 baseline year. Thus, the GHG emissions in the WM and WAM scenarios are compared to emissions registered in 1990, and not the emissions under the BAU scenario. The scenarios were generated for the following sectors: energy, industrial processes and product use, agriculture, land use, land use change and forestry, and waste. Aggregate emissions, as well as the following direct GHG were considered under the above scenarios: CO_2, CH_4, N_2O and F-gases.

To assess the GHG mitigation potential the 2006 IPCC Guidelines and the tools developed by national experts have been used within the top-down and bottom-up methodological approach. The WASP calculation tool was also used for the electricity sources development scenarios.

ES.5.2. Projections of Direct GHG Emissions

As a result of the promoting predetermined climate change mitigation policies and measures, the impacts were calculated for sectors defined by the IPCC, expressed as CO_2 equivalent of GHG emissions. The obtained results cover the entire country, including the territory on the left bank of the Dniester river (ATULBD).

As can be seen in Figure ES-5, GHG emissions under both scenarios, WM and WAM, are lower than the commitments made by the RM through the INDC for the Paris Agreement. The level of net emissions in 2030 is lower than in 1990 by 70.5% under the WM scenario and by 88.5% under the WAM scenario, compared to 64-67% under the unconditional INDC and respectively 78% under the conditional INDC. In other words, the country's policies developed and promoted over the last years are likely to achieve higher performance targets than those set out in the NDC reported by the Republic of Moldova to the COP 21 in Paris in December 2015.

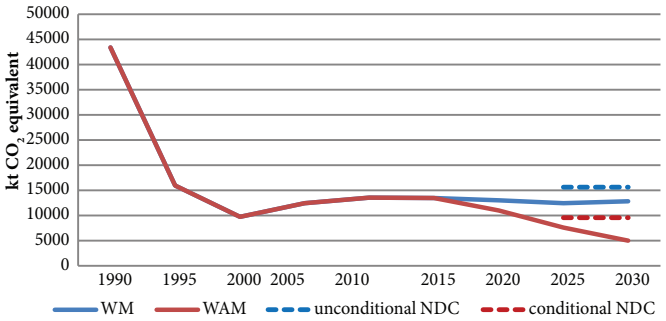
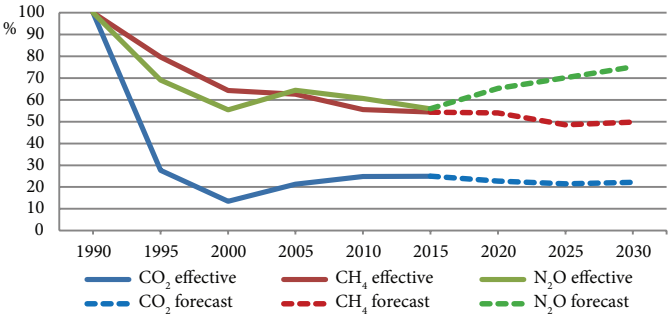
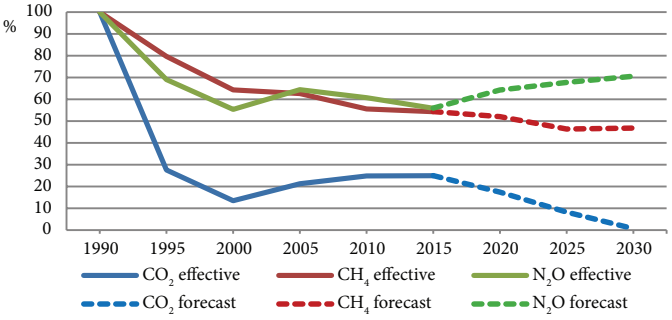


Figure ES-5: Total net GHG emissions in the RM within 1990-2030.

Figure ES-6 shows the evolution of aggregate individual gas emissions with impact on climate change under the WM and WAM scenarios. The amount of CO_2 and CH_4 emissions tends to decrease, while the amount of N_2O emissions, conversely, increase in the post-2015 period. The identified evolution is due to the gradual increase of livestock and poultry numbers by 2030, as well as carbon loss through the mineralization as a result of land use change and changes in the soil management practices over time by 2030.



a) with measures scenario



b) with additional measures scenario

Figure ES-6: GHG emissions under the WM and WAM, by gas as compared to 1990, %.

ES.5.3. Projections of Direct GHG Emissions by Sector

Energy

The energy sector, distinguished by the largest contribution to GHG emissions in the RM (70%, 2015), will significantly contribute to meeting the country's GHG reduction commitments. Thus, by 2030, GHG emissions under the WM and WAM scenarios will be 24.9% and 20.2%, respectively, relative to 1990. The most significant share of these emissions is CO_2, about 95% in under both scenarios.

Industrial Processes and Product Use

In 2015, the industrial processes and product use sector contributed around 5.5% of total GHG emissions, of which 72.8% were CO_2, and 28.2% F-gases. By 2030, GHG emissions will account for about 72.8% of the direct GHG emissions registered in the reference year (1990) under the WM scenario, and 68.7% under the WAM scenario, respectively.

Agriculture

In the animal husbandry sector (enteric fermentation and manure management), GHG emissions mitigation measures are based both on the improvement of the livestock and poultry structure, as well as gradual increase in the share of large farms, characteristic of the 1990s of the 20th century. With regard to GHG emissions reduction in the "Agricultural Soil" category, the emphasis will be put on reducing soil mineralization, i.e. promoting sustainable agriculture, including by using green manure in parallel with the implementation of soil conservative "No-Till" and "Mini-Till" technologies, increasing the weight of organic fertilizers in the soil, keeping crop residues in the field to form mulch, etc. Relative to the reference year 1990, in 2030 GHG emissions under the WM and WAM scenarios will be 56.1% and 52.8%, respectively.

Land Use, Land Use Change and Forestry

The policies underlying the mitigation scenarios (WM and WAM) for the LULUCF sector are targeted to: increasing the forest land area to 15% of the country's territory, with subsequent increase of the amount of wood mass; reducing the areas prone to forest fires; diminishing the fire-prone areas; gradual expansion of forest protection belts, trees and shrub groves, orchards and vineyards, improving the quality of plantations, etc. CO_2 equivalent reductions under the WAM will exceed those under the WM scenario by more than 4.4 times by 2030. However, to achieve this performance, donor support is required.

Waste

CH_4 and N_2O emissions are monitored within the waste sector. CH_4 emissions are generated by the solid waste deposit sites, and from wastewater treatment, while N_2O – by human sludge. Relative to the level of emissions registered in the reference year, in 2030, the level of GHG emissions related to the waste sector will be 86.4% under the WM scenario and 81.9% under the WAM scenario.

International Transport

Of the two types of international transport, water-born and air-born, only the air-born transport is relevant for the Republic of Moldova. Estimates of total national aggregate GHG emissions do not take into account the projections for the international air transport. It is estimated that relative to 2010 emissions from international air transport will increase by about 124% by 2020 and by 228% by 2030.

ES.6. Financial, Technical and Capacity Needs and Constraints

ES.6.1. Constraints in Mitigation Direct GHG Emissions

Energy

The low payment capacity of consumers and the relatively high cost of capital in the RM make investments in this sector either difficult, or unbearably expensive. Apparently, for now, a favorable legal framework for the development of renewable energy sources is in place. The latest amendments to it (2018) provide for attraction of investors in tenders for building the RES capacities predetermined by the authorities, so as to sell the energy produced at the lowest bid price. However, the lack of own traditional sources of electricity makes it difficult to balance the energy demand over time, as a result of intermittent renewable energy production (solar and wind), which delays promotion of energy produced from these sources.

Transport

In recent years, the number of motor vehicles in the RM has continued to increase, with the major share of second-hand cars, as a consequence of the low purchasing power of population who cannot afford purchasing of new cars. So far, the "Rabla" project, initiated by the MARDE, aiming at modernizing the motor vehicle fleet by replacing old vehicles with new ones, has not started yet, and the total cost of the project is unknown. As far as demand for cutting edge vehicles is concerned, pre-operational costs for electric vehicles remain high. Also, there are no clear economic signals, similar to those for hybrid vehicles, which could facilitate the import of these technologies in the country. The lack of infrastructure for charging electric vehicles is also a barrier.

Buildings

In addition to the constraints specified by NC4 of the RM under the UNFCCC (2018) in the buildings sector, it is worth to mention the following: a higher degree of moral and physical wear and tear of the existing thermal machinery and equipment; emigration of workforce and research staff; poor financing of institutions in the field of energy efficiency, including the wages of the staff; poor population motivation for increasing energy efficiency and implementation of RES.

Industry

Alongside the constraints listed in the NC4 of the RM under the UNFCCC (2018) for the industry sector, the following should also be mentioned: machinery and equipment have a high degree of moral and physical wear; the growing shortage of engineering and skilled personnel; expensive loans; lack of enabling business environment is a barrier to technological transfer; there are no separate tariff codes for HFCs and HFCs blends in the Moldovan Commodity Nomenclature, therefore monitoring of these substances consumption is extremely difficult.

Agriculture

Among the constraints of the agricultural sector, additionally to those stated in the NC4 of the RM under the UNFCCC (2018), are: much reduced sector's competitiveness; soil degradation is estimated at 1.5 billion lei annual losses; the soil, as a natural resource, is not protected by a legal framework regulating its use, conservation, protection and improvement; failure to comply with soil technologies and its degradation is also caused by the excessive fragmentation of agricultural land; the multitude of strategies, programs, activity plans, as well as the lack of a specific legal framework on soil, provide for the fragmentation of responsibilities in the field of agricultural land use, thus resulting in lack of integrated soil management.

Forestry

Among the key barriers and related constraints are: continuous degradation of forest ecosystems, fragmentation of forest habitats; insufficient amount of work for ecologic regeneration and reconstruction; continuous degradation, fragmentation, destruction, spontaneous management not based on forestry regime planning of forests owned by municipalities; lack of a National Forest Inventory and the data collection process does not fully comply with the international requirements; the lack of a clear view on grassland degradation at national, regional and local levels; minor attention from local authorities to conversion of various categories of degraded lands into pastures; poor compensation for loss of organic matter from soil.

Waste

Additionally, to what is specified in the NC4 of the RM under the UNFCCC (2018), it should be mentioned that waste management in terms of waste collection and disposal infrastructure is still underdeveloped in the RM; the legal framework is not fully implemented, and small penalties do not sufficiently motivate for compliance with legal norms. Institutions entitled to lead, implement and operate the water supply and sanitation infrastructure in a sustainable manner are inadequately equipped to cope with the challenges of adapting the national legislation to the EU standards and good practices in the field of water supply and sanitation.

ES.6.2. Capacity Building Needs in GHG Mitigation

The information provided in this chapter is reflected in the NC4 of the RM under the UNFCCC (2018). In addition, it is necessary to mention that in 2018 the RM registered 12 NAMAs in the UNFCCC NAMA Register with the request for implementation support. These NAMAs cover 68% of the country's NDC conditional target and can be implemented only with the donors' financial support, technical assistance and technology transfer.

ES.6.3. Financial Needs in the Context of Low Carbon Emission Development

The technical and capacity building needs of the Republic of Moldova are currently estimated at US$ 679,000, the technology transfer needs at US$ 375,000, and implementation of NAMAs targeted at achieving the National Determined Contribution – at US$ 4.9 billion, according to LEDS. The investments needed to implement measures and technologies resulting in GHG emissions reduction and which will also ensure the sustainability of the national economic development with own forces (as well as separately, with the donors' contribution), are reflected in the NC4 of the RM under the UNFCCC (2018).

ES.6.4. Technical Assistance Needs in the Context of Low Carbon Emission Development

In April 2018, the Cabinet of Ministers of the Republic of Moldova approved a decision amending the institutional framework and the external assistance coordination and management mechanism, in the context of assigning the external assistance coordination competences to the Ministry of Finance. As a consequence, the Inter-ministerial Strategic Planning Committee and Sectoral Councils will be excluded from the process of external assistance coordination. The State Chancellery was designated as the authority responsible for the external technical assistance coordination and management, and the Ministry of Finance – for the external financial assistance. Each sector shall identify the sector-specific technical assistance needs. It is complex by its nature, and as a rule, with no clear reference to GHG reduction, it is difficult to identify the needed TA from the External Assistance Management Platform comprising all external assistance, including technical assistance, negotiated and provided to the RM.

ES.7. Domestic System for Monitoring, Reporting and Verification

At the moment, the key elements of the domestic measurement, reporting and verification system are included in the mechanisms established by UNFCCC to report actual and future expected emissions, and a series of activities promoted through energy efficiency and renewable energy sources, as well as in the CDM projects of the Kyoto Protocol.

The achievement by the Republic of Moldova of the GHG reduction targets set out in the NDC is seen through implementation of NAMAs identified and set out in the LEDS, as well as other potential NAMAs initiated by the stakeholders. Aiming at achieving the LEDS objectives, the draft Government Decision has been prepared on the establishment of the Climate Change Coordination Mechanism to create an effective institutional tool for coordination, monitoring, verification and reporting in the field of climate change mitigation and adaptation. This normative act is expected to be approved in 2018 and will contribute to adopting optimal social, economic and financial decisions in the field of climate change in the Republic of Moldova, including at sectoral level, by approving policies, instruments and measures specific to the mitigation of GHG emissions and adaptation to climate change.

ES.8. Other Information Considered Relevant for the Convention in the Context of Climate Change Mitigation

ES.8.1. Integrating Climate Change Mitigation into Social, Economic and Environmental Policies

Aiming at commitments made under the EU - the Republic of Moldova Association Agreement, as well as NDC, a series of normative acts have already been approved. The climate change mitigation aspects continue to be reflected in a range of country policies still under development or as drafts prepared for public debate.

ES.8.2. Activities Related to Technology Transfer to Mitigate Climate Change

IPCC identifies three major dimensions needed to ensure efficient technology transfer: capacity building; enabling business environment; technology transfer mechanisms. In this context the following should be mentioned:

- starting 2011 to date 10 industrial parks have been established;
- in the World Bank's (2018) Doing Business Report, the RM ranked 44th among 190 countries in 2017;
- enabling legal framework was developed for the long- and medium-term SME development;
- on February 20, 2018, new amendments to the Code of Science and Innovation of the RM aiming at the national

system of science and innovation reform, came into force. The new amendments provide for the scientific institutions of the ASM to become subordinated to the Ministry of Education, Culture and Research;

- the total official development assistance commitments for the Republic of Moldova amount to 4,341.9 million Euro, of which – 2,523.7 million Euro were already disbursed by 31.03.2018;
- since accession of the Republic of Moldova to GEF the country received a non-reimbursable financial support amounting to US$ 176.1 million, as well as US$ 515.1 million in co-financing, including 10 climate change mitigation projects;
- currently the RM runs a number of projects supported by the Green Climate Fund;
- among the multilateral development banks, the World Bank and the European Bank for Reconstruction and Development have been particularly prominent in promoting sustainable development projects in the Republic of Moldova;
- to date, a number of CDM projects have been initiated in the Republic of Moldova; implementation of these projects is expected to achieve GHG emission reductions equivalent to about 1.5 million tons of CO_2 annually.

INTRODUCTION

On March 16, 1995, the Republic of Moldova (RM) ratified the United Nations Framework Convention on Climate Change (UNFCCC), followed by the Kyoto Protocol, ratified on February 13, 2003, recognizing thus, the complex influence of climate change on humankind evolution.

As a developing country, Party to this Convention, the RM has committed to promote sustainable development, to contribute to the achievement of the Convention's ultimate objective and to assist Annex I Parties to fulfil their commitments to limit and reduce greenhouse gas emissions.

In this context should be considered the concerns related to such areas as: GHG inventories; identifying and implementing GHG emissions mitigation actions; identifying and implementing climate change adaptation actions; transfer of environmentally friendly technologies; improvement of the national system of observation and environment monitoring networks; improving information systems for collecting, processing and data storage; developing, maintaining and updating databases related to climate change; as well as various capacity building activities, education, training and public awareness raising actions within the civil society and youth regarding the climate change issue.

The Second Biennial Update Report (BUR2) of the Republic of Moldova to UNFCCC reflects the degree of compliance with the Convention provisions nominated nationwide, updated for 2016/2017 years, according to the statistical data available.

This Report has been developed within the Project „Republic of Moldova: Enabling Activities for the Preparation of the Second Biennial Update Report under the United Nations Framework Convention on Climate Change", initiated on February 2017 and completed by January 2019, implemented by the Climate Change Office of the Ministry of Agriculture, Regional Development and Environment and United Nations Environment Programme, with financial support of the Global Environment Facility. The Report outlines a series of actions in the areas indicated above, revealing directions for future work and establishing effective partnerships.

Extensive information dissemination related to climate change phenomenon has contributed to a broader awareness rising within the society, scientific community and decision makers in the RM. Thus, one can say that the process of completing the Second Biennial Update Report (BUR2) strengthened the country's potential, both for assessing climate change impact, as well as to promote and implement strategies, politics, action plans and programmes focused on mitigation the effects caused by such changes.

It should also be noted the need for continuity in this direction, which would both make it possible for the RM to engage in global efforts to mitigate climate change, but would also involve the country's scientific and technical potential, qualified professionals in the adaptation process of national economic, social and environmental components to new climate conditions.

The Republic of Moldova was fully committed to the UNFCCC negotiation process towards adopting at COP 21 the Paris Agreement – a document with legal force under the Convention, applicable to all Parties, in line with keeping global warming below 2°C by 2100 compared to the preindustrial era.

The Paris Agreement was signed by the Prime Minister of the Republic of Moldova in New York on September 21, 2016, and was subsequently ratified by the Parliament through Law No. 78 from 04.05.2017 for the ratification of the Paris Agreement (Official Monitor No. 162-170 from 26.05.2017).

At 25th of September 2015, the Republic of Moldova communicated its Intended Nationally Determined Contribution (INDC) and the accompanying information to facilitate clarity, transparency, and understanding, with reference to decisions 1/CP.19 and 1/CP.20.

According to its INDC, the Republic of Moldova intends to achieve an economy-wide unconditional target of reducing its greenhouse gas emissions by 64-67 per cent below its 1990 level in 2030 and to make best efforts to reduce its emissions by 67 per cent.

The reduction commitment expressed above could be increased up to 78 per cent below 1990 level conditional to, a global agreement addressing important topics including low-cost financial resources, technology transfer, and technical cooperation, accessible to all at a scale commensurate to the challenge of global climate change.

GHG emissions reduction targets have been set in an emission budget covering the period from January 1, 2021 to December 31, 2030.

The GHG emission reduction targets set out in the national contribution intentionally determined of the Republic of Moldova were subsequently officially approved at national level by the Government Decision No. 1470 from 30.12.2016 regarding the approval of the Low Emissions Development Strategy of the Republic of Moldova by 2030 and the Action Plan for its implementation (Official Monitor No. 85-91 from 24.03.2017).

CHAPTER 1. NATIONAL CIRCUMSTANCES RELEVANT TO THE GREENHOUSE GAS EMISSIONS AND REMOVALS

1.1. Institutional Arrangements

1.1.1. Institutions

The Republic of Moldova proclaimed its independence on August 27, 1991 though it remained however a part of the Soviet Union until the latter's formal dissolution in December of 1991. The RM's new constitution was approved in the national referendum and ratified by the Parliament on July 28, 1994. According to the Constitution, the Republic of Moldova is a neutral country. The Constitution guarantees the voting right to all its citizens who have reached the age of 18 and provides for the various civil rights and liberties.

The President is the head of the state and is elected directly for a 4 years term (and may hold the presidential office no more than two consecutive terms). The President has the power to dissolve the Parliament. The Constitution provides for the possibility to accuse the President of a penal or constitutional infringement.

The President appoints the Prime Minister and (upon the latter's recommendations) the Cabinet of Ministers. The Prime Minister and the Cabinet require the approval of the Parliament. The current Government, invested on January 20, 2016 was initially comprised of 16 ministries, but as of July 26, 2017, since the Parliament voted a new structure for the Government, as a result of a transfer of competencies, from 16, only 9 ministries remained, including:

1. Ministry of Economy and Infrastructure,
2. Ministry of Finance,
3. Ministry of Justice,
4. Ministry of Internal Affairs,
5. Ministry of Foreign Affairs and European Integration,
6. Ministry of Defense,
7. Ministry of Education, Culture and Research,
8. Ministry of Health, Labor and Social Protection,
9. Ministry of Agriculture, Regional Development and Environment.

The nation's supreme legislative authority is the one-chamber Parliament. It is composed of 101 deputies elected directly for the term of four years. The Parliament has two ordinary sessions per year; furthermore, it is possible to convene extraordinary parliamentary sessions. In addition to adoption of laws and exercising other basic legislative functions, the Parliament may declare the state of national emergency, martial law or war.

The judiciary system includes three supreme courts: the Supreme Court of Justice, the Court of Appeals and the Constitutional Court – the supreme authority on constitutional issues issuing final decisions which cannot be appealed against. Tribunals and courts exercise judicial procedures at the local level. The President appoints judges for the Supreme Court of Justice and the Court of Appeals from the nominees submitted by the Supreme Council of Magistrates.

The Supreme Council of Magistrates composed of 11 magistrates and elected for a five-year term is in charge of appointments, transfers and promotions of judges. The Council includes the Minister of Justice, the Chairman of the Supreme Court of Justice, the Chairman of the Court of Appeals, the Chairman of the Economic Court and the Attorney General, three members elected from among the members of the Supreme Court of Justice and another three members elected by the Parliament from among the accredited university professors.

1.1.2. Institutional Arrangements Relevant for NCs and BURs Preparation

The Ministry of Agriculture, Regional Development and Environment (MARDE) of the Republic of Moldova is the state authority vested with the power to develop and promote policies and strategies addressing agriculture, food production, food safety, regional and rural development, spatial planning, environment protection and climate change as well as natural resources.

On behalf of the Government, MARDE is responsible for implementation of international environment treaties to which the Republic of Moldova is a Part (including the United Nations Framework Convention on Climate Change, signed by the Republic of Moldova on June 12, 1992, ratified by the Parliament on March 16, 1995, as well as the Kyoto Protocol, ratified by the Republic of Moldova on February 13, 2003, the official date of accession being April 22, 2003). The Ministry of Agriculture, Regional Development and Environment is also the UNFCCC National Focal Point.

Through the Government Decision No. 1574 as of 26.12.2003 it was established the *„National Commission for Implementing Provisions of the United Nations Framework Convention on Climate Change and Provisions and Mechanisms of Kyoto Protocol"*. In conformity with Article 2 of its working regulations, the *„National Commission"* is the supreme authority in the Republic of Moldova responsible for implementation of the UNFCCC provisions, as well as the mechanisms and provisions of Kyoto Protocol.

The National Commission was vested with full authority to develop and promote policies and strategies under the Clean Development Mechanism of the Kyoto Protocol. The respective National Commission collaborates with the Inter-Ministerial Committee for Sustainable Development and Poverty Reduction, the Commission

for European Integration, the National Council for Participation, as well as with other Commissions and National Committees.

The activity of the National Commission and execution of its decisions is coordinated and monitored by the National Commission's Secretary, who is also the Manager of the Climate Change Office under the MARDE.

The Climate Change Office was established through the Ministerial Order No. 21 as of February 11, 2004 of the Ministry of Ecology, Constructions and Territory Development of the Republic of Moldova (reorganized into Ministry of Environment and Natural Resources based on Government Resolution No. 357 as of April 23, 2005 'On reorganization of ministries and central administration authorities of the Republic of Moldova'; based on Law No. 21-XVIII as of September 18, 2009, the Ministry of Environment and Natural Resources was reorganized into the Ministry of Environment).

The main tasks of the Climate Change Office are:

- providing support to the Government, central and local public administration authorities, non-government and academic organizations, in activities implemented and promoted by the Republic of Moldova under the UNFCCC and the Kyoto Protocol;
- implementing climate change related projects and programs providing for such activities as: national greenhouse gas emissions assessment and development the National Inventory Reports by sources of GHG emissions and removals; development and implementation of greenhouse gas emissions mitigation activities and projects; development and implementation of measures and projects aimed at adapting to climate change; assessment of the climate change impacts on biologic and socio-economic components; cooperation, promotion and implementation of activities and projects under the Clean Development Mechanism of the Kyoto Protocol; implementation and facilitation of activities aimed at building awareness and information among civil society, relevant experts and decision makers on issues related to climate change etc.

Also, the role of CCO is also specified within the *Government Decision No. 141 dated 24.02.2014 on creating the Energy Statistical System*. Thus, Chapter 2.1, Paragraph 3(h) notes that the Climate Change Office of the Ministry of Environment is responsible for developing national inventories of direct (CO_2, CH_4, N_2O, HFC, PFC and SF_6) and indirect greenhouse gases (NO_x, CO, NMVOC and SO_2), originated from six sectors (Energy, Industrial Processes, Solvents and Other and Product Use, Agriculture, LULUCF and Waste).

Since its creation, the Climate Change Office was and remains fully responsible for activities related to the preparation of National Communications, while since 2014, as well of the Biennial Update Reports of the Republic of Moldova under the UNFCCC.

The Climate Change Office comprises three working groups: „National GHG Inventory Team", „Climate Change Mitigation Assessment, Monitoring, Reporting and Verification System Team", and „Climate Change Modelling, Vulnerability and Adaptation Assessment Team" (Figure 1-1).

Below is a brief description of functional responsibilities of the participants in the process:

- National experts (hired on a contract basis) are responsible for the process of activity data gathering, selecting suitable

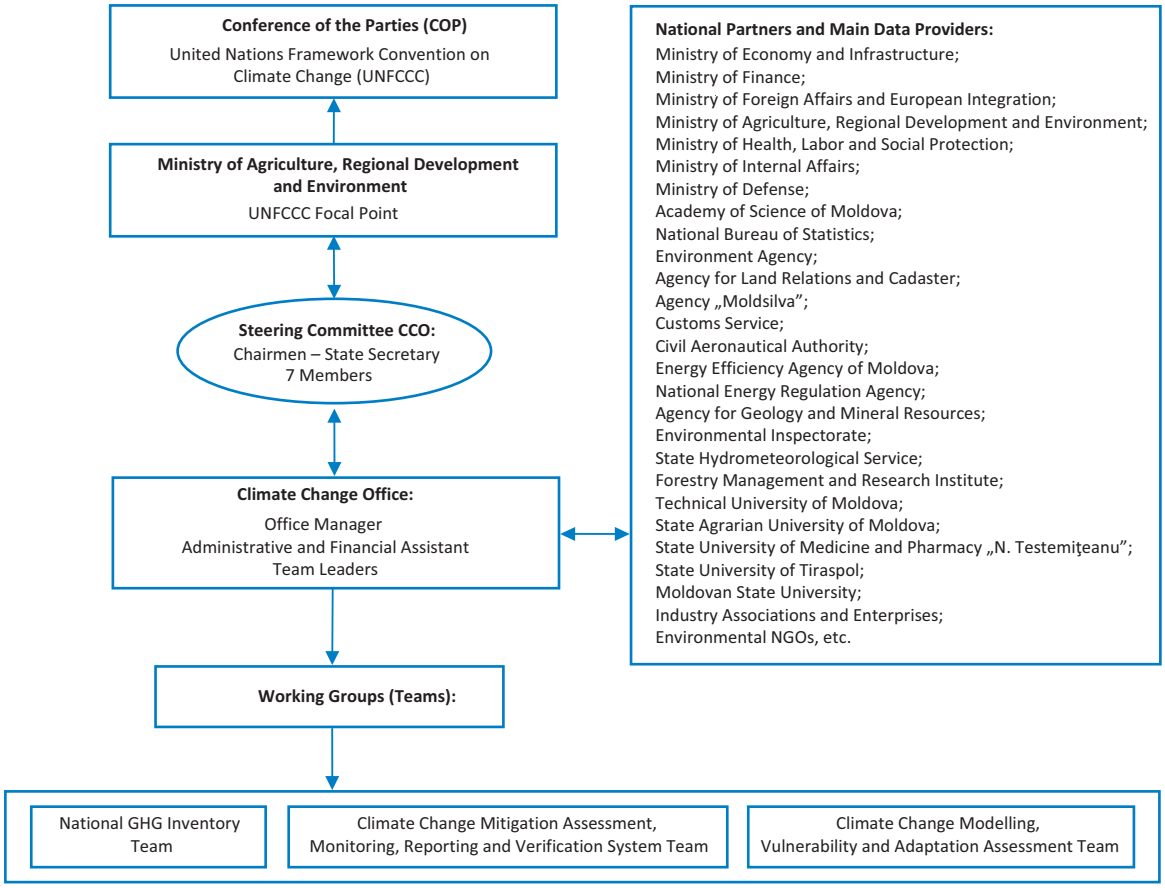


Figure 1-1: Institutional Arrangements Relevant for the Preparation of the National Communications, Biennial Update Reports and National Inventory Reports in the RM.

assessment methods, assessment at sectoral level, taking correction measures as a response to quality assurance and quality control activities as well as developing component parts of the National Communications, Biennial Update Reports and National Inventory Reports.

- Team leaders are responsible for the coordination of the process of compilation of the key parts of the National Communications, Biennial Update Reports and National Inventory Reports. They supervise the process at sectoral level, are responsible for interpreting the results obtained by national experts, coordination of quality assessment and quality control activities, documentation and archiving the materials used and aggregating the reports submitted by national experts.

At the same time, it should be noted that according to Government Decision No. 549 as of 13.06.2018 on the creation, organizing and functioning of the Environment Agency[7], the latter has been recently assigned the following competencies in the field of *atmospheric air protection and climate change*: implementing the provisions of policy documents and international environmental treaties to which the RM is a part in the field of protection of atmospheric air quality and ozone layer, *GHG emissions reductions and adaptation to climate change*, the elaboration and presentation to the MARDE of information on their implementation (point 9 (2), let. c); participation to the works of the *National Commission for Climate Change* (point 9 (2), let. j) (the National Commission for Climate Change is to be created by the end of 2018 and will take over the functions and responsibilities of the National Commission for the Implementation of the UNFCCC provisions on Climate Change as well as the provisions and mechanisms of the Kyoto Protocol); ensuring the implementation of the *monitoring, reporting and verification system for GHG emissions* (point 9 (2), let. k); performing the *process of collecting, centralizing, validating and processing data and required information for the inventories and reports on atmospheric pollutants and GHG emissions* (point 9 (2), let. l); providing technical support to MARDE for the development of *national communications* and *biennial update reports* according to UNFCCC provisions (point 9 (2), let. o).

Information related to the legal and institutional framework for collecting activity data needed do prepare NCs, BURs and NIRs are further described in details in Chapter 2.2 „Institutional Arrangements, Inventory Process" of this Report.

1.2. Administrative-Territorial Organization, Population Profile and Demographic Situation

1.2.1. Administrative-Territorial Organization

According to the Law No. 764 as of 27.12.2001 on the administrative territorial organization, the Republic of Moldova is divided into 32 districts (rayons), 5 municipalities and 2 administrative-territorial units (Figure 1-2).

In most districts (Anenii Noi, Basarabeasca, Briceni, Cahul, Cantemir, Calarasi, Causeni, Cimislia, Criuleni, Donduseni, Drochia, Edinet, Falesti, Floresti, Glodeni, Hincesti, Ialoveni, Leova, Nisporeni, Ocnita, Orhei, Rezina, Riscani, Singerei, Soroca, Straseni, Soldanesti, Stefan Voda, Taraclia, Telenesti, Ungheni) the administrative center is located in a town, and only the district of Dubasari has the Cocieri commune as its center. By January 1, 2017, the number of people in the districts varied between a minimum of 28.2 thousand people (Basarabeasca district) to a maximum of 124.8 thousand people (Orhei district).

Figure 1-2: Administrative-Territorial Map of the Republic of Moldova.

In the Republic of Moldova municipalities are urbanized areas which play a significant role in the nation's economic, social-cultural, scientific, political and administrative life, with relevant industrial, commercial, health care and cultural facilities as well as educational establishments. In most cases municipalities are an agglomeration of several settlements. For example, the municipality of Chisinau, which is the capital city of the Republic of Moldova, comprises 35 settlements, which include 5 city districts, 6 towns and 12 communes (the latter comprising the total of 26 settlements). The other 4 municipalities are: Balti, Comrat, Tiraspol and Bender (Tighina).

The purpose of dividing the territory of the country into a number of administrative territorial units is to ensure the execution of the principles of local autonomy, decentralize public services, electiveness of the local public administration authorities, and the access for the citizens to the elected authorities and to the advice on the local problems and issues of particular interest. All local problems and issues fall within the authority and powers of the local administrative councils, which are elected. The prefects and mayors for the districts and municipalities are nominated by the local administrative councils and appointed by the President of the Republic of Moldova.

There are two administrative-territorial units in the Republic of Moldova: the Administrative-Territorial Unit Gagauzia (ATU Gagauzia) and the administrative-territorial units on the left bank of the Dniester (ATULBD).

The area of ATU Gagauzia is approximately 3000 km^2 (162.0 thousand people)[8], while the area of ATULBD is respectively about 4163 km^2 (475.7 thousand people)[9].

[7] <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=375961>

[8] <http://statbank.statistica.md/pxweb/pxweb/ro/20%20Populatia%20si%20procesele%20demografice/20%20Populatia%20si%20procesele%20demografice__POP010/POP010300reg.px/?rxid=2345d98a-890b-4459-bb1f-9b565f99b3b9>

[9] <http://mer.gospmr.org/gosudarstvennaya-sluzhba-statistiki/informacziya/ezhegodnik-gosudarstvennoj-slu-

Since the collapse of the Soviet Union (USSR), the administrative-territorial units on the left bank of the Dniester started promoting the separatist policy in respect of the RM's centralized public administration authorities. Currently, the official authorities of the Republic of Moldova monitor that area only partially.

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1.2.2. Population

As of 01.01.2017, the population of the RM was 3827.4 thousand people, with the density of approximately 113.1 persons per square kilometer (Table 1-1). Thus, numerically the Republic of Moldova outruns such European countries as Bosnia and Herzegovina, Lithuania or Slovenia.

Table 1-1: Population of the RM at the beginning of the year within 1990-2017 periods

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total, thousand	4361.6	4366.3	4359.1	4347.8	4352.7	4347.9	4334.4	4320.0	4325.8	4315.0	4303.5	4286.3	4269.7	4251.3
Urban, thousand	2069.3	2073.6	2052.2	2039.2	2036.6	2033.0	2004.1	1995.3	2001.6	1990.7	1983.4	1948.8	1940.1	1932.5
Rural, thousand	2292.3	2292.7	2306.9	2308.6	2316.1	2314.9	2330.3	2324.7	2324.2	2324.3	2320.1	2337.5	2329.6	2318.8
Urban share, %	47.4	47.5	47.1	46.9	46.8	46.8	46.2	46.2	46.3	46.1	46.1	45.5	45.4	45.5
Rural share, %	52.6	52.5	52.9	53.1	53.2	53.2	53.8	53.8	53.7	53.9	53.9	54.5	54.6	54.5
Density, pers./km^2	129.2	129.3	129.1	128.5	128.6	128.4	128.0	127.6	127.8	127.5	127.2	126.6	126.2	125.6
Males, thousand	2077.8	2082.0	2080.2	2074.9	2078.3	2076.7	2071.0	2064.5	2071.9	2066.4	2061.0	2053.2	2045.8	2037.1
Females, thousand	2283.8	2284.3	2278.9	2272.9	2274.4	2271.2	2263.4	2255.5	2253.9	2248.6	2242.5	2233.1	2223.9	2214.2
Males share, %	47.6	47.7	47.7	47.7	47.7	47.8	47.8	47.8	47.9	47.9	47.9	47.9	47.9	47.9
Females share, %	52.4	52.3	52.3	52.3	52.3	52.2	52.2	52.2	52.1	52.1	52.1	52.1	52.1	52.1
	2004	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Total, thousand	4230.6	3940.4	3943.1	3973.4	3957.9	3946.9	3938.1	3931.0	3926.0	3923.7	3918.4	3884.8	3843.6	3827.4
Urban, thousand	1919.2	1685.9	1695.2	1728.9	1722.5	1718.0	1718.5	1720.3	1721.4	1728.2	1732.5	1726.1	1711.4	1709.3
Rural, thousand	2311.5	2254.5	2247.9	2244.5	2235.4	2228.9	2219.6	2210.6	2204.6	2195.5	2185.8	2158.7	2132.2	2118.1
Urban share, %	45.4	42.8	43.0	43.5	43.5	43.5	43.6	43.8	43.8	44.0	44.2	44.4	44.5	44.7
Rural share, %	54.6	57.2	57.0	56.5	56.5	56.5	56.4	56.2	56.2	56.0	55.8	55.6	55.5	55.3
Density, pers./km^2	125.0	116.4	116.5	117.4	116.9	116.6	116.4	116.1	116.0	115.9	115.8	114.8	113.6	113.1
Males, thousand	2027.5	1886.4	1888.8	1903.3	1896.5	1889.2	1884.9	1880.4	1877.9	1876.7	1874.7	1858.4	1839.4	1831.6
Females, thousand	2203.1	2054.0	2054.3	2070.1	2061.4	2057.7	2053.2	2050.6	2048.1	2047.0	2043.8	2026.4	2004.2	1995.8
Males share, %	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.8	47.8	47.8	47.8	47.8	47.9	47.9
Females share, %	52.1	52.1	52.1	52.1	52.1	52.1	52.1	52.2	52.2	52.2	52.2	52.2	52.1	52.1

Source: National Bureau of Statistics of the Republic of Moldova (2018) and the State Statistical Service of the ATULBD (2018).

During 1990-2017, the population decreased by circa 12.2 per cent or by 534.2 thousand people. That decrease was caused by the negative natural balance as well as the negative external migration flow balance.

The above dynamics resulted in the decrease in the average population density from 129.2 persons/km^2 in 1990 down to 113.1 persons/km^2 by the end of 2016. However, even in such conditions the density of population in the Republic of Moldova significantly exceeds the average population density in Europe and the world average.

Females prevail with 52.1 per cent in the nation's population, as opposed to 47.9 per cent of males in the total population.

This clear misbalance with prevalence of females in the population structure by gender has rated the Republic of Moldova among the top 10 states worldwide according to that indicator, thus impacting adversely the nation's demographic development.

The majority of the population is concentrated in the rural areas. The existing 1614 rural settlements have 2118.1 thousand residents or 55.3 per cent of the total population, averaging about 1400 residents per settlement.

The urban population is 1709.3 thousand residents or 44.7 per cent. The urbanization rate is among the lowest in Europe. Urban settlements are small in size, with about 27 thousand residents on the average, and only 5 municipalities and 4 cities can boast the population exceeding 33 thousand residents: Chisinau (820.5 thousand people), Balti (151.2 thousand people), Tiraspol (128.2 thousand people), Bender (Tighina) (83.8 thousand people), Ribnita (44.8 thousand people), Cahul (39.5 thousand people), Ungheni (38.3 thousand people), Soroca (37.6 thousand people) and Orhei (33.9 thousand people).

According to the data of the 2014 population census held separately in the areas on the right bank of the Dniester and in the administrative-territorial units on the left bank of the Dniester, Moldavians/Romanians accounted for about 73.1 per cent of the country's population (64.5 per cent in 1989), Ukrainians – 8.8 per cent (13.8 per cent in 1989), Russians – 7.6 per cent (13.0 per cent in 1989), Gagauz – 4.0 per cent (3.5 per cent in 1989), Bulgarians – 1.9 per cent (2.2 per cent in 1989), Gypsies – 0.3 per cent (0.3 per cent in 1989), other nationalities – 0.7 per cent (1.3 per cent in 1989) (Table 1-2).

Table 1-2: Stable Resident Population by the Main Nationalities in the Republic of Moldova (according to the 2004 and 2014 population census data)

	Resident population		% of the total population		% of the total population who declared ethnic origin	
	2004	2014	2004	2014	2004	2014
Total population on the Right Bank of Dniester River	**3 383 332**	**2 804 801**	**100.0**	**100.0**	**x**	**x**
Population who declared ethnic origin, *including:*	**3 369 312**	**2 754 719**	**99.6**	**98.2**	**100.0**	**100.0**
Moldovans	2 564 849	2 068 058	75.8	73.7	76.1	75.1
Ukrainians	282 406	181 035	8.3	6.5	8.4	6.6
Russians	201 218	111 726	5.9	4.0	6.0	4.1
Gagauz	147 500	126 010	4.4	4.5	4.4	4.6
Romanians	73 276	192 800	2.2	6.9	2.2	7.0

	Resident population		% of the total population		% of the total population who declared ethnic origin	
	2004	2014	2004	2014	2004	2014
Bulgarians	65 662	51 867	1.9	1.8	1.9	1.9
Gypsies	12 271	9 323	0.4	0.3	0.4	0.3
Other	22 130	13 900	0.7	0.5	0.7	0.5
Population who did not declare ethnic origin	14 020	50 082	0.4	1.8	x	x
Total population on the Left Bank of Dniester River	**555 347**	**475 665**	**100.0**	**100.0**	**x**	**x**
Population who declared ethnic origin, *including:*	**538 148**	**409 548**	**96.9**	**86.1**	**100.0**	**100.0**
Moldovans	177 382	135 565	31.9	28.5	33.0	33.1
Ukrainians	160 069	108 927	28.8	22.9	29.7	26.6
Russians	168 678	138 419	30.4	29.1	31.3	33.8
Bulgarians	13 858	11 416	2.5	2.4	2.6	2.8
Gagauz	4 096	5 232	0.7	1.1	0.8	1.3
Belarusian	3 811	2 378	0.7	0.5	0.7	0.6
Germans	2 071		0.4	0.0	0.4	0.0
Jews	1 259		0.2	0.0	0.2	0.0
Transdniestrians		952	0.0	0.2	0.0	0.2
Other	6 924	6 659	1.2	1.4	1.3	1.6
Population who did not declare ethnic origin	17 199	66 117	3.1	13.9	x	x
Total population in the Republic of Moldova	**3 938 679**	**3 280 466**	**100.0**	**100.0**	**x**	**x**
Population who declared ethnic origin, *including:*	**3 907 460**	**3 164 267**	**99.2**	**96.5**	**100.0**	**100.0**
Moldovans	2 742 231	2 203 623	69.6	67.2	70.2	69.6
Ukrainians	442 475	289 962	11.2	8.8	11.3	9.2
Russians	369 896	250 145	9.4	7.6	9.5	7.9
Gagauz	151 596	131 242	3.8	4.0	3.9	4.1
Romanians	73 276	192 800	1.9	5.9	1.9	6.1
Bulgarians	79 520	63 283	2.0	1.9	2.0	2.0
Gypsies	12 271	9 323	0.3	0.3	0.3	0.3
Other	32 384	21 511	0.8	0.7	0.8	0.7
Population who did not declare ethnic origin	31 219	116 199	0.8	3.5	x	x

1.2.3. Demographic Situation

Between 1990 and 2017, the demographic processes registered a distinctive negative development pattern (Table 1-3), which showed itself in the general instability of demographic indicators and phenomena as well as falling birth rate, growing mortality, depopulation, demographic ageing, etc.

Table 1-3: The Dynamic of Demographic Indicators in the Republic of Moldova (the Right Bank of Dniester), 1990-2017

	Live Births	Deceased	Infant Mortality	Natural Balance	Marriages	Divorces
1990	77 085	42 427	1 482	34 658	40 809	13 135
1991	72 020	45 849	1 441	26 171	39 609	13 879
1992	69 654	44 522	1 294	25 132	39 340	14 821
1993	66 179	46 637	1 437	19 542	39 469	14 468
1994	62 085	51 514	1 422	10 571	33 742	13 811
1995	56 411	52 969	1 214	3 442	32 775	14 617
1996	51 865	49 748	1 065	2 117	26 089	13 440
1997	45 583	42 957	901	2 626	22 106	10 153
1998	41 332	39 922	738	1 410	21 814	10 156
1999	38 501	41 315	714	-2 814	23 524	8 913
2000	36 939	41 224	681	-4 285	21 684	9 707
2001	36 448	40 075	597	-3 627	21 065	10 808
2002	35 705	41 852	528	-6 147	21 865	12 698
2003	36 471	43 079	522	-6 608	24 961	14 672
2004	38 272	41 668	464	-3 396	25 164	14 918
2005	37 695	44 689	468	-6 994	27 187	14 521
2006	37 587	43 137	442	-5 550	27 128	12 594
2007	37 973	43 050	428	-5 077	29 213	13 923
2008	39 018	41 948	473	-2 930	26 666	12 601
2009	40 803	42 139	493	-1 336	26 781	11 884
2010	40 474	43 631	476	-3 157	26 483	11 504
2011	39 182	39 249	431	-67	25 900	11 120
2012	39 435	39 560	387	-125	24 262	10 637
2013	37 871	38 060	359	-189	24 449	10 775
2014	38 616	39 494	372	-878	25 624	11 130
2015	38 610	39 906	375	-1 296	24 709	11 199
2016	37 394	38 489	353	-1 095	21 992	10 605
2017	34 060	36 768	330	-2 708	20 924	9 312

Source: <http://statbank.statistica.md/pxweb/Database/RO/02%20POP/POP02/POP02.asp>

For example, in 2016, the birth rate – 10.5‰ (a significant decrease in comparison with the 1990 rate of 17.7‰) was slightly lower the mortality rate – 10.8‰ (increasing compared to 1990 – 9.7‰). The infant mortality rate remains among the highest in Europe – 9.4‰, but still lower than the 1990 figures (19.0‰). Between 1999 and 2010, the natural balance of the population was profoundly negative, while within 2011-2016 time series, it varied insignificantly around 0.0‰ (2011-2012) and -0.3‰ (2015-2016) (in 1990, the natural population growth represented 8.0‰).

That dynamics has resulted, among other things, in the demographic ageing of the population which shows itself as the reduced portion of the young and the increased portion of the elderly. During 1990-2017, the share of population aged under 15 decreased from 27.9 per cent in 1990 down to 17.0 per cent in 2017, and the age group of persons above 57/62 years increased, respectively, from 12.6 per cent in 1990 to 18.5 per cent in 2017 (Table 1-4).

Table 1-4: The RM's Population by Age, Area and Sex, as of January 1, 2000 and January 1, 2017 in the RM (the Right Bank of Dniester River)

Situation as of January 1, 2000	Total			Urban			Rural		
	Total	Males	Females	Total	Males	Females	Total	Males	Females
Total, thousand people	**3 644.1**	**1 744.5**	**1 899.6**	**1 514.2**	**730.8**	**783.4**	**2 129.9**	**1 013.7**	**1 116.2**
Under the working age (0-15 years)	938.0	478.6	459.4	346.6	177.4	169.2	591.4	301.2	290.2
Working age (16-56/61 years)	2 180.1	1 097.3	1 082.8	991.8	498.8	493.0	1 188.3	598.5	589.8
Above the working age (57/62 years)	526.0	168.6	357.5	175.8	54.6	121.2	350.2	114.0	236.3
Total, %	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Under the working age (0-15 years)	25.7	27.4	24.2	22.9	24.3	21.6	27.8	29.7	26.0
Working age (16-56/61 years)	59.8	62.9	57.0	65.5	68.3	62.9	55.8	59.0	52.8
Above the working age (57/62 years)	14.4	9.7	18.8	11.6	7.5	15.5	16.4	11.2	21.2
Situation as of January 1, 2017	**Total**			**Urban**			**Rural**		
	Total	Males	Females	Total	Males	Females	Total	Males	Females
Total, thousand people	**3 550.9**	**1 707.4**	**1 843.5**	**1 516.8**	**711.2**	**805.6**	**2 034.0**	**996.2**	**1 037.9**
Under the working age (0-15 years)	604.1	311.3	292.8	220.4	114.5	105.9	383.7	196.8	186.9
Working age (16-56/61 years)	2 291.4	1 191.7	1 099.7	1 012.7	509.7	503.0	1 278.7	682.0	596.7
Above the working age (57/62 years)	655.3	204.3	451.0	283.7	87.0	196.8	371.6	117.4	254.2
Total, %	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Under the working age (0-15 years)	17.0	18.2	15.9	14.5	16.1	13.1	18.9	19.8	18.0
Working age (16-56/61 years)	64.5	69.8	59.7	66.8	71.7	62.4	62.9	68.5	57.5
Above the working age (57/62 years)	18.5	12.0	24.5	18.7	12.2	24.4	18.3	11.8	24.5

Source: <http://statbank.statistica.md/pxweb/pxweb/ro/20%20Populatia%20si%20procesele%20demografice/20%20Populatia%20si%20procesele%20demografice__POP010/POP010600.px/?rxid=2345d98a-890b-4459-bb1f-9b565f99b3b9>

For comparison, below is presented the share of stable population in the RM by age and sex in 1990 and 2017 (Table 1-5). The presented information is eloquent to the phenomenon of demographic ageing observed in the country between 1990-2017.

Table 1-5: The RM's Stable Population by Age and Sex as of January 1, 1990 and January 1, 2017, thousand people

Age, years	1990			2017		
	Males	Females	Total	Males	Females	Total
0	41.578	39.472	81.050	18.943	17.799	36.742
1	44.528	42.719	87.247	19.572	18.341	37.913
2	44.394	42.465	86.859	19.778	18.551	38.329
3	46.101	44.527	90.628	19.065	18.176	37.241
4	44.372	42.957	87.329	19.829	18.530	38.359
5	44.131	42.345	86.476	19.901	18.880	38.781
6	44.259	43.218	87.477	20.257	19.247	39.504
7	41.246	39.706	80.952	20.925	18.997	39.922
8	39.635	38.545	78.180	19.457	18.329	37.786
9	39.033	38.351	77.384	19.305	18.057	37.362
10	38.850	37.716	76.566	19.218	18.407	37.625
11	37.867	37.004	74.871	19.221	18.204	37.425
12	37.517	36.122	73.639	19.356	18.087	37.443
13	38.079	37.156	75.235	18.645	17.539	36.184
14	37.872	36.927	74.799	18.710	17.641	36.351
15	38.060	37.096	75.156	19.152	17.997	37.149
16	36.982	35.769	72.751	19.564	18.491	38.055
17	36.533	35.712	72.245	20.074	19.041	39.115
18	34.715	30.344	65.059	20.892	19.831	40.723
19	26.531	27.644	54.175	21.979	21.126	43.105
20	25.868	27.051	52.919	23.880	22.797	46.677
21	31.432	28.835	60.267	25.213	24.249	49.462
22	28.055	29.913	57.968	27.315	26.308	53.623
23	28.493	30.648	59.141	28.881	27.816	56.697
24	27.383	30.186	57.569	30.122	28.827	58.949
25	30.215	32.457	62.672	31.168	30.198	61.366

Age, years	1990			2017		
	Males	Females	Total	Males	Females	Total
26	32.254	34.853	67.107	33.278	32.171	65.449
27	33.890	36.064	69.954	34.484	33.136	67.620
28	36.048	38.112	74.160	36.337	35.554	71.891
29	37.408	39.808	77.216	37.128	35.922	73.050
30	38.185	40.752	78.937	36.868	35.115	71.983
31	36.954	39.360	76.314	35.411	34.826	70.237
32	37.046	38.508	75.554	34.587	33.061	67.648
33	34.846	36.974	71.820	32.630	31.934	64.564
34	33.539	35.065	68.604	30.319	29.082	59.401
35	34.749	36.560	71.309	30.483	29.275	59.758
36	32.361	34.332	66.693	29.845	29.102	58.947
37	32.559	34.603	67.162	28.780	28.110	56.890
38	33.826	36.017	69.843	26.998	27.176	54.174
39	34.502	36.639	71.141	26.323	26.399	52.722
40	35.156	37.530	72.686	25.199	25.845	51.044
41	27.441	29.455	56.896	24.343	25.000	49.343
42	19.258	21.122	40.380	23.948	25.093	49.041
43	17.532	19.804	37.336	23.188	24.285	47.473
44	11.191	13.272	24.463	22.882	24.108	46.990
45	15.428	18.321	33.749	21.372	22.776	44.148
46	17.034	19.453	36.487	21.184	22.675	43.859
47	20.748	24.241	44.989	20.656	22.364	43.020
48	25.612	28.586	54.198	21.233	22.954	44.187
49	20.591	23.972	44.563	20.580	22.704	43.284
50	20.673	25.109	45.782	20.579	23.327	43.906
51	22.286	27.238	49.524	20.244	23.042	43.286
52	23.251	26.944	50.195	21.898	25.350	47.248
53	21.653	26.070	47.723	22.179	25.861	48.040
54	20.523	23.892	44.415	23.059	27.041	50.100
55	19.188	22.774	41.962	24.223	28.150	52.373
56	16.821	20.482	37.303	24.772	29.586	54.358
57	19.701	25.101	44.802	24.461	29.678	54.139
58	17.648	22.150	39.798	22.193	27.662	49.855
59	18.072	23.013	41.085	22.116	26.970	49.086
60	18.974	24.579	43.553	19.635	25.106	44.741
61	18.698	24.071	42.769	19.178	24.463	43.641
62	18.753	23.593	42.346	19.313	24.920	44.233
63	13.195	21.036	34.231	17.087	22.763	39.850
64	13.036	20.873	33.909	17.483	23.420	40.903
65	12.891	21.115	34.006	16.158	22.147	38.305
66	12.295	18.959	31.254	14.808	20.928	35.736
67	11.813	20.044	31.857	13.176	19.156	32.332
68	11.494	17.352	28.846	9.338	14.047	23.385
69	10.327	15.056	25.383	8.890	12.462	21.352
70	8.367	13.707	22.074	8.183	11.282	19.465
71	6.654	11.087	17.741	7.498	10.297	17.795
72	5.144	8.714	13.858	6.479	10.175	16.654
73	4.594	7.941	12.535	6.453	10.124	16.577
74	5.235	8.586	13.821	7.386	11.625	19.011
75	6.766	12.731	19.497	6.017	10.770	16.787
76	6.004	9.210	15.214	5.433	9.906	15.339
77	5.892	11.155	17.047	4.688	9.766	14.454
78	4.419	8.017	12.436	5.025	9.485	14.510
79	3.882	7.211	11.093	4.670	8.659	13.329
80	3.241	6.640	9.881	3.962	7.922	11.884
81	2.606	5.319	7.925	3.260	6.686	9.946
82	2.291	4.246	6.537	2.797	5.863	8.660
83	1.862	3.714	5.576	2.221	4.551	6.772
84	1.449	3.197	4.646	2.715	5.696	8.411
85 and more	5.158	13.420	18.578	11.308	24.470	35.778

Source: <http://statbank.statistica.md/pxweb/pxweb/ro/20%20Populatia%20si%20procesele%20demografice/20%20Populatia%20si%20procesele%20demografice__POP010/?rxid=2345d98a-890b-4459-bb1f-9b565f99b3b9>

During 1990-2016, the 'average life expectancy at birth' indicator somewhat increased – from 68.0 years in 1990, to 72.2 years in 2016 (the respective indicator increased from 63.9 years to 68.1 years for males and from 71.9 years to 76.2 years for females) (Table 1-6).

Table 1-6: Average Life Expectancy at Birth by Area in the Republic of Moldova (the Right Bank of Dniester River) 1990-2016, Years

	Total			Urban			Rural		
	Total	Males	Females	Total	Males	Females	Total	Males	Females
1990	68.0	63.9	71.9	70.2	66.6	73.5	66.9	63.4	70.3
1991	67.7	64.3	71.0	69.6	66.1	72.8	66.2	62.5	69.7
1992	68.0	63.9	71.9	69.7	65.4	73.8	66.6	62.3	70.6
1993	67.5	63.9	70.9	69.7	65.4	73.8	66.6	62.3	70.6
1994	66.1	62.3	69.8	67.5	63.4	71.5	64.9	61.1	68.5
1995	65.8	61.8	69.7	67.3	63.3	71.3	64.6	60.7	68.5
1996	66.7	62.9	70.4	67.3	63.3	71.3	64.6	60.7	68.5
1997	66.6	62.9	70.3	67.6	63.6	71.6	65.9	62.2	69.6
1998	67.8	64.0	71.4	68.4	64.5	72.3	67.3	63.5	70.9
1999	67.4	63.7	71.0	68.4	64.6	72.2	66.8	63.1	70.3
2000	67.6	63.9	71.2	68.8	65.0	72.6	66.8	63.1	70.4
2001	68.2	64.5	71.8	69.6	65.7	73.6	67.3	63.6	70.9
2002	68.1	64.4	71.7	69.7	65.9	73.7	67.1	63.4	70.7
2003	68.1	64.5	71.6	69.8	66.3	73.4	67.1	63.3	70.8
2004	68.4	64.5	72.2	70.4	66.6	74.2	67.4	63.4	71.4
2005	67.9	63.8	71.7	70.0	66.1	74.0	66.5	62.4	70.6
2006	68.4	64.6	72.2	70.4	66.5	74.1	67.2	63.3	71.1
2007	68.8	65.0	72.6	70.5	66.4	74.3	67.8	64.2	71.5
2008	69.4	65.6	73.2	71.2	67.1	75.1	68.2	64.6	72.0
2009	69.3	65.3	73.4	71.5	67.5	75.3	68.0	64.0	72.2
2010	69.1	65.0	73.4	72.0	67.8	76.3	67.4	63.4	71.7
2011	70.9	66.8	74.9	73.2	69.1	77.2	69.5	65.5	73.6
2012	71.1	67.2	75.0	73.5	69.3	78.0	69.6	65.8	73.5
2013	71.9	68.1	75.6	74.0	70.1	77.6	70.5	66.8	74.3
2014	71.5	67.5	75.4	74.1	70.4	77.5	69.8	65.8	74.0
2015	71.5	67.5	75.5	74.1	70.1	77.8	69.9	65.9	74.1
2016	72.2	68.1	76.2	75.0	71.3	78.4	70.3	66.2	74.7

Source: <http://statbank.statistica.md/pxweb/pxweb/ro/20%20Populatia%20si%20procesele%20demografice/20%20Populatia%20si%20procesele%20demografice__POP020/POP020700.px/?rxid=2345d98a-890b-4459-bb1f-9b565f99b3b9>

The values of this particular indicator are relatively modest – as opposed to other countries, thus rating the RM among the last in Europe on the force of those levels.

1.3. Geographic Profile and Natural Resources

1.3.1. Geographical Location

The RM, covering an area of 33,846 square km, is located in Central Europe, in the north-western Balkans. The RM's capital city is the municipality of Chisinau (mentioned in the historical records for the first time in 1436) with a population of approximately 820.5 thousand people (NBS, 2017). The RM borders on Ukraine in the North, East and South and on Romania in the West, with the Western border line going along the river Prut (Figure 1-3). The total length of the RM's national border is 1,389 km, including 939 km of the border with Ukraine and 450 km of the border with Romania.

Figure 1-3: Map of the Republic of Moldova.

The RM is situated at longitude 28˚50' east and latitude 47˚ north. The exact location of the extreme points on the RM's territory is as follows: the northernmost point is Naslavcea (latitude 48˚ 21' north and longitude 27˚ 35' east); the southernmost point is Giurgiulesti (latitude 45˚ 28' north and longitude 28˚ 12' east) which is also RM's sole location on the bank of the Danube; the westernmost point is Criva (latitude 48˚ 16' north and longitude 26˚ 30' east); the easternmost point is Palanca (latitude 46˚ 25' north and longitude 30˚ 05' east). The distance between the extreme points is about 350 km from Naslavcea to Giurgiulesti and only 120 km from the West to the East at the latitude of the municipality of Chisinau.

The RM is a Black Sea region country. Its southern border extends almost as far as the Black Sea coast, and the access to the Black Sea is open for RM through the Dniester estuary and the Danube.

1.3.2. Relief

The region between the Prut and the Dniester is a part of the Moldovan Plateau, which starts at the foothills of the Bukovina Mountain Crest and Moldova's Sub-Carpathians in the West and reaches as far as the Dniester in the East. The south-western part of the Podol Upland extends along the left bank of the Dniester. Hills and flatland areas can be observed next to the upland relief within the framework of those major relief-forming units. The absolute altitudes are within the range of 429 m (Balanesti Hills) and 4 m above the sea level in the Dniester flood land (Palanca). The relief has contributed to the formation and development of geographic landscapes and ecosystems – next to the other geo-ecological, biotic and socio-human factors. The current geo-ecological complex took shape at the end of the Late Pleistocene Epoch and in the first half of the Holocene (Recent) Epoch. The current biotic complex (flora, fauna, soil) and soils appeared in the second half of the Holocene epoch.

1.3.3. Land Resources

RM has unique land resources characterized by: predominant black soils (chernozems) with high productivity potential; very high utilization rate (>75 per cent); and rugged topography (above 80 per cent of the total arable land are located on hill slopes). As of January 1, 2017, RM's total available land amounted to 3384.6 thousand hectares (NBS, 2017), including 2499.8 thousand ha (73.9 per cent) of agricultural land; of which 1827.3 thousand ha (54.0 per cent) – arable land, 288.8 thousand ha (8.5 per cent) – perennial plantations; 344.9 thousand ha (10.2 per cent) – hayfields and pastures; 38.8 thousand ha (1.2 per cent) – fallow land; 465.3 thousand ha (13.8 per cent) – forest land and areas covered with woody vegetation; 96.1 thousand ha (2.8 per cent) – rivers, lakes, water basins and ponds and 323.4 thousand ha (9.6 per cent) – other lands (Table 1-7).

Table 1-7: Available Land by Category in the Republic of Moldova within 1992-2017, thousand ha

	1992	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017
Land – total, including:	**3376.0**	**3385.1**	**3384.4**	**3384.6**	**3384.4**	**3384.4**	**3384.6**	**3384.6**	**3384.6**	**3384.6**	**3384.6**	**3384.6**
Agricultural land, of which:	2565.9	2556.7	2550.3	2521.6	2501.1	2498.3	2498.0	2497.8	2500.1	2499.7	2499.6	2499.8
Arable land	1736.3	1758.7	1813.8	1840.2	1816.7	1812.7	1810.5	1814.1	1816.1	1817.4	1822.9	1827.3
Perennial plantations, of which:	474.8	430.7	352.3	297.8	301.0	298.8	298.7	295.3	295.3	291.7	288.9	288.8
Orchards	224.5	208.3	170.8	131.9	132.5	133.3	134.5	135.1	135.8	134.5	132.5	133.5
Vineyards	215.8	202.6	168.9	155.5	153.5	149.6	147.3	142.6	141.2	137.5	132.5	135.3
Pastures	350.5	365.2	373.9	370.8	352.1	350.4	350.3	348.9	348.0	346.4	345.0	342.8
Hayfields	4.3	2.1	2.5	2.7	2.2	2.2	2.0	2.1	2.1	2.2	2.1	2.1
Fallow land	0.0	0.0	7.8	10.1	29.1	34.2	36.5	37.4	38.6	42.0	40.6	38.8
Forest land and areas covered with woody vegetation	421.7	425.3	422.7	439.5	462.8	463.1	462.7	464.2	465.2	464.5	465.2	465.3
Rivers, lakes, water basins and ponds	88.7	92.6	95.5	96.8	96.4	99.6	99.5	99.2	96.9	96.8	96.7	96.1
Other lands	299.7	310.5	315.9	326.7	324.3	323.6	324.4	323.4	322.4	323.6	323.1	323.4

Source: Statistical Yearbooks of the RM for 2017, 2016, 2014, 2012, 2008, 2003, 1999 and 1994.

According to the Centralized Land Cadastral Sheet of the General Land Cadaster of the Republic of Moldova, in 2016, the use of agricultural land by various landowners was as it follows: 74 state agribusiness enterprises with a total area of 179.1 thousand ha (8.8 per cent); 75 scientific research and education institutions with a total area of 20.9 thousand ha (1.0 per cent); 132 of other enterprises and auxiliary households in state ownership - 72.4 thousand ha (3.6 per cent); 34.8 thousand lands in the public property of the administrative-territorial units with a total area of 55.2 thousand ha (2.7 per cent); 2058 production cooperatives with a total area of 90.5 thousand ha (4.5 per cent); 152 joint stock companies with a total area of 32.1 thousand ha (1.6 per cent); 33.7 thousand limited liability companies - 745.5 thousand ha (36.8 per cent); 366.4 thousand peasant farms - 526.8 thousand ha (26.0 per cent); 788.3 thousand lands used individually by private owners with a total area of 230.3 thousand ha (11.4 per cent); 35.5 thousand of orchard farms - 2.6 thousand ha (0.1 per cent) and 96.9 thousand of other lands with a total area of 72.0 thousand ha (3.5 per cent).

RM's soil cover is very diverse and comprised of above 745 soil types. Chernozems (black soils) accounts for approximately 73.7 per cent of the country's total territory; grey forest soil (found mainly on elevations with altitudes above 200 m on the Northern Plateau, on hills along the Dniester and in the Codrii Zone) accounts for about 9.4 per cent, and brown forest soil (found on hilltops at altitudes exceeding 300 m, covered currently or previously with beech, hornbeam and oak tree forests) - respectively for about 0.6 per cent; alluvial soils (found in river floodplains and water meadows on recent alluvial deposits) account for approximately 10.2 per cent; and deluvial soils (formed on hill slopes and in valleys from soil particles brought by the land erosion processes) - respectively about 3.7 per cent; rendzine (soddy-calcareous) soils (formed on limestone under the influence of the steppe and forest grass aggregations) – about 1.0 per cent; chernozem-like, swamp and humus-peaty soils (found in fragments in forest-steppe zones) – about 0.7 per cent; vertisol soils (formed predominantly in the steppe and forest-steppe environment, under grass canopy on the bed of hard clay rock) – about 0.4 per cent; and alkaline (solonetzic) and saline soils account for about 0.2 per cent of the Republic of Moldova's total territory. The extremely high land utilization rate in agriculture dictates the necessity of rational use, resource conservation, amelioration and protection of soils from erosion, landslides and other types of ill-considered human intervention.

1.3.4. Water Resources

Rivers. In the Republic of Moldova there are 3621 rivers, permanent or temporary rivulets and streams with a length of over 16 thousand km, 90 per cent of which have a length of less than 10 km and only 9 exceed the length of 100 km.

All of them form part of the Black Sea basin and can be categorized as follows: the Dniester Basin Rivers, the Prut Basin Rivers and the southern region rivers falling into either the Danube estuary or in the Black Sea coastal salt lakes. The majority of rivers are small in size. The largest rivers include: the Dniester (1,352 km long, including 657 km in Moldova, with the annual water debit of approximately 10.0 cubic km), the Prut (976 km long, including 695 km in Moldova, with the annual water debit of about 2.4 cubic km), the Raut (286 km long), the Cogilnic (243 km long, including 125 km in Moldova), the Bic (155 km long), the Botna (152 km long). The RM's drainage network densities 0.48 km per square kilometer on the average, varying between 0.84 km/km^2 in the northern regions and 0.12 km/km^2 in the regions on the left bank of the Dniester. The main water sources feeding the rivers are snowfalls and rainfalls, whereas the groundwater plays only a minor role. The majority of precipitations occur in the form of rainfall, whereas snow accounts for as little as 10 per cent of the total precipitations. High water levels are observed in spring due to the melting snow (40-50 per cent of the annual flow). In summer the water levels in rivers - and in particular in small rivers – can rise considerably after storm rainfall, sometimes causing disastrous floods.

Lakes. There are approximately 60 natural lakes and more than 4.25 thousand water storage reservoirs. There are also about 7 thousand boreholes, circa 179 thousand water-wells and circa 3 thousand springs, estimated at 1.8 million m^3/day

There are approximately 4336 water storage reservoirs with a total area of circa 41.949 thousand ha, and only circa 60 natural lakes. Most of them are lakes located in the high-water beds of the rivers Prut (Beleu – 6.26 km^2, Dracele – 2.65 km^2, Rotunda – 2.08 km^2) and Dniester (Salas – 3.72 km^2, Ros – 1.16 km^2, Old Dniester – 1.86 km^2). In addition, there are above 4250 water storage ponds created and maintained for diverse economic purposes (such as: irrigation, fishing, recreation, industrial and household needs, protection from floods).

Large water-storage reservoirs have been created for hydro-power plants: Costesti–Stinca (59.0 km^2) on the river Prut jointly with Romania, on the Dniester river – Dubasari (67.5 km^2), Cuciurgan (27.3 km^2) and on the Bic river – Ghidighici (6.8 km^2).

Groundwater. Groundwater has a special role in the surface water balance in the RM. They participate actively in the hydrological cycle as a component of the ground water debit. The distribution of the available ground waters is not even across the country, because their major portion is concentrated in the high-water beds of the Dniester and the Prut. The water supply capacity of the ground water-bearing horizons decreases with the increasing distance to those rivers. Thus, the country has 17 horizons and water systems of various ages and uneven distribution[10]. Six of these water horizons are more important: the alluvial horizon dating back to the Quaternary Epoch (22 mil m^3), the Middle Sarmatian horizon (110 mil. m^3), the Early Sarmatian and the Badenian water system (770 mil. m^3), the Cretaceous (110 mil. m^3), the Late Sarmatian and the Pontian horizon (44 mil m^3). In most water horizons, circa 50 per cent presents potable properties, except for the phreatic horizon – 20-30 per cent. Groundwater reserves are around 1,100 mil m^3, while those approved for economic needs represent circa 255,000 m^3 per day.

Approximately 40 per cent of the rural population is supplied with water from groundwater wells with hydrostatic pressure (about 7000 wells are surveyed, of which, in 2016, only 2398 were exploited, including for drinking – 1571, with technical purposes – 569, for industrial and agricultural destination – 235, for curative purposes – 11) and from the first water layer (without pressure) (circa 178.7 thousand fountains, of which managed – 144.9 thousand fountains and 3.094 thousand springs, of which managed – 2.06 thousand springs), providing for 1.8 mill. m^3/day of confirmed reserves. Of the total national groundwater resources, only 50 per cent can be used for drinking purposes without prior treatment.

Mineral Waters. Currently, in the RM, about 50 types of mineral waters in circa 170 mineral water springs are approved for use and certified, but about half of them (particularly, because fluoride and hydrogen sulphide content exceeds by 10 and respectively 8 times the maximum permitted), are not operating[11]. Of these, circa 25 mineral water springs (Varnita–III, Branesti, Purcari, Edinet-II, Micauti, Cotiujeni, Orhei, Balti-III, Ialoveni, etc.), including therapeutic mineral water springs (Source no. 3 from Gura Cainarului village) are new springs, appreciated as a result of the last years prospections. Water mineralization levels vary between 1 and 10 g/dm^3. Mineral water springs are typical for the southern and north-eastern regions of the country, containing hydrocarbonates and hydrocarbonates-sulfates prevailing the sodium and calcium cations. Their water contains hydrogen sulphide (30-80 mg/dm^3), iodine (17-26 mg/dm^3), bromine (132-139 mg/dm^3) and other chemical elements (lithium, radon, strontium, boron).

Industrial Waters. The industrial ground water available in the RM contains less-common extractable chemical elements, with the waters containing iodine, bromine, strontium, cesium, rubidium, boron and helium being the most widespread. The highest concentration of chemical elements in the water with mineralization levels of 70-100 g/dm^3 is: 60 mg/dm^3 for iodine; 360 mg/dm^3 for bromine; 380 mg/dm^3 for strontium; 1.0 mg/dm^3 for cesium; 3 mg/dm^3 for rubidium; and 15.0 ml/dm^3 for helium.

Thermal Waters. Thermal water is common in the high-water bed of the Prut and in the southern regions of the RM. The water temperature is 20-80^{o}C, and the water debit of the wells is 10-100 m^3 per day.

1.3.5. Biological Resources

Flora. The RM's geographic location, climate and relief have pre-conditioned the development of extremely various vegetation with a large number of species; currently the country's flora comprises about 5,638 species: superior plants – 2,014 species (vascular plants – 1,856 species (pteridophytes – 25 species, gymnosperms – 1 specie, angiosperms – 1830 species), respectively bryophytes (mosses) – 158 species); inferior plants – 3,624 species (lichenes – 124 species and algae – 3,500 species). The ecosystems which have the richest flora composition include: the forest (above 850 species), steppe (above 600 species), high-water basin (about 650 species), petrophyte (circa 250 species), water and swamp (about 160 species) systems. In the Republic of Moldova there are also 1200 species of fungi and 836 species of macromycetes.

In terms of landscape, the RM's territory is located in two natural zones – wooded steppe and steppe. The steppe zone comprises the fields and elevations in the regions to the south of the Codrii Upland and to the south and east of the Tigheci Hills. In addition to the above, the steppe flora can be found also in the North - in the Cubolta Upland, in the Ciulucuri Hills and in the Middle Prut Upland.

Most of the steppe regions are used currently in agriculture; and therefore, the typical steppe flora represented by mat-grass, feather grass, fescue and diverse other grass types has persisted solely on small hill slope areas with old landslides or on more inclined

[10] <http://moldova-suverana.md/article/apa-este-dimensiunea-ecologic-fundamental-a-existenei_423>

[11] <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=352740>

erodible slopes. Of the total number of steppe plant species, 18 have been included in the Red Book of Moldova, including 9 species (*Astragalus dasyanthus Pall., Belevallia sarmatica (Georgi) Woronow, Bulbocodium versicolor (Ker.-Gawl.) Spreng., Colchicum triphyllum G.Kunze, C. Fominii Bordz., Galanthus elwesii Hook. fil., Ornithogalum amphibolum Zahar., O. oreoides Zahar., Stembergia colchiciflora Waldst. et Kit.*), which are also included in the Red Book of Ukraine (1996) and in Romania's Red List of superior plants (1994).

The forest flora can be found - in addition to the steppe regions - in the wooded steppe zone, on higher hills more frequent in the Codrii Region. The deciduous forests typical of the Central Europe prevail and account for 97.9 per cent (including Quercus spp. – 39.6 per cent, Robinia spp. – 36.1 per cent, Fraxinus spp. – 4.6 per cent, Carpinus spp. – 2.6 per cent, Populus spp. – 1.6 per cent), whereas resinaceous forests account for as little as 2.1 per cent.

The country's forest ecosystems include 45 native species of trees, 81 native species of shrubs and 3 native species of forest vines (lianas). The most common native woody plant species found in our forests include: English Oak *(Quercus robur)*, Durmast Oak *(Quercus petraea)*, Pubescent Oak *(Quercus pubescens)*, Common Ash *(Fraxinus excelsior)*, European Hornbeam *(Carpinus betulus)*, European White Elm *(Ulmus laevis)*, Sycamore Maple *(Acer pseudoplatanus)*, Small-Leaved Linden *(Tilia cordata)*, European Weeping Birch *(Betula pendula)* and European Beech *(Fagus sylvatica)*.

Fauna. The RM's fauna is relatively rich and manifold. There are above 15.0 thousand species of animals in Moldova, including 461 species of vertebrates and above 14 thousand species of non-vertebrates. The vertebrates include 70 species of mammals, 281 bird species, 14 reptile species, 14 amphibian species and 82 fish species. Birds are highest in number among the vertebrates (281 species and subspecies), and insects - among non-vertebrates (above 12 thousand species.

The most widespread native species of mammals include: brown long-eared bat *(Plecotus auritus)*, hedgehog *(Erinaceus europaeus)*, European mole *(Talpa europaea)*, common shrew *(Sorex araneus)*, noctule bat *(Nyctalus noctula)*, red squirrel *(Sciurus vulgaris)*, brown hare *(Lepus europaeus)*, European ground squirrel *(Citellus citellus)*, spotted squirrel *(Citellus suslicus)*, house mouse *(Mus musculus)*, Norway rat *(Rattus norvegicus)*, wood mouse *(Apodemus sylvaticus)*, yellow-necked mouth *(Apodemus flavicollis)*, red fox *(Vulpes vulpes)*, European roe deer *(Capreolus capreolus)*, wild boar *(Sus scrofa)*, Eurasian badger *(Meles meles)*, beech marten *(Martes foina)*, European polecat *(Mustela putorius)*, and least weasel *(Mustela nivalis)*. Rare and endangered species are protected by the law; 116 animal species have been entered in the Red Book of Moldova (the edition of 2001), including 14 mammal species, 39 bird species, 8 reptile species, 1 amphibian species, 12 fish species, 1 Cyclostomata species, 37 insect species, 1 Crustacean species and 3 Mollusc species. The mammals populate mostly the forest ecosystems – 47 species, meadows – 33 species and agricultural ecosystems – 25 species, while the birds populate mostly the water ecosystems – 109 species, the forest – 106 species, agricultural ecosystems – 76 species, steppe – 45 species and petrophyte ecosystems – 23 species.

There are five natural reservation established for scientific research purposes with the total area of 19.4 thousand ha in the Republic of Moldova. Two natural forest reservations – "Codrii" and "Plaiul Fagului" – are located in the central regions of Moldova; two more reservations – "Prutul de Jos" and "Padurea Domneasca" – in the Prut valley; and the fifth reservation – "Iagorlic" (Dubasari district) – has been established to protect and study the unique water ecosystem of the Dniester river.

1.3.6. Mineral Resources

The most popular minerals used in the Republic of Moldova are: (1) carbonate strata rocks dating back to the Early Sarmatian and Badenian Epoch - used in construction of industrial facilities and housing, cement production, sugar refining, road construction, as additives to animal feed, etc.; (2) clint rocks (siliceous limestone, diatomite/kieselgur, fossil meal/tripoli) - used in food industry, production of artificial leather, paper, thermal and electro-thermal materials, etc.; (3) clay rocks (slate clay, bentonite clay, ordinary clay) - used in production of cement, ceramite, bricks, tiles and ceramic pipes; (4) sand and broken stone (gravel) - used in the manufacture of glass, concrete, in the various construction sectors including road construction; (5) sulphate rocks (gypsum) - used in construction, medicine, pharmaceutics; (6) crystal rocks (gabbro, granite, gabbro-norite) - used in production of ferro concrete, in road construction; (7) caustobioliths (oil, gas, brown coal) available in insignificant quantities in the South (Valeni, Victorovca, Vladiceni).

Mineral resources in the Republic of Moldova are extracted from 415 deposits, of which only one third operate. The country holds industrial reserves of about 400 million tons of gypsum, sand for glass production, tripoli, diatomite and 1500 million m^3 of stone, gravel, limestone, clay, while non-metallic minerals are extracted from 900 local quarries Also, 37 deposits are being prepared for use, 230 represent exploitable reserves while 21 are not intended for exploitation.

The most common used minerals are carbonate, siliceous and clay rocks, as well as gravel and sand, sandstones, gypsum, granite and gabbro. The limestone and clay are the most used mineral resources in the construction industry.

Modest reserves of hydrocarbons have been identified in the Southern regions of the country, such as oil (Valeni, Cahul district), natural gas (Victorovca, Cantemir district) and brown coal (Etulia, ATU Gagauzia). According to official estimates, oil reserves represent circa 2.1 million tons while natural gas – about 960 million m^3. As a result, in 2016, circa 6 thousand tons of oil was extracted from Valeni oil fields and about 90 thousand cubic meters of natural gas were extracted from Victorovca gas fields.

1.4. Climate Profile

The climate of the Republic of Moldova is moderately continental, characterized by relatively mild winters with little snow, long warm summers and low humidity.

The country is located in the area where the air masses coming from the Atlantic Ocean via Western Europe interact and mix with the air from the extreme continental north-eastern regions and the Mediterranean air from the south-west.

Two distinctive patterns can be observed regarding the territorial distribution of the climatic features in RM: (i) distinct zoning of the annual rainfall averages which show a decreasing trend from the North to the South; and (ii) the increase by approximately 100 mm of the multiannual rainfall averages in the upland regions depending on the neighboring flatland areas.

As regarding to the historic climate change trends, over the last 130 years, the RM has experienced changes in temperature and mean precipitation. The country has become warmer, with the average temperature increase greater than 1.2°C (Figure 1-4), while the increase in precipitations constituted only around 55.6 mm (Figure 1-5).

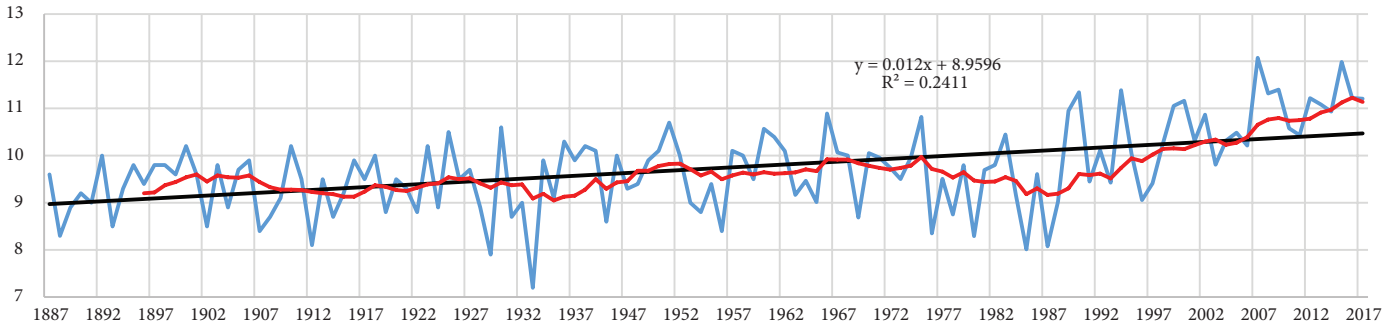


Figure 1-4: Trends of annual average air temperature change (°C) for 1887-2017: blue (actual course trend), black solid line (linear trend secular course) and red line (10 year moving average trend) at the meteorological station Chisinau, central part of the country.

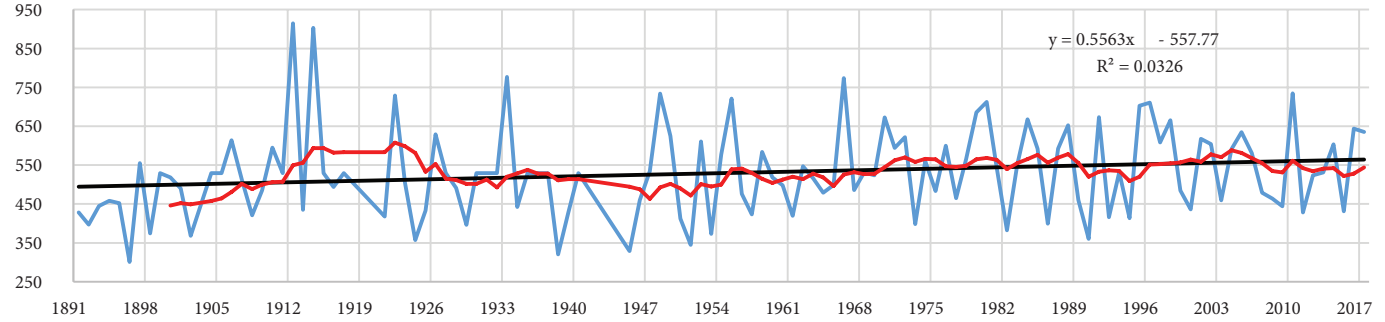


Figure 1-5: Trends of annual average precipitation (mm) for 1891-2017: blue (actual course trend), black solid line (linear trend secular course) and red line (10 year moving average trend) at the meteorological station Chisinau, central part of the country.

The early 1980s are generally regarded as a "turning point" in the long-term air temperature curve, when human influence on the atmosphere is most pronounced (IPCC, 2007); this fact has been statistically confirmed both by foreign (Gil-Alana, 2008), as well as national studies (Corobov et al, 2013; Taranu, 2014, Taranu et al., 2018[12]). The annual course of mean air temperature in the RM, with a maximum in July-August and a minimum in January, and total precipitation, maximum in June-July and minimum in February-March, is shown in Figure 1-6.

[12] Lilia Țăranu, Dmitri Deveatii, Catalina Croitoru, Tatiana Mironova et al. (2018), Vulnerability Assessment and Climate Change Impacts in the Republic of Moldova. Researches, Studies, Solutions. A Research Study Complimenting the Vulnerability and Climate Change Impacts Chapter of the Fourth National Communication of the Republic of Moldova under the United Nations Framework Convention on Climate Change. – Ch.: 2018, „Bons Office" SRL - 352 p.

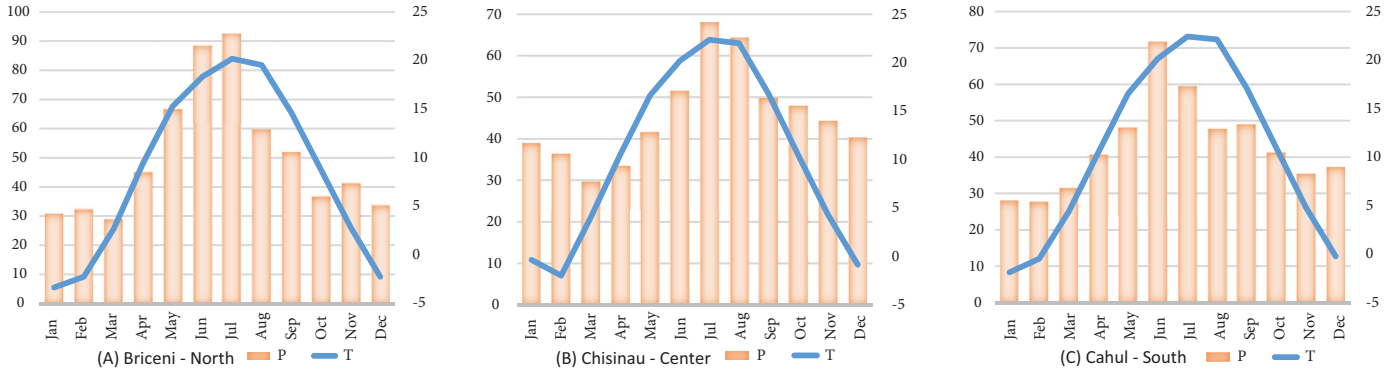


Figure 1-6: Diagrams of total monthly precipitation (columns) with superimposed curves of mean monthly temperatures in different areas, 1981-2017.

Their average numerical values in the seasonal aspect are listed in Table 1-8. The temperature rise in a southern direction is clearly seen (from an average annual value of 8.7°C in the North to 10.5°C in the South, followed by a decrease in the amount of annual precipitation, respectively, from 597.9 mm to 518.8 mm.

Table 1-8: Mean air temperatures and total precipitation over the period 1981-2017 and their inter-annual variability

Season	Observations at the meteorological stations					
	Briceni - North		Chisinau - Center		Cahul - South	
	X	CV,%	X	CV,%	X	CV,%
Maximal air temperature, °C[13]						
Winter	0.4	>50	1.9	>50	2.3	>50
Spring	14.4	11.1	15.4	11.1	15.8	11.7
Summer	25.1	5.4	26.9	5.8	27.3	5.8
Autumn	13.4	9.5	14.9	8.3	15.6	8.9
Annual	13.3	8.2	14.8	7.8	15.3	8.3

[13] Maximal air temperature, °C, 1981-2015.

Season	Observations at the meteorological stations					
	Briceni - North		Chisinau - Center		Cahul - South	
	X	CV,%	X	CV,%	X	CV,%
Mean air temperature, °C						
Winter	-2.5	>50	-1.1	>50	-0.9	>50
Spring	9.1	14.3	10.4	12.5	10.5	13.4
Summer	19.4	6.1	21.5	5.7	21.6	5.8
Autumn	8.8	12.5	10.5	10.5	10.9	10.9
Annual	8.7	11.1	10.4	9.4	10.5	9.9
Minimal air temperature, °C[13]						
Winter	-5.3	39.8	-3.6	48.1	-3.6	45.4
Spring	4.4	22.7	6.1	16.7	5.9	17.7
Summer	14.1	7.2	16.6	5.9	16.4	5.7
Autumn	4.9	23.8	6.8	16.1	7.0	15.6
Annual	4.5	19.5	6.5	13.0	6.5	13.0
Precipitations, mm						
Winter	97.5	43.0	104.8	45.8	93.4	44.9
Spring	140.9	32.7	126.8	51.1	120.6	45.3
Summer	240.7	34.7	182.3	38.5	179.0	48.5
Autumn	130.5	47.7	132.7	51.1	125.8	52.3
Annual	609.6	26.5	546.7	18.8	518.8	22.9

However, as it follows from the above definition of climate, it is described not only by the mean values, but also by their variability, which is usually characterized by standard deviations (σ) from the medium. The ratio of σ to the mean value (x), expressed as a percentage, or the so-called coefficient of variation (CV) provides an easily interpretable magnitude of the climate variability variable.

$$CV = \frac{\sigma}{x} \times 100\%$$

The temperature is the most variable in the winter, reaching 50 per cent or more for the mean, maximum and minimum temperatures. The least variable are the mean, maximum and minimum summer temperatures, when the CV ranges from 5.4 to 7.2 per cent. With regard to annual temperatures, they range from 8.2 (Briceni) to 8.3 per cent (Cahul) for maximum temperatures to up to 13.0 (Cahul) to 19.5 per cent (Briceni) for minimum temperatures. Variability of precipitation is considerably higher and it is >30 per cent for all seasons, with the exception of the annual precipitation.

Trends in air temperature and precipitation calculated by linear regression analysis are shown in Figures 1-7 and 1-8, and more details are provided in Table 1-9.

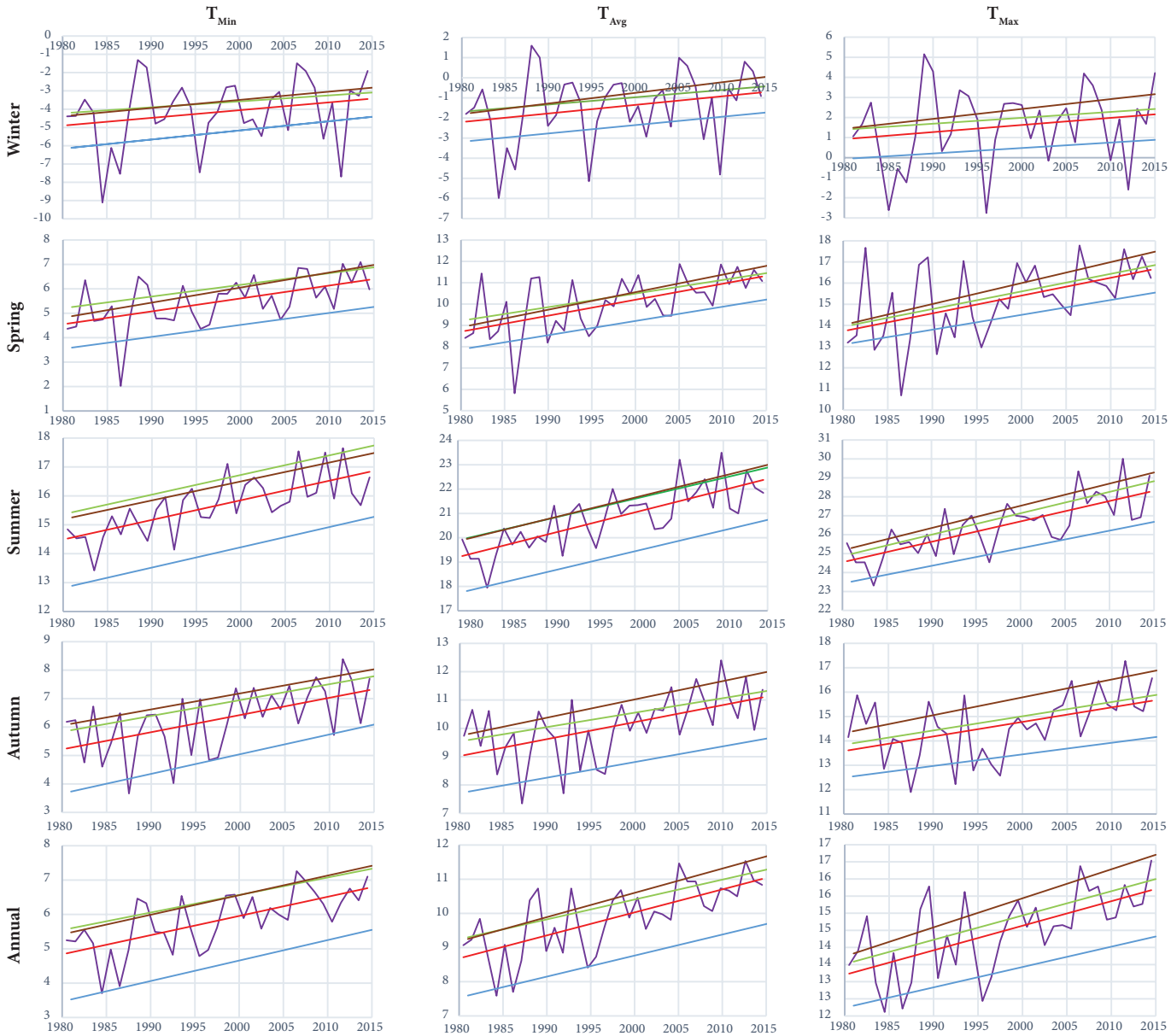


Figure 1-7: Trends in air temperature over period 1981-2015: Briceni – blue, Chisinau – green, Cahul – brown, the red linear trend – the average for the RM; the violet curve shows the inter-annual temperature variability for the Republic of Moldova.

Table 1-9: Indicators of linear trends of temperature and precipitation

Season	Observation site								
	Briceni			Chisinau			Cahul		
	r_0	r_1	p	r_0	r_1	p	r_0	r_1	p
Maximal air temperature, °C									
Winter	-0.06	0.027	0.4281	+1.40	0.029	0.3687	+1.44	0.049	0.1098
Spring	+13.10	0.070	0.0076	+13.94	0.083	0.0028	+14.02	0.100	0.0008
Summer	+23.42	0.093	0.0000	+24.87	0.113	0.0000	+25.18	0.117	0.0000
Autumn	+12.50	0.046	0.0239	+13.84	0.058	0.0037	+14.32	0.073	0.0009
Annual	+12.24	0.060	0.0005	+13.51	0.071	0.0000	+13.69	0.089	0.0002
Mean air temperature, °C									
Winter	-3.18	0.038	0.2049	-1.69	0.033	0.2283	-1.80	0.050	0.0465
Spring	+7.96	0.063	0.0005	+9.22	0.064	0.0009	+8.91	0.082	0.0000
Summer	+17.72	0.086	0.0000	+19.90	0.085	0.0000	+19.86	0.090	0.0000
Autumn	+7.71	0.055	0.0005	+9.54	0.051	0.0019	+9.74	0.064	0.0002
Annual	+7.53	0.062	0.0000	+9.24	0.058	0.0000	+9.18	0.072	0.0000
Minimal air temperature, °C									
Winter	-6.16	0.050	0.1648	-4.22	0.035	0.2817	-4.40	0.044	0.1090
Spring	+3.54	0.049	0.0026	+5.21	0.048	0.0038	+4.82	0.062	0.0002
Summer	+12.82	0.070	0.0000	+15.36	0.068	0.0000	+15.19	0.066	0.0000
Autumn	+3.66	0.070	0.0001	+5.83	0.056	0.0016	+6.06	0.056	0.0015
Annual	+3.47	0.060	0.0000	+5.54	0.051	0.0000	+5.42	0.057	0.0051
Precipitation, mm									
Winter	99.63	-0.111	0.8676	94.94	0.520	0.4958	90.02	0.177	0.7911
Spring	139.48	0.075	0.9173	115.15	0.615	0.4484	117.56	0.158	0.8559
Summer	248.96	0.436	0.7433	206.08	-1.252	0.2589	199.62	-1.084	0.4309
Autumn	107.12	1.231	0.2100	116.34	0.863	0.4227	91.01	1.831	0.0740
Annual	595.18	0.759	0.7273	532.51	0.746	0.6479	498.22	1.082	0.5616

Legend: r_0 – free term; r_1 - regression coefficient (trend coefficient); p - statistical significance of the trend

The positive trend rate on all graphs shows a temperature rise with different intensity in all seasons and on all territory of the RM. The statistical significance of the trend is shown by their p-values. Trends, where p<0.10, underlined in the table by shading should be considered as valid with 90% confidence level. In many cases, the statistical significance is significantly higher (p<0.05, and even <0.001).

The air temperature increase on the territory of the RM over the years 1981-2015/2017 bears no doubt and it is most clearly seen during the warm season, especially in summer, when T_{Avg} rises by 0.85-0.9°C and T_{Max} by 0.9-1.2°C per decade, with a very high degree of certainty. Climate is getting warmer to a lesser degree during the winter months, by 0.3-0.5°C per decade and this growth is statistically significant only for Cahul (southern region).

For the southern region, the greatest temperature rise is registered due to T_{Max}, while for the northern and central regions due to T_{Min}. In the transitional seasons, the greatest statistically significant increase in temperature is observed for T_{Max} in the spring from 0.7°C (Briceni) to 1.0°C (Cahul) over the decade, and the lowest over autumn from 0.5°C (Briceni) to 0.7°C (Cahul) per decade. However, T_{Min} shows a reverse pattern with autumn growth from 0.6°C (Cahul) to 0.7°C (Briceni) as compared to 0.5°C (Briceni) and 0.6°C (Cahul) per decade in spring.

In annual terms, also the largest increase in T_{Max} of 0.9°C per decade is observed in Cahul against 0.6°C in Briceni, while the largest increase in T_{Min} is observed, on the contrary more uniform, by 0.5-0.6°C for the whole territory of the Republic of Moldova.

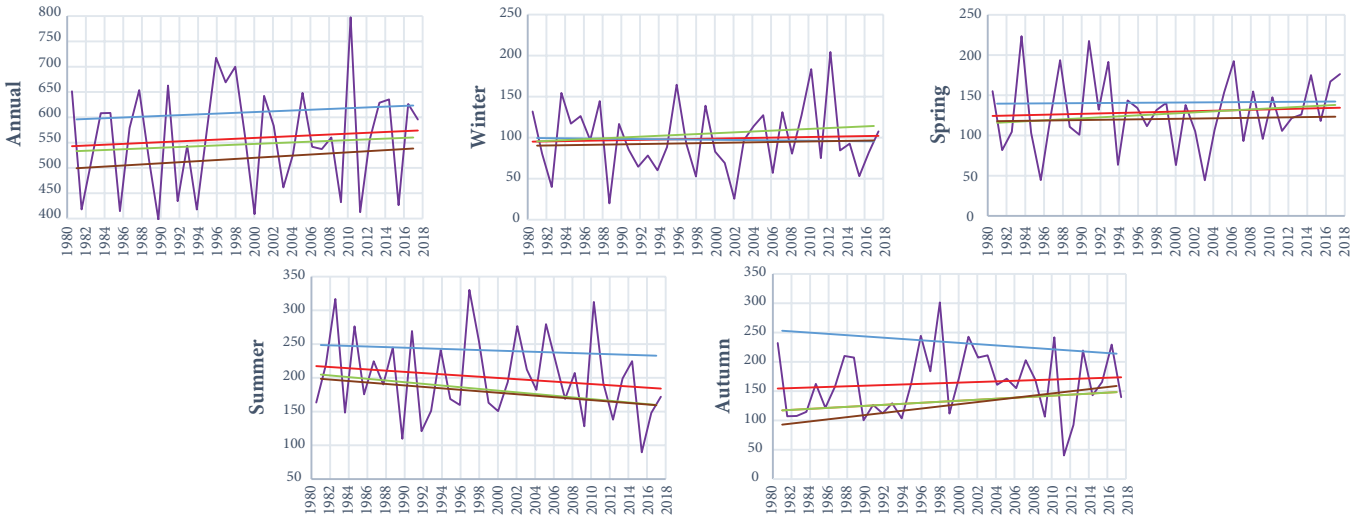


Figure 1-8: Trends in precipitation over period 1981-2017: Briceni - blue, Chisinau - green, Cahul - brown, red linear trend – the average for the RM; the violet curve shows the inter-annual fluctuations in precipitation for the RM.

Unlike temperature, statistically significant changes in precipitation are not observed, except for a statistically significant increase in autumn precipitation of 18 mm per decade for the South. The upward trend in mean annual rainfall is observed from 7.6 mm in the North to 10.8 mm per decade in the South. However, a trend towards a decrease of precipitation is observed in the South and Center, by 10.8-12.5 mm per decade during the summer, while in autumn, the increase is seen by 8.6-18.3 mm per decade.

1.5. Economic Profile

After the breakup of the Soviet Union and declaration of the Republic of Moldova's independence, the nation had to face a particularly severe crisis in view of both the size of the country and the scope of the crisis as compared to the other economies in transit. The RM rated among the medium-low income countries in 1991, and it has turned currently to one of the lowest income countries in Europe, with its per capita GDP below the average for both the Commonwealth of Independent States (CIS) and the Central European countries. In terms of its structure, the RM's economy is closer to that of the Central Asia republics than that of the other western former Soviet Union Republics.

1.5.1. Gross Domestic Product

The separatist actions of the industrialized Transnistrian region (i.e., the current administrative-territorial units on the left bank of the Dniester) have left the RM with an undiversified economic base, dependent in practical terms solely on the agricultural production and food industry. In 1995 the agricultural sector accounted for 29.3 per cent of GDP, and the manufacturing industry – for 22.5 per cent of GDP. By 2017, the share of GDP accounted for by the agriculture decreased to 12.2 per cent, and that of the manufacturing industry to 11.8 per cent (Table 1-10).

Table 1-10: GDP Structure in the Republic of Moldova, 1995-2017, %

	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017
GDP structure, %	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Gross Value Added	88.6	87.5	84.0	83.4	83.0	83.5	83.3	84.3	84.8	85.2	84.1
Production, total	54.2	41.9	32.2	25.7	26.6	25.6	27.1	28.1	27.5	27.3	26.8
Agriculture	29.3	25.4	16.4	12.0	12.3	11.2	12.3	13.0	12.2	12.2	12.2
Industry	22.5	14.1	13.5	10.6	11.2	11.2	11.7	12.1	12.3	12.2	11.8
Services, total	36.7	48.0	53.8	59.7	58.6	59.9	57.9	58.1	60.5	59.6	58.6
Wholesale and Retail Trade	8.0	12.5	10.4	12.8	13.5	13.7	13.6	13.7	13.7	14.1	14.4
Transports and Communications	2.9	4.5	5.0	4.7	5.0	5.0	4.9	4.9	5.0	5.1	4.9
Construction Sector	3.5	2.7	3.3	3.4	3.3	3.4	3.4	3.6	3.6	3.3	3.3
Financial Sector	3.7	5.3	4.6	5.7	5.0	4.7	4.4	4.5	6.4	5.4	5.1
Other	18.6	23.1	30.4	33.1	31.8	33.1	31.6	31.4	31.9	31.8	30.9
Agent (Intermediary) Services	-2.2	-2.4	-2.0	-2.1	-2.2	-2.0	-1.7	-1.9	-3.3	-1.7	-1.4
Product and Import Taxes, Net	11.4	12.5	16.0	16.6	17.0	16.5	16.7	15.7	15.2	14.8	15.9

Source: National Institute for Economic Research of the ASM and the Ministry of Economy and Infrastructure (March 2018).

It should be noted that certain economic decline patterns had been registered prior to 1991, but the separation from the USSR has considerably accelerated that process. GDP level was decreasing continuously during the period from 1990 to 1999 inclusive, when it fell down to as little as 34 per cent of the 1990 level. The only exception was 1997 year, when a slight increase by 1.6 per cent versus the previous year was registered due to the excellent agricultural yields as result of the very favorable climate conditions.

Table 1-11: GDP in the Republic of Moldova, 1990-2017, billion MDL

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017
GDP, billion MDL (real)	13.0	6.5	16.0	37.7	71.9	82.3	88.2	100.5	112.0	122.6	134.9	150.4
% compared to the previous year	97.6	98.6	102.1	107.5	107.1	106.8	99.3	109.4	104.8	99.6	104.5	104.5
% compared to 1990	100.0	39.4	34.8	49.0	57.4	61.3	60.8	66.6	69.8	69.5	72.6	75.8

Source: National Institute for Economic Research of the ASM and the Ministry of Economy and Infrastructure (March 2018).

The reasons for the economic collapse were multiple. First, the RM had been integrated completely in the USSR economic system, and the independence resulted, among other things, in the cessation of any subsidies or cash transfers from the centralized government.

Second, the end of the Soviet Era with its well-established commercial links has resulted in the emergence of multiple obstacles for free movement of products, and in access restrictions introduced by the emerging markets.

Third, the lack of domestic energy resources and raw materials in the RM has contributed considerably to the nation's strong dependence on other former Soviet Republics. That dependence has caused a shock in the sphere of imports due to the increased prices of the energy resources imported from the Russian Federation.

Table 1-12: GDP in the Republic of Moldova, 1995-2017, billion US $

	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017
GDP, billion US $ (real)	**1.441**	**1.288**	**2.988**	**5.813**	**7.016**	**7.284**	**7.983**	**7.981**	**6.514**	**6.773**	**8.132**
% compared to the previous year	123.7	110.0	115.0	106.9	120.7	103.8	109.6	100.0	81.6	104.0	120.1
GDP, billion US $ (PPP)	**7.586**	**7.687**	**8.492**	**10.926**	**11.916**	**15.035**	**16.611**	**17.397**	**17.311**	**18.074**	**18.880**
% compared to the previous year	69.3	103.7	116.2	108.3	109.1	126.2	110.5	104.7	99.5	104.4	104.5
GDP per capita, thousand MDL	**1.798**	**4.401**	**10.473**	**20.181**	**23.132**	**24.786**	**28.245**	**31.506**	**34.485**	**37.990**	**42.361**
% compared to the previous year	100.7	102.3	107.8	107.2	106.9	99.3	109.4	104.9	99.6	104.5	104.6
thousand US $	0.400	0.354	0.831	1.632	1.971	2.046	2.243	2.244	1.833	1.907	2.291
thousand US $ (PPP)	2.105	2.112	2.362	3.101	4.179	4.224	4.668	4.892	4.871	5.089	5.319

Source: National Institute for Economic Research of the ASM and the Ministry of Economy and Infrastructure (March 2018).

Certain internal reasons should be mentioned as well, such as: transition from a centralized economy to a market economy; loss of the industries located in Transnistrian region on the left bank of Dniester; frequent droughts; and the civil conflict. Despite these problems, the considerable GDP growth achieved since 2000 seems to indicate that the economy is finally developing in the correct direction (excluding 2009, when the country was affected by the regional economic crisis as well as 2012 and 2015 when disastrous droughts affected the RM) although it should be remembered that, according to the latest data available, in 2017 the GDP reached only 75.8 per cent of the 1990 level. Also, the substantial cash inflows from the Moldavians working abroad have somehow reduced the negative impact of the declining economic activity.

Table 1-13: GDP in the Republic of Moldova, 1990-2016, billion 2010 US $

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016	%
GDP, billion 2010 US $	10.133	3.995	3.524	4.961	5.812	6.207	6.163	6.743	7.066	7.038	7.327	-27.7
% compared to the previous year	97.6	98.6	102.1	107.5	107.1	106.8	99.3	109.4	104.8	99.6	104.1	6.7

Source: As of 19/12/2017, <http://www.ers.usda.gov/data-products/international-macroeconomic-data-set.aspx#.UXFRlKJTCQo>

1.5.2. Trade Balance Deficit

The RM's import expenses exceed considerably the nation's proceeds from its exports, thus indicating a severe problem in terms of the nation's trade balance deficit (Table 1-14). That deficit reached 23.7 per cent of the GDP in 2000 and over 29.6 per cent of the GDP in 2017.

Table 1-14: Trade Balance Deficit of the Republic of Moldova, 1995-2017

	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017
GDP, billion US $	**1.441**	**1.288**	**2.988**	**5.813**	**7.016**	**7.284**	**7.983**	**7.981**	**6.514**	**6.773**	**8.132**
Exports (CIF), billion US $	**0.746**	**0.471**	**1.091**	**1.541**	**2.217**	**2.162**	**2.428**	**2.340**	**1.967**	**2.045**	**2.425**
% compared to the preceding year	131.9	101.7	110.7	120.1	143.8	97.5	112.3	96.3	84.1	104.0	118.6
Imports (FOB), billion US $	**0.841**	**0.776**	**2.292**	**3.855**	**5.191**	**5.213**	**5.492**	**5.317**	**3.987**	**4.020**	**4.831**
% compared to the preceding year	127.5	132.4	129.6	117.6	134.7	100.4	105.4	96.8	75.0	100.8	120.2
Trade balance deficit, billion US $	**-0.095**	**-0.305**	**-1.201**	**-2.314**	**-2.974**	**-3.051**	**-3.064**	**-2.977**	**-2.020**	**-1.976**	**-2.406**
Coverage of IMP with EXP, %	88.7	60.7	47.6	40.0	42.7	41.5	44.2	44.0	49.3	50.9	50.2
% of GDP: exports	51.7	36.6	36.5	26.5	31.6	29.7	30.4	29.3	30.2	30.2	29.8
imports	58.3	60.3	76.7	66.3	74.0	71.6	68.8	66.6	61.2	59.4	59.4
balance	-6.6	-23.7	-40.2	-39.8	-42.4	-41.9	-38.4	-37.3	-31.0	-29.2	-29.6

Source: National Institute for Economic Research of the ASM and the Ministry of Economy and Infrastructure (March 2018).

The above reflects the nation's dependence on the imports of energy resources and the growing demand for the imported products (Table 1-15). The imports growth is driven by the massive inflow of cash transfers from abroad, which are channeled in domestic consumption.

Table 1-15: Structure of imports by group of goods, 1997-2017, %

	1997	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017
Total Imports, including:	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Live animals and animal products	1.9	1.4	2.5	2.5	2.1	2.5	2.7	3.0	2.5	2.7	2.7
Vegetable products	**3.2**	**3.3**	**2.8**	**4.4**	**3.8**	**3.9**	**3.7**	**3.7**	**4.9**	**4.3**	**4.0**
Animal or vegetable fats and oils; processed fats; wax of animal or vegetal origin	0.4	0.3	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.5
Food; alcoholic and nonalcoholic drinks, vinegar; tobacco	**7.5**	**9.2**	**6.4**	**8.0**	**6.9**	**7.3**	**7.3**	**6.4**	**6.8**	**7.6**	**7.3**
Mineral products	**35.3**	**33.0**	**22.0**	**20.9**	**22.7**	**23.4**	**22.9**	**21.7**	**18.4**	**15.7**	**16.0**
Chemical products and from related industries	**9.6**	**9.6**	**10.1**	**10.5**	**10.2**	**10.7**	**11.4**	**11.7**	**12.4**	**12.5**	**11.9**
Plastics, rubber and articles thereof	**3.1**	**3.1**	**6.1**	**5.9**	**5.9**	**5.8**	**5.8**	**6.2**	**6.4**	**6.4**	**6.0**
Raw hides and skins, leather, fur skins and articles thereof	0.3	0.3	3.0	0.7	0.7	0.6	0.6	0.8	1.0	1.2	1.3
Wood, wood charcoal and articles of wood; cork and articles of cork; articles from straw, wickerwork from vegetal fibers or from twigs	1.7	1.3	1.9	1.9	1.7	1.8	1.8	1.9	2.1	2.1	2.2
Wood pulp or from other fibrous cellulosic materials; paper, cardboard, recycled from waste and scrap; paper, cardboard (waste and scrap) and articles thereof	4.1	3.6	3.6	2.7	2.6	2.3	2.3	2.3	1.9	2.0	1.8
Textiles and textile articles	**5.3**	**10.0**	**7.8**	**7.3**	**7.4**	**7.4**	**7.0**	**6.7**	**7.2**	**8.6**	**8.2**
Footwear, headgear, umbrellas; canes; whips and parts used for these; feathers and fluff) and articles thereof; articles from human hair	0.3	0.3	0.5	0.6	0.7	0.6	0.6	0.6	0.5	0.7	0.9
Articles of stone, gypsum, cement, asbestos, or from similar materials; ceramic, glass and articles from glass	3.9	2.1	2.9	2.6	2.5	2.5	2.6	2.5	2.6	2.6	2.5
Natural or cultured pearls, precious or semiprecious stones, plated metals or doubled with precious metals and articles thereof; imitation jewelry; coins	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Base metals and articles of base metals	**4.4**	**4.1**	**7.0**	**6.3**	**6.0**	**5.5**	**5.9**	**6.5**	**7.2**	**6.8**	**7.1**
Machinery and mechanical appliances, electrical equipment and parts used for these; equipment for recording and reproducing sounds and images	**12.9**	**12.7**	**13.7**	**15.0**	**15.9**	**15.1**	**15.3**	**15.1**	**15.8**	**16.0**	**16.6**
Vehicles, aircrafts, vessels and associated transport equipment	**3.0**	**2.0**	**5.7**	**6.2**	**6.4**	**5.8**	**5.5**	**6.2**	**4.8**	**5.8**	**6.1**
Optical, photographic or cinematographic instruments and apparatus, medical and surgical apparatus; instruments for watchmaking; musical instruments; parts and accessories for them	1.7	2.5	1.2	1.4	1.4	1.5	1.5	1.8	2.0	1.4	1.6
Miscellaneous manufactured articles	1.1	1.2	1.9	2.6	2.4	2.6	2.4	2.3	2.8	2.9	2.9
Art objects or antiques	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0

Source: National Bureau of Statistics. Statistical database (<http://www.statistica.md/category.php?l=ro&idc=336&>)

The range of RM's exports is relatively narrow, thus complicating the nation's efforts to penetrate the western markets. Food and alcoholic drinks, textiles and textile articles, vegetable products, base metals and products thereof, machinery and mechanical appliances and electrical equipment prevail in the exports. In 2017, food and alcoholic drinks, chemical products and related industries, textiles and textile articles, as well as machinery, mechanical appliance and electrical equipment, other goods and products accounted for circa 79.2 per cent of the total exports (Table 1-16).

Table 1-16: Structure of exports by group of goods, 1997-2017, %

	1997	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017
Total exports, including:	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Live animals and animal products	8.6	4.8	1.6	1.7	1.7	1.7	1.5	2.6	1.9	2.0	1.9
Vegetable products	**8.6**	**14.0**	**12.1**	**22.1**	**21.2**	**16.7**	**20.9**	**23.5**	**25.5**	**25.9**	**27.3**
Animal or vegetable fats and oils; processed fats; wax of animal or vegetal origin	1.0	0.8	3.5	3.1	3.5	4.1	1.8	3.3	3.7	2.7	2.2
Food; alcoholic and nonalcoholic drinks, vinegar; tobacco	**54.8**	**42.1**	**36.3**	**20.6**	**14.9**	**18.1**	**17.6**	**16.2**	**15.4**	**15.7**	**15.2**
Mineral products	0.4	0.6	1.8	1.1	1.7	1.5	1.7	1.2	0.9	0.7	1.2
Chemical products and from related industries	**1.5**	**1.7**	**1.4**	**4.8**	**5.0**	**6.7**	**6.9**	**7.2**	**6.0**	**4.4**	**4.1**
Plastics, rubber and articles thereof	0.6	0.4	1.1	1.7	2.8	2.8	2.6	1.9	2.0	1.7	1.4
Raw hides and skins, leather, fur skins and articles thereof	1.4	2.8	6.6	1.6	1.6	1.4	1.4	1.5	1.3	1.2	0.9
Wood, wood charcoal and articles of wood; cork and articles of cork; articles from straw, wickerwork from vegetal fibers or from twigs	0.1	0.2	0.2	0.4	0.5	0.6	0.4	0.4	0.4	0.5	0.4
Wood pulp or from other fibrous cellulosic materials; paper, cardboard, recycled from waste and scrap; paper, cardboard (waste and scrap) and articles thereof	0.4	0.4	1.1	0.8	1.1	0.9	1.1	0.8	0.5	0.6	0.5
Textiles and textile articles	**6.7**	**17.7**	**17.8**	**17.4**	**16.0**	**15.9**	**13.6**	**14.1**	**13.9**	**15.0**	**14.3**
Footwear, headgear, umbrellas; canes; whips and parts used for these; feathers and fluff) and articles thereof; articles from human hair	0.7	0.8	2.4	2.0	2.3	1.9	1.5	1.5	1.2	1.4	1.4
Articles of stone, gypsum, cement, asbestos, or from similar materials; ceramic, glass and articles from glass	1.4	3.1	1.7	2.3	2.1	1.7	2.4	2.5	2.1	2.2	1.7
Natural or cultured pearls, precious or semiprecious stones, plated metals or doubled with precious metals and articles thereof; imitation jewelry; coins	0.1	0.0	0.0	0.0	0.2	0.1	0.0	0.1	0.0	0.0	0.1
Base metals and articles of base metals	1.0	2.5	4.5	3.8	5.1	3.4	5.1	2.4	2.2	2.1	2.0
Machinery and mechanical appliances, electrical equipment and parts used for these; equipment for recording and reproducing sounds and images	**5.2**	**5.1**	**4.2**	**11.1**	**12.8**	**12.9**	**13.0**	**13.2**	**15.0**	**14.6**	**16.1**
Vehicles, aircrafts, vessels and associated transport equipment	5.9	1.1	1.4	1.4	2.1	3.0	1.9	1.2	0.9	1.3	1.7
Optical, photographic or cinematographic instruments and apparatus, medical and surgical apparatus; instruments for watchmaking; musical instruments; parts and accessories for them	0.4	0.7	0.7	0.8	1.0	1.5	1.7	1.5	1.4	1.4	1.3
Miscellaneous manufactured articles	**1.4**	**1.1**	**1.6**	**3.4**	**4.4**	**5.0**	**4.9**	**5.0**	**5.5**	**6.5**	**6.4**
Art objects or antiques	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: National Bureau of Statistics. Statistical database (<http://www.statistica.md/category.php?l=ro&idc=336&>)

1.5.3. Cash Transfers and Remittances

Cash transfers from outside the country, and in particular cash inflows from the Moldovans working abroad are of major importance for the economy of the RM. Globally, the country is among the leaders regarding the share of remittances into the GDP. In 2017, the total net inflow of foreign currency from the Moldovans working abroad accounted for circa USD 1.585 billion or circa 19.5 per cent of the GDP (Table 1-17).

Table 1-17: Remittances from Moldovans Working Abroad within 1998-2017 periods

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
GDP, million US $	1 697.9	1 170.8	1 288.4	1 480.7	1 661.8	1 980.9	2 598.2	2 988.2	3 408.1	4 402.5
Remittances, million US $	**122.2**	**110.4**	**178.0**	**242.2**	**322.6**	**484.0**	**701.4**	**915.1**	**1 175.8**	**1 491.3**
% compared to the preceding year	106.9	90.3	161.2	136.1	133.2	150.0	144.9	130.5	128.5	126.8
% of the GDP	**7.2**	**9.4**	**13.8**	**16.4**	**19.4**	**24.4**	**27.0**	**30.6**	**34.5**	**33.9**
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
GDP, million US $	6 056.3	5 437.6	5 813.0	7 016.2	7 284.2	7 982.9	7 981.4	6 513.7	6 772.7	8 132.4
Remittances, million US $	**1 888.0**	**1 352.4**	**1 752.8**	**1 813.1**	**1 986.4**	**2 191.5**	**2 075.9**	**1 540.1**	**1 464.2**	**1 585.0**
% compared to the preceding year	126.6	71.6	129.6	103.4	109.6	110.3	94.7	74.2	95.1	108.2
% of the GDP	**31.2**	**24.9**	**30.2**	**25.8**	**27.3**	**27.5**	**26.0**	**23.6**	**21.6**	**19.5**

Source: World Bank, 2017 (<https://data.worldbank.org/indicator/BX.TRF.PWKR.CD.DT?end=2017&start=1990>)

Notwithstanding the trade balance deficit for products and services, increasingly higher cash inflows from the Moldovans employed outside the country have contributed to the decrease of the current account deficit of the RM.

The country's evident dependence on cash transfers from its citizens employed abroad presents a potential threat and indicates the lack of sustainability because the inflow of funds from outside the country creates incentives to increase consumption rather than production, thus leading to growth of imports and inflation, and a direct negative economic shock may ensure, should the volume of such transfers decrease rapidly.

In recent years the flows of money transferred from abroad tend to decrease, as some of the immigrants settle for permanent residence in other countries.

1.5.4. Investments, International Investment Position and Gross External Debt

Investments are of major importance for the growth of the RM's economy. In recent years, investments registered a significant increase as compared to the preceding years' levels. In 2017, the investments attracted by the national economy represented about 20.997 billion MDL, equivalent to about USD 1.136 billion (14.0 per cent of the GDP) (Table 1-18).

Table 1-18: Investments in the National Economy of the Republic of Moldova within 1993-2017

	1993	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017
Investments, billion MDL	**0.171**	**0.845**	**1.759**	**7.797**	**13.805**	**16.450**	**17.154**	**19.132**	**21.159**	**21.123**	**19.664**	**20.997**
Investments, billion US $	0.128	0.188	0.141	0.619	1.116	1.402	1.416	1.520	1.507	1.123	0.987	1.136
% of the GDP	**9.4**	**13.0**	**11.0**	**20.7**	**19.2**	**20.0**	**19.4**	**19.0**	**18.9**	**17.2**	**14.6**	**14.0**

Source: National Institute for Economic Research of the ASM and the Ministry of Economy and Infrastructure (March 2018).

At the same time, in 2017, the Direct Net Foreign Investments (DFI) attracted to the national economy represented USD 208.5 million (2.6 per cent of the GDP) (Table 1-19), much less compared to 2008, when these accounted for USD 726.6 million (12.0 per cent of the GDP). Though in 2017 global DFI inflows decreased significantly (including in countries with an economy in transition), in the RM, these net DFI inflows doubled compared to 2016 and represented 2.6 per cent from de GDP. At the same time, although the World Bank Report Doing Business 2018, shows that the Republic of Moldova has made significant progress in terms of simplifying the process of creating new businesses, the increase in net DFI inflows was due not to the creation of new businesses, but to the reinvestment of profits by existing businesses, as well as the accumulation of new debt to foreign direct investors as a result of intragroup lending (in 2016, were recorded net debt payments) [14].

[14] <https://www.bnm.md/ro/content/conturile-internationale-ale-republicii-moldova-pentru-anul-2017-date-provizorii-materialul>

Table 1-19: Direct Net Foreign Investments attracted to the National Economy within 1993-2017

	1993	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017
GDP, million US $	1358.3	1441.4	1288.4	2988.2	5813.0	7016.2	7284.2	7982.9	7981.4	6513.7	6772.7	8132.4
DFI, million US $	**14.0**	**25.9**	**127.5**	**190.7**	**286.1**	**347.9**	**250.8**	**241.9**	**341.9**	**216.1**	**91.0**	**208.5**
% compared to the previous year	82.4	224.0	336.6	126.3	110.8	121.6	72.1	96.5	141.3	63.2	42.1	229.2
% of the GDP	**1.0**	**1.8**	**9.9**	**6.4**	**4.9**	**5.0**	**3.4**	**3.0**	**4.3**	**3.3**	**1.3**	**2.6**

Source: World Bank <https://data.worldbank.org/indicator/BX.KLT.DINV.CD.WD?locations=MD>

The international investment position of the country, as of 31.12.2017, accounted -3,954.33 mill. USD, with the negative balance increasing towards the end of 2016 by 30.3 per cent: the foreign assets, representing 4,990.74 mill. USD, increasing by 8.3 per cent, while the liabilities – 8,945.07 mill. USD, increasing by 17.0 per cent. The ratio between the stock of assets and foreign liabilities represented 55.8 per cent.

The stock of liabilities to foreign direct investments accounted for 3,701.74 mill. USD (increasing by 21.9 per cent from the beginning of the year), representing 41.4 per cent of the total. During 2017, the stock of official reserve assets increased by 27.1 per cent compared to the beginning of the year, and accounting for 2,803.26 mill. USD as of 31.12.2017, thus approaching to the pre-crisis level (2013).

The country's gross external debt increased compared to the beginning of the year by 11.8 per cent and, as of 31.12.2017 recorded 6,973.70 mill. USD, thus accounting for 85.8 per cent of the GDP. Public debt as well as the publicly guaranteed debt represented 28.7 per cent of the total debt, totaling 1,999.63 mill. USD (+12.4 per cent from the beginning of the year).

Unsecured private debt amounted to 4,974.07 mill. USD, an increase by 11.6 per cent compared to 31.12.2016. The largest share of gross external debt stock is represented by the long-term debt (74.9 per cent). Still, in 2017, a significant increase of short-term external debt was recorded (+25.9 per cent compared to the beginning of the year).

1.5.5. Social Sphere

In 2016, the average gross nominal salary of an employee in the national economy represented 5,697.1 MDL (Table 1-20), an increase by 14.0 per cent in nominal value compared to 2016, and by 5.2 per cent in real terms (adjusted to the consumer price index). In the fourth trimester 2017, the average monthly salary represented 6,113.6 MDL, recording an increase by 12.4 per cent compared to the similar period in 2016. In the public sector, the average monthly salary was 5,165.7 MDL (+18.0 per cent compared to the same period of the previous year), in the economic (real) sector – 6,491.8 MDL (+10.3 per cent compared to the same period of the previous year). The real salary index for the fourth trimester 2017 compared to the similar period in 2016 (calculated as the ratio between the gross nominal salary and the consumer price index) represented 104.6 per cent, or an increase by 4.6 compared to the same period of the previous year.

In 2017, the subsistence minimum level of income amounted to an average of 1,862.4 MDL per month, increasing by 3.5 per cent compared to the previous year. There are significant differences by residence areas, the highest value being recorded in large cities (Chisinau and Balti) – 2,072.6 MDL or by 11.3 per cent more compared to the subsistence minimum for other cities – 1,861.6 MDL and by 17.1 per cent more compared to rural areas – 1,770.5 MDL. The level of the subsistence minimum per residence area is determined by the share of the food and food prices, which varies not only depending of the semester, but also by the territorial disaggregation criterion. If to consider the population categories, the maximum value of the subsistence minimum is specific to the working age population – 1,984.5 MDL and especially for men – 2,153.7 MDL. The subsistence minimum level for children amounts to an average of 1,768.6 MDL per month, with differences depending on the age of the child, from 699.5 MDL for one child aged up to 1 year, up to 2,002.5 MDL for a child aged 7-17 years. Depending on the residence area, the subsistence minimum for children in large cities is by 17.8 per cent higher compared with rural areas, and for children aged 1-6 years, this difference is by 20.9 per cent.

Monthly available incomes of the population in 2017 amounted to an average of 2,244.9 MDL per person and exceeded the average level of the subsistence minimum by 20.5 per cent.

The average monthly salary of an employee in this period was 5,697.1 MDL thus, it was possible to ensure the subsistence minimum for the working age population by 2.9 times. The ratio between the average monthly salary and the average level of the subsistence minimum for the working age population differs according to the national economy's activities. The maximum coverage level of the subsistence minimum for the working age population was reached by the employees in the information and communication sector – by 6.3 times, while the minimum – by the employees in the recreational sector – by 1.7 times.

Table 1-20: Average Monthly Salary and Average Monthly Old Age Pension, 1993-2017

	1993	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017
Nominal salary, MDL	**31.2**	**143.2**	**407.9**	**1318.7**	**2971.7**	**3042.2**	**3386.2**	**3674.2**	**4089.7**	**4538.4**	**4997.8**	**5697.1**
Nominal salary growth, %	897.3	132.1	133.9	119.5	108.2	106.3	111.3	108.5	111.3	111.0	110.1	114.0
Real salary growth, %	69.9	101.6	102.1	106.8	100.7	98.8	106.4	103.7	105.9	101.2	103.5	106.9
Nominal salary, US $	**23.3**	**31.9**	**32.8**	**104.7**	**240.3**	**259.2**	**279.6**	**291.8**	**291.3**	**241.2**	**250.8**	**308.1**
Real salary growth, %		119.5	113.4	117.0	97.2	107.9	107.9	104.4	99.8	82.8	104.0	122.8
Nominal salary, US $ (CPI)	**185.6**	**167.7**	**195.7**	**297.4**	**456.6**	**549.6**	**577.1**	**607.2**	**635.0**	**641.0**	**669.4**	**715.3**
Real salary growth (%)		66.9	106.8	118.2	98.6	120.4	105.0	105.2	104.6	101.0	104.4	106.9
Old age pension, MDL	**18.8**	**64.3**	**85.1**	**383.4**	**810.9**	**874.1**	**957.6**	**1020.6**	**1087.6**	**1165.2**	**1275.2**	**1527.9**
Old age pension, US $	14.0	14.3	6.9	30.4	65.6	74.5	79.1	81.1	77.5	61.9	64.0	74.7

Source: National Institute for Economic Research of the ASM and the Ministry of Economy and Infrastructure (March 2018).

According to preliminary data provided by the National Office of Social Insurance, the number of pensioners registered by the social security authorities as of January 1, 2018 represented 716 thousand people, with 24.8 thousand more compared to January 1, 2017 (691.2 thousand people).

For pensioners, the subsistence minimum represented 1,547.5 MDL or 83.1 per cent of the average level for total population. As of January 1, 2018, the average monthly old-age pension was 1,527.9 MDL (1,275.2 MDL on January 1, 2017), thus making possible to cover the subsistence minimum for this category at a level of 98.7 per cent. If to consider the average pension for the age limit, the respective ratio reaches 94.1 per cent.

Given that monthly allowances for child care up to 3 years represents on average 1,348.4 MDL for insured persons, these payments cover the subsistence minimum for children aged 1-6 years in proportion of 88.8 per cent. As for uninsured persons, monthly allowances for child care (540 MDL) provides only 35.6 per cent of the minimum necessary for children aged 1-6 years.

In 2017, economically active population (employed plus unemployed) in the Republic of Moldova represented 1,259.1 thousand people, without essential changes compared to 2016 (-1.1 per cent) (Table 1-21). No significant differences based on sex or areas within economically active population were recorded: the share of males (50.8 per cent) was higher compared to females (49.2 per cent), while the share of economically active population in rural areas was higher compared urban areas: respectively 53.7 per cent and 46.3 per cent.

The population aged 15 years and above (the share of active population above 15 years in the total population of the same age group) show an activity rate of 42.2 per cent, a small decrease compared to 2016 (42.6 per cent). This indicator reached higher values among the male population – 45.3 per cent, compared to female population – 39.4 per cent. Activity rate represented 44.5 per cent in urban areas and 40.4 per cent in rural areas. For the 15-29 age group, this indicator was 30.1 per cent, while for the 15-64 group – 46.9 per cent. The activity rate of working age population according to national legislation (16-56 years for females and 16-61 years for males) accounted for 49.4 per cent.

Table 1-21: Economically Active Population, Employees, Number of Unemployed and Unemployment Rate in the Republic of Moldova, 2000-2017

	2000	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Economically active population, thousand people	**1654.7**	**1422.3**	**1357.2**	**1313.9**	**1302.8**	**1265.3**	**1235.4**	**1257.5**	**1214.5**	**1235.8**	**1232.4**	**1265.6**	**1272.8**	**1259.1**
Employees, thousand people	1514.6	1318.7	1257.3	1247.2	1251.0	1184.4	1143.4	1173.5	1146.8	1172.8	1184.9	1203.6	1219.5	1207.5
Number of unemployed, thousand people	**140.1**	**103.7**	**99.9**	**66.7**	**51.7**	**81.0**	**92.0**	**84.0**	**67.7**	**63.1**	**47.5**	**62.1**	**53.3**	**51.6**
Males	80.6	59.8	61.7	41.5	30.0	50.8	57.3	49.6	42.2	38.0	28.9	39.3	35.0	30.9
Females	59.5	43.9	38.2	25.2	21.8	30.2	34.7	34.4	25.6	25.1	18.6	22.7	18.3	20.7
Urban	107.6	72.5	56.8	40.7	32.7	47.5	57.4	50.0	43.6	36.8	29.4	38.3	35.7	33.4
Rural	32.5	31.2	43.1	25.9	19.1	33.5	34.6	34.1	24.2	26.3	18.1	23.8	17.6	18.2
Unemployment rate, %	**8.5**	**7.3**	**7.4**	**5.1**	**4.0**	**6.4**	**7.4**	**6.7**	**5.6**	**5.1**	**3.9**	**4.9**	**4.2**	**4.1**
Males	9.7	8.7	8.9	6.3	4.6	7.8	9.1	7.7	6.8	6.0	4.6	6.2	5.5	4.8
Females	7.2	6.0	5.7	3.9	3.4	4.9	5.7	5.6	4.3	4.1	3.1	3.6	2.9	3.3
Urban	15.7	11.2	9.2	6.9	5.5	8.0	9.6	8.2	7.3	6.3	5.2	6.4	6.0	5.7
Rural	3.4	4.0	5.8	3.6	2.7	5.0	5.4	5.2	3.9	4.1	2.7	3.5	2.6	2.7

Source: Statistical Data Bank of the National Bureau of Statistics: <http://statbank.statistica.md/pxweb/pxweb/ro/30%20Statistica%20sociala/30%20Statistica%20sociala__03%20FM__03%20MUN__MUN010/MUN010100.px/table/tableViewLayout1/?rxid=2345d98a-890b-4459-bb1f-9b565f99b3b9>

Employed population represented 1207.5 thousand people, without significant changes compared to 2016 (-1.0 per cent). As in the case of economically active population, there were no gender disparities recorded (50.5 per cent males and 49.5 per cent females), the share of employees in rural areas (54.4 per cent) was higher than in urban areas (45.6 per cent).

The share of employed population aged 15 years and above (the share of employed population above 15 years in the total population of the same age group) represented 40.5 per cent, without essential changes compared to 2016 (40.8 per cent). This indicator reached higher values among the male population - 43.1 per cent, compared to female population – 38.1 per cent. In territorial aspect, the indicator accounted for 41.9 per cent in urban areas and 39.3 per cent in rural areas. For the working age population (16- 56/61 years) employment rate was 47.2 per cent: for population aged 15-64 years – 44.9 per cent, while for the 15-29 age group - 27.6 per cent. Employment rate among people with disabilities reached 19.1 per cent. The gender distribution was as follows: 19.7 per cent for male population and 18.5 per cent for female population.

As for the employed population distribution by economic activities 390.5 thousand people work in the agriculture sector (32.3 per cent of the total). Of these, 46.0 per cent (or 14.9 per cent of the total) are people employed in producing agricultural products exclusively for their own consumption. Compared to 2016, the population employed in the agriculture sector decreased by 20.5 thousand, or by 5.0 per cent. In the industry sector work 12.0 per cent (12.1 per cent in 2016), while in the construction sector – 4.7 per cent (5.0 per cent in 2016). Compared to the previous year, the number of

employees in the industry sector decreased by 2.5 per cent, while in the construction sector – by 7.1 per cent. More than half of the entire employed population worked in the services sector (51.0 per cent), an increasing share compared to 2016 (49.2 per cent). People with disabilities are employed mostly in the agriculture sector (52.6 per cent), followed by public administration, education and health sectors (15.8 per cent), trade (10.0 per cent), and industry (7.3 per cent).

In 2017, the number of unemployed, estimated according to the standards of the International Labor Organization (ILO) was 51.6 thousand people, by 3.2 per cent less compared to 2016 (53.3 thousand). The unemployment rate affected more the male population – 59.9 per cent of the total and people from urban area – 64.7 per cent.

The unemployment rate (unemployed persons as a percentage of the total economically active population) recorded at the country level represented 4.1 per cent, with no significant changes compared to 2016 (4.2 per cent). The unemployment rate for males reached 4.8 per cent, while for females – 3.3 per cent. There still are significant differences between the unemployment rate depending on areas: 5.7 per cent in urban areas, compared to 2.7 per cent in rural areas. Among young population (15-24 years) the unemployment rate reached 11.8 per cent, while for the age group 15-29 years, this indicator represented 8.1 per cent.

1.6. Current State of National Economy

1.6.1. Industry

The 2017 industrial production reached approximately 52.0 billion MDL (in current prices). Compared to the 2016 level, the industrial production level index increased by 3.4 per cent (Table 1-22, Figure 1-9).

Table 1-22: Evolution of Industry Sector in the Republic of Moldova, 1990-2017

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Industry, billion MDL	**11.5**	**22.2**	**129.8**	**1.2**	**3.7**	**4.3**	**4.7**	**5.9**	**6.0**	**7.2**	**8.2**	**10.4**	**12.6**	**16.0**
% compared to previous year		-11.1	-27.0	0.0	-27.8	-3.9	-6.5	0.0	-15.0	-11.6	7.7	13.7	10.8	15.6
% compared to 1990		**88.9**	**64.9**	**64.9**	**46.9**	**45.0**	**42.1**	**42.1**	**35.8**	**31.6**	**34.1**	**38.7**	**42.9**	**49.6**
Industry, billion US $				0.885	0.921	0.949	1.019	1.274	1.113	0.683	0.657	0.810	0.930	1.145
	2004	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Industry, billion MDL	**17.6**	**20.8**	**22.4**	**26.2**	**28.5**	**22.6**	**28.1**	**34.2**	**36.4**	**39.4**	**43.5**	**45.7**	**47.6**	**50.8**
% compared to previous year	8.2	6.7	-4.8	-1.3	1.5	-21.1	9.3	13.4	-2.4	8.6	7.3	0.6	0.9	3.4
% compared to 1990	**53.7**	**57.3**	**54.5**	**53.8**	**54.6**	**43.1**	**47.1**	**53.4**	**52.1**	**56.6**	**60.8**	**61.1**	**61.7**	**63.8**
Industry, billion US $	1.427	1.648	1.704	2.157	2.747	2.038	2.276	2.913	3.002	3.130	3.102	2.426	2.389	2.749

Source: National Institute for Economic Research of the ASM and the Ministry of Economy and Infrastructure (March 2018).

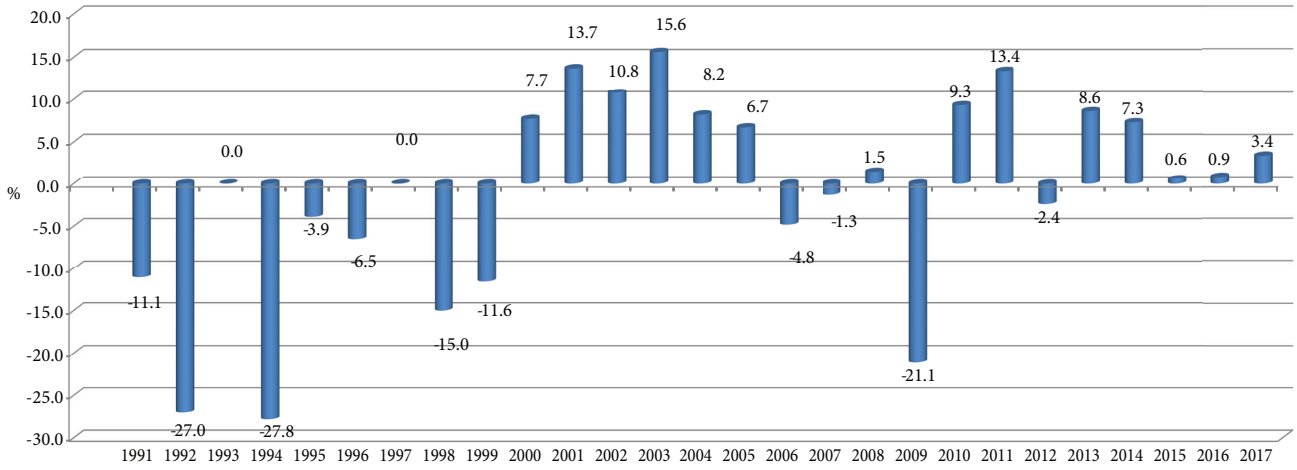


Figure 1-9: Evolution of Industry Sector in the Republic of Moldova within 1991-2017 periods, in % compared to the previous year.

During 1990-2017, the industrial sector featured certain fluctuations, showing the best performance in 2001, 2003 and 2011, and the worst performance in 1992, 1994, 1998, 1999 and 2009.

Processing Industry. The situation in the Industry Sector was determined mainly by the processing industry which accounted in 2016 for 87.6 per cent of the total production of the large enterprises whose main business was manufacturing. The production of those enterprises increased by 1.8 per cent compared to 2015. Food and drinks industry accounted for the highest share in the processing industry performance (Table 1-23).

Table 1-23: Production of Main Industrial Products by RM's Manufacturing Industry (Right Bank of Dniester River), 2005-2016

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Meat, kt	5.9	9.0	14.3	12.1	15.3	23.7	27.8	31.0	34.5	43.1	44.6	44.2
Poultry, kt	2.3	4.8	5.8	7.6	10.4	12.5	14.0	16.7	21.3	26.6	28.5	29.6
Sausages, kt	14.2	14.6	17.0	18.9	14.1	13.2	14.5	15.9	17.2	16.3	17.2	16.4
Canned meat, kt	0.6	1.0	1.1	1.3	1.0	1.5	1.3	1.5	0.9	0.7	0.5	0.5
Fruit and vegetable juices, kt	25625	27721	47995	32196	23215	27115	29715	46055	49059	49075	39243	49687
Unconcentrated juices	7171	18398	26921	16959	11467	17461	16828	21099	22826	21483	21535	18755
concentrated juices	14642	9324	21074	15237	11747	9654	12887	24956	26234	27592	17708	30932
Canned fruits and vegetables, thou.l.	33.0	44.4	22.7	41.9	26.5	29.9	26.3	24.3	25.1	30.4	15.7	16.7
Processed and canned fruits, kt	18.3	17.3	16.5	17.8	3.7	8.0	6.8	4.7	10.7	7.6	7.9	9.4
Crude oil, kt	83.2	81.2	84.7	79.2	83.7	80.7	89.7	93.5	53.9	109.6	109.5	79.9

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Margarine, t	3390	2624	2225	1944	1658	1274	1119	788	706	..	..	..
Milk and cream with fat content <6%, kt	20.8	50.3	55.3	66.6	61.4	65.1	62.9	62.4	65.3	78.7	80.0	86.0
Solid milk and cream, t	4565	3806	2676	2693	1821	1217	625	536	439	1042	1357	1675
Butter, tons	3393	3321	3387	4338	3819	4199	3878	3764	4159	4673	4787	5869
Fat cheese and young sheep cheese, t	2380	2008	2035	2519	1309	1779	2087	2113	2435	2427	2469	2402
Curd, curd cream, yogurt, kefir, sour cream and other fermented products, t	21032	21378	23851	23934	24464	25615	27314	29144	30216	31542	32659	32744
Ice-cream and other ice-forms with or without cocoa, thousand l	12225	13258	12646	11477	10671	12491	12375	14064	15160	15633	15969	16473
Flour, kt	144.0	133.5	113.3	122.6	115.6	108.0	118.2	101.9	117.9	118.4	113.2	103.8
Cereals, kt	3.0	4.3	4.7	6.4	7.2	5.6	4.8	3.6	4.4	4.7	5.7	5.3
Ready-made forage for animals, kt	48.8	60.6	42.9	49.1	56.8	71.6	73.3	94.9	96.3	97.3	79.0	95.4
Bread and bakery foods, kt	108.4	112.3	122.8	137.5	130.6	129.0	130.0	129.3	132.5	128.4	131.5	129.2
Fresh bread	105.7	108.8	119.4	133.7	126.7	124.3	125.9	124.8	126.8	122.3	124.4	121.2
Other bakery products	2.7	3.5	3.4	3.8	3.9	4.8	4.2	4.5	5.7	6.1	7.1	8.0
Flour confectionary, kt	19.8	20.8	21.4	22.0	22.9	26.9	28.3	30.6	33.9	34.0	33.6	34.4
Sugar, kt	133.5	149.0	74.0	134.0	38.4	103.2	88.4	83.4	140.3	177.7	84.5	100.0
Molasses, kt	42.2	42.3	24.9	34.5	23.3	36.2	35.8	31.7	53.1	61.1	30.6	39.1
Sugar confectionery, kt	12.3	12.2	13.2	13.8	12.6	12.9	13.0	12.3	13.4	13.7	14.0	14.2
Macaroni, kt	7.8	7.2	6.9	5.7	6.1	6.3	6.5	5.6	6.3	5.6	5.7	5.0
Mayonnaise and other emulsified sauces, tons	2578	2141	1768	1066	827	540	466	476	486	549	509	607
Cognac (Divine), thousand dal	4781	2245	2022	2815	1785	1766	2395	3084	3451	2762	2186	1433
Vodka, thousand dal	4906	2625	2020	1418	1059	1290	1967	2601	3380	3264	2737	2632
Brandy and liqueurs, thousand dal	8133	6214	4627	3099	2433	2662	2719	3025	3896	3673	3103	3075
Sparkling wine, thousand dal	1051	402	541	572	500	556	686	654	596	514	502	629
Natural grape wine, mil. dal	36.3	19.3	12.3	15.4	12.5	12.7	12.5	14.1	15.3	13.9	13.4	13.3
Porto, Madeira, Sherry, Tokay wine and other, thousand dal	3238	1337	753	922	693	1051	1112	528	651	348	371	470
Mineral and carbonated waters, mil.dal	9.6	10.6	12.9	12.3	11.1	11.6	10.8	10.7	9.5	10.8	11.9	12.6
Soft beverages, mil. dal	6.4	7.5	9.4	7.7	6.0	6.5	7.2	7.2	6.4	6.4	6.5	4.6
Fermented tobacco, kt	8.2	5.2	4.3	6.3	4.9	7.3	6.8	5.7	3.5	2.6	1.7	1.1
Fabrics, thousand m^2	116.0	107.0	201.0	174.0	111.0	55.0	20.0	10.0	13.0	-	-	-
Hosiery, thousand pairs	1082	1518	1428	1558	1463	1288	1470	1607	1056	1573	2046	1979.2
Knitwear, mil. pcs	17.0	16.5	16.9	19.3	17.6	20.2	17.2	18.6	18.2	16.9	15.2	16.6
Clothing for work, thousand pcs	3848	4528	5660	5581	4034	6191	6554	4791	3971	3684	4067	4368
Overcoats, raincoats, capes, cloaks, anoraks, thousand pcs	938	860	939	791	776	650	616	524	694	758	730	840
Suits and assemblies, thousand pcs	344	215	435	270	127	98	136	102	95	81	60	72
Coats, jackets and blazers, thousand pcs	514	709	509	601	565	458	503	579	534	698	658	477
Trousers, shorts and overalls, thousand pcs	2452	2841	2258	1651	1530	1776	1613	1286	1188	1294	1120	1407
Dresses, thousand pcs	121	343	671	1013	735	799	1034	1898	1372	1182	1125	1072
Skirts and divided skirts, thousand pcs	733	636	526	367	377	250	336	379	1307	635	530	472
Blouses and shirts for women and girls, thousand pcs	1984	2549	1824	1939	1920	1916	1835	3310	2451	2060	2170	2507
Coffers, suitcases, trunks and similar containers of any material, thou pcs	317	312	279	340	138	129	137	135	107	110	83	49
Bags for women of any material, thousand pcs	99	80	101	155	117	95	131	107	134	169	136	151
Footwear, thousand pairs	3650	3673	3796	3832	2221	2717	2849	3053	2942	2866	1886	2078
Saw-timber, thousand cubic meters	21.7	25.9	29.3	45.3	32.9	24.8	17.4	18.4	15.7	14.9	15.9	13.6
Wooden blocks for doors and windows, thousand m^2	16.4	18.9	21.4	16.4	22.8	19.1	14.1	13.7	12.5	15.2	11.8	10.1
Wooden block parquet, thousand m^2	98.4	119.1	104.4	60.5	37.0	26.3	23.6	15.3	19.7	14.7	10.6	20.0
Paper and corrugated paper-board, mil. m^2	52.3	35.2	30.1	36.2	32.5	35.7	29.3	27.8	-	-	-	-
Paper and corrugated paper-board, kt	-	-	-	-	-	-	-	-	14.1	11.8	11.7	12.0
Copybooks, t	558	553	750	596	423	723	709	981	727	899	706	1445
Oxygen, thousand m^3	1454	1496	1460	1417	1141	1789	1997	663	540	590	461	327
Carbon dioxide, t	3198	3227	2599	2346	1691	1306	1385	503	..	..	..	..
Paints and varnishes, t	6269	8295	10815	11557	11822	12864	18011	17907	12345	17685	26858	32747
Soap, t	317	526	562	399	380	538	523	570	637	787	993	995
Washing and cleaning products, t	533	769	1034	451	482	618	727	798	1892	1416	1760	2821
Natural essential oil, t	62.5	66.9	41.5	72.4	46.0	67.9	50.9	13.1	50.3	47.2	42.4	45.5
Plastic tubes and pipes, t	714	2339	2135	1553	1578	1679	2048	2156	1989	2325	2749	2878
Boxes, cases, crates and similar plastic products, t	945	1219	668	555	470	298	160	193	214	182	159	151
Multiple-walled insulating glass, thousand m^2	31.4	85.2	79.7	246.7	186.0	339.6	352.1	389.9	449.5	531.7	476.8	403.3
Glass mirrors, thousand m^2	9.8	11.0	12.9	12.5	11.3	10.8	11.7	19.5	-	-	-	-
Glass mirrors, thousand pcs.	-	-	-	-	-	-	-	-	12.6	8.6	13.5	8.2
Glass Bottles and vials, mil. pcs	355	321	303	285	201	246	326	223	273	244	229	219
Ceramic building bricks for construction, thousand m^3	114	109	118	108	80	77	85	59	74	74	78	72
Dry gypsum mixtures, kt	132	188	331	380	136	142	159	188	162	172	195	204
Prefabricated structural components from cement, concrete or artificial stone for constructions, kt	231	233	224	223	177	202	184	221	207	241	289	277
Grey iron castings, tons	2214	1914	1878	1294	784	875	1009	953	898	902	675	651

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Steel castings, tons	173	222	125	109	31	59	73	77	85	46	70	36
Light non-ferrous metal castings, tons	7.8	8.0	7.6	7.6	5.7	6.1	11.8	11.5	13.8	6.8	10.3	..
Doors, windows and their frames, thresholds, windowsills from ferrous metal, pcs.	1718	2525	4168	3967	3463	3110	4943	3687	4047	5414	4012	4614
Doors, windows and their frames, thresholds, windowsills from aluminum, pcs.	36806	29758	21382	31926	53675	64636	62709	61126	35382	41309	25717	21736

Source: National Bureau of Statistics, <http://statbank.statistica.md/pxweb/pxweb/ro/40%20Statistica%20economica/40%20Statistica%20economica__14%20IND__IND030/IND030100.px/table/tableViewLayout1/?rxid=b2ff27d7-0b96-43c9-934b-42e1a2a9a774>

In 2016, compared to the previous year food and drinks industry reported an increase of production by 1.0 per cent due to increasing production in the following sectors: fish, crustaceans and mollusks processing and canning – by 48.2 per cent; dairy products – by 6.1 per cent; cocoa, chocolate and sugar confectionary manufacture – by 5.5 per cent; meat and meat products production, processing and canning – by 3.0 per cent; bread and fresh confectionary manufacturing – by 2.6 per cent and others. At the same time, a decreasing trend was registered in some other processing sectors, such as: soft beverages; mineral and carbonated waters – by 35.5 per cent; vegetable and animal oils and fats production – by 14.9 per cent; fruits and vegetables processing and canning – cu 11.0 per cent; distillation, refining and mixing alcoholic beverages – by 2.2 per cent etc.

The increase in overall industrial production was driven by increases in other manufacturing sectors such as: wood and cork products processing excluding furniture; articles of straw and planting materials manufacture – by 50.2 per cent; textiles – by 31.8 per cent; furniture manufacture – by 27.5 per cent; paper and paper products – by 21.7 per cent; chemical industry – by 17.2 per cent; clothing manufacturing – by 15.1 per cent; footwear manufacturing – by 14.8 per cent; metal industry, exclusively machinery and equipment – by 3.9 per cent and others. At the same time, a decreasing trend was registered in some other processing sectors, such as: electrical equipment – by 17.4 per cent; metal industry – by 10.6 per cent; non-metallic minerals – by 9.0 per cent; manufacture of tobacco products – by 8.5 per cent; computer, electronic and optical products manufacture – by 7.6 per cent; rubber and plastic products – by 5.5 per cent; manufacture of basic pharmaceutical products – by 1.3 per cent etc.

The table below presents aggregate data for the entire country (Right and Left Bank of Dniester River) regarding the production of main industrial products affecting the evolution of direct and indirect GHG emissions in the Republic of Moldova between 1990 and 2016 (Table 1-24). As can be noted, with few exceptions, the production of main industrial products recorded a significant decreasing trend within the respective period.

Table 1-24: Production of Main Industrial Products Affecting GHG Emissions in the Republic of Moldova within 1990-2016

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Cement, kt	2 288.0	1 800.0	1 088.2	960.3	769.1	518.8	494.4	611.8	493.0
Clinker, kt	1 801.3	1 666.6	879.3	752.5	608.6	459.7	357.3	500.2	397.8
Lime - commercial, kt	204.3	178.6	87.8	78.0	60.9	38.8	53.9	48.7	38.7
Lime - auto producers, kt	109.0	59.2	52.0	57.6	41.7	54.7	66.1	53.3	48.6
Glass jars, mil. conventional units	657.6	693.7	187.4	248.9	152.7	87.4	39.6	86.4	84.2
Glass containers and bottles, mil. units	165.5	153.0	138.8	138.2	133.4	184.0	165.2	172.2	189.1
Bricks, kt	663.4	612.6	332.9	506.2	251.5	166.8	149.9	168.2	156.9
Polymer films, kt	5.2	4.4	2.6	2.3	1.2	0.7	1.8	1.3	1.2
ABS Resins, kt	17.5	14.6	5.8	4.8	1.5	1.1	0.0	0.2	0.4
Steel, kt	711.9	617.8	599.6	610.8	633.7	656.8	669.1	810.7	718.1
Laminates, kt	614.2	561.3	547.6	487.2	438.0	357.0	341.0	407.0	588.0
Road paving with asphalt, kt	1 220.3	1 014.8	853.0	678.0	410.0	370.0	335.6	113.7	92.3
Paint and varnish, kt	11.7	8.8	6.0	3.1	1.2	0.8	0.7	0.5	0.4
Rubber products, kt	46.9	44.3	20.7	4.2	0.9	1.4	1.5	1.4	1.2
Pharmaceutical products, kt	1.9	1.6	1.1	0.7	0.3	0.3	0.3	0.3	0.5
Refurbished Tires, thousand pieces	75.3	73.1	40.1	1.5	4.5	6.6	8.0	9.8	7.1
Shoes, mil. pairs	23.2	20.8	16.3	13.2	9.5	7.6	6.9	6.2	4.6
Timber, thousand m^3	265.0	215.0	106.0	55.0	32.0	25.1	21.2	17.2	15.2
Cigars and Cigarettes, billion units	9.1	9.2	8.6	8.8	8.0	7.1	9.7	9.5	7.5
Meat, kt	257.9	218.5	136.0	114.2	85.9	58.4	52.6	50.8	27.3
Fish and fish products, kt	9.5	5.2	6.5	9.5	2.1	0.0	0.0	0.9	0.8
Cereals dried in elevators, kt	2 169.8	2 539.6	1 725.9	2 374.2	1 241.3	1 581.1	1 264.6	1 692.4	1 339.3
Sugar, kt	435.8	236.9	192.2	230.2	166.7	218.7	264.5	213.3	194.5
Confectionary Products, kt	24.3	23.5	12.1	10.1	5.0	5.2	5.2	5.6	9.2
Bread, kt	601.9	528.3	468.6	431.7	325.2	268.4	252.5	221.9	180.2
Animal Feed, kt	1 037.3	946.2	867.5	440.2	309.8	333.6	350.4	231.9	221.2
Crude oils, kt	125.6	117.9	57.3	60.3	50.4	50.7	39.4	35.2	28.7
Refined oils, kt	57.5	54.0	26.3	27.6	23.1	23.2	18.0	16.1	13.2
Grape wine, thousand hl	1 630.0	1 430.0	920.0	1 130.0	977.8	996.9	1 458.0	1 941.5	1 239.6
White wine, thousand hl	764.5	670.7	431.5	530.0	458.6	467.5	683.8	910.6	581.4
Red wine, thousand hl	865.5	759.3	488.5	600.0	519.2	529.4	774.2	1 030.9	658.2
Wines of Porto, Madeira, Sherry, Tokay and other, thousand hl	217.7	189.0	126.0	156.7	135.4	141.5	216.1	290.7	182.6
Sparkling wine, thousand hl	80.4	78.3	85.4	88.8	74.2	94.8	141.9	134.5	51.9
Brandy, thousand hl	139.4	140.2	75.0	74.0	79.3	102.7	45.7	58.6	49.7
Grain Whisky and Liqueurs, thousand hl	55.9	55.6	67.6	139.4	264.7	412.7	335.8	237.0	174.1
Vodka, thousand hl	21.5	21.4	26.7	54.4	99.2	146.6	103.9	82.5	74.6
Beer, thousand hl	760.0	660.0	430.0	360.0	285.0	302.9	256.0	262.7	300.1

	1999	2000	2001	2002	2003	2004	2005	2006	2007
Cement, kt	462.0	431.9	402.1	477.0	484.4	667.6	772.8	1 051.1	1 531.0
Clinker, kt	390.4	320.3	321.9	406.8	452.7	525.7	678.7	850.6	1 302.2
Lime - commercial, kt	24.2	15.1	5.3	11.3	2.9	3.1	9.1	10.2	15.1
Lime - auto producers, kt	25.1	26.4	33.2	41.9	26.8	27.7	33.4	37.3	18.5
Glass jars, mil. conventional units	104.6	156.2	148.8	137.4	107.4	98.9	103.1	121.3	98.7
Glass containers and bottles, mil. units	125.2	260.5	228.3	296.1	281.4	308.0	354.6	321.4	302.7
Bricks, kt	160.0	149.0	149.6	176.9	192.1	213.8	207.6	199.4	211.0
Polymer films, kt	0.7	1.7	2.1	3.3	4.2	3.8	4.6	3.9	4.0
ABS Resins, kt	0.6	0.8	1.0	0.8	0.7	0.9	1.0	0.8	1.0
Steel, kt	796.1	908.1	967.1	513.3	886.7	1 013.9	1 049.4	676.0	966.2
Laminates, kt	593.0	636.0	791.0	381.0	693.0	791.0	890.0	633.0	914.0
Road paving with asphalt, kt	66.5	53.8	67.3	58.9	72.2	229.3	215.1	347.9	365.4
Paint and varnish, kt	0.7	2.1	2.9	4.1	3.4	5.1	6.3	8.3	11.0
Rubber products, kt	0.9	1.6	1.8	3.1	2.4	2.3	0.1	0.3	0.5
Pharmaceutical products, kt	0.8	0.5	0.6	0.7	0.5	0.6	0.7	0.8	1.3
Refurbished Tires, thousand pieces	10.2	7.0	9.2	4.6	6.0	4.6	3.2	2.8	2.6
Shoes, mil. pairs	3.7	5.9	4.9	4.9	6.0	6.6	7.5	6.8	6.7
Timber, thousand m^3	21.2	14.9	16.2	17.1	17.2	24.1	23.1	27.0	31.8
Cigars and Cigarettes, billion units	8.7	9.3	9.4	6.3	7.1	7.0	6.2	5.0	5.0
Meat, kt	25.7	13.4	7.3	11.3	14.9	10.2	6.7	10.2	16.1
Fish and fish products, kt	1.0	1.9	2.3	2.7	2.7	2.7	3.0	2.5	2.3
Cereals dried in elevators, kt	985.8	899.6	860.2	876.1	618.9	849.2	814.7	678.4	282.6
Sugar, kt	100.5	105.4	132.6	167.6	107.1	110.9	133.5	149.0	74.0
Confectionary Products, kt	8.4	8.7	12.8	15.9	18.0	17.9	20.7	21.7	22.3
Bread, kt	147.0	138.1	133.3	130.8	144.7	145.8	142.0	144.8	154.8
Animal Feed, kt	108.6	59.8	31.4	41.4	28.1	46.1	50.8	64.3	46.4
Crude oils, kt	24.3	31.3	43.5	53.6	77.0	96.1	83.4	81.5	85.0
Refined oils, kt	11.1	14.4	19.9	24.6	35.3	44.0	38.2	35.6	38.8
Grape wine, thousand hl	690.1	1 092.2	1 564.2	1 494.0	1 921.8	3 351.4	3 643.5	1 886.8	1 258.1
White wine, thousand hl	323.7	512.3	733.6	700.7	901.3	1 571.8	1 710.2	983.0	717.9
Red wine, thousand hl	366.4	580.0	830.6	793.3	1 020.5	1 779.6	1 933.3	903.8	540.2
Wines of Porto, Madeira, Sherry, Tokay and other, thousand hl	101.6	163.3	235.2	225.3	289.9	301.8	323.8	133.7	75.3
Sparkling wine, thousand hl	67.5	41.6	58.4	61.3	73.9	93.8	105.1	40.2	54.1
Brandy, thousand hl	48.6	71.8	95.6	103.8	136.1	142.8	171.1	79.1	82.4
Grain Whisky and Liqueurs, thousand hl	87.0	48.9	59.4	77.9	139.8	212.9	238.8	196.3	172.2
Vodka, thousand hl	34.4	18.0	24.4	34.9	69.6	109.8	122.6	65.6	50.5
Beer, thousand hl	220.9	257.9	336.2	462.4	599.1	695.7	777.8	913.3	1 014.6
	2008	2009	2010	2011	2012	2013	2014	2015	2016
Cement, kt	1 775.9	869.4	861.4	1 018.0	1 051.4	1 095.3	1 086.2	1 122.8	900.2
Clinker, kt	1 486.6	641.3	655.6	804.7	832.8	897.6	871.9	830.9	809.0
Lime - commercial, kt	14.3	4.6	3.4	7.6	7.0	5.6	8.4	8.2	4.1
Lime - auto producers, kt	33.5	9.6	25.8	22.1	20.9	35.1	44.4	21.1	25.0
Glass jars, mil. conventional units	80.7	92.2	99.8	107.4	145.2	170.5	212.5	287.5	307.2
Glass containers and bottles, mil. units	284.7	201.3	246.2	326.3	223.1	272.5	243.7	228.9	218.5
Bricks, kt	207.6	145.4	137.9	152.1	121.1	141.9	142.4	131.9	123.6
Polymer films, kt	3.7	2.9	3.8	4.2	3.8	4.1	4.5	3.6	3.5
ABS Resins, kt	1.0	0.8	1.5	1.7	1.8	1.8	1.7	0.9	1.5
Steel, kt	886.1	426.8	242.4	321.4	317.5	191.2	346.0	431.8	129.6
Laminates, kt	818.0	437.5	237.7	302.2	360.4	173.1	389.3	318.8	222.5
Road paving with asphalt, kt	209.4	156.9	194.4	219.8	248.2	248.3	360.1	250.4	155.7
Paint and varnish, kt	11.6	11.8	12.9	18.0	17.9	12.3	17.7	26.8	32.5
Rubber products, kt	0.2	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0
Pharmaceutical products, kt	3.7	3.8	5.0	3.3	3.7	3.3	4.1	4.1	3.8
Refurbished Tires, thousand pieces	2.3	5.8	6.7	6.9	18.4	17.3	11.9	6.0	7.3
Shoes, mil. pairs	7.1	4.8	6.2	7.7	7.4	8.3	7.6	5.5	5.2
Timber, thousand m^3	46.5	34.0	25.6	18.5	19.4	16.7	15.8	16.5	14.3
Cigars and Cigarettes, billion units	4.0	4.9	6.3	6.5	4.7	3.5	2.3	1.8	1.8
Meat, kt	12.8	16.3	24.7	28.5	31.6	35.5	44.1	46.0	45.9
Fish and fish products, kt	4.6	3.7	1.3	7.6	7.7	8.5	8.8	9.2	9.2
Cereals dried in elevators, kt	920.7	658.1	764.9	803.1	405.4	882.6	955.2	724.7	987.6
Sugar, kt	134.0	38.4	103.2	88.4	83.4	140.3	177.7	84.5	100.0
Confectionary Products, kt	22.9	23.6	27.7	29.4	31.3	34.6	34.9	34.3	35.2
Bread, kt	169.8	161.6	160.4	162.9	161.8	165.5	160.3	161.3	157.7
Animal Feed, kt	51.0	60.1	74.4	75.4	96.3	97.8	98.5	80.1	96.4
Crude oils, kt	79.3	83.9	80.7	89.8	96.8	65.5	113.2	109.5	80.0
Refined oils, kt	34.6	28.4	26.5	20.9	20.6	14.4	16.2	16.7	25.7
Grape wine, thousand hl	1 553.0	1 263.1	1 285.5	1 260.6	1 422.0	1 551.7	1 409.5	1 356.5	1 345.8
White wine, thousand hl	814.4	600.4	591.7	664.3	679.2	694.3	765.1	622.5	576.2

	2008	2009	2010	2011	2012	2013	2014	2015	2016
Red wine, thousand hl	738.6	662.7	693.8	596.3	742.8	857.4	644.3	734.0	769.6
Wines of Porto, Madeira, Sherry, Tokay and other, thousand hl	92.2	69.3	105.1	111.2	52.8	65.1	34.8	37.1	47.0
Sparkling wine, thousand hl	57.3	50.0	55.6	68.6	65.4	60.0	52.2	50.2	63.3
Brandy, thousand hl	103.7	69.8	74.6	91.2	109.4	118.0	93.9	70.2	50.1
Grain Whisky and Liqueurs, thousand hl	129.1	110.8	127.1	140.2	165.9	196.1	183.4	162.3	162.8
Vodka, thousand hl	35.4	26.5	32.2	49.2	65.0	84.5	81.6	68.4	65.8
Beer, thousand hl	866.6	781.7	952.6	1 068.1	1 118.4	1 029.3	984.8	994.5	847.8

Source: Statistical Yearbooks of the RM for 1988, 1991, 1994, 1999, 2003, 2005, 2007, 2009, 2012, 2015, 2017; Statistical Yearbooks of the ATULBD for 1998, 2000, 2002, 2005, 2007, 2009, 2011, 2013, 2015, 2017; Statistical Reports PRODMOLD-A „Total production, as a natural expression, in the Republic, by product type for 2005-2016".

Energy Industry. In 2016, the energy sector enterprises accounted for circa 10.9 per cent of the total production of the large enterprises where industrial manufacture was the main business. These enterprises generated the sales of circa 4.4 billion MDL (in current prices), decreasing by 1.0 per cent compared to 2015. The decreasing production within the energy sector was largely due to the decreasing production, transportation and distribution of electricity by 1.8 per cent. At the same time, an increase was recorded in steam and air conditioning supply sector – by 2.3 per cent.

Brief Description of the Energy System of the Republic of Moldova

In the Republic of Moldova, power generating capacity includes: Moldovan Thermal Power Plant (MTPP) from Dnestrovsk (on the left bank of the Dniester) with an installed capacity of 2520 MW, operating on natural gas, residual fuel oil and coal, built between 1964-1982; CHP-2 Chisinau, with an installed capacity of 240 MW (available 210 MW) and 1200 Gcal/heat capacity, built between 1976-1980; CHP-1 Chisinau, with an installed capacity of 66 MW (available 40 MW) and 254 Gcal/heat capacity, built between 1951-1961; CHP-North Balti, with an installed capacity of 28.5 MW (available 24 MW) and 200 Gcal/heat capacity built in during 1956-1970; HPP Dubasari on the river Dniester with an installed capacity of 48 MW (30 MW available), 75 per cent overused degree, built between 1954-1966; HPP Costesti on the river Prut, with an installed capacity of 16 MW (10 MW available), 67 per cent overused degree, built in 1978; other power plants, including nine CHP owned by sugar plants with an installed capacity of 97.5 MW operating on natural gas and residual fuel oil, built during 1956-1981.

Of relatively high total nominal capacity (2996.5 MW) it can be used only about 346 MW in cogeneration regime in Chisinau and Balti and in the hydro base, respectively, it is used only about half of the MTPP capacity (in particular, due to difficult trading conditions). Most (stabilized at around 75-78 per cent during 2007-2016) of the electricity consumption of the country is covered by MTPP and imports from Ukraine.

It should be noted, however that between 1990-2016 electricity generation registered a decrease of 62.7 per cent, while electricity consumption decreased by 54.3 per cent (Table 1-25).

Table 1-25: Electricity Generation and Consumption within the National Economy, 1990-2016, billion kWh

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Electricity Generation	15.690	13.154	11.248	10.376	8.308	6.168	6.240	5.375	4.841	4.110	3.624	4.913	4.408	4.062
Electricity Consumption	11.426	10.839	10.022	8.569	7.306	7.022	6.686	6.133	5.351	4.715	4.510	4.705	5.309	6.452
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	%
Electricity Generation	4.179	4.225	2.867	3.869	4.026	6.195	6.115	5.785	5.802	4.491	5.380	6.050	5.852	-62.7
Electricity Consumption	6.025	5.838	5.485	5.684	5.732	5.302	5.257	5.416	5.468	5.795	5.975	5.455	5.227	-54.3

Source: Statistical Yearbooks of the RM for 1994 (p.272), 1999 (p. 311), 2003 (p. 400), 2006 (p. 319), 2009 (p. 313), 2012 (p. 317); 2014 (p. 311), 2016 (p.416-424), 2017 (p.277-279); Statistical Yearbooks of the ATULBD for 2000 (page 99), 2006 (page 93), 2009 (page 92), 2010 (page 93), 2011 (page 94), 2012 (page 98), 2014 (page 91), 2016 (page 101), 2017 (page 101).

The power transmission system operator Moldelectrica SE manages the internal transport network on the right bank of the Dniester River, including 5977.5 km transmission lines of 400, 330, 110 kV, and 25,877.4 km radial lines of 35 and 6-10 kV. Interconnections include 7 lines of 330 kV and 11 lines of 110 kV with Ukraine, 3 lines of 110 kV with Romania and 1 line of 400 kV with Romania and from there, with Bulgaria.

In 2000, the Republic of Moldova privatized a large part of the distribution sector (approximately 70 per cent), that including three of the five power distribution units, which, subsequently, merged in the RED "Union Fenosa" J.S.C[15], while the other two remained state-owned enterprises: J.S.C "RED North" and "RED North-West" J.S.C. On the left bank of the Dniester River the service is provided by "RED East" J.S.C. and "RED South-East".

15 Beginning with January 1, 2015, J.S.C. „Red Union Fenosa" legally separates the activity of electricity distribution from the electricity supply at regulated tariffs. This legal provision is stipulated in particular in art. 54 (5) of the Law on Electricity No. 124-XVIII dated 23.12.2009. As a result, the electricity supply at regulated tariffs is now ensured by the new enterprise J.S.C „Gas Natural Fenosa Electricity Supply", which is the legal successor of J.S.C. „Red Union Fenosa" (<http://www.gasnaturalfenosa.md/page/despre-noi>)

Electricity Generation

The energy system of the Republic of Moldova owns only one condensation Thermal Power Plant (TPP) situated in Dnestrovsk, on the left bank of the Dniester. The MTTP is equipped with eight energy groups on coal, with an electric power of 200 MW (in service from 1964-1971, of which only five are currently operational energy groups; during 1999-2007 none was working), 2 energy groups on residual fuel oil and natural gas with an electric power of 210 MW (in service since 1973-1974, both operational) and two energy groups on natural gas, operating on gas-steam combined cycle, with an installed capacity of 250 MW each (in service since 1980, both operational).

The technological processes used by MTPP are based on the classical cycle of steam turbines with condensation and involve combusting fossil fuels for electricity generation, heat production representing only a secondary process. Electricity generation decreased by circa 67.2 per cent between 1990 and 2016 at MTPP (Table 1-26).

Table 1-26: Electricity Generation at MTPP, 1990-2016, billion kWh

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Electricity Generation	13.569	11.223	9.468	8.626	6.836	4.747	4.560	3.629	3.296	2.687	2.463	3.366	2.942	2.793
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	%
Electricity Generation	2.891	2.701	1.347	2.482	2.622	4.862	4.723	4.494	4.615	3.031	3.868	4.581	4.447	-67.2

Source: Express Information, Key Performance Indicators for the Industry Sector in the Republic for 2009-2016 (other than Small Industries). State Statistical Service of the TMR.

When the Russian Federation increased the price for imported natural gas, MTPP changed its tariff policy, increasing the price of electricity supplied to the Republic of Moldova. In this context, from November 2005 through September 2009, the Republic of Moldova has stopped buying electricity from MTPP, opting for cheaper electricity imports from Ukraine. The lack of demand during 09.11.2005-11.01.2007 forced the MTPP to use just one energy unit that operated by gas-steam combined cycle based on natural gas consumption.

Between 1995 and 2016, the annual production of electricity on the left bank of the Dniester River (MTPP from Dnestrovsk and HPP Dubasari) varied between 1.7-5.2 billion kWh, of which about 40-65 per cent was exported to the right bank of Dniester River and the southern regions of Ukraine (Table 1-27). The long-term strategy of the Russian company *Inter RAO EES*, who owns MTPP, is to create operating conditions for the plant to a capacity of at least 1500 MW, providing energy exports to the Balkans countries, over 6.0 billion kWh annually. In order to achieve modernization plans, beginning with 2005, the Russian company has invested about 100 million USD in upgrading MTPP.

Table 1-27: Electricity Generation in the ATULBD, 1995-2016

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Electricity Generation, bill. kWh, including at:	4.987	4.840	3.924	3.593	2.973	2.720	3.649	3.228	3.016	3.157	2.996
MTPP Dnestrovsk, bil. kWh	4.747	4.560	3.629	3.296	2.687	2.463	3.366	2.942	2.793	2.891	2.701
HPP Dubasari, bil. kWh	0.240	0.280	0.295	0.297	0.286	0.257	0.283	0.286	0.223	0.266	0.295
Electricity Imports in ATULBD, bill. kWh	0.000	0.000	0.000	0.000	0.003	0.014	0.000	0.285	0.921	0.812	0.659
Electricity consumption in ATULBD, bil. kWh	2.878	2.589	2.364	1.929	2.098	2.031	2.183	1.899	2.112	2.124	2.108
Electricity exports from ATULBD, bill. kWh	2.109	2.250	1.560	1.665	0.878	0.703	1.467	1.615	1.826	1.844	1.547
	2006	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Electricity Generation, bill. kWh, including at:	1.675	2.769	2.929	5.164	5.051	4.770	4.869	3.586	4.417	5.111	4.946
MTPP Dnestrovsk, bil. kWh	1.347	2.482	2.622	4.862	4.723	4.494	4.615	3.031	3.868	4.581	4.447
HPP Dubasari, bil. kWh	0.296	0.275	0.307	0.303	0.328	0.276	0.235	0.265	0.261	0.215	0.188
Electricity Imports in ATULBD, bill. kWh	0.276	0.000	0.000	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.001
Electricity consumption in ATULBD, bil. kWh	1.899	2.134	2.151	1.815	1.670	1.763	1.832	1.644	1.808	1.770	1.605
Electricity exports from ATULBD, bill. kWh	0.052	0.636	0.793	3.358	3.391	3.023	3.054	1.962	2.611	3.343	3.343

Source: Statistical Yearbooks of the ATULBD for 2000 (pages 99, 101, 175, 183), 2006 (pages 93, 95, 173, 179), 2009 (pages 92, 94, 169, 175), 2010 (pages 93, 96, 167, 173), 2011 (pages 94, 97, 171, 177), 2012 (pages 98, 101, 175, 181), 2014 (pages 88, 91, 163, 169), 2016 (pages 98, 101, 170, 176), 2017 (pages 98, 101, 174, 180).

Combined Heat and Power Generation

Currently, on the right bank of the Dniester there are three Combined Heat and Power Plants (CHP): in Chisinau municipality the CHP-1 and the CHP-2, and in Balti municipality: the CHP–North. Also, there are some small power plants with cogeneration at sugar plants. The installed capacity of cogeneration power plants on the right bank of the Dniester River is only about 14 per cent of the total installed capacity of power plants in the RM. Of the total nominal installed capacity on the right bank of Dniester River, the largest share has CHP-2 in Chisinau, about 55 per cent of the total, followed by CHP-1 in Chisinau, with a share of about 14 per cent and CHP-North in Balti, with a share of about 7 per cent. Total nominal installed capacity in this region covers only around 30 per cent of the electricity needs.

Total production of electricity on the right bank of Dniester River decreased from approximately 1.901 billion kWh in 1990 to about circa 0.906 billion kWh in 2016 (Table 1-28). In the context of increasing trend of electricity consumption in the last period, this is a negative factor, including from the energy security point of view.

Table 1-28: Electricity Generation on the Right Bank of Dniester River, 1990-2016, billion kWh

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Electricity Generation	1.901	1.655	1.581	1.442	1.24	1.181	1.4	1.451	1.248	1.137	0.904	1.263	1.18	1.046
	2004	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**%**
Electricity Generation	1.022	1.229	1.192	1.1	1.097	1.031	1.064	1.016	0.932	0.905	0.963	0.939	0.906	-52.3

Source: NBS, Energy Balances of the Republic of Moldova for 1990-2016.

Heat Generation

There is a big number of Heat Plants (HPs) in the Republic of Moldova, mainly operating on natural gases and residual fuel oil, less on coal and biomass. The amount of fuel consumption is accounted in the Energy Balances of the Republic of Moldova. Between 1990-2016, the total amount of heat produced in the Republic of Moldova decreased by circa 81.4 per cent, from 22.212 million Gcal in 1990 to 4.125 million Gcal in 2016 (Table 1-29).

Table 1-29: Heat Generation in the RM, including ATULBD, 1990-2016, million Gcal

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Heat Generation	22.212	16.896	12.423	10.208	7.507	9.827	9.647	9.000	8.369	6.736	4.986	5.188	5.068	5.158
Heat Consumption	20.983	15.961	11.736	8.703	6.658	8.796	8.528	7.885	7.338	5.896	4.501	4.608	4.469	4.539
	2004	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**%**
Heat Generation	4.919	5.324	5.284	4.824	4.803	4.366	4.600	4.419	4.273	4.377	4.064	3.979	4.125	-81.4
Heat Consumption	4.397	4.765	4.566	4.199	4.180	3.832	3.988	3.952	3.785	3.861	3.584	3.473	3.628	-82.7

Source: Energy Balances of the Republic of Moldova for 1990-2015; Statistical Yearbooks of the ATULBD for 2000 (page 99), 2006 (page 93), 2009 (page 92), 2010 (page 93), 2011 (page 94), 2012 (page 98), 2014 (page 88), 2016 (page 98).

The continuously decreasing tendency of heat generation is characteristic both to the right bank of the Dniester River, for example between 1995-2016, the decrease represented circa 64.3 per cent (from 7.097 million Gcal in 1995 to 2.531 million Gcal in 2016), as well as for the left bank of the Dniester River, where, between 1995-2016, the decrease represented circa 41.6 per cent (from 2.730 million Gcal in 1995 to 1.594 million Gcal in 2016).

Table 1-30 provides data regarding heat generation on the right bank of Dniester. As can be noted, in 2016, about 66.1 per cent of the total heat generated was produced by combined heat and power plants (CHP), while 33.9 per cent was produced by heat plants (HP) (for comparison, in 1990, the situation was vice versa, 32.5 per cent of the total heat generated was produced by CHP, respectively 66.6 per cent by HP).

Table 1-30: Heat Generation in the RM, 1990-2016, since 1993 only for the Right Bank of Dniester River, million Gcal

	1990	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Heat, including:	22.212	10.208	7.507	7.097	7.077	6.590	6.120	4.647	3.057	3.298	3.217	3.347	3.147
From CHP	7.220	4.657	3.641	3.528	3.659	3.294	3.127	2.534	1.847	2.113	2.128	1.922	1.922
From HP	14.802	5.542	3.862	3.568	3.417	3.296	2.991	2.113	1.207	1.183	1.087	1.423	1.423
From Other Plants	0.190	0.009	0.003	0.001	0.001	0.000	0.002	0.000	0.003	0.002	0.002	0.002	0.002
	2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**%**
Heat, including:	3.591	3.552	3.094	3.074	2.638	2.874	2.721	2.596	2.681	2.498	2.397	2.531	-88.6
From CHP	2.140	2.165	1.855	1.939	1.647	1.874	1.780	1.701	1.655	1.661	1.585	1.650	-77.1
From HP	1.451	1.358	1.386	1.133	0.990	1.000	0.940	0.895	1.022	0.837	0.812	0.881	-94.0
From Other Plants	-	0.001	0.001	0.002	0.001	-	0.001	-	0.004	-	-	-	

Source: Energy Balances of the Republic of Moldova for 1990-2016.

Fuel and Energy Balance in the Republic of Moldova

The table below presents the fuel and energy balance in the RM for 1990-2014 time series (Table 1-31), as it is available in the Statistical Yearbooks published between 1992 and 2015 (in more recent publications, the presentation form of the statistical data was changed, thus it was not possible to present in this table the data regarding 2015-2016 years).

Table 1-31: Fuel and Energy Balance in the Republic of Moldova, 1990-2014, kt of coal equivalent

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Resources – total	**18225**	**16547**	**12545**	**10467**	**5110**	**5617**	**5334**	**5180**	**4521**	**3519**	**2837**	**2704**	**2906**
Fuel extraction	67	65	64	49	53	83	85	96	79	80	84	97	93
Hydroelectric power generation	84	113	84	122	15	28	28	28	27	30	19	24	39
Imports	16703	15097	11374	9414	4603	5109	4720	4758	3934	3092	2535	2394	2549
Fuel stocks (at the beginning of the year)	1371	1272	1023	882	439	397	501	298	481	317	199	189	225
Distribution – total, including:	**18225**	**16547**	**12545**	**10467**	**5110**	**5617**	**5334**	**5180**	**4521**	**3519**	**2837**	**2704**	**2906**
Consumed within the country, from which:	14269	13704	10459	8155	4636	5085	5045	4725	4218	3319	2647	2479	2701
to transform it in other types of energy (power and heat)	7724	7570	5607	5925	2680	3156	3001	2735	2521	1937	1337	1158	1145
for technological manufacturing needs and others (including transport and storage losses)	6545	6134	4852	2230	1956	1929	2044	1990	1697	1382	1310	1321	1556
Exports	2449	1820	1716	1881	86	45	1	9	–	1	5	2	1
Fuel stocks (at the end of the year)	1507	1023	370	431	388	487	288	446	303	199	185	223	204
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**%**
Resources – total	**3127**	**3398**	**3520**	**3471**	**3374**	**3444**	**3304**	**3434**	**3494**	**3373**	**3420**	**3263**	**-82.1**
Fuel extraction	113	103	101	112	99	110	116	95	113	130	132	420	526.9
Hydroelectric power generation	8	7	10	9	4	10	7	10	9	4	6	5	-94.0
Imports	2795	2996	3123	3082	3025	3006	2820	2960	3075	2918	2977	2826	-83.1
Fuel stocks (at the beginning of the year)	208	281	272	258	223	281	308	324	254	278	265	297	-78.3
Distribution – total, including:	**3127**	**3398**	**3520**	**3471**	**3374**	**3444**	**3304**	**3434**	**3494**	**3373**	**3420**	**3263**	**-82.1**
Consumed within the country, from which:	2826	3065	3257	3242	3090	3128	2960	3157	3201	3068	3091	2837	-80.1
to transform it in other types of energy (power and heat)	971	1107	1202	1166	1095	1091	1025	1055	1025	1008	1025	703	-90.9
for technological manufacturing needs and others (including transport and storage losses)	1855	1958	2055	2076	1995	2037	1935	2102	2176	2060	2066	2134	-67.4
Exports	18	62	5	6	10	7	21	25	19	39	60	43	-98.2
Fuel stocks (at the end of the year)	283	271	258	223	274	309	323	252	274	266	269	280	-81.4

Sources: Statistical Yearbooks of the Republic of Moldova for 1994 (page 271), 1999 (page 309), 2003 (page 398), 2006 (page 315), 2007 (page 314), 2008 (page 310), 2009 (page 308), 2010 (page 309), 2014 (page 307-308) and the Energy Balance of the Republic of Moldova for 2014.

These data show that between 1990 and 2014, the total distributed energy resources decreased by 82 per cent (from 18225 kt.c.e to 3263 kt.c.e), the imports of energy resources decreased by 83 per cent (from 16719 kt.c.e to 2826 kt.c.e), the domestic consumption of energy resources decreased by 80 per cent (from 14269 kt.c.e to 2837 kt.c.e), while the local sources of energy (especially biomass) increased by 527 per cent (from 67 kt.c.e to 420 kt.c.e).

At the same time, as Table 1-32 shows, during 1990-2014 domestic energy resources increased by circa 206 per cent (from circa 151 kt.c.e to 462 kt.c.c), the imports of liquid fuels decreased by circa 84 per cent (from 7032 kt.c.e to 1144 kt.c.e), the imports of solid fuels decreased by circa 96 per cent (from 3608 kt.c.e to 142 kt.c.e), while the imports of gaseous fuels decreased by circa 74 per cent (from 4604 kt.c.e to 1215 kt.c.e).

Table 1-32: The Energy Balance of the RM, 1990-2014, kt coal equivalent

	1990	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Domestic sources	**151**	**148**	**171**	**68**	**111**	**113**	**124**	**106**	**110**	**103**	**121**	**132**
Liquid fuels	–	–	–	–	–	–	–	–	–	–	–	–
Solid fuels	67	64	49	53	83	85	96	79	80	84	97	93
Hydroelectric power	84	84	122	15	28	28	28	27	30	19	24	39
Imports	**16703**	**11374**	**9414**	**4603**	**5109**	**4720**	**4758**	**3934**	**3092**	**2535**	**2394**	**2549**
Liquid fuels	7032	4181	2565	1589	1509	1141	1326	879	577	593	645	694
Natural gas	4604	4157	3728	2149	2186	2391	2436	2181	1818	1268	1401	1395
Solid fuels	3608	1538	1492	664	765	678	427	251	119	94	125	139
Electricity	1458	1498	1629	201	649	510	569	623	578	580	223	321
Exports	**2449**	**1716**	**1881**	**86**	**45**	**1**	**9**	**–**	**1**	**–**	**–**	**1**
Change of stocks	136	653	451	51	90	-213	148	-178	-118	-14	34	-21
Domestic consumption	**15054**	**10459**	**8155**	**4636**	**5085**	**5045**	**4725**	**4218**	**3319**	**2647**	**2479**	**2701**
For electricity and heat generation	8631	5773	5925	2680	3156	3001	2735	2521	1937	1337	1158	1145

	1990	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
For other purposes, including:	6489	4686	2230	1956	1929	2044	1990	1697	1382	1310	1321	1556
industry and construction	1054	690	268	148	164	137	165	150	130	147	157	165
agriculture	980	701	354	336	314	260	247	185	119	98	96	114
transport	1753	1245	704	551	514	509	413	347	259	244	240	353
wholesale and retail trade	508	366	223	149	151	144	120	121	88	79	93	123
sold to population	2025	1314	531	602	613	778	815	697	610	602	610	681
other (including transport and storage losses)	169	370	150	170	173	219	230	197	176	140	125	120
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Domestic sources	**124**	**121**	**125**	**131**	**126**	**157**	**176**	**150**	**165**	**177**	**178**	**462**
Liquid fuels	3	11	14	10	23	37	53	45	43	43	40	37
Solid fuels	113	103	101	112	99	110	116	95	113	130	132	420
Hydroelectric power	8	7	10	9	4	10	7	10	9	4	6	5
Imports	**2795**	**2996**	**3123**	**3082**	**3025**	**3006**	**2820**	**2960**	**3075**	**2918**	**2977**	**2826**
Liquid fuels	824	871	891	862	922	953	944	952	1060	967	1016	1144
Natural gas	1517	1548	1721	1716	1585	1511	1395	1476	1450	1387	1331	1215
Solid fuels	238	164	147	150	158	178	120	160	179	162	221	142
Electricity	216	413	364	354	360	364	361	372	386	402	409	410
Exports	**18**	**62**	**5**	**6**	**10**	**7**	**21**	**25**	**19**	**39**	**60**	**43**
Change of stocks	75	-10	-14	-35	51	28	15	-72	20	-12	4	-17
Domestic consumption	**2826**	**3065**	**3257**	**3242**	**3090**	**3128**	**2960**	**3157**	**3201**	**3068**	**3091**	**2837**
For electricity and heat generation	971	1107	1202	1166	1095	1091	1025	1055	1025	1008	1025	703
For other purposes, including:	1855	1958	2055	2076	1995	2037	1935	2102	2176	2060	2066	2134
industry and construction	175	186	230	234	224	207	124	154	172	178	187	156
agriculture	112	101	87	87	74	73	67	69	64	61	67	84
transports	397	364	381	406	466	479	416	515	548	525	723	866
comm. and public services	190	176	171	175	171	173	248	222	227	224	152	169
sold to population	822	938	1004	986	856	906	943	984	1012	914	746	859
other (including transport and storage losses)	159	193	171	188	204	199	137	158	153	158	191	103

Source: Statistical Yearbooks of the Republic of Moldova for 1994 (page 274), 1999 (page 310), 2003 (page 399), 2006 (page 317), 2007 (page 316), 2008 (page 312), 2009 (page 309), 2010 (page 310), 2014 (page 307-308) and The Energy Balance of the Republic of Moldova for 2014.

Also, during the respective period, the domestic consumption of energy resources for electricity and heat generation decreased by circa 92 per cent (from 8631 kt.c.e to 703 kt.c.e), the consumption of energy resources in the industry and construction sectors decreased by circa 85 per cent (from 1054 kt.c.e to 156 kt.c.e), in the agriculture sector – by circa 91 per cent (from circa 980 kt.c.e to 84 kt.c.e), in the transport sector – by circa 51 per cent (from 1753 kt.c.e to 866 kt.c.e), in the commercial sector and for communal services – by circa 67 per cent (from 508 kt.c.e to 169 kt.c.e), while in the residential sector – by circa 58 per cent (from 2025 kt.c.e to la 859 kt.c.e).

The Energy Balances of the Republic of Moldova for 2015 and 2016 were published in a new format – according to the common framework for the production, transmission, evaluation and dissemination of comparable energy statistics under the Energy Community, at the international level is given by Regulation (EC) No. 1099/2008 of the European Parliament and of the Council as of October 22, 2008 on energy statistics, with further changes, while at the national level, by the National Bureau of Statistics Board Decision No. 6/3 as of December 23, 2014.

The differences observed when comparing the information presented in the tables above (Tables 1-31 and 1-32) with that presented in Table 1-33 are due to the fact that data on biofuels consumption and waste within the residential sector (by population) have been revised for the 2010-2016 time period.

Activity data were recalculated with the support of the Energy Community experts and was based on the results obtained in the "Research on Household Energy Consumption", by the NBS for the reference year 2015.

Table 1-33: The Energy Balance of the RM, 2010-2016, kt coal equivalent

	2010	2011	2012	2013	2014	2015	2016
Primary energy production	**748**	**792**	**850**	**853**	**934**	**934**	**1010**
Inputs from other sources (ATULBD)	369	304	298	230	320	405	408
Imports	2590	2771	2620	2748	2575	2522	2597
Exports	18	20	27	48	31	24	22
Stock variation	72	-20	12	-4	17	-5	-4
Gross Domestic Consumption	**3761**	**3827**	**3753**	**3779**	**3815**	**3832**	**3989**
Transformations, inputs	707	668	636	623	638	590	604
Transformations, outputs	570	539	512	501	500	474	495
Not elsewhere specified - transformation	25	24	21	17	23	24	25
Losses	258	239	229	221	218	188	182
Final Consumption	**3341**	**3435**	**3379**	**3419**	**3436**	**3504**	**3673**
Industry	325	341	343	369	330	305	290
Transports	855	914	817	851	884	943	1023
Other sectors	2117	2139	2156	2137	2151	2193	2295
Residential sector (population)	1631	1664	1692	1675	1705	1722	1797
Commercial and public services	385	378	380	372	354	368	384
Agriculture and forestry	101	97	84	90	92	103	114
Non-energy use	**44**	**41**	**63**	**62**	**71**	**63**	**65**

Source: Statistical Yearbook of the Republic of Moldova for 2017 (page 278); The Energy Balance of the Republic of Moldova for 2016. Statistical Compilation. Chisinau, 2017, pages 63-64.

When considering the structure of gross domestic consumption in the reference year (1990) and in 2016, one can note a clear decreasing trend regarding the share of solid fuels (from 23.8 per cent of the total in 1990 to 2.7 per cent of the total in 2016) and liquid fuels (from 41.5 per cent of the total in 1990 to 32.0 per cent of the total in 2016), respectively an increasing trend regarding the share of electricity (from 8.5 per cent of the total in 1990 to 10.4 per cent of the total in 2016), gaseous fuels (from 25.9 per cent of the total in 1990 to 30.0 per cent of the total in 2016) and biofuels (from 0.4 per cent of the total in 1990 to 25.0 per cent of the total in 2016) (Table 1-34, Figures 1-10 and 1-11).

Table 1-34: Gross Domestic Consumption by Fuel Type and Energy Resources in the Republic of Moldova within 1990-2016, kt conventional fuel (in kt coal equivalent)

Years	Total	Coal	Natural Gas	Petroleum products	Biofuels	Electricity
1990	18 131	4 311	4 688	7 518	72	1 542
1995	4 482	227	1 436	1 402	71	650
2000	2 647	108	1 121	753	85	580
2005	3 257	155	1 626	1 022	96	358
2010	3 761	166	1 373	1 109	731	382
2011	3 827	171	1 329	1 162	770	395
2012	3 753	165	1 264	1 096	822	406
2013	3 779	215	1 192	1 124	833	415
2014	3 815	137	1 214	1 149	898	417
2015	3 832	146	1 165	1 182	926	413
2016	3 989	107	1 196	1 276	997	413
1990-2016, %	-78.0	-97.5	-74.5	-83.0	1284.7	-73.2

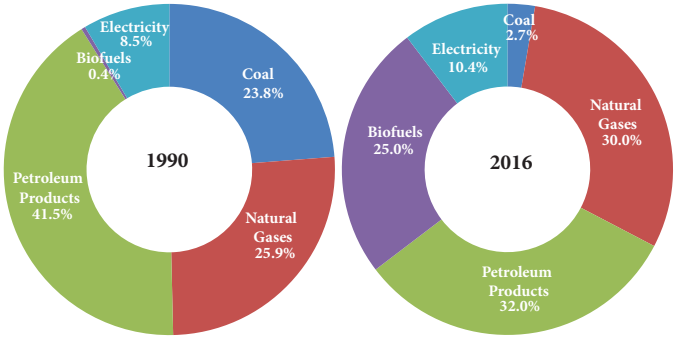


Figure 1-10: Gross Domestic Consumption by Fuel Type and Energy Resources in the Gross Domestic Consumption in the Republic of Moldova in 1990 and 2016, % of the total.

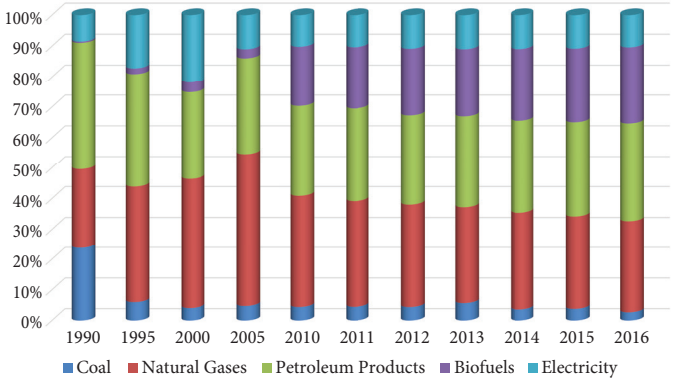


Figure 1-11: Gross Domestic Consumption by Fuel Type and Energy Resources in the Republic of Moldova within 1990-2016, % of the total.

Electricity Generation from Renewable Sources in the Republic of Moldova

According to the provisions of the Renewable Energy Act, No. 160 of 12.07.2007, the National Agency for Energy Regulation (NAER) approves annual tariffs for electricity produced from renewable energy sources (RES), calculated by the producers in accordance with the methodology developed and approved by NAER. Thus, for example, according to the provisions of the Methodology for the determination, approval and application of tariffs for electricity produced from renewable energy sources and biofuel, approved by the NAER Board through Decision No. 321 of 22.01.2009, in 2017 tariffs were established for 16 producers of electricity from renewable energy sources.

All power plants belonging to those producers of electricity from renewable sources for which tariffs have been approved so far are connected to the electrical distribution networks, except for the power plant belonging to „Covoare Lux" Ltd., which is connected to electric transport network from S.E. „Moldelectrica".

In 2017, a total of 343 guarantees of origin were issued, for a total amount of electricity produced from renewable energy sources of 30.2 GWh. The respective amount increased by circa 69.4 per cent compared to 2016 (respectively by circa 15.8 times compared to 2013). In the years 2011-2012, only one producer of electricity from RES (biogas; installed capacity – 85 kW; 2011 – 0.02 GWh, 2012 – 0.31 GWh) operated on the electricity market, for which NAER approved a tariff for electricity generation as of 11.11.2010.

Table 1-35 shows aggregated data on different types of RES regarding the installed capacity of power plants and on the amount of electricity produced from RES and delivered to electricity networks between 2013 and 2017, for which guarantees of origin were issued.

Table 1-35: Electricity Produced from Renewable Energy Sources within 2013-2017, according to guarantees of origin issued by the system operators in the Republic of Moldova

Renewable energy sources	Installed capacity, kW				
	2013	2014	2015	2016	2017
Photovoltaic	105.0	466.0	1 257.0	1 778.0	2 061.4
Biomass (biogas)	405.0	405.0	2 805.0	2 805.0	5 709.0
Wind power	1 100.0	1 100.0	1 130.0	2 330.0	9 190.0
Hydroelectric power	-	-	-	-	254.0
Total, kW	**1 610.0**	**1 971.0**	**5 192.0**	**6 913.0**	**17 214.4**
Renewable energy sources	**Electricity produced and delivered to electricity networks, thousand kWh**				
	2013	**2014**	**2015**	**2016**	**2017**
Photovoltaic	101.2	377.8	1 091.0	1 311.0	1 509.2
Biomass (biogas)	826.9	1 275.5	14 530.8	14 030.4	21 575.9
Wind power	979.8	1 481.2	1 547.7	2 476.7	7 065.6
Hydroelectric power	-	-	-	-	38.4
Total, thousand kWh	**1 907.9**	**3 134.5**	**17 169.5**	**17 818.1**	**30 189.1**

To be noted that the largest amount of electricity produced from RES is generated by the power plant belonging to the M.E. „Sudzucker Moldova" J.S.C, with an installed capacity of 3.6 MW, using as fuel the biogas produced from organic waste (sugar beet pulp) at the sugar factory in Drochia.

Electricity produced from biogas accounted for the largest share of the total electricity produced from RES in 2017 (71.5 per cent of the total) followed by the wind power (23.4 per cent) and, respectively, electricity produced from solar energy (photovoltaic) (5 per cent) (Figure 1-12).

By the end of 2017, NAER approved tariffs for electricity produced from RES by power plants for 44 producers, owning power plants with a total capacity of 17.2 MW. The structure of generation capacity for electricity produced from RES for which tariffs were approved by NAER, by type of RES is presented in Figure 1-13.

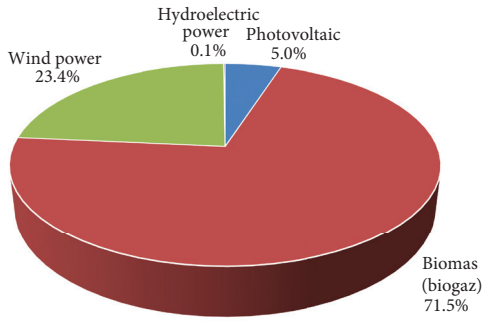


Figure 1-12: The share of each type of RES in the total electricity production of RES in 2017.

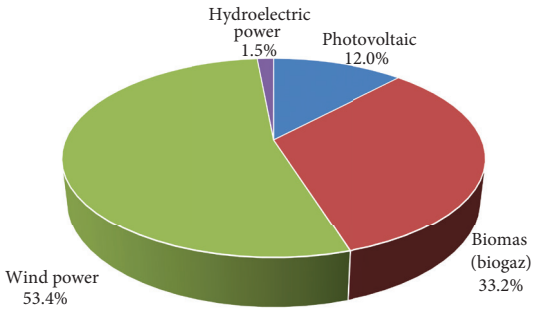


Figure 1-13: Electricity generation installed capacity, the share by types of RES in 2017.

Mining and Quarrying. In 2016, the extractive industry enterprises accounted for about 1.4 per cent of the total production of large enterprises whose main business is manufacturing. These enterprises generated the sales of circa 578.1 million MDL (in current prices), by 15.8 per cent the level recorded in 2015.

The table below shows the production of main industrial products by mining and quarrying industry in the RM between 1990 and 2016 (Table 1-36). To be noted that the monitored statistical indicators and the units for the volume of industrial production have been changed since 2005.

Table 1-36: Production of Main Industrial Products by Mining and Quarrying Industry in the Republic of Moldova, 1990-2016

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Calcareous stones for carving or construction, alabaster, thou m^3	468.0	501.0	295.0	180.0	133.0	99.0	79.0	106.1	94.0
Sand, thousand m^3	3 360.0	2 583.0	508.0	331.0	256.0	229.0	218.0	264.8	263.3
Pebbles, Gravel, Boulders and Silex, thou m^3	7 237.0	6 538.0	3 254.0	1 266.0	965.0	672.0	701.0	838.5	732.5
Sand-gravel mixture, thou m^3	617.0	365.0	29.0	77.0	37.0	37.0	22.0	26.0	16.5
	1999	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Ecausin and other stones for carving or construction, kt	...	...	...	...	...	...	474.8	512.6	568.1
Calcareous stones for carving or construction, alabaster, thou m^3	68.2	63.4	90.8	172.7	137.8	137.7	...	...	...
Other stones for carving or construction, exclusively granites or sandstones, kt	...	...	...	...	...	...	250.3	281.5	254.5
Sand, thou m^3	282.0	246.3	255.0	376.7	559.7	832.2	...	...	...
Sand, kt	...	...	...	...	...	...	1 051.9	940.6	1 482.9
Pebbles, Gravel, Boulders and Silex, thou m^3	541.9	536.0	540.8	672.5	770.4	938.7	...	...	...
Pebbles, Gravel, Boulders and Silex, kt	...	...	...	...	...	...	1 370.2	1 784.9	1 814.9
Sand-gravel mixture, thousand m^3	12.1	22.4	26.7	36.5	52.3	47.8	...	...	...
Mixtures of slags and similar industrial waste, with pebbles, gravel and flakes incorporated or not used in constructions (sand-gravel mixture), kt	...	...	...	...	...	...	151.6	286.3	273.1
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Ecausin and other stones for carving or construction, kt	522.6	399.1	346.0	350.4	316.4	286.5	317.1	279.4	188.8
Other stones for carving or construction, exclusively granites or sandstones, kt	253.5	243.0	203.6	316.3	441.8	648.2	674.1	638.4	498.5
Sand, kt	1 511.3	1 071.1	1 211.1	1 286.7	1 373.1	1 521.8	1 660.0	1 599.9	1 522.5
Pebbles, Gravel, Boulders and Silex, kt	2 054.9	1 349.3	1 640.3	2 156.4	2 013.5	2 492.5	2 871.1	2 717.1	2 349.0
Mixtures of slags and similar industrial waste, with pebbles, gravel and flakes incorporated or not used in constructions (sand-gravel mixture), kt	206.3	143.7	258.3	655.7	875.7	1 290.1	1 412.0	1 087.8	1 109.7

Source: National Bureau of Statistics, <http://statbank.statistica.md/pxweb/pxweb/ro/40%20Statistica%20economica/40%20Statistica%20economica__14%20IND__IND030/IND030100.px/table/tableViewLayout1/?rxid=b2ff27d7-0b96-43c9-934b-42e1a2a9a774>

1.6.2. Agriculture

In 2017, the agriculture production accounted to circa 32.3 billion MDL (in current prices), an increase by 8.6 per cent compared to the previous year (in similar conditions) (Figure 1-14).

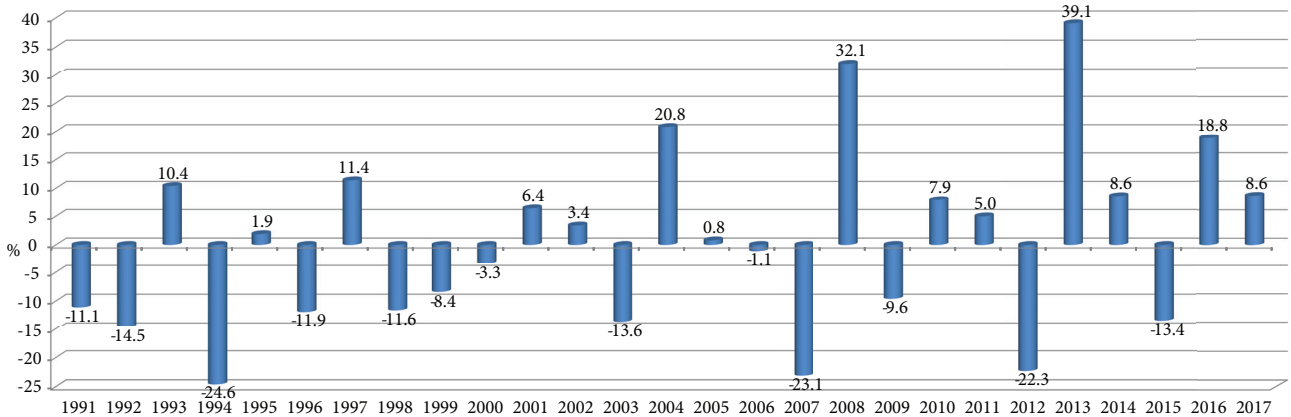


Figure 1-14: Evolution of Agricultural Production in the Republic of Moldova within 1991-2017, in % as compared to the previous year.

The total agricultural production increase was determined by the increase in vegetable production – by 13.1 per cent, while the animal production decreased by 2.1 per cent. In 2017, the share of vegetable production in total agricultural production represented 74 per cent (in 2016 – 71 per cent), and the animal production accounted for 26 per cent (in 2016 – 29 per cent).

Between 1991 and 2017, the agricultural production was characterized by fluctuations, with the best performance reported in 1993, 1997, 2004, 2008, 2010, 2011,2013, 2014 and 2017, and with poor results – respectively in 1992, 1994, 1996, 1998, 2003, 2007, 2012 and 2015 (Table 1-37).

Table 1-37: RM's Agricultural Production 1990-2017

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Agriculture, billion MDL	**6.1**	**11.3**	**97.3**	**1.1**	**3.2**	**4.2**	**4.6**	**5.1**	**4.8**	**6.4**	**8.3**	**8.6**	**9.5**	**10.4**
in % compared to the previous year		-11.1	-14.5	10.4	-24.6	1.9	-11.9	11.4	-11.6	-8.4	-3.3	6.4	3.4	-13.6
in % compared to 1990		**88.9**	**76.0**	**83.9**	**63.3**	**64.5**	**56.8**	**63.3**	**55.9**	**51.2**	**49.5**	**52.7**	**54.5**	**47.1**
Agriculture, billion USD				0.80	0.79	0.94	1.01	1.10	0.89	0.61	0.66	0.67	0.70	0.74
	2004	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Agriculture, billion MDL	**11.8**	**12.7**	**13.7**	**12.8**	**16.5**	**13.3**	**19.9**	**22.6**	**19.9**	**23.8**	**27.3**	**27.2**	**30.4**	**32.3**
in % compared to the previous year	20.8	0.8	-1.1	-23.1	32.1	-9.6	7.9	5.0	-22.3	39.1	8.6	-13.4	18.8	8.6
in % compared to 1990	**56.9**	**57.3**	**56.7**	**43.6**	**57.6**	**52.1**	**56.2**	**59.0**	**45.9**	**63.8**	**69.3**	**60.0**	**71.3**	**77.4**
Agriculture, billion USD	0.96	1.01	1.05	1.06	1.59	1.20	1.61	1.93	1.64	1.89	1.94	1.45	1.52	1.75

Source: National Institute for Economic Research of the ASM and the Ministry of Economy and Infrastructure (March 2018).

To be noted that between 1990 and 2016 in the Republic of Moldova decreased significantly areas sown with particular crops (for example, areas sown with tobacco decreased during the respective period by 98.1 per cent, with perennial grass for silo and green fodder – by 87.8 per cent, sugar beet – by 74.4 per cent, leguminous maize – by 63.8 per cent, vegetables – by 57.1 per cent, potatoes – by 49.2 per cent, etc.). A decrease was recorded for the average yields per hectare of agricultural crops (for example, the average yields per hectare decreased during the reference period for perennial grass for silo and green fodder – by 87.9 per cent, forage roots – by 68.5 per cent, annual grass for green fodder – by 56.1 per cent, vegetables – by 36.6 per cent, tobacco – by 27.3 per cent, wheat – by 27.3 per cent, oats – by 22.2 per cent, grain maize – by 10.9 per cent, etc.). At the same time, increased significantly the areas sown with sun flower (by 210.3 per cent), grain maize (by 88.2 per cent), wheat (by 58.6 per cent) and soybean (by 56.2 per cent). Also, in the case of several crops the production increased, including melons & gourds (by 135.4 per cent), potatoes (by 46.8 per cent), winter rye (by 37.0 per cent), leguminous maize (by 28.5 per cent), soybean (by 17.9 per cent), rapeseed (by 17.3 per cent), oats (by 11.6 per cent) and sugar beet (by 9.2 per cent) (Tables 1-38, 1-39 and 1-40).

Table 1-38: Areas Sown with Crops within 1990-2016 periods, thousand ha

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Sown Areas – total	**1 733.1**	**1 717.0**	**1 711.1**	**1 779.5**	**1 715.5**	**1 725.4**	**1 717.4**	**1 726.3**	**1 717.6**
Cereals and leguminous crops – total	**745.7**	**837.0**	**746.6**	**910.7**	**830.1**	**920.5**	**902.4**	**1 055.5**	**1 039.0**
...Wheat (Winter and Spring)	286.7	303.0	281.7	345.9	300.4	393.9	380.9	410.3	405.8
...Winter rye	0.9	0.8	0.7	1.1	1.7	2.7	4.7	3.9	3.7
...Barley (Winter and Spring)	120.4	134.0	123.0	139.0	147.0	135.0	108.7	129.5	134.0
...Oat	2.1	3.0	3.0	4.0	5.0	5.8	3.7	6.5	6.1
...Millet	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.3
...Buckwheat	3.6	6.0	7.0	7.0	8.0	5.5	7.4	7.3	11.1
...Leguminous crops	72.6	77.0	71.2	70.7	65.5	54.0	44.6	46.2	58.8
...Grain maize	258.0	310.0	259.4	342.6	283.4	321.3	350.0	450.7	416.7
...Grain sorghum	1.2	3.1	0.5	0.3	1.2	1.1	0.3	0.3	0.2
...Other cereal crops	0.1	0.0	0.0	0.0	17.8	1.0	1.8	0.5	2.2
Industrial crops – total	**295.3**	**277.0**	**275.3**	**291.5**	**293.3**	**284.0**	**333.7**	**300.0**	**344.7**
...Sugar beet	81.5	79.9	82.6	91.0	91.2	90.3	83.9	76.3	76.4
...Sun flower	134.1	126.9	130.9	146.1	160.9	163.2	225.1	199.0	234.5
...Soybeans	26.5	24.1	16.6	9.3	5.6	3.4	2.4	2.4	6.5
...Tobacco	32.1	32.5	28.1	31.4	28.6	20.1	16.4	17.3	22.0
...Grain rapeseed	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
...Other industrial crops	21.1	13.6	17.1	13.7	7.0	6.6	6.0	5.1	5.2
Potatoes, vegetables and melons & gourds – total	**131.8**	**141.0**	**143.1**	**175.3**	**157.6**	**142.0**	**130.3**	**135.4**	**127.9**
...Potatoes	41.2	46.9	55.3	72.8	64.4	57.1	59.6	62.3	62.0
...Vegetables	71.1	78.0	73.7	89.2	83.3	74.0	61.4	63.5	58.6
...Melons and gourds	9.2	8.0	7.0	6.7	5.4	7.6	6.7	7.9	5.2
...Other	10.3	8.1	7.1	6.6	4.5	3.3	2.6	1.7	2.1
Forage crops – total	**560.3**	**462.0**	**546.1**	**505.1**	**551.2**	**379.0**	**351.0**	**235.4**	**206.0**
...Forage roots	26.4	30.0	29.0	30.3	26.2	24.5	17.6	16.3	15.5
...Maize for silo and green fodder	292.3	200.0	299.3	243.8	305.2	179.0	181.0	98.7	97.1
...Perennial grasses for green fodder, silage and fodder	206.3	205.2	182.9	198.4	180.5	144.7	124.0	102.6	75.2
...Annual grasses for green fodder	31.4	26.8	35.0	32.6	39.3	29.3	27.0	16.8	17.3
...Other	3.9	0.0	0.0	0.0	0.0	1.3	1.4	1.0	0.9

	1999	2000	2001	2002	2003	2004	2005	2006	2007
Sown Areas – total	**1 663.8**	**1 701.4**	**1 733.4**	**1 736.2**	**1 593.1**	**1 682.5**	**1 698.1**	**1 546.9**	**1 552.4**
Cereals and leguminous crops – total	**1 024.7**	**1 077.4**	**1 172.1**	**1 165.7**	**940.6**	**1 144.6**	**1 131.7**	**953.9**	**989.2**
...Wheat (Winter and Spring)	392.1	423.8	490.0	502.8	213.2	342.4	456.1	316.1	333.6
...Winter rye	3.9	3.8	5.5	3.6	1.3	2.6	3.2	0.7	0.8
...Barley (Winter and Spring)	128.5	125.0	115.4	133.7	96.1	140.8	147.8	123.2	138.1
...Oat	4.9	4.2	4.8	4.3	4.6	5.9	6.4	4.5	4.4
...Millet	0.2	0.4	0.0	0.1	0.2	0.5	0.2	0.1	0.4
...Buckwheat	16.8	12.1	13.7	5.1	4.9	4.1	3.1	3.8	1.3
...Leguminous crops	64.7	53.6	52.2	59.9	48.3	37.9	43.3	42.2	40.1
...Grain maize	411.7	454.1	488.7	454.7	567.9	604.1	469.1	461.4	469.2
...Grain sorghum	0.1	0.4	1.0	0.5	3.1	3.8	0.7	0.4	0.2
...Other cereal crops	1.7	0.0	0.8	0.7	0.8	2.5	1.8	1.4	1.3
Industrial crops – total	**355.1**	**364.9**	**336.6**	**358.6**	**447.9**	**367.2**	**392.6**	**413.3**	**376.7**
...Sugar beet	65.5	66.6	63.3	52.0	39.7	34.9	34.4	42.4	34.3
...Sun flower	246.0	256.9	237.8	280.7	381.3	293.0	309.2	299.7	241.1
...Soybeans	17.2	11.8	9.7	10.3	18.3	28.6	36.3	55.7	50.5
...Tobacco	18.8	23.7	17.2	9.3	5.6	5.8	4.8	3.5	3.1
...Grain rapeseed	1.0	1.0	1.0	1.0	1.0	0.9	2.4	7.1	41.3
...Other industrial crops	5.9	3.9	5.8	4.2	2.0	4.1	4.9	4.7	6.0
Potatoes, vegetables and melons & gourds – total	**131.0**	**132.3**	**122.5**	**112.6**	**92.5**	**81.4**	**84.0**	**90.1**	**84.0**
...Potatoes	66.6	65.4	43.0	45.1	38.6	34.8	36.7	34.8	35.8
...Vegetables	56.3	56.8	69.6	58.7	43.7	38.2	39.8	44.4	39.7
...Melons and gourds	6.0	7.9	7.5	6.5	8.7	7.3	5.2	9.1	7.1
...Other	2.1	2.2	2.4	2.3	1.5	1.1	2.2	1.8	1.4
Forage crops – total	**153.0**	**126.8**	**102.3**	**99.3**	**112.1**	**89.3**	**89.9**	**89.6**	**102.4**
...Forage roots	14.3	11.5	4.5	4.1	4.5	3.7	2.5	3.0	1.9
...Maize for silo and green fodder	62.8	49.7	40.3	35.1	44.5	24.6	18.2	16.1	24.9
...Perennial grasses for green fodder, silage and fodder	58.3	53.1	48.4	49.8	50.9	53.6	60.2	63.5	68.4
...Annual grasses for green fodder	16.9	11.3	8.1	8.9	11.3	6.1	8.1	5.8	5.6
...Other	0.7	1.1	0.6	1.1	0.9	1.2	0.9	1.1	1.6
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Sown Areas – total	**1 552.0**	**1 593.0**	**1 628.2**	**1 597.3**	**1 653.5**	**1 686.3**	**1 694.3**	**1 693.8**	**1 715.1**
Cereals and leguminous crops – total	**1 034.8**	**1 033.8**	**1 020.3**	**991.6**	**1 037.3**	**1 080.0**	**1 055.1**	**1 065.3**	**1 074.2**
...Wheat (Winter and Spring)	429.6	395.8	380.8	353.2	374.2	432.7	415.0	416.9	454.8
...Winter rye	1.0	1.9	1.6	0.6	1.3	2.0	0.5	0.4	0.6
...Barley (Winter and Spring)	139.4	184.7	164.9	128.4	114.1	126.9	120.9	104.8	101.4
...Oat	2.8	2.4	3.0	2.2	2.3	2.6	2.1	1.7	1.4
...Millet	0.3	0.3	0.5	0.2	0.2	0.0	0.1	0.1	0.2
...Buckwheat	0.8	1.0	0.2	0.6	0.9	0.3	0.3	0.3	0.5
...Leguminous crops	28.3	36.1	39.5	30.2	25.2	23.5	22.5	24.9	26.3
...Grain maize	429.5	407.3	425.7	473.8	516.9	488.9	490.3	515.1	485.6
...Grain sorghum	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2
...Other cereal crops	2.8	3.8	3.5	2.3	1.6	2.0	2.8	0.8	2.4
Industrial crops – total	**355.9**	**401.0**	**440.5**	**477.2**	**462.7**	**463.3**	**501.9**	**499.0**	**510.6**
...Sugar beet	24.7	23.4	26.5	25.4	31.2	28.7	28.0	21.9	20.9
...Sun flower	239.1	249.5	288.1	320.9	348.4	348.3	371.0	380.6	416.2
...Soybeans	30.5	48.8	59.0	58.9	62.5	42.8	56.5	69.7	41.4
...Tobacco	2.7	2.5	4.4	3.8	2.4	1.5	0.9	0.8	0.6
...Grain rapeseed	53.5	67.4	48.9	53.8	8.2	36.0	38.2	13.3	22.4
...Other industrial crops	4.9	7.2	10.4	12.2	9.8	5.8	6.9	9.4	7.5
Potatoes, vegetables and melons & gourds – total	**83.2**	**78.7**	**80.5**	**76.4**	**68.4**	**69.9**	**67.1**	**59.6**	**61.5**
...Potatoes	31.3	28.5	28.0	29.7	25.1	24.1	23.1	22.5	20.9
...Vegetables	41.7	37.0	40.6	37.4	34.9	37.0	35.5	29.4	30.5
...Melons and gourds	8.8	11.9	10.6	8.2	7.3	7.8	7.3	6.7	7.9
...Other	1.4	1.3	1.4	1.1	1.1	1.0	1.2	1.1	2.2
Forage crops – total	**78.1**	**79.5**	**86.8**	**79.7**	**85.1**	**73.2**	**70.0**	**69.9**	**68.6**
...Forage roots	1.9	1.5	1.7	1.2	1.4	1.2	1.3	1.3	1.5
...Maize for silo and green fodder	10.3	11.3	10.1	10.4	22.4	8.8	9.3	11.2	8.0
...Perennial grasses for green fodder, silage and fodder	60.2	61.5	66.9	61.8	56.7	57.7	54.6	51.6	55.0
...Annual grasses for green fodder	4.6	3.5	6.5	4.8	3.9	4.4	3.9	4.4	2.2
...Other	1.1	1.7	1.6	1.4	0.7	1.1	0.9	1.4	1.8

Source: NBS on-line database, Section 'Sown Area, crops average yield and harvest within 1980-2016: <http://statbank.statistica.md/pxweb/Database/RO/16%20AGR/AGR02/AGR02.asp>; Statistical Yearbooks for ATULBD: 1998 (page 218), 2002 (page 113), 2005 (page 101), 2009 (page 97), 2011 (page 100), 2014 (page 94), 2017 (page 111).

Table 1-39: Gross Harvest of Agricultural Crops in the Republic of Moldova within 1990-2016, kt

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Cereals and leguminous crops – total	**2538.6**	**3105.9**	**2099.8**	**3340.2**	**1753.8**	**2638.6**	**1981.2**	**3512.3**	**2751.9**
...Wheat (Winter and Spring)	1129.0	1056.5	925.8	1392.6	658.8	1154.3	673.7	1152.6	951.9
...Winter rye	1.9	1.6	1.4	2.8	2.7	5.9	9.9	10.9	7.0
...Barley (Winter and Spring)	417.9	427.0	405.0	481.0	324.9	311.2	136.7	256.9	242.2
...Oat	3.8	5.0	6.8	10.7	7.1	9.8	4.2	10.3	9.5
...Millet	0.1	0.1	0.0	0.1	0.1	0.3	0.2	0.5	0.1
...Buckwheat	1.8	5.0	2.3	5.5	3.5	2.2	3.0	4.8	4.3
...Leguminous crops	97.1	105.7	121.8	121.6	70.2	55.4	31.6	63.2	76.9
...Grain maize	885.5	1501.2	635.6	1324.5	629.3	948.6	1006.6	1788.0	1272.7
...Grain sorghum	1.2	3.1	1.1	1.4	1.1	0.8	0.1	0.5	0.2
...Other cereal crops	0.3	0.7	0.0	0.0	56.1	0.3	0.2	0.0	4.7
Industrial crops – total									
...Sugar beet	2374.5	1988.6	1783.4	2048.3	1526.7	1877.9	1682.1	1674.8	1356.8
...Sun flower	252.2	151.4	176.2	173.7	149.2	208.1	284.0	174.3	196.4
...Soybeans	23.8	33.4	7.9	9.3	4.0	3.3	2.5	2.7	6.0
...Tobacco	66.2	62.8	42.4	50.2	41.5	27.1	19.8	23.9	24.6
...Grain rapeseed	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Potatoes, vegetables and melons & gourds – total									
...Potatoes	295.3	290.6	310.8	726.0	474.7	385.3	344.3	392.6	372.5
...Vegetables	1177.3	989.2	787.5	777.2	598.5	568.8	362.4	393.6	570.8
...Melons and gourds	34.4	35.6	9.3	18.6	12.6	23.3	23.3	30.4	25.9
Forage crops – total									
...Forage roots	1171.8	1416.4	922.5	988.6	547.0	597.0	336.5	310.2	286.4
...Maize for silo and green fodder	4509.0	4979.1	3025.9	3358.7	2285.7	2136.2	1212.0	1065.0	856.5
...Perennial grasses for green fodder, silage and fodder	4456.1	6053.5	3401.4	3514.6	2013.8	1704.7	1027.2	855.6	498.5
...Annual grasses for green fodder	288.9	420.7	339.0	339.1	190.7	222.3	143.4	96.7	106.6
	1999	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Cereals and leguminous crops – total	**2375.0**	**2070.2**	**2847.5**	**2791.2**	**1654.4**	**3178.0**	**3059.9**	**2371.2**	**932.5**
...Wheat (Winter and Spring)	797.8	725.0	1180.8	1113.1	102.4	861.2	1048.6	682.3	406.5
...Winter rye	6.3	5.0	9.3	5.9	0.8	5.1	6.1	1.1	0.8
...Barley (Winter and Spring)	203.1	152.3	248.4	241.7	74.4	284.1	240.9	214.6	125.7
...Oat	5.9	3.5	6.4	4.7	4.0	10.3	7.6	6.1	1.4
...Millet	0.0	0.1	0.0	0.1	0.1	0.3	0.2	0.0	0.1
...Buckwheat	6.1	8.0	6.4	1.4	1.6	1.2	1.1	0.5	0.4
...Leguminous crops	61.6	30.8	79.1	50.2	30.2	51.0	67.1	68.4	14.4
...Grain maize	1151.3	1050.4	1141.9	1206.3	1440.2	1845.1	1523.4	1327.6	363.2
...Grain sorghum	0.3	0.5	1.1	0.5	4.4	3.4	0.3	0.5	0.1
...Other cereal crops	6.0	3.2	5.7	4.2	0.7	3.7	12.3	15.2	1.1
Industrial crops – total									
...Sugar beet	956.4	982.5	1120.6	1157.4	660.3	911.3	996.2	1177.3	612.3
...Sun flower	291.6	305.1	278.3	340.9	421.4	354.8	368.7	396.1	158.7
...Soybeans	13.7	11.6	10.5	12.6	19.4	40.2	66.4	80.2	40.0
...Tobacco	22.6	26.3	16.3	12.4	7.2	7.9	6.7	4.9	3.6
...Grain rapeseed	1.2	1.1	1.0	1.0	1.2	1.1	3.4	6.9	34.9
Potatoes, vegetables and melons & gourds – total									
...Potatoes	330.6	330.4	388.6	326.0	303.2	321.8	391.1	384.1	200.9
...Vegetables	535.8	396.1	487.4	408.4	371.7	328.7	410.3	490.6	226.6
...Melons and gourds	33.9	31.7	39.3	29.0	72.7	57.3	49.3	92.6	41.2
Forage crops – total									
...Forage roots	170.1	125.0	63.5	67.9	55.7	52.7	41.6	34.9	13.8
...Maize for silo and green fodder	428.6	350.7	316.4	322.8	327.9	219.4	199.6	153.3	104.6
...Perennial grasses for green fodder, silage and fodder	506.8	317.4	201.5	173.4	145.4	206.7	183.8	194.9	177.0
...Annual grasses for green fodder	53.7	28.8	19.3	16.0	12.6	12.6	16.3	13.6	7.4
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Cereals and leguminous crops – total	**3261.6**	**2375.5**	**2674.3**	**2794.6**	**1359.0**	**3130.4**	**3341.0**	**2587.0**	**3531.9**
...Wheat (Winter and Spring)	1286.5	738.9	749.5	797.1	496.9	1009.6	1102.6	927.4	1302.4
...Winter rye	2.0	3.4	2.4	1.0	2.6	5.7	1.4	1.0	1.8
...Barley (Winter and Spring)	362.3	290.5	240.7	218.9	139.3	241.6	244.7	199.1	273.9
...Oat	3.9	1.6	3.1	3.6	2.0	3.8	2.9	1.6	2.8
...Millet	0.5	0.7	0.3	0.1	0.1	0.1	0.1	0.1	0.2
...Buckwheat	0.5	0.6	0.5	0.5	0.3	0.6	0.4	0.2	0.8
...Leguminous crops	38.0	32.0	40.1	33.1	17.3	24.1	32.9	25.1	45.1
...Grain maize	1484.1	1159.6	1462.1	1547.2	587.2	1546.8	1642.1	1133.6	1485.7
...Grain sorghum	0.1	0.2	0.2	0.1	0.1	0.4	0.3	0.2	0.3
...Other cereal crops	8.1	5.3	7.7	4.8	2.1	5.4	8.3	2.8	9.2
Industrial crops – total									
...Sugar beet	960.7	337.4	837.6	588.6	587.0	1009.0	1356.2	537.5	664.8
...Sun flower	387.2	310.2	440.2	497.4	339.1	602.2	627.1	562.3	789.4

	2008	2009	2010	2011	2012	2013	2014	2015	2016
...Soybeans	58.8	50.1	113.0	80.6	48.9	67.6	111.4	49.2	43.8
...Tobacco	3.9	4.4	7.6	5.4	2.9	2.2	1.4	1.2	0.9
...Grain rapeseed	100.1	81.6	51.0	67.7	8.1	58.8	90.2	25.6	52.4
Potatoes, vegetables and melons & gourds – total									
...Potatoes	273.7	264.8	286.7	362.9	191.5	244.0	275.7	163.8	220.3
...Vegetables	389.4	322.8	365.8	396.0	251.9	319.1	352.3	266.9	320.6
...Melons and gourds	69.9	102.4	104.9	85.2	52.6	56.6	48.3	56.7	69.3
Forage crops – total									
...Forage roots	26.4	20.0	31.7	23.2	10.6	22.2	26.1	14.6	21.0
...Maize for silo and green fodder	113.0	106.4	143.8	125.2	110.8	168.2	135.7	91.7	139.6
...Perennial grasses for green fodder, silage and fodder	364.2	213.4	323.9	238.5	97.6	198.6	275.0	118.5	144.2
...Annual grasses for green fodder	15.3	7.9	10.9	11.3	6.3	9.6	13.4	8.8	9.0

Source: NBS on-line database, Section 'Sown Area, crops average yield and harvest within 1980-2016', <http://statbank.statistica.md/pxweb/Database/RO/16%20AGR/AGR02/AGR02.asp>; Statistical Yearbooks for ATULBD: 1998 (page 218), 2002 (page 113), 2005 (page 101), 2009 (page 98), 2011 (page 101), 2014 (page 95), 2017 (page 112).

Table 1-40: Average Yield per Hectare of Agricultural Crops in within 1990-2016, t/ha

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Cereals and leguminous crops – total	**3.4**	**3.7**	**2.8**	**3.7**	**2.1**	**2.9**	**2.2**	**3.3**	**2.6**
...Wheat (Winter and Spring)	3.9	3.5	3.3	4.0	2.2	2.9	1.8	2.8	2.3
...Winter rye	2.1	2.0	2.0	2.6	1.6	2.2	2.1	2.8	1.9
...Barley (Winter and Spring)	3.5	3.2	3.3	3.5	2.2	2.3	1.3	2.0	1.8
...Oat	1.8	1.7	2.3	2.7	1.4	1.7	1.1	1.6	1.6
...Millet	1.0	1.0	0.4	1.0	0.6	1.4	0.7	1.6	0.4
...Buckwheat	0.5	0.8	0.3	0.8	0.4	0.4	0.4	0.7	0.4
...Leguminous crops	1.3	1.4	1.7	1.7	1.1	1.0	0.7	1.4	1.3
...Grain maize	3.4	4.8	2.5	3.9	2.2	3.0	2.9	4.0	3.1
...Grain sorghum	1.0	1.0	2.2	4.6	0.9	0.8	0.3	1.7	0.9
...Other cereal crops	3.0	3.1	2.6	2.8	2.1	0.3	1.4	0.0	2.1
Industrial crops – total									
...Sugar beet	29.1	24.9	21.6	22.5	16.7	20.8	20.0	22.0	17.8
...Sun flower	1.9	1.2	1.3	1.2	0.9	1.3	1.3	0.9	0.8
...Soybeans	0.9	1.4	0.5	1.0	0.7	1.0	1.0	1.1	0.9
...Tobacco	2.1	1.9	1.5	1.6	1.5	1.3	1.2	1.4	1.1
...Grain rapeseed	2.0	2.0	1.6	1.2	1.0	0.8	0.7	1.0	0.9
Potatoes, vegetables and melons & gourds – total									
...Potatoes	7.2	6.2	5.6	10.0	7.4	6.8	5.8	6.3	6.0
...Vegetables	16.6	12.7	10.7	8.7	7.2	7.7	5.9	6.2	9.7
...Melons and gourds	3.7	4.5	1.3	2.8	2.3	3.1	3.5	3.8	5.0
Forage crops – total									
...Forage roots	44.4	47.2	31.8	32.6	20.9	24.4	19.1	19.0	18.5
...Maize for silo and green fodder	15.4	24.9	10.1	13.8	7.5	11.9	6.7	10.8	8.8
...Perennial grasses for green fodder, silage and fodder	21.6	29.5	18.6	17.7	11.2	11.8	8.3	8.3	6.6
...Annual grasses for green fodder	9.2	15.7	9.7	10.4	4.9	7.6	5.3	5.8	6.2
	1999	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Cereals and leguminous crops – total	**2.3**	**1.9**	**2.4**	**2.4**	**1.8**	**2.8**	**2.7**	**2.5**	**0.9**
...Wheat (Winter and Spring)	2.0	1.7	2.4	2.2	0.5	2.5	2.3	2.2	1.2
...Winter rye	1.6	1.3	1.7	1.6	0.6	2.0	1.9	1.6	1.1
...Barley (Winter and Spring)	1.6	1.2	2.2	1.8	0.8	2.0	1.6	1.7	0.9
...Oat	1.2	0.8	1.3	1.1	0.9	1.7	1.2	1.3	0.3
...Millet	0.1	0.2	0.8	0.5	0.5	0.7	0.9	0.5	0.1
...Buckwheat	0.4	0.7	0.5	0.3	0.3	0.3	0.4	0.1	0.3
...Leguminous crops	1.0	0.6	1.5	0.8	0.6	1.3	1.6	1.6	0.4
...Grain maize	2.8	2.3	2.3	2.7	2.5	3.1	3.2	2.9	0.8
...Grain sorghum	3.1	1.3	1.1	0.9	1.4	0.9	0.4	1.1	0.5
...Other cereal crops	3.6	1.2	7.5	6.0	0.9	1.5	2.0	2.0	0.8
Industrial crops – total									
...Sugar beet	14.6	14.8	17.7	22.3	16.6	26.1	29.0	27.8	17.9
...Sun flower	1.2	1.2	1.2	1.2	1.1	1.2	1.2	1.3	0.7
...Soybeans	0.8	1.0	1.1	1.2	1.1	1.4	1.8	1.4	0.8
...Tobacco	1.2	1.1	0.9	1.3	1.3	1.4	1.4	1.4	1.2
...Grain rapeseed	1.2	1.0	1.0	1.0	1.0	1.2	1.4	1.0	0.8
Potatoes, vegetables and melons & gourds – total									
...Potatoes	5.0	5.1	9.0	7.2	7.9	9.2	10.6	11.0	5.6
...Vegetables	9.5	7.0	7.0	7.0	8.5	8.6	10.3	11.0	5.7
...Melons and gourds	5.7	4.0	5.2	4.5	8.4	7.8	9.4	10.2	5.8
Forage crops – total									
...Forage roots	11.9	10.9	14.0	16.6	12.3	14.2	16.4	11.6	7.4
...Maize for silo and green fodder	6.8	7.1	7.8	9.2	7.4	8.9	11.0	9.6	4.2
...Perennial grasses for green fodder, silage and fodder	8.7	6.0	4.2	3.5	2.9	3.9	3.1	3.1	2.6
...Annual grasses for green fodder	3.2	2.6	2.4	1.8	1.1	2.1	2.0	2.3	1.3

	2008	2009	2010	2011	2012	2013	2014	2015	2016
Cereals and leguminous crops – total	**3.2**	**2.3**	**2.6**	**2.8**	**1.3**	**2.9**	**3.2**	**2.4**	**3.3**
...Wheat (Winter and Spring)	3.0	1.9	2.0	2.3	1.3	2.3	2.7	2.2	2.9
...Winter rye	1.9	1.8	1.5	1.8	2.0	2.8	2.8	2.3	2.9
...Barley (Winter and Spring)	2.6	1.6	1.5	1.7	1.2	1.9	2.0	1.9	2.7
...Oat	1.4	0.7	1.0	1.6	0.9	1.5	1.4	0.9	2.0
...Millet	1.7	2.5	0.5	0.7	0.6	1.1	1.5	1.1	1.0
...Buckwheat	0.6	0.6	3.2	0.8	0.3	1.7	1.5	1.0	1.7
...Leguminous crops	1.3	0.9	1.0	1.1	0.7	1.0	1.5	1.0	1.7
...Grain maize	3.5	2.8	3.4	3.3	1.1	3.2	3.3	2.2	3.1
...Grain sorghum	0.5	0.8	0.9	0.7	0.5	3.0	2.8	0.9	1.5
...Other cereal crops	2.1	1.7	1.8	1.9	1.9	2.0	2.1	2.2	2.3
Industrial crops – total									
...Sugar beet	38.9	14.4	31.6	23.2	18.8	35.2	48.4	24.5	31.8
...Sun flower	1.6	1.2	1.5	1.6	1.0	1.7	1.7	1.5	1.9
...Soybeans	1.9	1.0	1.9	1.4	0.8	1.6	2.0	0.7	1.1
...Tobacco	1.4	1.8	1.7	1.4	1.2	1.5	1.6	1.5	1.5
...Grain rapeseed	1.9	1.2	1.0	1.3	1.0	1.6	2.4	1.9	2.3
Potatoes, vegetables and melons & gourds – total									
...Potatoes	8.7	9.3	10.2	12.2	7.6	10.1	11.9	7.3	10.5
...Vegetables	9.3	8.7	9.0	10.6	7.2	8.6	9.9	9.1	10.5
...Melons and gourds	7.9	8.6	9.9	10.4	7.2	7.3	6.6	8.5	8.8
Forage crops – total									
...Forage roots	14.1	13.7	18.5	19.0	7.4	18.5	20.1	11.2	14.0
...Maize for silo and green fodder	11.0	9.4	14.2	12.0	5.0	19.2	14.5	8.2	17.4
...Perennial grasses for green fodder, silage and fodder	6.0	3.5	4.8	3.9	1.7	3.4	5.0	2.3	2.6
...Annual grasses for green fodder	3.3	2.2	1.7	2.3	1.6	2.2	3.4	2.0	4.0

Source: NBS on-line database, Section 'Sown Area, crops average yield and harvest": <http://statbank.statistica.md/pxweb/Database/RO/16%20AGR/AGR02/AGR02.asp>; >; Statistical Yearbooks for ATULBD: 1998 (page 218), 2002 (page 113), 2005 (page 101), 2009 (page 99), 2011 (page 102), 2014 (page 96), 2017 (page 114).

Plant Production. In 2017, agricultural production data show a significant increase driven by the growth of average crop harvest and increased areas sown in that year. Thus, compared to the previous year, the global crop yield increased for de cereals and leguminous maize – by 349 kt or by 11.6 per cent more (of which: grain maize – by 26.5 per cent), sugar beet – by 166 kt (by 24.9 per cent), sun flower – by 123 kt (by 18.1 per cent), grain rapeseed – by 28 kt (by 65.4 per cent), vegetables – by 15 kt (by 5.1 per cent), fruits, berries and walnuts – 63 kt (by 10.6 per cent) and grapes –59 kt (by 9.6 per cent). In 2017, the agricultural enterprises have the main share in the production of: grain rapeseed – 94.2 per cent, sugar beet – 92.8 per cent, tobacco – 83.7 per cent, soybeans – 75.7 per cent, sun flower – 72.9 per cent, cereals and leguminous crops (exclusive corn) – 72.3 per cent. At the same time, farm households and peasant (family) farms have the main share in the production of: melon & gourds – 97.7 per cent, potatoes - 90.2 per cent, vegetables - 86.2 per cent, grapes - 72.5 per cent, grain maize - 67.2 per cent and fruits, berries and walnuts - 61.3 per cent.

Over the 1990-2016 periods, the amount of synthetic and organic fertilizers applied to soils in the RM decreased by circa 74.7 per cent and, respectively 99.2 per cent (Table 1-41). In 2017, in agricultural enterprises and farm households larger than 50 hectares there were introduced about 69.1 kg of synthetic fertilizers (recalculated to 100 per cent a.s.), (or by 38.5 per cent more than in 2016), while the sown area increased by 9.1 per cent. As for organic fertilizers, about 0.05 t were applied per one hectare of sown fields. In 2017, increased the use of biological fertilizers applied per one hectare (by 24.0 per cent). At the same time, decreased the use of herbicides (by 11.9 per cent), fungicides (by 8.0 per cent) and insecticides (by 6.3 per cent).

Table 1-41: Applied Synthetic and Organic Fertilizers in the RM, 1990-2016, kt

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Synthetic fertilizers (a.s.), kt	**232.4**	**191.4**	**127.6**	**44.9**	**20.0**	**12.5**	**14.3**	**12.1**	**10.3**	**6.1**	**10.3**	**12.8**	**18.4**	**15.4**
nitrogen	92.1	82.7	61.8	26.4	14.1	10.5	13.2	11.4	10.2	5.9	10.2	12.7	18.0	14.6
phosphorus	85.7	75.2	43.4	12.7	8.0	1.4	0.7	0.5	0.1	0.1	0.1	0.1	0.3	0.6
potassium	54.6	33.5	22.4	5.8	1.6	0.6	0.3	0.2	0.0	0.0	0.0	0.0	0.1	0.2
On average kg/ sown ha	134.1	111.5	74.6	25.2	11.7	7.2	8.3	7.0	6.0	3.6	6.1	7.4	10.6	9.7
Organic fertilizers, kt	**9 740**	**8 600**	**5 300**	**4 200**	**1 620**	**1 779**	**906**	**353**	**227**	**122**	**83**	**98**	**54**	**47**
On average kg/ sown ha	5 620	5 009	3 097	2 360	944	1 031	527	204	132	73	49	57	31	30
	2004	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**%**
Synthetic fertilizers (a.s.), kt	**17.5**	**18.0**	**16.6**	**22.4**	**24.7**	**19.9**	**25.5**	**30.9**	**44.0**	**54.8**	**84.5**	**52.4**	**58.8**	**-74.7**
nitrogen	16.1	16.1	13.8	18.8	21.9	17.0	20.6	25.0	34.1	42.1	61.1	38.7	43.4	-52.9
phosphorus	1.0	1.5	2.0	2.4	1.7	2.0	3.3	4.1	7.1	9.6	19.4	10.8	11.6	-86.4
potassium	0.4	0.5	0.8	1.1	1.1	0.9	1.6	1.8	2.8	3.1	4.0	2.9	3.8	-93.0
On average kg/ sown ha	10.4	10.6	10.7	14.4	15.9	12.5	15.6	19.3	26.6	32.5	49.9	30.9	34.3	-74.4
Organic fertilizers, kt	**42**	**44**	**10**	**8**	**8**	**7**	**18**	**31**	**23**	**43**	**34**	**61**	**75**	**-99.2**
On average kg/ sown ha	25	26	7	5	5	4	11	20	14	25	20	36	43	-99.2

Source: Statistical Yearbooks of the RM for 1988 (page 280), 1994 (page 239), 1999 (page 330), 2003 (page 442), 2006 (page 352), 2011 (page 345) 2014 (page 345) and 2016 (page 461). Statistical Yearbooks of the ATULBD for 1998 (page 230), 2000 (page 107), 2002 (page 111), 2006 (page 108), 2009 (page 107), 2012 (page 114), 2014 (page 103), 2016 (page 106).

Livestock. Between 1990 and 2016, the livestock production significantly decreased in the RM, including cattle and poultry sold for slaughter (in live weight) – by 65.2 per cent, milk yield – by 69.3 per cent, egg production – by 41.4 per cent and wool production – by 43.8 per cent (Table 1-42).

Table 1-42: The Main Livestock Products Produced in the RM, 1990-2016

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Cattle and poultry sold for slaughter (in live weight), kt	530	433	334	228	193	174	166	161	145	147	123	115	120	118
...cattle	181	154	121	99	91	70	58	49	37	35	30	26	27	27
...swine	238	189	150	88	66	67	73	76	75	81	63	56	57	55
...sheep and goats	15	10	8	9	10	11	10	9	8	8	7	6	6	6
...poultry	92	76	52	30	23	24	24	25	24	21	21	26	28	29
...other species	4	4	3	2	3	2	2	2	2	2	1	2	2	2
Milk yield, kt	1 503	1 284	1 128	867	805	751	671	597	589	569	555	561	583	570
Eggs, million pcs	1 129	1 061	813	530	418	477	526	512	539	555	575	618	671	620
Wool, tons	3 043	2 869	2 616	2 598	2 812	2 895	2 808	2 711	2 433	2 278	2 066	2 074	2 072	2 057
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	%
Cattle and poultry sold for slaughter (in live weight), kt	119	121	134	149.5	108.2	124.5	150.0	159.0	156.0	154.8	164.0	174.5	184.6	-65.2
...cattle	27	26	25	25.3	17.6	18.4	16.9	16.1	15.8	13.8	13.7	14.0	15.8	-91.3
...swine	53	51	61	75.1	44.7	53.8	72.5	81.4	82.2	77.8	82.3	91.6	92.9	-61.0
...sheep and goats	6	5	5	5.0	4.8	4.8	4.7	4.7	4.7	4.4	4.2	4.4	4.2	-72.0
...poultry	33	37	41	42.4	39.5	46.0	54.7	55.2	51.7	57.3	62.2	62.7	69.9	-24.0
...other species	2	2	2	1.7	1.6	1.5	1.5	1.6	1.6	1.5	1.6	1.7	1.7	-57.5
Milk yield, kt	604	627	595	571.4	510.5	538.9	591.2	525.8	489.6	485.9	485.3	479.5	462.1	-69.3
Eggs, million pcs	668	762	765	704.3	562.6	640.3	718.5	705.2	621.9	623.7	645.0	628.8	661.7	-41.4
Wool, tons	2 028	2 079	2 170	2 146	2 021	1 996	2 067	2 043	1 843	1 899	1 947	1 899	1 711	-43.8

In 2017, compared to the previous year, egg production increased by 5.1 per cent for all categories of producers due to the increase of egg production both in agricultural enterprises – by 8.4 per cent, as well as in farm households – by 2.7 per cent.

The production of cattle and poultry in live weight decreased by 3.1 per cent as a result of decreasing production in agricultural enterprises and in farm households, respectively, by 2.4 per cent and by 3.7 per cent, while milk production decreased by 3.8 per cent as a result of decreasing production in agricultural enterprises by 2.9 per cent and in farm households - by 3.9 per cent. The situation by categories of producers show that in farm households was recorded the largest share of livestock production: milk yield – 95.0 per cent of the total volume, the production of cattle and poultry in live weight – 60.3 per cent and egg production – 55.2 per cent.

Over the 1990-2016 periods, the livestock population related to particular species decreased sharply: cattle - 81.2 per cent (dairy cows – by 66.5 per cent, other cattle – by 89.8 per cent), swine – by 74.6 per cent, poultry of all categories – by 46.5 per cent, sheep – by 42.6 per cent, horses – by 20.8 per cent. At the same time, during the period under review it was reported an increase regarding other species such as: goats – by 350.1 per cent, asses and mules – by 82.4 per cent and rabbits – by 29.6 per cent (Table 1-43).

Table 1-43: Total Livestock and Poultry in all Households Categories in the Republic of Moldova in 1990-2016 (as of the end of the year), thousand heads

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Cattle	1 060.7	1 000.5	970.1	882.6	832.0	729.5	646.3	549.7	532.4
Dairy Cows	395.2	397.1	403.2	401.8	402.6	380.8	355.4	323.7	318.4
Other cattle	665.5	603.4	566.9	480.7	429.4	348.7	290.9	226.0	214.0
Sheep and goats	1 281.9	1 288.8	1 357.2	1 437.3	1 501.9	1 423.0	1 372.4	1 235.3	1 147.2
Sheep	1 244.8	1 239.3	1 294.3	1 362.4	1 409.8	1 326.6	1 271.1	1 136.3	1 046.4
Goats	37.1	49.5	62.9	74.9	92.2	96.4	101.3	99.0	100.8
Horses	47.2	48.4	51.4	54.5	58.2	61.6	63.3	65.4	68.5
Asses and mules	1.7	1.8	2.1	2.2	2.9	3.2	3.1	3.0	3.2
Swine	1 850.1	1 753.0	1 487.4	1 082.3	1 046.8	1 016.4	950.1	797.5	928.0
Poultry:	24 625.0	23 715.0	17 128.0	12 809.2	13 448.3	13 746.4	12 364.9	12 363.9	13 046.0
...Chicken	20 234.4	19 607.1	13 271.0	9 516.6	9 957.4	10 200.6	9 137.4	9 112.0	9 557.0
...Geese	1 335.5	1 321.8	1 300.4	1 378.9	1 457.0	1 487.4	1 357.9	1 372.3	1 470.0
...Ducks	2 165.7	1 914.7	1 736.5	1 198.9	1 284.8	1 293.3	1 166.6	1 169.5	1 264.8
...Turkey	889.3	871.3	820.2	714.8	749.0	765.2	703.0	710.1	754.2
Rabbits	283.0	250.8	298.5	262.4	237.2	209.3	189.8	176.8	185.9
	1999	2000	2001	2002	2003	2004	2005	2006	2007
Cattle	482.4	445.4	453.8	454.7	409.1	359.5	339.8	326.9	253.7
Dairy Cows	306.9	298.5	300.1	304.8	277.7	249.0	233.1	222.0	181.1
Other cattle	175.5	146.9	153.7	149.9	131.5	110.5	106.7	104.9	72.6
Sheep and goats	1 055.5	962.1	971.8	978.4	958.4	959.8	954.3	962.5	866.4
Sheep	948.9	846.3	851.7	843.7	829.2	832.6	827.0	842.6	759.9
Goats	106.6	115.8	120.2	134.6	129.2	127.2	127.3	119.9	106.5
Horses	72.0	76.0	81.6	82.6	81.4	75.8	72.0	69.3	60.5
Asses and mules	3.4	3.8	4.3	4.0	4.3	4.0	3.7	3.6	3.1
Swine	751.3	492.7	490.8	550.1	476.4	422.3	493.0	568.3	320.8
Poultry:	13 730.1	13 624.9	14 737.4	15 535.3	16 195.5	17 883.9	22 773.6	23 017.2	17 544.2
...Chicken	9 992.5	9 952.9	10 952.8	11 484.5	12 184.2	13 559.0	17 195.3	17 320.6	14 162.0
...Geese	1 581.6	1 550.6	1 589.9	1 777.4	1 780.2	1 828.0	2 120.3	2 111.5	1 342.2
...Ducks	1 349.4	1 325.3	1 368.2	1 423.3	1 461.9	1 592.6	2 394.1	2 551.0	1 435.5
...Turkey	806.6	796.2	826.6	850.1	769.3	904.4	1 063.9	1 034.0	604.5
Rabbits	182.6	161.3	191.4	190.7	205.4	239.1	278.9	326.0	263.4

	2008	2009	2010	2011	2012	2013	2014	2015	2016
Cattle	238.4	243.0	236.4	224.4	210.6	208.0	210.7	204.5	199.8
Dairy Cows	171.9	173.2	165.8	155.8	145.1	141.3	140.6	137.6	132.3
Other cattle	66.5	69.8	70.5	68.6	65.5	66.7	70.1	66.8	67.6
Sheep and goats	879.6	929.7	920.6	846.2	836.9	862.0	887.0	880.8	881.8
Sheep	767.7	809.4	793.1	714.2	699.0	717.4	733.5	722.2	714.8
Goats	111.9	120.3	127.5	132.0	137.8	144.6	153.4	158.6	167.0
Horses	57.4	56.1	53.6	50.9	47.5	46.0	42.8	40.2	37.4
Asses and mules	3.2	2.9	2.8	2.5	2.4	2.1	2.2	2.0	3.1
Swine	302.9	403.6	511.7	471.7	438.4	444.8	504.7	484.5	469.7
Poultry:	18 830.6	22 986.6	23 782.5	19 766.7	15 897.8	11 947.9	12 520.0	12 590.6	13 172.2
...Chicken	15 464.0	18 836.1	19 456.4	16 194.1	13 252.8	10 096.2	10 438.5	10 655.6	11 337.5
...Geese	1 277.2	1 497.4	1 597.3	1 351.6	1 028.5	718.7	768.0	734.0	700.2
...Ducks	1 501.7	1 981.8	2 010.8	1 622.1	1 166.9	822.4	986.1	894.5	829.9
...Turkey	587.8	671.4	718.1	599.0	449.6	310.6	327.4	306.5	304.7
Rabbits	248.5	274.5	277.0	277.4	267.0	296.2	326.1	350.2	366.7

Source: NBS, Statistical Annual Report No. 24-agr „Animal Breeding Sector", the number of livestock and poultry in all Households Categories as of 1st of January (annually for 1990-2016 periods). Statistical Yearbooks of the ATULBD for 1998 (pag224), 2002 (page 118), 2006 (page 109), 2010 (page110), 2014 (page 104), 2017 (page117).

1.6.3. Transport

RM's transport sector is comprised of the following segments: road transportation, railway transport, air transportation and naval transportation.

Road Transportation. The national network of roads has a total length of 10,897 km (including: 9,386 km – on the right bank of Dniester, 1,511 km – on the left bank of Dniester; hard-surface roads: 8,894 km – on the right bank of Dniester and 1,470 km – on the left bank of Dniester) (Table 1-44) has the municipality of Chisinau as its principal hub, intersection of the principal national and international roads crossing the country.

Table 1-44: Length and Density of Road Communication Lines by the end of the year in the RM, per 1,000 km², 1997-2016

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Public Roads – total, km	10680	10679	10678	10655	10711	10739	10740	10743	10746	10746
On the Right Bank of Dniester, km	9403	9402	9401	9378	9433	9461	9462	9464	9467	9467
On the Left Bank of Dniester, km	1277	1277	1277	1277	1278	1278	1278	1279	1279	1279
With hard surface, km	10143	10142	10141	10003	10059	10101	10102	10105	10108	10112
On the Right Bank of Dniester, km	8920	8919	8918	8780	8835	8877	8878	8880	8883	8887
On the Left Bank of Dniester, km	1223	1223	1223	1223	1224	1224	1224	1225	1225	1225
Density of Public Roads, km/1000 km²	315.5	315.5	315.5	314.8	316.5	317.3	317.3	317.4	317.5	317.5
On the Right Bank of Dniester, km	316.7	316.7	316.7	316.0	317.8	318.8	318.8	318.8	318.9	318.9
On the Left Bank of Dniester, km	306.7	306.7	306.7	306.7	307.0	307.0	307.0	307.2	307.2	307.2
With hard surface, km/1000 km²	299.6	299.6	299.6	295.6	297.2	298.5	298.5	298.6	298.6	298.8
On the Right Bank of Dniester, km	300.5	300.4	300.5	295.8	297.7	299.1	299.1	299.2	299.3	299.4
On the Left Bank of Dniester, km	293.8	293.8	293.8	293.8	294.0	294.0	294.0	294.3	294.3	294.3
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Public Roads – total, km	10615	10621	10817	10818	10826	10826	10826	10871	10884	10897
On the Right Bank of Dniester, km	9337	9343	9344	9344	9352	9352	9352	9360	9373	9386
On the Left Bank of Dniester, km	1278	1278	1473	1474	1474	1474	1474	1511	1511	1511
With hard surface, km	10015	10034	10234	10239	10257	10265	10266	10331	10349	10364
On the Right Bank of Dniester, km	8791	8810	8811	8811	8827	8835	8836	8861	8879	8894
On the Left Bank of Dniester, km	1224	1224	1423	1428	1430	1430	1430	1470	1470	1470
Density of Public Roads, km/1000 km²	313.6	313.8	319.6	319.6	319.9	319.9	319.9	321.2	321.6	322.0
On the Right Bank of Dniester, km	314.6	314.8	314.8	314.8	315.1	315.1	315.1	315.3	315.8	316.2
On the Left Bank of Dniester, km	307.0	307.0	353.8	354.1	354.1	354.1	354.1	363.0	363.0	363.0
With hard surface, km/1000 km²	295.9	296.5	302.4	302.5	303.0	303.3	303.3	305.2	305.8	306.2
On the Right Bank of Dniester, km	296.2	296.8	296.8	296.8	297.4	297.6	297.7	298.5	299.1	299.6
On the Left Bank of Dniester, km	294.0	294.0	341.8	343.0	343.5	343.5	343.5	353.1	353.1	353.1

Source: Statistical Yearbooks of the RM for 2003 (page 500), 2006 (page 405), 2012 (page 400), 2014 (page 397), 2016 (page 534). Statistical Yearbooks of the ATULBD for 2000 (page 127), 2006 (page 121), 2009 (page 119), 2010 (page 123), 2012 (page 128), 2014 (page 117), 2016 (page 124).

The roads network is sufficiently developed (the public roads density represents about 322 km/1000 km², while the hard-surface roads - circa 306 km/1000 km²), but the state of the roads and the infrastructure in general is deplorable, though in the last years repairs and restoration of the national road network are being widely performed.

In the RM road transportation is represented by a wide range of transport means: cars, buses and minibuses, trucks, special destination vehicles (ambulances, fire fighting vehicles, hook-and-ladder trucks, mobile cranes and other) (Table 1-45).

Table 1-45: Road Transportation Means Existent by the end of the year in the RM (including the ATULBD) within 1990-2016 periods, units

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Trucks	76909	77941	61595	63235	62171	61433	58597	58206	58558	53439	47501	47099	47442	47873
Buses and Minibuses	11305	11226	8924	9101	9139	9697	10282	11623	13345	14005	13176	15094	16132	16069
Cars	208984	218059	166259	166440	169387	232866	245515	289105	306825	323264	329431	347574	360488	356752
Special Destination Vehicles	20328	19632	16155	15241	15228	17255	16314	14981	14076	12455	11024	10437	9918	9311
	2004	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	2014	**2015**	**2016**	**%**
Trucks	74684	82545	84682	95587	116804	120639	131585	142015	152245	154537	160532	164878	168963	119.7
Buses and Minibuses	20063	20123	21336	21672	22062	21939	21973	21919	21985	21792	21788	21565	21399	89.3
Cars	359248	386034	414315	441991	470926	492481	512386	537145	574647	611812	642985	637140	654108	213.0
Special Destination Vehicles	9058	8951	8510	8186	7983	7631	7373	7098	6747	6552	6355	6165	5980	-70.6

Source: Statistical Yearbooks of the RM for 1994 (page 325), 1999 (page 390), 2006 (page 407), 2008 (page 399), 2010 (page 399), 2012 (page 402), 2014 (page 399), 2016 (page 538). Statistical Yearbooks of the ATULBD for 2000 (page 127), 2006 (page 121), 2009 (page 119), 2010 (page 123), 2012 (page 128), 2014 (page 117).

During the period under review, the number of special destination vehicles decreased significantly by 70.6 per cent, while the number of cars increased by 213.0 per cent, buses and minibuses - 89.3 per cent and trucks – by 119.7 per cent.

The main types of fuels consumed by road transportation are Gasoline, Diesel Oil, Liquefied Petroleum Gases – LPG and Liquefied Natural Gases – LNG.

In 2016, the total volume of freight transportation with motor vehicles represented 33.4 million tons which is a decrease by 87.3 per cent compared to the 1990 level, but an increase of 3.0 per cent as compared to 2015 (Table 1-46). Buses and minibuses transported 106.0 mill. passengers, by 76.3 per cent less than in 1990, but an increase by 2.4 per cent compared to 2015 (Table 1-47).

Table 1-46: Goods Transportation, by Types of Public Transport in the RM, 1990-2016

	1990	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Transported goods, million tons												
Transport – total, of which by:	**331.1**	**54.2**	**45.5**	**45.5**	**38.7**	**28.0**	**28.9**	**27.8**	**31.8**	**34.3**	**34.7**	**36.4**
Railway transport, mill. tons	65.4	13.1	12.5	12.8	11.1	6.6	8.2	10.6	12.6	14.7	13.3	11.7
Road transportation, mill. tons	262.8	41.0	33.0	32.7	27.6	21.4	20.7	17.2	19.1	19.5	21.3	24.6
River navigation, kt	2885.5	19.7	19.7	39.1	13.1	15.9	30.8	103.7	107.5	120.0	119.7	111.8
Air transportation, kt	12.2	1.6	1.2	1.2	1.5	1.3	1.4	1.7	0.9	0.8	0.7	0.8
Turnover of goods, million t-km												
Transport – total, of which by:	**21648**	**4296**	**3891**	**3968**	**3597**	**2267**	**2605**	**3044**	**4007**	**4598**	**5169**	**5460**
Railway transport	15007	3134	2897	2937	2575	1191	1513	1980	2748	3019	3006	3053
Road transportation	6305	1160	993	1028	1018	1073	1088	1060	1257	1577	2161	2405
River navigation	317	0.2	0.2	0.3	0.0	0.2	0.1	2.6	0.3	0.3	0.4	0.4
Air transportation	19	2.8	1.5	2.4	3.6	3.3	4.1	2.0	1.3	0.9	1.0	1.0
	2006	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**%**
Transported goods, million tons												
Transport – total, of which by:	**38.3**	**40.8**	**39.8**	**26.0**	**27.8**	**30.7**	**30.0**	**35.7**	**37.1**	**36.7**	**37.0**	**-88.8**
Railway transport, mill. tons	11.1	11.8	11.0	4.4	3.9	4.6	4.2	5.4	5.0	4.2	3.5	-94.7
Road transportation, mill. tons	27.0	28.8	28.6	21.4	23.8	26.0	25.7	30.1	31.9	32.4	33.4	-87.3
River navigation, kt	141.5	166.5	202.0	182.0	127.2	149.1	144.2	162.6	227.2	152.0	135.6	-95.3
Air transportation, kt	1.0	1.0	0.8	0.8	1.3	1.6	1.6	1.3	0.8	0.6	0.5	-95.9
Turnover of goods, million t-km												
Transport – total, of which by:	**6242**	**5865**	**5841**	**3774**	**4193**	**4796**	**4916**	**5652**	**5490**	**5182**	**5484**	**-74.7**
Railway transport	3673	3120	2873	1058	959	1196	960	1227	1181	964	790	-94.7
Road transportation	2567	2743	2966	2714	3232	3597	3955	4423	4307	4217	4693	-25.6
River navigation	0.6	0.6	0.8	0.6	0.4	0.5	0.4	0.5	0.8	0.4	0.3	-99.9
Air transportation	1.3	1.3	1.2	1.1	1.7	1.7	1.7	1.1	1.0	0.8	0.7	-96.3

Source: Statistical Yearbooks of the RM for 2016 (page 525), 2014 (page 390), 2012 (page 393), 2009 (page 387), 2007 (page 395) and 1999 (page 385).

Table 1-47: Passenger Transportation by Types of Public Transport in the RM, 1990-2016

	1990	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Passengers transported, million passengers												
Transport – total, of which by:	**757.7**	**410.9**	**373.5**	**337.5**	**384.7**	**406.1**	**326.7**	**211.5**	**280.6**	**296.3**	**306.9**	**316.4**
Railway transport	21.1	11.7	10.4	10.3	9.4	5.4	4.8	4.8	5.1	5.3	5.1	5.0
Buses	446.9	84.0	77.8	65.6	71.7	65.5	72.4	72.7	83.9	93.4	99.3	105.7
Taxi	13.7	0.7	0.5	0.4	0.3	0.3	0.7	0.7	0.6	0.7	1.1	1.0
Trolley-buses	272.6	314.2	284.6	260.9	303.1	334.6	248.4	133.0	190.7	196.5	201.0	204.3
River transport	2.5	–	–	–	–	–	0.0	0.1	0.1	0.1	0.1	0.1
Air transport	0.9	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4
Passenger turnover, million passenger-km												
Transport – total, of which by:	**10102**	**3605**	**3296**	**3059**	**3013**	**2675**	**2415**	**2131**	**2624**	**2963**	**3347**	**3549**
Railway transport	1626	1019	882	789	656	343	315	325	355	352	346	355
Buses	4878	1163	1195	1071	1067	1013	1021	1069	1298	1640	1949	2059
Taxi	164	15	11	7	6	6	12	12	11	13	20	19
Trolley-buses	1063	1103	914	838	969	1074	815	435	636	654	667	676
River transport	19	–	–	–	–	–	0.1	0.2	0.2	0.3	0.4	0.3
Air transport	2352	305	294	354	315	239	253	290	324	304	365	440

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	%
Passengers transported, million passengers												
Transport – total, of which by:	**318.1**	**319.1**	**326.1**	**291.8**	**232.5**	**237.1**	**240.4**	**240.9**	**241.5**	**249.5**	**252.0**	**-66.7**
Railway transport	5.3	5.6	5.8	5.2	5.0	4.7	4.3	4.1	3.8	3.3	2.3	-89.3
Buses	109.4	103.2	110.3	105.8	106.0	115.3	118.1	118.4	112.6	103.5	106.0	-76.3
Taxi	1.1	3.4	4.3	3.8	4.3	4.1	3.7	3.8	3.0	5.0	4.7	-65.3
Trolley-buses	201.9	206.3	205.2	176.4	116.5	112.2	113.4	113.8	121.0	136.6	137.7	-49.5
River transport	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-94.5
Air transport	0.4	0.4	0.5	0.5	0.6	0.7	0.7	0.7	0.9	1.1	1.1	25.4
Passenger turnover, million passenger-km												
Transport – total, of which by:	**3794**	**4187**	**4430**	**3933**	**3993**	**4350**	**4472**	**4694**	**4785**	**5160**	**5397**	**-46.6**
Railway transport	471	468	486	423	399	363	347	330	257	181	122	-92.5
Buses	2206	2476	2599	2300	2417	2733	2836	3124	2874	2922	3106	-36.3
Taxi	20	66	84	73	80	81	75	76	63	101	102	-37.7
Trolley-buses	615	628	623	533	347	335	340	342	367	413	416	-60.9
River transport	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.3	0.3	0.3	-98.4
Air transport	481	550	638	604	751	837	875	822	1225	1543	1651	-29.8

Source: Statistical Yearbooks of the RM for 2016 (page 531), 2014 (page 395), 2012 (page 398), 2009 (page 392), 2007 (page 401) and 1999 (page 389).

Railways. The history of railway transportation dates back 140 years. The total length of railway lines is 1157 km, while the density per 1,000 km² is 34 km (Table 1-48).

Table 1-48: Length (km) and Density (km per 1,000 km²) of Railways by the end of the year in the Republic of Moldova, 1990-2017

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Railways, km	1150	1150	1150	1150	1150	1150	1150	1140	1137	1140	1139	1121	1120	1111
on RBDR, km	977	977	977	977	977	977	977	967	964	967	999	981	980	971
on LBDR, km	173	173	173	173	173	173	173	173	173	173	140	140	140	140
Railways density, km/1000km²	34.1	34.0	34.0	34.0	34.0	34.0	34.0	33.7	33.6	33.7	33.7	33.1	33.1	32.8
on RBDR, km	33.0	32.9	32.9	32.9	32.9	32.9	32.9	32.6	32.5	32.6	33.7	33.1	33.0	32.7
on LBDR, km	41.6	41.6	41.6	41.6	41.6	41.6	41.6	41.6	41.6	41.6	33.6	33.6	33.6	33.6
	2004	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Railways, km	1075	1139	1154	1154	1157	1157	1157	1157	1157	1157	1156	1151	1151	1151
on RBDR, km	970	1034	1049	1049	1043	1043	1043	1043	1043	1043	1042	1037	1037	1037
on LBDR, km	105	105	105	105	114	114	114	114	114	114	114	114	114	114
Railways density, km/1000km²	31.8	33.7	34.1	34.1	34.2	34.2	34.2	34.2	34.2	34.2	34.2	34.0	34.0	34.0
on RBDR, km	32.7	34.8	35.3	35.3	35.1	35.1	35.1	35.1	35.1	35.1	35.1	34.9	34.9	34.9
on LBDR, km	25.2	25.2	25.2	25.2	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4

Source: Statistical Yearbooks of the RM for 1994 (page 319), 1999 (page 382), 2006 (page 405), 2012 (page. 400), 2014 (page 397) and 2016 (page 534); Statistical Yearbooks of the ATULBD for 2000 (page 127), 2006 (page 121), 2009 (page 119), 2010 (page 123), 2012 (page 128), 2014 (page 117), 2016 (page 124).

The railway transport in the RM is assured by Diesel Locomotives (400-4000 kW), Maneuvering Locomotives (200-2000 kW), Diesel Trains, Cargo and Passenger Trains.

To be noted that during the period under review the rolling stock has decreased significantly: Diesel Locomotives (over 350 HP) (by circa 57.4 per cent), Diesel Trains (by circa 54.1 per cent), Cargo Wagons (by circa 54.9 per cent) and Passenger Coaches (by circa 28.8 per cent) (Table 1-49). The main type of fuel used in railways is Diesel Oil. Other types of fuels, such as: Coal, Residual Fuel Oil, Gasoline, Natural Gas and Lubricants are also used for auxiliary needs.

Table 1-49: Railway Transport Means Existent by the end of the year in the RM, 1990-2016, units

	1990	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Diesel Locomotives	324	256	231	198	180	172	162	162	160	159	156	156
Diesel Trains (Sections)	15446	14579	13796	13308	12691	11471	11037	10473	9763	9175	8944	8758
Cargo Wagons	14960	14097	13316	12838	12233	11010	10577	10033	9303	8723	8492	8318
Passenger Coaches	486	482	480	470	458	461	460	440	460	452	452	440
	2006	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**%**
Diesel Locomotives	154	154	152	152	152	150	139	138	138	138	138	-57.4
Diesel Trains (Sections)	8613	8356	8319	8342	8246	8005	7832	7423	7247	7247	7087	-54.1
Cargo Wagons	8177	7940	7921	7919	7835	7606	7433	7035	6866	6866	6741	-54.9
Passenger Coaches	436	416	398	423	411	399	399	388	381	381	346	-28.8

Source: Official Letter from SE „Railways Moldova" dated 26.03.1999, No. 94/T, dated17.12.2003 No. H-4/993 and dated 19.09.2006 No. Nteh /338; Letter dated 28.02.2011, No. 54/Nteh, answer to Request No. 03-07/175 dated 02.02.2011; Letter dated 17.01.2014 No. H-4/147, answer to Request No. 02/9-6-206 dated 03.01.2014; Letter dated 02.03.2015 No. H-4/458, answer to Request No. 407/2015-01-09 dated 29.01.2015; Letter dated 02.06.2016 No. H-4/1186, answer to Request No. 512/2016-05-01 dated 10.05.2016.

The railway transport employs around 15,000 persons. An important railway segment 45 km long was constructed and commissioned in 2005 to connect Revaca and Cainari and to enable the transportation of freights and passengers to the south of the RM without the necessity to go through the town of Tighina in ATULBD. Furthermore, the construction of the railway section Cahul – Giurgiulesti 50 km was completed in 2008 to connect the railway network with the port Giurgiulesti, ensuring a direct link to the Danube transport system.

In 2016, railways accounted for 3.5 million tons of the total freight transportation, registering a decrease of 94.7 per cent as compared to 1990, respectively by 16.0 per cent as compared to 2015 (Table 1-46). Around 2.3 million passengers used railway transportation services, which is 89.3 per cent less than in 1990, and 30.9 per cent less than in 2015 (Table 1-47).

River Navigation. RM's river navigation is in the process of development after a long period of stagnation (freight transportation along the Dniester, suspended for above 10 years, was resumed starting in 2000). Currently, operating ports are located in Bender, Dnestrovsk, Malovata and Rîbnița on Dniester River, Ungheni on Prut River and Giurgiulesti on the Danube, the latter providing access to the Black Sea. The current length of navigable waterways of public use in the RM is around 624 km (558 km on the right bank of the Dniester and 66 km on the left bank of the Dniester). The number of river transport means used in the RM for both passenger and cargo transportation on Danube, Dniester and Prut, especially in the warm season, is relatively small (Tables 1-50 and 1-51).

Table 1-50: River Transport Means Existent by the end of the year on the Right Bank of Dniester River, 1990-2016, units

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Goods Self-Propelled Ships	14	9	5	5	5	5	5	4	4	3	-	-	-	-
Goods Non-Self-Propelled Ships	72	67	67	67	20	20	15	15	15	15	15	15	15	15
Towboats, Stamps & Stamp-Towboats	49	48	47	47	12	12	11	11	11	11	11	10	10	10
Passenger Self-Propelled Ships	36	37	32	32	3	3	3	4	3	3	3	3	3	3
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	%
Goods Self-Propelled Ships	-	-	-	-	-	-	-	-	-	-	-	-	-	-100.0
Goods Non-Self-Propelled Ships	15	15	13	12	9	9	9	9	9	9	9	9	9	-87.5
Towboats, Stamps & Stamp-Towboats	10	10	8	8	8	8	8	8	8	8	8	8	8	-83.7
Passenger Self-Propelled Ships	3	3	2	1	1	1	1	1	1	1	1	1	1	-97.2

Source: Statistical Yearbooks of the RM for 1993 (page 330), 1994 (page 325), 1999 (page 390), 2006 (page 407), 2007 (page 403), 2008 (page 399), 2009 (page 398), 2010 (page 399), 2011 (page 399), 2012 (page 402), 2014 (page 399) and 2016 (page 537).

Table 1-51: River Transport Means Existent by the end of the year on the Left Bank of Dniester River, 1990-2016, units

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Goods Ships including Towboats, Stamps & Stamp-Towboats	73	71	69	67	65	63	59	59	58	57	54	52	52	52
Passenger Ships	33	32	31	30	29	28	25	25	25	25	24	23	23	23
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	%
Goods Ships including Towboats, Stamps & Stamp-Towboats	52	50	45	42	42	42	42	42	42	41	39	39	39	-46.6
Passenger Ships	23	14	8	8	8	8	8	8	9	9	9	7	7	-78.8

Source: Statistical Yearbooks of the ATULBD for 2000 (page 128), 2006 (page 121), 2009 (page 119), 2011 (page 124), 2012 (page 128), 2014 (page 128), 2016 (page 124).

In 2016, the river ships transported 135.6 kt of freight, which is by 95.3 per cent less than in 1990, respectively by 10.8 per cent compared to 2015 (Table 1-46). The number of passengers transported by river transport means was 138.7 thousand persons, which is 94.5 per cent less than in 1990 and by 0.5 per cent less than in 2015 (Table 1-47).

Air Transportation. There are 4 airports in Moldova: in Chisinau, Balti, Cahul and Marculesti, of which only the Chisinau airport offers regular scheduled flights. The airports in Cahul and Marculesti are still in the process of obtaining the required statutory approvals and certificates. The Balti Airport is certified, but it offers only charter flights. In recent years, the aircraft fleet of the Republic of Moldova significantly changed its structure. Before 1997, circa 90 per cent of flights were operated by aircrafts produced in CIS countries, by 2014 their share decreased to 45 per cent. Most aircrafts used today are modern, with low GHG emissions, produced mainly in western countries.

Table 1-52 provides information on the number of aircraft in use at the end of each year during 1996-2016.

Table 1-52: Air Transport Means Existing in the RM by the end of the year, units

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Civil aircrafts for passenger transportation	40	40	32	20	26	21	19	19	20	32	35
Civil aircrafts for goods transportation	9	6	6	5	6	6	7	9	8	7	16
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	%
Civil aircrafts for passenger transportation	20	23	24	22	20	19	21	21	7	9	-77.5
Civil aircrafts for goods transportation	3	3	4	3	4	2	2	2	-	3	-66.7

Source: Statistical Yearbooks of the RM for 2004 (page 562), 2006 (page 407), 2008 (page 399), 2010 (page 399), 2012 (page 399), 2014 (page 399), 2016 (page 537).

In 2016, 0.5 kt of freights were transported by air, a decrease by 95.9 per cent compared to 1990, respectively by 16.7 per cent compared to the previous year. The number of passengers using air transport services was 1.1285 million persons, by 25.4 per cent more than in 1990, respectively by 4.0 per cent compared to 2015.

1.6.4. Dwellings

As of January 1, 2018, the dwelling stock in the Republic of Moldova represented 1287.3 thousand dwellings with a total area of 87.3 million m^2 (by 0.6 per cent more compared to the previous year, respectively by circa 12.1 per cent more compared to 1990) (Table 1-53). In territorial aspect, 539.0 thousand dwellings were registered in urban areas with a total area of 38.3 million m^2, accounting for 41.9 per cent of the total dwelling stock. In rural areas there are about 748.3 thousand dwellings with a total area of 49.0 million m^2 or 58.1 per cent of the total.

Table 1-53: Dwelling Stock in the Republic of Moldova (Right Bank of Dniester River) within 1990-2017 (by the end of the year), million m² of total area

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Dwelling stock - total, mill m²	77.9	79.1	66.9	68.7	70.2	71.8	72.2	73.2	74.5	75.4	75.6	75.9	76.2	76.8
in average per one inhabitant, m²	17.8	18.2	18.2	19.0	19.5	19.9	20.1	20.0	20.4	20.7	20.8	20.9	21.0	21.3
Urban dwelling stock, mil m²	29.5	30.1	23.5	23.9	24.9	26.0	26.1	26.6	27.1	27.9	28.1	28.4	28.5	28.5
in average per one inhabitant, m²	14.2	14.7	14.9	15.3	16.0	16.9	17.0	17.3	17.7	18.2	18.8	18.9	19.0	19.1
Rural dwelling stock, mil m²	48.4	49.0	43.4	44.8	45.3	45.8	46.1	46.6	47.4	47.5	47.5	47.5	47.7	48.3
in average per one inhabitant, m²	21.1	21.3	20.7	21.8	22.1	22.2	22.4	22.0	22.4	22.4	22.3	22.3	22.5	22.9
	2004	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Dwelling stock - total, mill m²	76.8	77.1	77.1	77.8	78.4	78.9	79.3	79.9	80.2	80.6	81.0	81.5	86.8	87.3
in average per one inhabitant, m²	21.3	21.4	21.5	21.8	22.0	22.1	22.3	22.4	22.5	22.7	22.8	22.9	24.4	24.6
Urban dwelling stock, mil m²	28.4	28.6	28.6	29.1	29.7	30.1	30.4	30.9	31.1	31.7	32.1	32.5	37.9	38.3
in average per one inhabitant, m²	19.1	19.2	19.3	19.7	20.1	20.4	20.5	20.8	20.9	21.1	21.3	21.5	25.0	25.2
Rural dwelling stock, mil m²	48.4	48.5	48.5	48.7	48.7	48.8	48.9	49.0	49.1	48.9	49.0	49.0	48.9	49.0
in average per one inhabitant, m²	22.9	23.0	23.1	23.2	23.3	23.4	23.5	23.6	23.7	23.8	23.9	24.0	24.0	24.1

Source: Statistical Yearbooks of the RM for 1993 (pages 318-320), 1994 (pages 312-315), 1999 (pages 214-218), 2003 (pages 183-189), 2006 (pages 149-154), 2007 (pages 141-146), 2008 (pages143-148), 2009 (pages 137-142), 2010 (pages 137-142), 2014 (pages137-141), 2015 (pages 135-139), 2016 (pages 180-187), 2017 (pages 134-137).

According to the number of rooms, in 2017 only 10.0 per cent of the total number of registered dwellings were one-room units (in comparison to 21.7 per cent in 1990), 32.2 per cent – with two rooms (47.6 per cent in 1990), 36.5 per cent – with three rooms (30.7 per cent in 1990), respectively 21.2 per cent – with four rooms and more.

The supply of dwellings to population per inhabitant, on average in the country represents 24.6 m², in urban areas – 25.2 m², in rural areas – 24.1 m² (Table 1-53).

On January 1, 2018, circa 98.5 per cent of the total dwelling stock in the RM was privately owned (69.2 per cent in 1990), respectively circa 1.5 per cent was public owned (30.8 per cent in 1990) (Table 1-54).

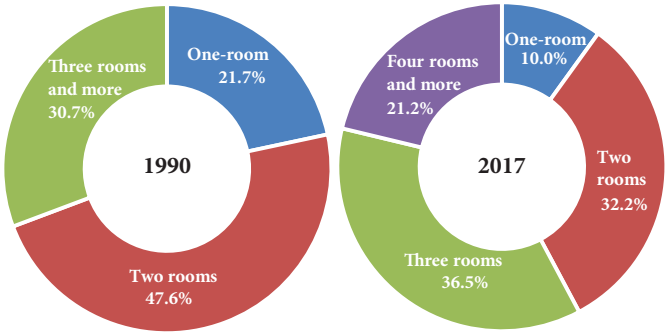


Figure 1-15: Structure of dwellings by number of rooms in 1990 and 2017 in the RM.

Table 1-54: Dwelling Stock by Forms of Ownership in the Republic of Moldova within 1990-2017 (by the end of the year), million m² of total area

	1990	1991	1992	1993	1994	1997	1998	1999	2000	2001	2002	2003	2004
Dwelling stock - total, million m² of which:	77.9	79.1	66.9	68.7	70.2	73.2	74.5	75.4	75.6	75.9	76.2	76.8	76.8
Public	24.0	23.5	16.7	17.1	14.7	5.9	5.9	5.3	4.7	4.4	4.0	3.9	3.7
Private	53.9	55.6	50.2	51.6	55.5	66.5	68.0	69.5	70.5	71.2	71.9	72.7	73.0
Other forms	0.0	0.0	0.0	0.0	0.0	0.8	0.7	0.5	0.4	0.3	0.2	0.1	0.1
	2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Dwelling stock - total, million m² of which:	77.1	77.1	77.8	78.4	78.9	79.3	79.9	80.2	80.6	81.0	81.5	86.8	87.3
Public	3.5	3.5	3.3	3.2	3.0	2.3	2.0	2.0	1.9	1.8	1.8	1.8	1.3
Private	73.4	73.5	74.3	75.1	75.7	76.9	77.8	78.1	78.7	79.1	79.7	85.0	85.9
Other forms	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0

Source: Statistical Yearbooks of the RM for 1993 (pages 318-320), 1994 (pages 312-315), 1999 (pages 214-218), 2003 (pages 183-189), 2006 (pages 149-154), 2007 (pages 141-146), 2008 (pages143-148), 2009 (pages 137-142), 2010 (pages 137-142), 2014 (pages137-141), 2015 (pages 135-139), 2016 (pages 180-187), 2017 (pages 134-137).

The table below presents data on the indicative energy consumption per m² of total area in the residential sector of the Republic of Moldova between 1990 and 2016 (Table 1-55).

Table 1-55: Indicative Energy Consumption per m² of Total Area in the Residential Sector of the Republic of Moldova, 1990-2016

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Dwelling stock, mil m² total area	77.9	79.1	66.9	68.7	70.2	71.8	72.2	73.2	74.5
Energy consumption in the residential sector, thousand t.c.e.	2025	1670	1314	531	602	613	778	815	697
Indicative energy consumption per m² total area in the residential sector, kg c.c./m²	26.0	21.1	19.6	7.7	8.6	8.5	10.8	11.1	9.4
	1999	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Dwelling stock, mil m² total area	75.4	75.6	75.9	76.2	76.8	76.8	77.1	77.1	77.8
Energy consumption in the residential sector, thousand t.c.e.	610	602	610	681	822	938	1004	986	856
Indicative energy consumption per m² total area in the residential sector, kg c.c./m²	8.1	8.0	8.0	8.9	10.7	12.2	13.0	12.8	11.0
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Dwelling stock, mil m² total area	78.4	78.9	79.3	79.9	80.2	80.6	81.0	81.5	86.8
Energy consumption in the residential sector, thousand t.c.e.	906	943	1631	1664	1692	1675	1705	1722	1797
Indicative energy consumption per m² total area in the residential sector, kg c.c./m²	11.6	12.0	20.6	20.8	21.1	20.8	21.0	21.1	20.7

Source: Statistical Yearbooks of the RM for 1993 (pages 318-320), 1994 (pages 312-315), 1999 (pages 214-218), 2003 (pages 183-189), 2006 (pages 149-154), 2007 (pages 141-146), 2008 (pages143-148), 2009 (pages 137-142), 2010 (pages 137-142), 2014 (pages137-141), 2015 (pages 135-139), 2016 (pages 180-187), 2017 (pages 134-137); Statistical Yearbooks of the RM for 1994 (page 274), 1999 (page 310), 2003 (page 399), 2006 (page 317), 2007 (page 316), 2008 (page 312), 2009 (page 309), 2010 (page 310), 2014 (pages 307-308), 2017 (page 278); The Energy Balance of the Republic of Moldova for 2016. Statistical Compilation. Chisinau, 2017, pages 63-64.

Information presented below is relevant only to identify general trends, as time series associated with energy consumption in the residential sector are not consistent (referring to 1990-2009 and 2010-2016 time periods), due to the fact that biofuels and waste consumption in the residential sector had been revised for 2010-2016 time series with the support of the Energy Community experts, based on the results of the „Research on Energy Consumption in Households" carried out by the NBS in 2015. The significant decrease (by circa 69.4 per cent) of the indicative energy consumption per m^2 of total area in the residential sector between 1990 and 2000 correlates with the evolution of socio-economic indicators (for example, GDP per capita) during the respective period and is explained, not by improving the energy efficiency in the residential sector, but, by the austere living conditions of the population in the transition period to the market economy with the independence of the RM and the collapse of the USSR, an aspect revealed by the low incomes per capita, as well as the significant increase of costs for energy resources and the reduced capacity of purchasing these resources, of adequately maintaining the dwelling stocks and ensuring decent living conditions. Within 2001-2016 time periods, there is a gradual tendency to increase the indicative energy consumption per m^2 of total area in the residential sector, with relatively constant values during 2010-2016. Recorded values are below the reference year value, including as a result of implementing energy efficiency measures foreseen by sectoral policies, especially from 2011 onwards.

According to data presented below, recently an improving trend was recorded in the RM related to living conditions of the population. A larger number of people has access to water pipe, sewerage systems, central heating, bathrooms, gas and hot water supply (Table 1-56).

Table 1-56: Equipment of Dwelling Stock by Total Area with Water Supply System, Sewerage System, Central Heating, Bathroom, Gas, Hot Water Supply System, Electric Stoves, 1997-2016, %

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Share of total area equipped with:					**Total**					
water supply system	32.4	32.8	33.8	33.4	33.2	33.4	33.9	34.3	34.6	34.8
sewerage system	28.3	29.1	28.8	29.4	29.9	30.0	30.4	30.6	30.8	30.9
central heating	27.1	27.3	27.0	26.7	26.9	26.7	26.7	27.4	27.5	27.8
bathroom (shower)	26.4	25.4	25.7	25.7	25.2	25.3	25.8	25.8	26.0	27.4
gas	81.3	82.9	81.9	82.6	83.2	83.3	84.4	85.1	85.4	85.7
hot water supply system	20.5	19.2	19.3	19.4	19.6	19.0	19.2	19.4	19.5	21.1
electric stoves	1.4	1.1	1.0	1.0	0.9	0.8	0.8	0.7	0.7	0.7
Share of total area equipped with:					**Urban Area**					
water supply system	77.9	78.4	77.4	77.0	77.2	77.5	78.7	78.9	79.0	78.9
sewerage system	76.2	77.7	75.2	75.9	76.3	76.6	77.8	77.7	77.9	77.8
central heating	77.3	78.0	75.5	74.8	74.5	73.4	74.0	73.7	73.8	74.2
bathroom (shower)	70.3	67.5	66.1	66.0	66.1	66.4	67.6	67.2	67.3	71.4
gas	89.0	90.4	90.0	91.0	91.2	91.1	91.4	91.8	92.1	92.4
hot water supply system	59.9	56.0	55.1	55.2	55.6	53.9	55.1	55.1	55.0	59.8
electric stoves	3.5	3.1	2.6	2.5	2.3	2.0	2.0	1.9	1.8	1.8
Share of total area equipped with:					**Rural Area**					
water supply system	9.4	9.7	10.9	10.3	9.8	10.0	10.4	11.0	11.3	11.6
sewerage system	4.1	4.6	4.5	4.7	5.2	5.4	5.5	6.0	6.1	6.4
central heating	1.5	1.6	1.5	1.3	1.5	1.9	1.9	3.2	3.3	3.4
bathroom (shower)	4.1	4.1	4.4	4.4	3.3	3.5	3.9	4.2	4.2	4.3
gas	77.3	79.1	77.7	78.2	78.9	79.4	80.7	81.6	81.8	82.2
hot water supply system	0.6	0.6	0.6	0.4	0.4	0.4	0.4	0.8	0.8	0.8
electric stoves	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Share of total area equipped with:					**Total**					
water supply system	35.7	36.5	37.5	44.2	46.3	47.5	50.1	51.7	53.5	58.2
sewerage system	32.1	32.9	34.6	43.8	46.0	47.5	49.9	51.5	53.2	55.8
central heating	28.4	29.5	30.8	35.1	36.3	37.6	39.3	40.4	41.5	46.0
bathroom (shower)	28.2	28.9	29.5	35.6	37.3	38.5	39.9	41.0	42.6	37.3
gas	86.2	86.6	87.3	87.8	88.7	89.0	89.4	90.0	90.2	90.4
hot water supply system	21.8	22.6	23.4	29.5	30.4	31.3	33.8	35.2	36.3	34.4
electric stoves	0.7	0.7	0.7	1.0	0.8	0.6	0.6	0.5	0.5	0.4
Share of total area equipped with:					**Urban Area**					
water supply system	79.5	79.8	80.0	82.8	84.4	84.7	85.4	85.6	86.3	90.1
sewerage system	78.4	78.7	79.1	82.7	84.4	84.7	84.9	85.1	85.8	84.9
central heating	74.9	75.0	76.3	77.6	78.8	78.4	78.9	79.2	80.5	83.9
bathroom (shower)	81.3	72.3	72.6	75.0	76.4	77.3	77.6	78.1	79.2	60.0
gas	93.0	93.1	93.4	92.6	93.4	93.7	93.9	94.2	94.4	93.9
hot water supply system	62.9	61.6	62.3	66.6	67.4	68.7	70.8	71.6	72.5	61.8
electric stoves	2.0	1.7	1.7	2.1	2.0	1.6	1.5	1.3	1.3	1.0
Share of total area equipped with:					**Rural Area**					
water supply system	12.4	13.1	14.5	20.2	22.3	23.9	27.2	29.4	31.7	33.6
sewerage system	7.5	8.2	10.4	19.6	22.2	23.9	27.2	29.4	31.6	33.3
central heating	3.8	5.0	6.0	8.6	9.5	11.7	13.7	15.0	15.7	16.6
bathroom (shower)	4.8	5.5	6.0	11.2	12.7	13.9	15.4	16.8	18.4	19.7
gas	82.6	83.1	84.0	84.9	85.6	85.9	86.5	87.3	87.4	87.6
hot water supply system	1.0	1.6	2.3	6.4	7.0	7.6	9.7	11.3	12.2	13.1
electric stoves	0.1	0.1	0.1	0.3	0.1	0.0	0.0	0.0	0.0	0.0

Source: Statistical Yearbooks of the RM for 1993 (pages 318-320), 1994 (pages 312-315), 1999 (pages 214-218), 2003 (pages 183-189), 2006 (pages 149-154), 2007 (pages 141-146), 2008 (pages143-148), 2009 (pages 137-142), 2010 (pages 137-142), 2014 (pages137-141), 2015 (pages 135-139), 2016 (pages 180-187), 2017 (pages 134-137).

During 1990-2016, the gasification of the country has been successfully accomplished. This has made possible to considerably reduce the consumption of solid and liquid fuels in favor of natural gas and, after 2010 also in favor of renewable energy sources (in particular biomass).

According to data presented in Table 1-57, the length of the natural gas networks increased between 1990 and 2016 by 12.3 times, including by 6.5 times in urban areas and by 20 times in rural areas. In the same context, the total number of flats (houses) fueld from the gas networks in the RM increased in the respective period by circa 1.6 times in urban areas and by circa 10.2 times in rural areas.

Table 1-57: Gas Supply to Population in the Republic of Moldova within 1990-2016

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Length of gas pipes – total, km, of which:	**1 873.4**	**2 868.0**	**2 040.6**	**2 227.6**	**2 597.3**	**4 305.8**	**4 696.0**	**5 490.4**	**6 427.3**
in urban area	1 072.0	1 699.0	898.3	1 003.7	1 167.9	2 262.5	2 429.7	2 678.5	3 173.6
in rural area	801.4	1 169.0	1 142.3	1 223.9	1 429.4	2 043.3	2 266.3	2 811.9	3 253.7
Number of flats (houses) connected to gas pipe, thousand	1 286.5	1 304.7	1 083.8	1 105.5	1 112.8	1 115.5	1 115.5	1 108.9	1 103.6
Of total number of flats/houses connected to gas pipes – supplying:									
in urban area	281.8	299.6	214.7	230.9	252.1	263.0	281.2	289.1	296.9
in rural area	21.5	26.2	21.7	27.4	33.3	38.9	47.3	55.2	62.8
	1999	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Length of gas pipes – total, km, of which:	**7 137.7**	**7 470.9**	**7 926.2**	**8 627.9**	**9 509.2**	**10 835.1**	**12 465.0**	**13 955.8**	**15 735.4**
in urban area	3 564.9	3 675.0	3 799.8	4 039.7	4 321.8	4 687.8	4 983.7	5 303.4	5 616.7
in rural area	3 572.8	3 795.9	4 126.4	4 588.2	5 187.4	6 147.3	7 481.3	8 652.4	10 118.6
Number of flats (houses) connected to gas pipe, thousand	1 108.8	1 085.5	1 093.8	1 098.5	1 104.1	1 115.5	1 141.4	1 121.2	1 145.0
Of total number of flats/houses connected to gas pipes – supplying:									
in urban area	305.8	309.3	315.7	322.9	332.9	345.2	357.8	368.2	385.6
in rural area	67.7	71.5	77.3	84.6	94.9	107.7	123.7	139.0	157.5
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Length of gas pipes – total, km, of which:	**17 408.6**	**19 003.4**	**20 203.5**	**21 070.3**	**21 537.6**	**21 843.4**	**22 129.3**	**22 860.0**	**22 981.0**
in urban area	5 968.0	6 139.3	6 272.8	6 471.3	6 564.9	6 642.7	6 743.4	6 907.0	6 990.0
in rural area	11 440.6	12 864.1	13 930.7	14 599.0	14 972.7	15 200.7	15 385.9	15 353.0	15 991.0
Number of flats (houses) connected to gas pipe, thousand	1 146.5	592.1	610.5	625.7	633.6	642.3	653.0	665.5	675.2
Of total number of flats/houses connected to gas pipes – supplying:									
in urban area	396.1	406.9	414.7	421.6	427.0	432.9	440.3	449.5	456.4
in rural area	172.8	185.2	195.8	204.1	206.6	209.4	212.7	216.0	218.8

Source: Statistical Yearbooks of the RM for 1993 (pages 318-320), 1994 (pages 312-315), 1999 (pages 214-218), 2003 (pages 183-189), 2006 (pages 149-154), 2007 (pages 141-146), 2008 (pages143-148), 2009 (pages 137-142), 2010 (pages 137-142), 2014 (pages137-141), 2015 (pages 135-139), 2016 (pages 180-187), 2017 (pages 134-137).

Information presented below also point to the fact that the power of purchasing energy resources by the population is increasing. At the same time, in particular after 2010, in the RM one can note a decreasing trend in the per capita consumption of network gas (Table 1-58) in favor of renewable energy sources (in particular biomass).

Table 1-58: Supplying the Population with Network Natural Gas and Liquefied Gas in the Republic of Moldova, 1995-2015

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Gas delivery to the population, per inhabitant:										
Network natural gas, m^3	64	76	89	82	74	61	63	66	84	92
in urban area	110	124	155	128	120	115	118	123	150	176
in rural area	30	40	41	49	41	23	23	26	37	40
Liquefied Gas, kg	3.3	4.2	5.6	5.5	6.9	7.8	7.4	11.6	12.4	12.8
	2006	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Gas delivery to the population, per inhabitant:										
Network natural gas, m^3	101	86	89	92	99	91	86	80	80	78
in urban area	174	148	151	151	170	153	151	137	138	133
in rural area	50	43	45	51	47	46	39	38	37	38
Liquefied Gas, kg	12.0	9.1	12.0	11.8	11.2	15.2	15.7	16.3	16.3	16.6

Source: Statistical Yearbooks of the RM for 1993 (pages 318-320), 1994 (pages 312-315), 1999 (pages 214-218), 2003 (pages 183-189), 2006 (pages 149-154), 2007 (pages 141-146), 2008 (pages143-148), 2009 (pages 137-142), 2010 (pages 137-142), 2014 (pages137-141), 2015 (pages 135-139), 2016 (pages 180-187), 2017 (pages 134-137).

1.6.5. Waste Management

Current situation with the waste management in the Republic of Moldova is similar to the situation in other developing countries; it is in the budding stage and includes two basic elements: municipal solid waste generating sources and the landfills.

The generating process of municipal solid waste is influenced by multiple factors, the most relevant being the population income, consumer behavior, the use of new packed products, as well as the demographic evolution.

The recent increase in the wellbeing of the population and the evolution of the urbanization process resulted in an increased waste generation rate per capita, varying, according to the World Bank's studies, between 0.3 and 0.4 kg/per capita/day in rural areas and around 0.9 kg/per capita/per day in urban areas. These data were taking into consideration during the development of the Republic of Moldova's Waste Management Strategy for 2013-2027[16].

Food consumption currently generates more and more waste. The introduction of new packages, plastic in particular, produces a significant negative impact on the environment. The polyethylene terephthalate (PET) packaging have replaced in the last years the glass packaging; while the polyethylene (PE) sacks, bags or boxes have replaced paper packaging, thus influencing the amount

[16] <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=347341>

and composition of generated waste. The increasing number of markets, shops and supermarkets, along with an increase in welfare, respectively in purchasing power of packed products led to a greater capacity to generate waste, in particular in urban areas.

Waste generation indicators were revised in the Republic of Moldova during the completing process of the feasibility studies for the development of integrated waste management systems at regional level, and the following values were proposed: for rural areas - 0.5-0.7 kg/per capita/day, respectively 0.9 kg/ per capita/day for small urban areas and district towns, and between 1.3-1.5 kg/per capita/day for Balti and Chisinau municipalities. It should be mentioned that these calculations use AD on waste disposed provided by waste collection services.

Currently, the most used method of treating waste is waste disposal on sites, which often is a major source of soil pollution and groundwater contamination. In this context, sanitation and waste management services represent an important goal for local and governmental structures.

According to the "State Ecological Inspectorate Yearbook for 2016 – Environment Protection in the Republic of Moldova", the total area of SWDS in urban areas represent circa 168.6 ha (NBS, 2017), therefore another circa 1061 ha were occupied by the so called "dump sites" (unauthorized landfills) situated especially in the rural areas of the Republic of Moldova. From the existing 1151 landfills, about ¾ do not comply with sanitary and environment protection requirements and, the total amount of solid wastes accumulated on these sites cannot be estimated.

It should be noted that between 2010 and 2017, the construction of several landfills started in the country, in particular in district centers, serving the neighborhood villages. Thus, for example, new landfills became operational in 2013-2015 in Nisporeni, Telenesti and Hincesti.

Within 2000-2016 time periods, through urban sanitation services, about 1,144.0 and 2,915.5 thousand m^3 of waste was transported to solid waste disposal sites. No statistical records on disposed waste volume is being made, there are only some visual estimates of environment inspectors, who appreciate the total volume of MSW disposed at approximately 35 million tons.

To be noted that only 10 per cent of SWDS are enacted but even these are far from meeting environmental requirements since they are not operated properly: without compacting and using intermediary cover material to prevent the spread of fires and odors; lacking a strict control through weighing of disposed waste quality and quantity; there are no facilities to recover biogas produced or to recover/treat the filtrate; access road to and within the disposal sites are not maintained, vehicles are not washed on leaving the landfill; these sites do not have proper fences, an appropriate entry and warning signs. In most district towns the dump sites are overfilled, the disposed waste layer being 7-8 m deep (ex., in Ungheni, Cahul, Ocnita, etc.), at some landfills the layer is circa 10-15 m deep (ex., in Briceni, Balti, Ialoveni, etc.) and even 25-30 m deep (Cretoaia and Orhei). Circa 3/4 of district town's landfills are being explored for circa 25-35 years at over 80 per cent of their capacity.

In recent years, there have been changes in waste management in Chisinau municipality. The landfill situated in Cretoaia village that served until recently Chisinau municipality became operational by the end of 1990 (de facto exploitation began in 1991); this landfill has an area of about 24.95 ha, of which net area represents 20.89 ha. According to the project, it was designed to storage until the end of 2010 about 44 million m^3 of solid waste. By 2011, when it's use stopped, only 19 million m^3 of solid waste were stored, which is less than half the capacity of the landfill. Meanwhile, since 2011 to 2017, Chisinau municipality has stored its waste near the waste transshipment station, located in Bubuieci village. The new location, was treated as a temporary solution, and became a serious environmental problem since waste was disposed on an unmanaged land, lacking environment protection measures such as sealing foundation, collecting storage gas, collecting and treating leachate, rainwater deviation etc. Since summer 2017, Chisinau municipality is storing again its waste at the Cretoaia landfill, after negotiating with local public authorities conditions for re-opening the landfill, including the solutions for environmental problems. Rehabilitation and remediation measures for environment pollution caused by the Bubuieci waste transshipment station are currently in progress.

Between 1986 and 2016, several waste morphologic composition studies have been performed in the Republic of Moldova. Figure 1-14 illustrates the shares of biodegradable fractions in the waste stream in the RM, indicating a decrease from circa 77.0 per cent in 1986, to circa 54.0 per cent in 2001 with a further increase to 72 per cent in 2005 and a subsequent decrease to circa 59 per cent in 2016.

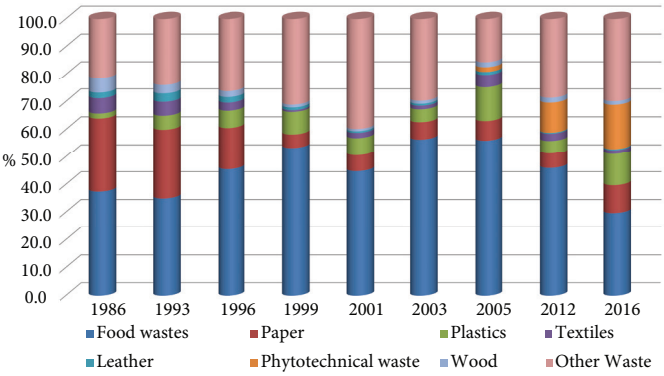


Figure 1-16: Biodegradable Waste in the Major Waste Streams in the Republic of Moldova.

The last study on the morphology of solid household waste generated in Chisinau, respectively Causeni and Straseni municipalities was conducted in 2016 by a technical team within the State Centre for Ecological Investigations, previously trained in similar waste management analysis, in fully cooperation with project experts from Climate Change Office and Prevention of Environment Pollution of the Ministry of Agriculture, Regional Development and Environment (Table 1-59).

Table 1-59: Average annual WDS Morphological Composition in 2016

Waste Type		Morphological Composition of Municipal Waste, %			
		Chisinau	Causeni	Straseni	Average
Recyclable Waste	Paper, cardboard	6.5	8.0	15.8	10.1
	Glass	5.5	6.0	5.7	5.7
	Plastics	7.0	14.2	12.8	11.3
	Metals and non-metals	1.5	1.8	1.5	1.6
Organic Waste	Food waste	26.4	33.6	29.2	29.7
	Phytotechnical Waste	19.5	11.8	16.3	15.9
	Textiles	2.9	0.3	1.3	1.5
	Shoes	0.1	0.8	0.3	0.4

Waste Type		Morphological Composition of Municipal Waste, %			
		Chisinau	Causeni	Straseni	Average
Bulky Waste	Furniture	2.0	0.0	0.0	0.7
	Electronic and Electrical Equipment	0.3	0.5	0.0	0.3
Other Waste	Wood	1.7	0.2	0.0	0.6
	Construction and Demolition Waste	26.6	22.8	17.0	22.1

In 2013, with the support of GIZ Project „Modernization of local public services" and relying on the Waste Management Strategy of the Republic of Moldova for 2013-2027, approved by Government Decision no. 248 dated 10.04.2013, several activities of waste management planning were initiated at regional level. As a result, in February 2014 sectoral regional programs in waste management were approved for Central and North Development Regions.

As for the statistical sources on waste management records, it should be noted the Statistical Forms: F-1 "Toxic Waste" and F-2 "Waste" and Statistical Form "Special Road Transport", while since 2003, also the Statistical Form Nr.2–gc "Urban Settlements Sanitation" reflecting the amounts of municipal solid waste transported to landfills and approved by the Order of the Department of Statistics and Sociology, No. 83, from 01.08.2003.

The performed analyses revealed that only municipal solid waste is being transported to dumps by means of sanitation services, while other organic types of waste such as waste from food processing industry, from animal breeding and phytotechnical waste are disposed as well to the dumps, however, due to the fact that these types of waste are transported to the landfills through beneficiary transport units and are not included in the Statistical Form Nr.2–gc "Urban Settlements Sanitation". In these conditions, data on the amount of waste from food processing industry, from animal breeding and phytotechnical waste disposed were collected through the Statistical Form F-2 "Waste".

Table 1-60 refers only to the urban landfills were sanitation services exist and provide activity data to the National Bureau of Statistics of the Republic of Moldova. Historical AD regarding 1959-1984 time periods were deduced based on population number, the social-economic development conditions as well as waste generation trends. At the same time, the average value of the MCF was estimated considering the SWDS characteristics, such as managed or unmanaged SWDS and the deep of the disposed waste layer. By the end of 1990, the landfill in Tintareni village, Anenii Noi district became operational and serving Chisinau municipality (de facto use of this landfill started in 1991), while the GHG emissions generated by this landfill began in 1992.

Table 1-60: Activity Data on the Amount of Solid Waste Disposed on Land and Industrial Waste Disposed on Land in the Republic of Moldova within 1959-2016

	Total	MSW			D_{ind}, kt	DDMS			Average MCF
	MSW + D_{ind}, kt	Total, kt	Inert waste, kt	Without inert waste, kt		Managed, MCF=1.0	Unmanaged, >5 m, MCF=0.8	Unmanaged, <5 m, MCF=0.4	
1959	595.26	357.16	103.56	253.60	238.11	0.0	10.0	90.0	23.4
1960	626.59	375.96	109.01	266.95	250.64	0.0	10.0	90.0	23.6
1961	659.57	395.74	114.75	280.99	263.83	0.0	15.0	85.0	23.8
1962	694.29	416.57	120.79	295.79	277.71	0.0	15.0	85.0	24.1
1963	730.83	438.50	127.17	311.33	292.33	0.0	15.0	85.0	24.3
1964	769.29	461.58	133.84	327.74	307.72	0.0	15.0	85.0	24.6
1965	809.78	485.87	140.88	344.99	323.91	0.0	15.0	85.0	24.8
1966	852.40	511.44	148.31	363.13	340.96	0.0	20.0	80.0	25.1
1967	897.26	538.36	156.11	382.25	358.91	0.0	20.0	80.0	25.4
1968	944.49	566.69	164.31	402.38	377.80	0.0	20.0	80.0	25.7
1969	994.20	596.52	172.90	423.62	397.68	0.0	20.0	80.0	26.1
1970	1046.53	627.92	182.09	445.82	418.61	0.0	20.0	80.0	26.4
1971	1162.81	697.68	202.30	495.38	465.12	0.0	25.0	75.0	27.2
1972	1224.01	734.40	212.98	521.43	489.60	0.0	25.0	75.0	27.6
1973	1288.43	773.06	224.19	548.87	515.37	0.0	25.0	75.0	28.0
1974	1356.24	813.74	235.97	577.77	542.50	0.0	25.0	75.0	28.4
1975	1427.62	856.57	248.44	608.13	571.05	0.0	25.0	75.0	28.9
1976	1502.76	901.66	261.46	640.19	601.10	0.0	30.0	70.0	29.4
1977	1581.85	949.11	275.24	673.87	632.74	0.0	30.0	70.0	29.9
1978	1665.11	999.06	289.73	709.34	666.04	0.0	30.0	70.0	30.4
1979	1752.74	1051.65	306.12	745.52	701.10	0.0	30.0	70.0	31.0
1980	1844.99	1014.75	294.26	720.48	830.25	0.0	35.0	65.0	31.2
1981	1892.30	1040.77	301.80	738.96	851.54	0.0	35.0	65.0	31.5
1982	1940.82	1067.45	309.55	757.91	873.37	0.0	35.0	65.0	31.9
1983	1990.59	1094.82	317.49	777.33	895.76	0.0	35.0	65.0	32.2
1984	2041.63	1122.89	325.64	797.25	918.73	0.0	35.0	65.0	32.5
1985	2093.98	1163.32	337.36	825.96	930.66	0.0	40.0	60.0	32.9
1986	2236.52	1242.51	360.33	882.18	994.01	0.0	40.0	60.0	33.8
1987	2217.94	1232.19	357.34	874.85	985.75	0.0	40.0	60.0	33.7
1988	2307.89	1282.16	371.83	910.33	1025.73	0.0	45.0	55.0	34.2
1989	2414.81	1341.56	389.04	952.53	1073.25	0.0	45.0	55.0	34.9
1990	2311.52	1359.72	394.31	965.41	951.80	0.0	45.0	55.0	34.6
1991	2204.61	1377.88	399.56	978.32	826.73	0.0	45.0	55.0	34.2
1992	2156.28	1437.52	416.88	1020.65	718.76	16.3	30.0	53.7	34.3
1993	1279.31	719.41	208.63	510.78	559.90	27.2	30.0	42.8	27.9

	Total	MSW			D_{ind}, kt	DDMS			Average MCF
	MSW + D_{ind}, kt	Total, kt	Inert waste, kt	Without inert waste, kt		Managed, MCF=1.0	Unmanaged, >5 m, MCF=0.8	Unmanaged, <5 m, MCF=0.4	
1994	1161.65	670.52	194.45	476.07	491.14	28.6	30.0	41.4	27.3
1995	1070.97	632.19	183.34	448.85	438.78	31.1	30.0	38.9	26.8
1996	1074.35	651.73	208.42	443.31	422.62	30.0	30.0	40.0	26.9
1997	1003.87	613.00	196.16	416.84	390.87	32.8	30.0	37.2	26.4
1998	1003.69	618.92	198.05	420.87	384.77	32.5	30.0	37.5	26.5
1999	947.81	580.75	220.67	360.08	367.06	32.9	30.0	37.1	26.1
2000	924.55	523.80	199.04	324.76	400.74	31.8	30.0	38.2	25.8
2001	867.26	475.49	213.98	261.52	391.77	31.9	30.0	38.1	25.4
2002	926.28	522.07	235.22	286.85	404.22	32.0	30.0	38.0	25.8
2003	975.80	548.08	186.35	361.73	427.72	30.6	30.0	39.4	26.1
2004	1041.40	575.44	195.64	379.80	465.96	29.4	30.0	40.6	26.5
2005	1109.58	602.50	162.68	439.83	507.08	28.3	30.0	41.7	26.9
2006	1205.78	653.59	176.47	477.12	552.18	27.2	35.0	37.8	27.5
2007	1529.12	847.37	228.77	618.60	681.74	30.8	35.0	34.2	29.6
2008	1760.41	1003.42	270.92	732.50	756.99	33.8	35.0	31.2	31.1
2009	1651.91	1114.28	300.86	813.42	537.63	35.8	35.0	29.2	31.2
2010	1531.58	1075.06	290.27	784.80	456.52	39.0	35.0	26.0	30.5
2011	1554.28	1091.58	294.73	796.84	462.70	40.1	35.0	24.9	30.7
2012	1590.83	1117.94	346.55	771.39	472.89	40.0	35.0	25.0	31.0
2013	1726.60	1214.21	376.40	837.81	512.39	37.8	35.0	27.2	31.9
2014	1824.88	1270.13	393.73	876.40	554.75	36.3	35.0	28.7	32.5
2015	1826.90	1270.69	393.92	876.78	556.21	39.1	35.0	25.9	32.5
2016	1818.37	1263.09	517.87	745.22	555.28	39.5	35.0	25.5	32.5

Since 2001, the trends in waste generation per capita are steadily growing, in Chisinau city this level even exceeded the level recorded in the early 90's of the twentieth century. In 1990 year just 20 per cent of the waste was generated in Chisinau city, while in the last four or five years the share of Chisinau city of the total amount of waste disposed in landfills practically tripled.

According to the information provided by the National Bureau of Statistics in the Press release as of 07.05.2018 "City infrastructure and sanitation activities in urban localities in 2017", in sanitation activities in localities during 2017, 764 vehicles with special destination were used (with 18 units more than in 2016), of which 686 vehicles served urban areas (with 7 units more), while 78 – rural areas (with 11 units more). Of the total, 294 (38.5 per cent) serve Chisinau municipality, 35 (4.6 per cent) localities in the UTA Gagauzia, 28 (3.7 per cent) – Cahul district, 26 (3.4 per cent) - Anenii Noi district, 25 (3.3 per cent) – Ungheni district, 23 (3.0 per cent) – Orhei district, 22 (2.9 per cent) – Balti municipality and Hincesti district.

For winter roads clearing 50 sand scattering vehicles were used, 6 snow loaders and 7 rotary snow plows. In order to maintain cleanliness, in the localities operated 105 tractors equipped with cleaning mechanisms, 16 auto-sweeping machines, 38 auto-spraying machines (including 23 in Chisinau municipality). During 2017, a surface of 35.7 million m^2 was cleaned in the country or by 8 per cent less compared to 2016. Circa 95 per cent of the localities are cleaned with mechanized means.

To be noted that in most cases, household waste is collected without being separated at source and is stored at landfills. The area of solid waste landfills represented in 2017 – 168.6 ha. To these landfills were transported 3,274.4 thousand m^3 of waste, of which 3,084.4 thousand m^3 solid household waste, 129.1 thousand m^3 of street waste and 60.8 thousand m^3 of snow and other loads.

Compared to the previous year, municipal waste increased, with the exception of street waste which decreased by 34 thousand m^3. The localities' hygiene reflects, besides the level of sanitation (sanitation of domestic waste from the population and from economic agents) and the street sanitation, which has as main purpose the hygiene of the communication ways in order to increase the urban comfort.

Total urban waste generated in Chisinau municipality (1,777.9 thousand m^3) represented 58.6 per cent of the total municipal waste in the country (3,034.0 thousand m^3). In the household waste structure, in 2017, the largest share was represented by domestic waste collected from the population – 67.9 per cent, followed by waste collected from institutions, economic agents – 32.1 per cent.

In the municipal waste structure, in 2017, the largest share was represented by household waste (94.2 per cent), followed by street waste collected from public spaces, streets, parks, green spaces (3.9 per cent). Compared to the previous year, liquid waste increased by 30.0 per cent, representing 69.4 thousand m^3.

In 2017, only 30.9 per cent of the population had access to sanitation services, the coverage in urban areas is 64.1 per cent and 6.0 per cent in rural areas. It should be noted that there are some amount of waste not collected by sanitation services. 169 localities benefited from solid waste collection services in 2017, including 53 municipalities and towns, respectively 116 villages.

It should be mentioned also that statistical information sometimes does not reflect the real situation regarding the solid municipal waste management. Thus, for example, the amount of solid municipal waste disposed in rural areas are not subject to statistical evidence, as no sanitation services exist there. Also, although waste processing enterprises operate in the RM, information on the amount of recycled waste is not always subjected to a strict statistical evidence. Given the Republic of Moldova's intention to align to EU standards, the waste sector will be essentially restructured. In this context, the majority of SWDS are to be recover and their number – drastically reduced.

1.6.6. Sewerage and Water Supply

Water Supply Systems. Compared to 2016, the number of water supply systems (water pipes) increased in the RM in 2017 by 33 units, and thus 1214 water supply systems operated in the country (Table 1-61). Of the total water pipes, 1150 systems or 94.7 per cent were operating during the year, while 26 water pipes were rebuilt, of which 25 in rural areas.

Table 1-61: Water Supply Systems and the Water Volume Distributed to Consumers in the RM, 2008-2017

	Water supply systems – total, units			Functional water supply systems, units			Water volume distributed to consumers – total mil m³			Water volume distributed to population mil m³		
	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
2008	600	88	512	514	85	429	82.8	76.3	6.5	53.2	48.1	5.1
2009	644	91	553	562	86	476	78.1	70.9	7.2	53.6	47.5	6.0
2010	690	88	602	611	85	526	75.0	68.0	7.1	51.3	45.5	5.8
2011	723	90	633	643	83	560	73.6	66.1	7.4	51.2	44.8	6.4
2012	742	83	659	677	80	597	75.0	66.6	8.3	52.1	44.8	7.3
2013	779	85	694	721	82	639	74.9	66.8	8.2	52.8	45.7	7.1
2014	836	68	768	784	65	719	74.3	62.8	11.5	53.2	43.1	10.2
2015	1113	73	1040	1044	69	975	80.5	63.9	16.6	58.2	43.6	14.6
2016	1181	75	1106	1115	71	1044	84.8	67.2	17.6	60.0	44.2	15.8
2017	1214	75	1139	1150	71	1079	86.4	68.4	18.0	59.9	43.9	16.0

Each year are being carried out rehabilitation, modernization and extension works on water supply systems. The total length of the water distribution networks and water pipes in 2017 expanded by 0.6 thousand km, representing circa 14.0 thousand km (Table 1-62), 0.2 thousand km were rebuilt and 0.3 thousand km of new networks were built. Since not all water supply systems are functional, de facto, during the year, 13.6 thousand km of network were operational (96.7 per cent).

Table 1-62: Water Supply System in the RM, 1996-2017

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Length of water pipes and water supply systems – total, km	**7 060.8**	**7 214.8**	**7 171.9**	**6 991.2**	**6 613.4**	**6 483.5**	**6 606.3**	**6 655.5**	**6 712.0**	**6 765.8**	**6 847.2**
in urban area	3 856.7	3 962.2	3 922.7	4 009.4	3 934.0	3 897.3	3 984.5	4 035.7	4 033.8	4 045.0	4 150.5
in rural area	3 204.1	3 252.6	3 249.2	2 981.8	2 679.4	2 586.2	2 621.8	2 619.8	2 678.2	2 720.8	2 696.7
Water delivered to all consumers – total, mil. m³	**203.9**	**192.1**	**173.1**	**150.0**	**98.7**	**86.8**	**76.7**	**66.3**	**63.4**	**67.1**	**67.9**
in urban area	182.5	174.7	160.9	141.8	93.3	81.6	72.2	62.0	58.8	62.3	62.7
in rural area	21.4	17.4	12.2	8.2	5.4	5.2	4.5	4.3	4.6	4.8	5.2
Of which, water delivered to population, mil. m³	**134.7**	**128.7**	**123.2**	**105.8**	**70.9**	**52.1**	**46.3**	**43.7**	**44.1**	**47.9**	**49.2**
in urban area	122.5	119.5	116.7	100.9	67.2	48.5	43.1	40.6	40.6	44.5	45.3
in rural area	12.2	9.2	6.5	4.9	3.7	3.6	3.2	3.1	3.5	3.4	3.9
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Length of water pipes and water supply systems – total, km	**7 100.7**	**7 478.1**	**8 036.2**	**8 509.9**	**8 914.7**	**9 324.2**	**9 901.1**	**10 483.7**	**12 756.5**	**13 385.0**	**14 038.7**
in urban area	4 196.2	4 216.7	4 371.8	4 462.4	4 545.9	4 585.2	4 839.8	4 457.2	4 696.0	4 665.9	4 618.8
in rural area	2 904.5	3 261.4	3 664.4	4 047.5	4 368.8	4 739.0	5 061.3	6 026.5	8 060.5	8 719.1	9 419.9
Water delivered to all consumers – total, mil. m³	**84.5**	**82.8**	**78.1**	**75.0**	**73.5**	**74.9**	**74.9**	**74.3**	**79.5**	**84.8**	**86.4**
in urban area	78.3	76.3	70.9	67.9	66.1	66.6	66.8	62.8	63.4	67.2	68.4
in rural area	6.2	6.5	7.2	7.1	7.4	8.3	8.1	11.5	16.1	17.6	18.0
Of which, water delivered to population, mil. m³	**53.2**	**53.2**	**53.6**	**51.3**	**51.2**	**52.1**	**52.8**	**53.2**	**57.3**	**60.0**	**59.9**
in urban area	48.3	48.1	47.5	45.5	44.8	44.8	45.7	43.0	43.1	44.2	43.9
in rural area	4.9	5.1	6.0	5.8	6.4	7.3	7.1	10.2	14.2	15.8	16.0

Source: Statistical Yearbooks of the RM for 1993 (pages 318-320), 1994 (pages 312-315), 1999 (pages 214-218), 2003 (pages 183-189), 2006 (pages 149-154), 2007 (pages 141-146), 2008 (pages143-148), 2009 (pages 137-142), 2010 (pages 137-142), 2014 (pages137-141), 2015 (pages 135-139), 2016 (pages 180-187), 2017 (pages 134-137).

Population with access to water supply systems. Currently, 52 municipalities and cities, as well as 708 rural localities are supplied by water systems, representing 45.3 per cent of total settlements in the country. Circa 23 per cent of villages in the RM do not have access to drinking water and sewerage systems, and many of the existing systems are obsolete.

Compared to 2016, the number of localities with access to water supply systems increased by 66 units, accounting for 761 localities. The largest number is in Chisinau municipality (85.7 per cent) and in the UTA Gagauzia (78.1 per cent). The lowest connection rate to water supply systems is in the northern region of the country - 35.5 per cent.

In 2017, circa 1.9 million people had access to water supply services, representing 54.2 per cent of the total population. The largest share of population with access to water supply systems is recorded in the UTA Gagauzia (73.3 per cent) and Chisinau municipality (66.7 per cent), followed by the southern region – 63.2 per cent, Centre – 47.0 per cent and the northern region of the country – 43.5 per cent. In the last three years, about 92 thousand people were connected to water pipes and over 28 thousand – to sewerage systems.

Captured and distributed water. In 2017, the total water captured represented 131.5 mil. m³, of which, the volume of water collected from surface sources was 87.6 mil. m³ (66.6 per cent), from underground sources - 31.9 mil. m³ (24.3 per cent), and from other sources - 11.9 mil. m³ (9.1 per cent). At the same time, the amount of water distributed to consumers accounted for 86.4 mil. m³, by 1.6 mil. m³ more than in 2016. The difference is the own consumption of enterprises that captured water, as well as water losses during transportation.

On average, the ratio for one year is 17.0 m³ of distributed water per one inhabitant. In the territorial aspect, the largest volume of distributed water per one inhabitant is recorded in Chisinau municipality – 40.8 m³, UTA Gagauzia – 10.4 m³ followed by the central and southern regions, both with 10.0 m³. Of the total volume of distributed water, 59.9 mil. m³ or 69.3 per cent was distributed to the population, 5.3 per cent – to public institutions, while 25.4 per cent to other consumers, such as economic agents. The volume of water distributed to the population decreased by 0.2 per cent compared to the previous year.

During 2017, 35.2 thousand cases of accidental damages to the water distribution network were recorded or by 1.2 thousand more cases than in 2016. The share of water distributed to the consumers having installed water meters, in total distributed water reaches 85.2 per cent, with the largest numbers recorded in the South and North regions, respectively 96.1 per cent and 91.2 per cent.

Public Sewage System[17]. In 2017, the wastewater discharge from households and from economic and social units was operational in 51 municipalities and cities, as well as in 98 villages of the country. From the total number of water pipes, only 164 were equipped with sewage systems (14.0 per cent), of which only 141 systems or by 5 units more than in 2016 were operational. Of the total sewage networks, 106 were equipped with treatment plants, of which 91 were operational (Table 1-63). Not all sewage systems are equipped with treatment plants, the best situation by development regions is presented in the UTA Gagauzia, where each of 4 sewage systems is equipped with treatment plants. The lack of treatment plants is recorded in Glodeni, Soroca and Dubasari districts.

[17] The public sewage system represents an assembly of technological installations, functional equipment and specific facilities through which the public sewage service is operating. The system comprises the following components: public sewage networks, pumping stations, treatment plants, discharging facilities.

Table 1-63: Sewage Systems and Sewage Systems Equipped with Wastewater Treatment Plants in the RM, 2008-2017

	Sewage systems - total			Operational sewage systems			Sewage systems equipped with wastewater treatment plants - total			Operational sewage systems equipped with wastewater treatment plants		
	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
2008	174	65	109	105	61	44	129	47	82	73	43	30
2009	172	67	105	110	63	47	128	49	79	77	45	32
2010	169	65	104	106	61	45	126	48	78	75	44	31
2011	167	64	103	107	59	48	132	49	83	83	45	38
2012	158	62	96	110	60	50	124	47	77	83	45	38
2013	156	63	93	108	61	47	120	47	73	79	45	34
2014	166	61	105	121	58	63	101	45	56	70	39	31
2015	171	60	111	131	56	75	103	45	58	81	40	41
2016	169	63	106	136	60	76	106	52	54	89	48	41
2017	164	62	102	141	61	80	106	54	52	91	49	42

The total length of the sewage network represented circa 2.9 thousand km, of which, de facto, only circa 2.8 thousand km were operational (97.5 per cent) (Table 1-64).

Table 1-64: Sewage Networks in the RM, 1996-2017

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Length of sewage networks– total, km	**2 674.2**	**2 683.0**	**2 695.0**	**2 673.0**	**2 614.0**	**2 590.5**	**2 603.3**	**2 586.5**	**2 593.3**	**2 592.2**	**2 540.1**
in urban area	1 850.6	1 846.2	1 885.3	1 990.0	1 970.0	1 989.1	2 057.4	2 062.7	2 070.8	2 078.7	2 083.7
in rural area	823.6	836.8	809.7	683.0	644.0	601.4	545.9	523.8	522.5	513.5	456.4
Treated wastewater – total, mil. m³	**174.7**	**171.3**	**166.4**	**143.5**	**114.2**	**95.4**	**79.0**	**70.1**	**70.4**	**76.4**	**74.7**
in urban area	169.3	166.9	162.7	141.9	113.1	94.2	78.1	69.2	69.5	75.4	73.8
in rural area	5.4	4.4	3.7	1.6	1.1	1.2	0.9	0.9	0.9	1.0	0.1
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Length of sewage networks– total, km	**2 552.0**	**2 556.2**	**2 548.5**	**2 586.5**	**2 592.1**	**2 602.1**	**2 633.4**	**2 690.7**	**2 779.1**	**2 907.4**	**2 924.5**
in urban area	2 103.9	2 128.6	2 141.9	2 182.3	2 235.9	2 241.4	2 272.6	2 186.7	2 232.6	2 351.1	2 303.8
in rural area	448.1	427.6	406.6	404.2	356.2	360.7	360.8	504.0	546.5	556.3	620.7
Treated wastewater – total, mil. m³	**72.2**	**71.2**	**68.8**	**70.1**	**66.3**	**64.4**	**65.9**	**66.6**	**67.6**	**65.0**	**67.9**
in urban area	71.3	70.5	68.3	69.6	65.8	63.9	65.2	65.3	65.4	64.1	67.4
in rural area	0.9	0.7	0.5	0.5	0.5	0.5	0.7	1.3	2.2	0.9	0.5

Source: Statistical Yearbooks of the RM for 1993 (pages 318-320), 1994 (pages 312-315), 1999 (pages 214-218), 2003 (pages 183-189), 2006 (pages 149-154), 2007 (pages 141-146), 2008 (pages143-148), 2009 (pages 137-142), 2010 (pages 137-142), 2014 (pages137-141), 2015 (pages 135-139), 2016 (pages 180-187), 2017 (pages 134-137).

Compared to the previous year, the total length of sewage network increased by 17.1 km. During the year, 12.6 km were rebuilt and new 8.0 km of sewage systems were built.

Population connected to the sewage system. In 2017, circa 818 thousand people had access to centralized sewage services, representing 23.1 per cent of the total population. In urban areas, about 770.6 thousand people were connected to centralized sewage services, representing 50.6 per cent of the country's urban population, while in rural areas – 47.4 thousand people had access, representing 2.3 per cent of the country's rural population.

Collected wastewater. The total volume of collected wastewater in 2017 accounted for 70.1 mil. m³, of which 54.6 per cent represent wastewater collected from the population, which is by 2.4 per cent less compared to 2016. About 67.9 mil. m³ of wastewater (96.7 per cent) passed through the wastewater treatment facilities. Out of the total treated wastewater, 95.9 per cent were biologically treated, 85.3 per cent – mechanically, while 4.5 per cent were insufficiently treated. During the year, 25.5 thousand cases of damages were recorded in the sewage networks, or by 1.6 thousand cases more compared to 2016.

Wastewater discharged into surface water basins. During the recent decades, a decrease in the volume of wastewater discharged into surface water basins was recorded. For example, between 1990 and 2016, the respective volume decreased by approximately 75.6 per cent, from 2,731 million m³ to 666 million m³ (Table 1-65).

Table 1-65: Wastewater Discharged into Surface Water Basins within 1990-2016, million m³

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Discharged wastewater – total	**2731**	**2486**	**2231**	**1993**	**1810**	**1381**	**1384**	**1239**	**1030**
Conventional pure water (untreated)	2424	2173	1935	1717	1547	1120	1133	1007	802
Polluted wastewater	**90**	**69**	**41**	**21**	**16**	**15**	**12**	**11**	**12**
untreated	1.0	1.0	0.0	0.0	0.4	0.4	0.5	0.3	0.4
insufficiently treated	89	68	41	21	15	14.6	11.5	10.7	11.6
Treated water according to normative requirements	**216**	**244**	**255**	**255**	**247**	**245**	**238**	**222**	**215**
Treated water according to normative, in % compared to the total volume of wastewater needing treatment	70	78	86	92	94	94	95	95	94

	1999	2000	2001	2002	2003	2004	2005	2006	2007
Discharged wastewater – total	**794**	**740**	**708**	**695**	**685**	**688**	**689**	**688**	**680**
Conventional pure water (untreated)	593	569	557	560	558	561	556	562	551
Polluted wastewater	**10**	**9**	**13**	**19**	**48**	**42**	**9**	**7**	**10**
untreated	0.4	0.5	0.3	0.5	0.8	0.5	0.6	0.5	0.7
insufficiently treated	9.6	8.2	12.6	18.9	47.5	41.4	8.3	6.7	9.2
Treated water according to normative requirements	**191**	**162**	**138**	**116**	**79**	**85**	**124**	**119**	**119**
Treated water according to normative, in % compared to the total volume of wastewater needing treatment	95	95	91	86	62	67	93	94	92
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Discharged wastewater – total	**679**	**678**	**683**	**678**	**675**	**672**	**664**	**666**	**666**
Conventional pure water (untreated)	550	552	556	555	553	551	545	546	544
Polluted wastewater	**14**	**10**	**8**	**8**	**9**	**9**	**10**	**8**	**28**
untreated	0.8	0.8	0.9	1.0	1.5	1.0	1.4	1.0	2.0
insufficiently treated	13.3	9.5	7.5	7.2	7.4	7.9	8.7	7.0	26.0
Treated water according to normative requirements	**115**	**116**	**119**	**115**	**113**	**112**	**109**	**112**	**94**
Treated water according to normative, in % compared to the total volume of wastewater needing treatment	89	92	94	93	93	93	92	93	77

Source: NBS, Statistical Yearbooks of the RM for 1994 (page 41), 1999 (page 23), 2006 (page 27), 2011 (page 24) 2014 (page 24); Statistical database: <http://statbank.statistica.md/pxweb/pxweb/ro/10%20Mediul%20inconjurator/10%20Mediul%20inconjurator__MED020/MED020200.px/table/tableViewLayout1/?rxid=b2ff27d7-0b96-43c9-934b-42e1a2a9a774>

Due to insufficient functioning of wastewater treatment plants, the amount of pollutants in the wastewater discharged from managed sources, as well as the maximum allowable concentration permitted by current standards, are still above the limit established by the environmental authority. During this period, the volume of insufficient treated wastewater discharged into water bodies decreased by circa 70.8 per cent, from 89 million m^3 in 1990, to 26 million m^3 in 2016. Simultaneously, it can be noticed that the situation regarding the operation of treatment and pre-treatment plants did not improve in this period, on the contrary, it got worse.

The sewage systems remain underdeveloped and require major investment in order to extend the collecting networks, the rehabilitation of wastewater pumping stations, as well as sewage treatment plants. Sewage services in rural areas are absolutely undeveloped or at an early stage of development.

Until the 90's of the last century, in the Republic of Moldova over 580 wastewater biological treatment plants (WBTP) were built, but by 2001, only 330 were operational, the rest being demolished[18]. In 2002, 106 WBTP[19] operated, while in 2003 only 104 treatment plants existed (they used only a third of capacity, about 198 thousand m^3/day being treated, at a total capacity of circa 614 thousand m^3/day)[20]. In 2004, 252 WBTP existed, most of them presenting a high attrition rate regarding the buildings. In reality, only 93 plants functioned, of which 89 were bellow normative requirements (partial mechanical, partial biological treatment, with wastewater storage and/or discharge)[21]. By 2005, 84 WBTP functioned, of which 79 were bellow normative requirements: 59 performed insufficient wastewater treatment, another 17 performed wastewater storage without discharging, while another 3 received wastewater and discharged them without treatment[22]. To be noted that between 1998 and 2005 the share of population connected to the sewage system in the total water supply system has not exceeded 39 per cent[23]. In 2006, 131 WBTP existed, but functioned only 78 and just one was according to normative requirements; another 53 WBTP were closed[24]. The closed plants presented a high rate of attrition and the restoration required major capital investments.

In 2007, 99 treatment plants functioned, of which only one according to normative requirements, the other 98 performed insufficient wastewater treatment[25]. Of the 103 plants that were not operational, 44 only received and storage wastewater without discharging into natural receivers and this fact contributed to soil pollution and groundwater contamination, infiltrating through the walls and the bottom of the storage units, biological ponds and filtration fields), 21 were receiving wastewater and discharged them into natural receivers without treatment, while 27 were not operational since the respective enterprises did not functioned or due to lack of wastewater. In 2008, 154 wastewater treatment plants functioned, most of them performed only insufficient treatment and only 28 plants performed wastewater treatment according to normative requirements[26]. Approximately 106 wastewater treatment plants were destroyed and another 116 plants required capital reconstruction including the technological modernization of treatment stages. In 2009, 172 water pipelines were provided with sewage systems, of which functioned 110 systems and 128 sewage systems were provided with wastewater treatment plants[27].

Between 2010-2011, 79 wastewater treatment plants had project documentation, 17 units operated according to normative requirements, 112 units performed insufficient treatment while 69 did not functioned[28]. In 2012, 73 wastewater treatment plants had project documentation, 30 units operated according to normative requirements, 116 units – performed insufficient treatment[29]. In 2013, 84 wastewater treatment plants had project documentation, 39 units operated according to normative requirements, 134 units – performed insufficient treatment while 51 did not functioned[30]. In 2014, 81 wastewater treatment plants had project documentation, 24 units operated according to normative requirements, 138 units performed insufficient treatment[31]. In 2015, 97 wastewater treatment plants had project documentation, 21 units operated according to normative requirements, 143 units performed

[18] State of the Environment in the Republic of Moldova in 2002: (National Report): [addressed to users working or studying in the field] – Ch.: Mediul Ambiant, 2003, - 116 p. (see page 55).
[19] State of the Environment in the Republic of Moldova in 2003: (National Report): [addressed to users working or studying in the field] – Ch.: National Institute of Ecology, 2004, - 130 p. (see page 49).
[20] State of the Environment in the Republic of Moldova in 2004: (National Report): [addressed to users working or studying in the field] – Ch.: National Institute of Ecology, 2005, - 123 p. (see page 54-55).
[21] State of the Environment in the Republic of Moldova in 2005: (National Report) – Ch.: Institute of Ecology and Geography, 2006, - 116 p. (see page 54).
[22] State of the Environment in the Republic of Moldova in 2006: (National Report) – Ch.: S.n., 2007, - 103 pages (see page 50).
[23] State of the Environment in the Republic of Moldova: 2007-2010. (National Report) – Ch.: S.n. („Nova-Imprim" SRL). – 2011. – 192 pages (see page 92).
[24] Environment Protection in the Republic of Moldova: (National Report for the Ministerial Conference in Belgrade, Serbia) – Chisinau, 2008, - 64 pages (see page 32).
[25] SEI Yearbook „Quality of the Environment and the State Ecological Inspectorate Activity – 2007" – Chisinau, 2008 – 202 pages (see page 8).
[26] State Ecological Inspectorate (2009), SEI Yearbook – 2008 "Environment protection in the Republic of Moldova" / Iurie Stamatin, Alexandru Apostol, Mihai Mustea [et al.]. – Ch.: "A.V.i.T. Publ" SRL, 2009 ("Continental-Grup" SRL). – 288 pages (see pages 85-86).
[27] State Ecological Inspectorate (2011), Anuarul IES -2010 „Environment Protection in the Republic of Moldova" / editorial board Grigore Prisacaru, Valentina Tapis, Vadim Stangaci [et al.]. – Ch.: S.n., 2011 („Sirius" SRL) – 232 pages (see pages 39).
[28] State Ecological Inspectorate (2012), SEI Yearbook – 2011 „Environment protection in the Republic of Moldova" / editorial board: Gr. Prisacaru, V. Tapis, V. Stangaci [et al.]. – Ch. : Continental Grup, 2012. – 248 pages (see pages 55-56).
[29] State Ecological Inspectorate (2013), SEI Yearbook – 2012 „Environment Protection in the Republic of Moldova" / editorial board V. Untilă [et al.]. – Ch.: Pontos, 2013. – 256 pages (see pages 78-79).
[30] State Ecological Inspectorate (2014), SEI Yearbook – 2013 „Environment Protection in the Republic of Moldova"/ editorial board V. Curarari [et al.]. – Ch.: Pontos, 2014. – 300 pages (see pages 77-78).
[31] State Ecological Inspectorate (2015), SEI Yearbook - 2014 „Environment Protection in the Republic of Moldova"/ editorial board V. Stângaci [et al.]. Ch: „Pontos", 2015, 336 pages (see pages 60-61).

insufficient treatment[32]. In 2016, 99 wastewater treatment plants had project documentation, 19 units operated according to normative requirements, 145 units performed insufficient treatment[33].

Currently, a strong reason for concern represents the ecological situation created by untreated wastewater discharged from Cantemir town into Prut river, from Cimislia town into Cogalnic river, from Rezina town into Dniester river, from Straseni town into Bic river, from Tvardita village, Taraclia district into Chirghij-Chitai river, as well as from Soroca town into Dniester river (since 2002, the wastewater treatment plant in Soroca is inoperable due to the deterioration of Soroca-Tekinovca (Ukraine) pressure manifold, therefore, the Soroca wastewater, accounting for circa 1000 m^3/day, are discharged to the main pumping plant through the sewage system and without treatment is subsequently discharged into the Dniester river.

The sewage systems have a high rate of attrition, physical degradation and are morally obsolete, since it operates for more than 30 years without reconstruction, requiring thus, a technological modernization of treatment stages. Most of the existing plants offer only mechanical treatment, while the biological systems with higher energy consumption were not used due to higher costs. The disastrous situation within this sector is determined primarily by divesting the wastewater plants to local public authorities, which lack the infrastructure, the professional staff with expertise and the financial resources needed to ensure proper operation; as well as by the essential decrease of wastewater volumes. Insufficient volume of wastewater and the excessive concentration of noxious substances received disturb the optimal functioning of the wastewater treatment plants. At the same time, in recent years, a clear trend of increasing the number of operational wastewater treatment plants was recorded.

At national level, there are no centralized records of data regarding the population connected to sewage services, and its lack makes it difficult to develop policies and to plan measures in order to improve services in this area. The NBS gathers data only for centralized sewage systems, while centralized information on access to other individual sources (water discharge into decentralized systems, septic tanks, EcoSan toilets, toilets with later discharge of wastewater) are not available.

The low share of population connected to sewage systems is conditioned by the fact that the operational and technical state of the sanitation infrastructure is insufficient and cannot cover the entire population, especially in rural areas. In urban areas (large cities such as Chisinau and Balti), the percentage of population connected reaches up to 90 per cent, in small towns – up to 58 per cent, while in rural areas circa 9-10 per cent have access to sewage systems.[34]

Currently, in the Republic of Moldova there is a lack of implementation of new technologies, as well as a lack of experience in the field. Only recently, with the investments in the water supply and sewage systems, well-known practices in European countries began to be applied. These relate to the implementation of new technologies for treating wastewater, drinking water, the use of new materials (plastics) for water and sewage pipes, which are superior to metal corrosive and expensive pipes.

An important issue in the wastewater treatment process greatly influencing the environment is the lack of modern sludge processing facilities within the wastewater plants. In order to overcome the existing situation, in 2009, the wastewater treatment plant in Chisinau implemented the pilot-project for raw sludge dewatering using the "Geotube" method, the general goal being to process the sludge and to eliminate odor. The sludge dewatering project implied reconstructing 8 sludge platforms. This project implying the use of "Geotube" bags has reduced the number of sludge platforms, as well as the odor emitted during the process of sludge fermentation. The annual capacity of the sludge dewatering process is 584 thousand m^3 with 95 per cent humidity, which, after dewatering has a capacity of 97.3 thousand m^3 and a 70 per cent humidity. Two open storage facilities were built to storage the sludge from the "Geotube" bags after the dewatering process.

It should be noted that in 2018 rehabilitation works of the Wastewater Treatment Plant in Chisinau were initiated. The project includes the construction of a new sludge treatment facility, the renovation of the infrastructure, the construction of several specialized facilities as well as the installation of the wastewater filtering equipment. It is planned to build a power plant using the sludge as raw material. As a result of biogas production, electricity will be produced, providing 50 per cent of the electricity used at the wastewater treatment plant.

1.6.7. Forestry

According to the national definition, 'forest' is an element of geographical landscape, a functional unit of the biosphere, composed of the totality of forest vegetation (dominated by trees and shrubbery), live layers, animals and microorganisms which are interdependent in their biological development and affect their habitat. Lands covered with forest vegetation occupying areas over 0.25 ha are regarded as forests. The minimal consistency of trees and shrubbery for the lands with forest vegetation to be considered forests should reach an operational level of 30 per cent. The consistency requirement should apply only to trees and shrubbery with a natural potential to reach a minimum height of 5 meters at maturity.

In the Republic of Moldova, the areas covered with forests varied considerably over time, from 366.2 thousand ha in 1848 to 222.0 thousand ha in 1945[35], recovering to 386.5 thousand ha in 2016 or circa 11.4 per cent of the country's territory (Figure 1-17).

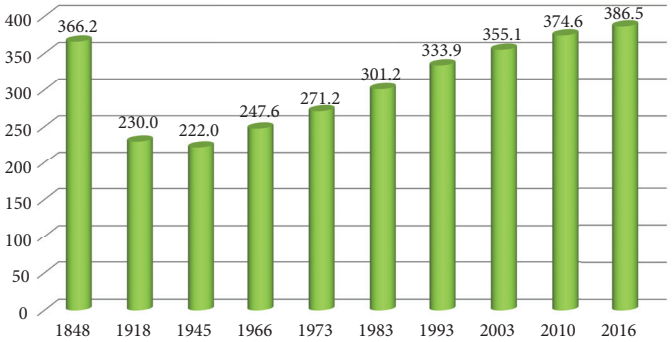


Figure 1-17: Evolution of Areas Covered with Forests in the RM, 1848-2016, thousand ha.

The respective indicator is significantly below the European average (circa 30 per cent). According to the scientific research studies, the current areas covered with forests are obviously insufficient to meet the ecological and social-economic needs of the Republic of Moldova. In order to ensure a constant ecological equilibrium and a stronger effect on the climate and hydrological conditions, enhance productivity of agricultural lands, forest lands should occupy at least 15 per cent of

[32] State Ecological Inspectorate (2016), SEI Yearbook – 2015 „Environment Protection in the Republic of Moldova"/ editorial board I. Talmazan [et al.]; coord.: D. Osipov. Ch: „Pontos", 2016, 348 pages (see pages 63-64).
[33] State Ecological Inspectorate (2017), SEI Yearbook – 2016 „Environment Protection in the Republic of Moldova"/ editorial board V. Nani [et al.]; coord.: D. Osipov. Ch: „Pontos", 2017, 356 pages (see pages 51, 56).
[34] Government Decision No.1063 as of 16.09.2016 on the approval of the National Programme for the implementation of the Protocol on Water and Health in the Republic of Moldova for 2016-2025. Published on: 20.09.2016 in the Official Monitor No. 314, article Nr: 1141, changed GD 1090 as of 18.12.17, MO 440 / 20.12.17 article 1214, <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=366749>

[35] Gh. Vdovii, D. Galupa et al. (1997), National Report on the Conditions of the Forest Resources of Republic of Moldova, Galupa D., Talmaci I., Spitoc L. (2006), Forest Land Sector in the Republic of Moldova – issues, accomplishments, perspectives; Galupa Dumitru, Platon Ion et al. (2011), Report on the Conditions of the Forest Resources of Republic of Moldova: 2006-2010. 'Moldsilva' Agency; Ch., 48 p.; Official Monitor No. 265-276 dated 19.08.2016, art. No. 1054: Government Decision No. 971 dated 12.08.2016 on the approval of Land Cadaster of the RM as of January 1, 2016.

the country's territory. The dispersion and fragmentation of forest resources, their uneven distribution across the country represent negative aspects for exercising beneficial eco-protective influences on the environment, creating comfortable living conditions for the population and providing wood and non-wood products.

The total volume of standing wood mass in the forests of the Republic of Moldova is circa 45.4 million m^3, on average 118 m^3 per hectare. The average forest increment is 3.8 m^3/yr/ha, and the total average increment is circa 1468.7 thousand m^3/yr. The average production class is 3.9 (Table 1-66). The structure by age in all forest species[36] is misbalanced, in particular in those of low productivity.

[36] Abbreviations used in Table 1-66: Quercus spp. – QU; Quercus petraea – GO; Quercus pubescens – STP; Populus spp.– PO; Salix spp. – SA; Acer platanoides – PA; Fraxinus spp. – FR; Tilia spp. – TI; Carpinus spp – CA; Juglans spp. – NU; Ulmus spp. – UL; Robinia spp – RB; Various resinous species – DR, Various softwoods – DM; Various hardwoods – DT; Various exotic species – EX.

Table 1-66: The General Structure of Forest Fund in the Republic of Moldova

Structure Elements	Total / average	Species							
		QU	GO	STP	PLA	SA	PA	FR	TE
Area, ha	386 395.4	57 152.1	46 289.2	7 240.8	5 071.2	4 707.1	6 859.1	30 290.6	13 666.8
Proportions of above-ground species, %	100.0	14.8	12.0	1.9	1.3	1.2	1.8	7.8	3.5
Average production class	3.9	3.6	2.8	3.0	3.1	4.0	3.7	3.4	3.1
Average consistency	0.76	0.75	0.76	0.73	0.75	0.66	0.76	0.77	0.78
Average age, year	45	68	79	79	38	35	35	60	67
Current growth, m^3/yr/ha	3.8	4.2	3.9	0.9	5.6	6.5	2.3	4.4	6.4
Annual growth, m^3	1 457 791	241 111	178 467	6 875	28 262	30 540	16 046	134 292	87 863
Average volume per standing wood, m^3/ha	118	184	234	119	174	106	90	195	238
Forest fund per standing wood, m^3	45 407 785	10 536 945	10 843 035	863 755	881 432	498 840	615 719	5 909 773	3 256 044
Proportion of species per volume, %	100.0	23.2	23.9	1.9	1.9	1.1	1.3	13.0	7.2
Structure Elements	**Total / average**	**Species**							
		QU	ULC	NU	SC	DR	DM	DT	EX
Area, ha	386 395.4	20 576.9	6 261.9	11 762.7	127 902.7	6 033.0	3 886.9	38 257.4	437.0
Proportions of above-ground species, %	100.0	5.3	1.6	3.1	33.1	1.6	1.0	9.9	0.1
Average production class	3.9	3.6	4.4	4.8	4.6	3.9	3.7	4.1	4.5
Average consistency	0.76	0.79	0.68	0.63	0.77	0.69	0.67	0.72	0.74
Average age, year	45	60	28	34	17	34	33	37	28
Current growth, m^3/yr/ha	3.8	5.0	2.9	2.7	3.2	4.7	4.6	3.1	2.6
Annual growth, m^3	1 457 791	102 138	17 927	32 332	414 757	28 455	18 012	119 572	1142
Average volume per standing wood, m^3/ha	118	152	62	34	30	89	116	84	70
Forest fund per standing wood, m^3	45 407 785	3 131 245	386 897	403 949	3 841 412	534 891	450 882	3 222 509	30 457
Proportion of species per volume, %	100.0	6.9	0.8	0.9	8.5	1.2	1.0	7.1	0.1

In conformity with Article 14 of the Forest Code, the forests in the Republic of Moldova are included in the functional group I, having exclusively environment protection functions.

In terms of functions, there are 5 functional sub-groups: forests with water protection functions – 1.6 per cent; forests with lands and soils protection functions – 6.7 per cent; forests with protection functions against harmful climatic and industrial factors– 48.6 per cent; forests with recreational functions – 29.5 per cent; forests presenting scientific interest and for protection of forestry genetic and ecological pool – 13.6 per cent.

In spring-summer of 2007, a catastrophic drought has been reported, affecting over 80 per cent of the country's territory. This phenomenon has significantly damaged the national forests on an area of circa 19 thousand ha or 5.5 per cent of the forest fund area, in particular the southern and central regions of the country.

The respective drought affected about 20 indigenous as well as non-native forest species, including: pedunculate oak (*Quercus robur L.*), sessile oak (*Quercus petraea (Matt) Liebl.*), pubescent oak (*Quercus pubescens Willd*), ash tree (*Fraxinus exelsior L.*), field maple (*Acer platanoides L.*), mountain maple (*Acer pseudoplatanus L.*), acacia (*Robinia pseudoacacia L.*), white birch (*Betula verrucosa Ehrh.*), pine silvestre (*Pinus sylvestris L.*), Crimeea black pine (*Pinus pallasiana (Lamb) Holmboe*). The most affected were acacia, representing 71.3 per cent (13 thousand ha) of the total forest area affected. The 2007 drought has long-lasting consequences, visible over many years. In 2009, according to the forestry-pathological survey data, the total area of degraded and dried in different intensity trees accounted for 17.9 thousand ha, in 2010 – 13.1 thousand ha, in 2011 – 8.9 thousand ha, while in 2012 – 9.0 thousand ha.

The diversity of forest species growing in the forests of the RM is presented in Table 1-67, forming eleven large groups of species.

Table 1-67: Groups of Forest Species and their Structure in the Republic of Moldova

No.	Groups of species by name		Species included in categories	Abbreviations
	Scientific	Common		
1.	*Quercus spp.*	Oak tree	Ilex, durmast, oak, red oak	QU
2.	*Carpinus ssp.*	Hornbeam	Hornbeam (*Carpinus betulus*)	CA
3.	*Fraxinus spp.*	Ash tree	Ash tree	FR
4.	*Acer spp.*	Sycamore maple	Field maple, Common maple, Mountain maple	AC
5.	*Ulmus spp.*	Elm	Field elm, Elm tree, Turkestan elm, etc.	UL
6.	*Tilia spp.*	Linden tree	Foul lime, Silver lime, big leaf linden tree	TI
7.	*Salix spp.*	Willow	Willow, Osier, etc.	SA
8.	*Pinus spp.*	Pine	Pine silvestre, Black pine, Spruce fir, Fir tree	PI
9.	*Populus spp.*	Poplar	Trembling poplar, Black poplar, Aspen tree	PO
10.	*Robinia spp.*	Acacia	Acacia, Honey locust, Sofora	RB
11.	*Other species*	Other species	Apple tree, Peer, Sweet cherry tree, Sour cherry tree magaleb, Apricot tree, sycamore, Weeping willow, Hazel tree, Corneal tree, Hawthorn, Sweet briar, Female cornel, etc.	OS

In order to estimate biomass increments in forests and implicitly, CO_2 removals, there were used data on the areas of forest land in the Republic of Moldova in the time series from 1990 through 2016 resulting from the National Report on Forestry Resources in the Republic of Moldova (2011), the Report on Forest Fund and the results of Agency „Moldsilva" activity within 2010-2015 time periods (2016) and the General Land Cadasters of the Republic of Moldova (Table 1-68). At the same time, beginning with 2013, information on the distribution of predominant forest species were taken from Forestry Research and Management Institute (ICAS) database.

Table 1-68: Forest Land Areas in the Republic of Moldova within 1990-2016 periods, thousand ha

Year	Total	Forest Land Areas by Species										
		QU	CA	FR	AC	UL	TI	SA	PI	PO	RB	OS
1990	325.4	140.6	9.4	16.6	2.9	3.1	2.9	1.9	6.9	5.7	124.0	11.4
1991	328.2	141.3	9.4	16.7	2.9	3.1	2.9	2.0	6.9	5.9	125.7	11.4
1992	331.0	142.0	9.4	16.8	3.0	3.1	2.9	2.1	6.9	6.0	127.4	11.4
1993	333.9	142.7	9.5	16.9	3.0	3.1	2.9	2.2	6.9	6.1	129.1	11.5
1994	335.4	143.1	9.9	17.2	3.0	3.1	2.9	2.2	6.9	6.2	130.0	10.9
1995	336.9	143.5	10.2	17.6	3.0	3.1	2.9	2.3	6.9	6.2	130.9	10.4
1996	338.4	143.8	10.6	17.9	3.0	3.1	2.9	2.3	6.9	6.3	131.7	9.8
1997	339.9	144.2	11.0	18.2	3.0	3.1	2.9	2.4	6.9	6.3	132.6	9.3
1998	341.4	144.6	11.3	18.6	3.0	3.1	2.9	2.4	6.9	6.4	133.5	8.7
1999	342.9	145.0	11.7	18.9	3.0	3.1	2.9	2.5	6.9	6.5	134.4	8.1
2000	344.4	145.3	12.1	19.2	3.0	3.1	2.9	2.5	6.9	6.5	135.3	7.6
2001	345.9	145.7	12.4	19.6	3.0	3.1	2.9	2.6	6.9	6.6	136.1	7.0
2002	347.3	146.0	12.8	19.9	3.0	3.1	2.9	2.6	6.9	6.6	137.0	6.4
2003	352.4	148.4	12.6	20.1	3.2	3.2	3.1	2.5	6.9	6.7	137.9	7.8
2004	357.6	151.7	12.4	20.2	3.4	3.4	3.2	2.4	6.9	6.8	138.8	8.4
2005	362.7	153.6	12.1	20.3	3.7	3.8	3.4	2.4	7.0	6.9	139.7	9.8
2006	366.0	153.9	12.1	20.5	4.0	3.8	3.4	2.4	7.0	7.0	141.9	10.0
2007	369.0	154.2	11.8	20.7	4.1	3.9	3.5	2.4	7.0	7.0	144.4	10.0
2008	372.0	154.7	11.9	20.8	4.1	3.9	3.5	2.4	6.9	7.1	146.7	10.0
2009	372.9	155.1	12.1	20.9	4.1	3.9	3.5	2.4	6.9	7.1	146.9	10.0
2010	374.5	155.4	12.1	21.0	4.1	3.9	3.5	2.4	6.9	7.1	148.0	10.1
2011	374.8	155.6	12.1	21.0	4.1	3.9	3.5	2.4	6.9	7.1	148.1	10.1
2012	375.3	155.8	12.1	21.0	4.1	3.9	3.5	2.4	6.9	7.1	148.3	10.1
2013	372.8	154.7	12.0	20.9	4.1	3.9	3.5	2.4	6.8	7.1	147.3	10.1
2014	379.3	167.1	16.4	21.8	5.7	4.1	5.7	3.9	6.3	7.5	125.6	15.1
2015	386.4	170.3	16.7	22.2	5.8	4.2	5.8	4.0	6.4	7.7	128.0	15.4
2016	386.5	170.3	16.7	22.2	5.8	4.2	5.8	4.0	6.4	7.7	128.1	15.4

Source: National Report on Forestry Resources of the Republic of Moldova (2011), General Land Cadasters for 1990-2017 periods; Statistical Records/Reports of Agency „Moldsilva" on forest species planting for 1998-2016; OSC Report on updating basic indicators for forest and other types of forest vegetation in the Republic of Moldova (2016).

Final data on species distribution over the period of time under review was obtained by modelling using the primary data set obtained from the Statistical Records and Reports of Agency "Moldsilva", which featured the following distribution of forest species planted over the reference period: *Robinia species* – accounted for circa 80 per cent, *Juglans spp.* (*Regia and Nigra*) – for 8 per cent, *Quercus species* – for 3 per cent, *Populus* and *Salix species* – for 3 per cent, *other species* – for 6 per cent (Table 1-69).

Table 1-69: Forest land areas remaining forest land in the RM within 1990-2016 periods, kha

Species	1990	1991	1992	1993	1994	1995	1996	1997	1998
Quercus spp.	97.76	99.33	103.72	107.53	110.63	113.35	116.52	118.55	120.54
Carpinus spp.	6.54	6.61	6.87	7.16	7.63	8.08	8.59	9.01	9.45
Fraxinus spp.	11.54	11.74	12.27	12.74	13.33	13.88	14.50	14.99	15.48
Acer spp.	2.02	2.04	2.19	2.26	2.32	2.37	2.43	2.47	2.50
Ulmus spp.	2.16	2.20	2.26	2.34	2.40	2.45	2.51	2.55	2.58
Tilia spp.	2.02	2.04	2.12	2.19	2.24	2.29	2.35	2.38	2.42
Salix spp.	1.32	1.41	1.53	1.66	1.74	1.81	1.89	1.96	2.02
Pinus spp.	4.80	4.85	5.04	5.20	5.34	5.45	5.59	5.67	5.75
Populus spp.	3.96	4.15	4.38	4.60	4.76	4.91	5.09	5.21	5.34
Robinia spp.	86.22	88.37	93.06	97.28	100.51	103.40	106.73	109.03	111.31
Other Species	7.93	8.01	8.33	8.67	8.43	8.22	7.94	7.65	7.25
Grooves	31.99	32.11	30.53	29.99	27.64	25.98	25.54	25.87	26.77
Total	**258.25**	**262.85**	**272.30**	**281.60**	**286.95**	**292.20**	**299.67**	**305.34**	**311.41**
Species	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Quercus spp.	123.36	126.75	128.28	128.06	128.32	130.51	131.76	130.54	131.44
Carpinus spp.	9.95	10.52	10.94	11.23	10.90	10.67	10.38	10.26	10.06
Fraxinus spp.	16.08	16.77	17.23	17.45	17.38	17.38	17.41	17.39	17.64
Acer spp.	2.55	2.62	2.64	2.63	2.77	2.93	3.17	3.39	3.49
Ulmus spp.	2.64	2.70	2.73	2.72	2.77	2.93	3.26	3.22	3.32
Tilia spp.	2.47	2.53	2.55	2.54	2.68	2.75	2.92	2.88	2.98
Salix spp.	2.10	2.19	2.25	2.28	2.16	2.06	2.06	2.04	2.05
Pinus spp.	5.87	6.02	6.08	6.05	5.97	5.94	6.00	5.94	5.97
Populus spp.	5.50	5.69	5.79	5.82	5.79	5.85	5.92	5.94	5.97
Robinia spp.	114.36	117.97	119.87	120.18	119.24	119.39	119.81	120.37	123.09
Other Species	6.89	6.63	6.16	5.61	6.74	7.23	8.41	8.48	8.52
Grooves	24.63	24.32	24.48	24.97	27.76	27.79	25.84	28.69	30.43
Total	**316.42**	**324.71**	**329.01**	**329.57**	**332.48**	**335.43**	**336.94**	**339.15**	**344.96**

Species	2008	2009	2010	2011	2012	2013	2014	2015	2016
Quercus spp.	131.78	131.96	132.60	131.93	127.64	122.80	129.17	128.69	125.80
Carpinus spp.	10.14	10.29	10.32	10.27	9.93	9.55	12.64	12.59	12.31
Fraxinus spp.	17.72	17.78	17.92	17.82	17.24	16.59	16.81	16.75	16.37
Acer spp.	3.49	3.49	3.50	3.48	3.37	3.24	4.42	4.41	4.31
Ulmus spp.	3.32	3.32	3.33	3.31	3.20	3.09	3.20	3.19	3.12
Tilia spp.	2.98	2.98	2.99	2.97	2.88	2.76	4.41	4.39	4.29
Salix spp.	2.04	2.04	2.05	2.04	1.97	1.90	3.02	3.01	2.94
Pinus spp.	5.88	5.87	5.89	5.85	5.66	5.40	4.88	4.86	4.75
Populus spp.	6.05	6.04	6.06	6.02	5.83	5.64	5.81	5.79	5.66
Robinia spp.	124.96	124.98	126.29	125.60	121.51	116.89	97.10	96.73	94.65
Other Species	8.52	8.51	8.62	8.57	8.29	7.98	11.82	11.65	11.39
Grooves	30.42	34.73	33.39	30.49	30.27	33.54	26.26	20.94	20.03
Total	**347.30**	**352.00**	**352.95**	**348.34**	**337.79**	**329.39**	**319.53**	**312.99**	**305.62**

Source: General Land Cadasters for 1990-2017 periods; Land Use and Land Use-Change Matrix for 1970-2016 periods.

The volume of commercial timber, as well as the quantity of fuel wood gathered in the RM, were identified based on statistical data and reports on commercial felling in managed forest land (by species and sort categories, etc.), revealed illegal logging (on other owners lands, inclusively), data being provided by the "Moldsilva" Agency, and the environment protection institutions (since 2018 – Environment Protection Inspectorate, former State Ecological Inspectorate) on authorized felling and illegal logging in forests and other woody vegetation areas managed by local public authorities, as well as data available in the Statistical Yearbooks of the ATULBD on fuel wood harvests in forests on the left bank of Dniester river (Table 1-70).

Table 1-70: Trends in Wood Harvests in the RM within 1990-2016 periods, thousand m^3

Sort categories	1990	1991	1992	1993	1994	1995	1996	1997	1998
Commercial timber	39.42	27.00	27.39	31.50	39.80	68.49	51.69	52.70	38.00
Fuel wood	184.80	376.50	490.29	489.18	538.70	531.42	450.43	423.85	398.55
Total	**224.22**	**403.50**	**517.68**	**520.68**	**578.50**	**599.91**	**502.12**	**476.55**	**436.55**
Sort categories	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Commercial timber	38.79	39.68	37.28	50.41	46.99	43.47	39.01	46.51	44.44
Fuel wood	368.62	393.34	432.47	381.98	420.20	415.37	394.79	430.10	390.92
Total	**407.41**	**433.02**	**469.75**	**432.39**	**467.19**	**458.84**	**433.80**	**476.61**	**435.36**
Sort categories	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Commercial timber	42.79	37.34	40.63	33.91	31.69	29.92	25.60	28.00	50.16
Fuel wood	401.84	396.82	429.89	485.45	541.47	587.20	624.33	607.32	567.42
Total	**444.63**	**434.16**	**470.52**	**519.36**	**573.16**	**617.12**	**649.93**	**635.32**	**617.57**

Source: Statistical Records/Reports of "Moldsilva" Agency and of the State Ecological Inspectorate for the 1990-2016 time series; D. Galupa, I. Talmaci, L. Spitoc, Study for the Republic of Moldova "Ensuring sustainability of forests and livelihoods through improving governance and control of illegal logging". Chisinau, Editorial Center of UASM, 2005, 116 pages; Statistical Yearbooks of the ATULBD (2000-2017); Galupa Dumitru, Ciobanu Anatol, Scobioala Marian et al. (2011), Illegal logging of forest vegetation in the Republic of Moldova. Analytical study, Chisinau, "Moldsilva" Agency, 38 pages.

The "Moldsilva" Agency keeps records of harvested wood by species (except for some species suitable for industrial processing, ex.: (1) hardwood - oak, durmust, hornbeam, ash tree, sycamore maple tree, elm, acacia, honey locust, etc.; (2) softwood - poplar, willow, linden tree etc. The ratio of the estimated volume by species to total volume harvested per year provided data of acceptable quality (the difference between the estimated volume and harvested volume is on average 5-10 per cent). Distribution by species of wood suitable for industrial processing and fuel wood is presented in Tables 1-71 and 1-72 and refers to the 1990-2016 time series.

Table 1-71: Trends in Commercial Timber Harvest in the RM within 1990-2016, thousand m^3

Species	1990	1991	1992	1993	1994	1995	1996	1997	1998
Quercus spp.	7.16	4.32	4.09	4.41	6.88	9.59	10.05	10.26	7.40
Carpinus spp.	1.05	0.71	0.72	0.83	1.04	1.79	1.35	1.39	1.00
Fraxinus spp.	3.65	2.99	3.24	3.94	4.03	8.56	4.47	4.47	3.23
Acer spp.	0.31	0.23	0.23	0.27	0.34	0.58	0.45	0.44	0.32
Ulmus spp.	0.17	0.1	0.1	0.12	0.15	0.26	0.19	0.21	0.15
Tilia spp.	3.78	2.48	2.52	2.9	3.66	6.31	4.70	4.91	3.54
Salix spp.	0.26	0.19	0.19	0.22	0.28	0.48	0.37	0.36	0.26
Pinus spp.	0.28	0.17	0.18	0.2	0.26	0.44	0.32	0.35	0.25
Populus spp.	4.87	3.2	3.26	3.74	4.73	8.14	6.07	6.33	4.56
Robinia spp.	16.74	12.02	12.26	14.18	17.54	30.83	22.66	22.70	16.37
Other species	1.15	0.59	0.6	0.69	0.89	1.51	1.06	1.28	0.92
Total	**39.42**	**27.00**	**27.39**	**31.50**	**39.80**	**68.49**	**51.69**	**52.70**	**38.00**
Species	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Quercus spp.	7.51	7.77	5.18	10.12	10.31	9.34	7.63	9.26	7.49
Carpinus spp.	0.99	1.07	1.09	1.85	1.00	0.92	1.05	1.28	0.92
Fraxinus spp.	3.49	3.17	2.96	4.45	3.41	3.03	3.12	5.57	5.94
Acer spp.	0.37	0.28	0.30	0.42	0.26	0.19	0.28	0.28	0.28
Ulmus spp.	0.13	0.18	0.19	0.24	0.22	0.22	0.18	0.27	0.31
Tilia spp.	3.34	3.97	4.86	4.82	4.22	4.47	3.90	4.06	3.45
Salix spp.	0.30	0.24	0.32	0.29	0.20	0.21	0.24	0.31	0.42
Pinus spp.	0.22	0.30	0.33	0.00	0.00	1.10	0.30	0.79	1.60
Populus spp.	4.32	5.11	2.89	5.82	8.28	6.62	5.02	7.81	6.44
Robinia spp.	17.67	16.13	18.19	19.94	16.43	15.93	15.85	15.68	16.58
Other species	0.45	1.46	0.97	2.46	2.66	1.44	1.44	1.22	1.01
Total	**38.79**	**39.68**	**37.28**	**50.41**	**46.99**	**43.47**	**39.01**	**46.51**	**44.44**

Species	2008	2009	2010	2011	2012	2013	2014	2015	2016
Quercus spp.	7.17	5.84	7.16	5.68	4.77	6.28	6.05	6.62	12.15
Carpinus spp.	1.13	0.77	0.87	0.74	0.49	0.52	0.33	0.36	0.40
Fraxinus spp.	6.02	5.70	5.83	4.03	4.52	4.76	4.26	4.66	7.49
Acer spp.	0.25	0.15	0.20	0.14	0.11	0.15	0.06	0.06	0.14
Ulmus spp.	0.20	0.17	0.19	0.24	0.12	0.17	0.06	0.06	0.07
Tilia spp.	3.84	3.24	3.42	3.17	2.67	2.21	2.00	2.19	5.46
Salix spp.	0.38	0.38	0.14	0.19	0.24	0.25	0.07	0.08	0.37
Pinus spp.	0.60	0.89	1.19	1.95	1.35	0.73	0.62	0.68	0.49
Populus spp.	6.09	4.87	6.32	5.61	5.26	5.06	4.69	5.13	9.52
Robinia spp.	16.01	14.34	14.41	11.47	11.69	9.43	7.09	7.76	13.50
Other species	1.10	0.98	0.89	0.69	0.47	0.36	0.37	0.40	0.56
Total	**42.79**	**37.34**	**40.63**	**33.91**	**31.69**	**29.92**	**25.60**	**28.00**	**50.16**

Source: Statistical Records/Reports of "Moldsilva" Agency and of the State Ecological Inspectorate for the 1990-2016 time series.

Data on the volume of fuel wood gathered also include the volume of twigs, boughs, branches, etc., which are used as fuel as well. Considering that most illegal loggings occur in forests managed by local public authorities, situated near settlements and composed preponderantly of acacia, the respective volumes were attributed to *Robinia* group of species

Table 1-72: Trends in Fuel Wood Harvest in the RM within 1990-2016 periods, thousand m^3

Species	1990	1991	1992	1993	1994	1995	1996	1997	1998
Quercus spp.	30.10	50.35	49.29	51.15	39.07	63.60	58.99	49.12	64.60
Carpinus spp.	12.50	17.96	13.24	13.15	10.05	11.30	15.45	20.41	26.84
Fraxinus spp.	15.80	38.99	56.52	73.07	55.81	71.97	73.74	25.80	33.93
Acer spp.	8.70	11.39	6.65	6.19	4.73	5.30	5.00	14.12	18.57
Ulmus spp.	3.50	6.19	6.54	10.23	7.81	8.76	2.26	5.72	7.52
Tilia spp.	10.60	18.97	20.40	29.23	22.32	20.10	19.50	17.29	22.73
Salix spp.	3.40	6.68	7.95	12.42	9.49	10.64	4.14	5.57	7.33
Pinus spp.	0.40	2.10	4.09	6.58	5.02	5.63	3.80	0.70	0.92
Populus spp.	11.80	34.34	55.04	73.07	55.81	74.35	70.09	19.21	25.26
Robinia spp.	76.80	172.62	256.75	198.01	316.31	246.00	184.48	247.59	166.76
Other species	11.20	16.91	13.82	16.08	12.28	13.77	12.98	18.32	24.09
Total	**184.80**	**376.50**	**490.29**	**489.18**	**538.70**	**531.42**	**450.43**	**423.85**	**398.55**
Species	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Quercus spp.	55.32	53.71	48.34	56.93	65.45	64.16	56.64	71.56	57.00
Carpinus spp.	24.10	23.40	22.46	23.41	23.07	25.30	24.68	27.49	23.70
Fraxinus spp.	30.09	29.22	28.35	28.91	32.38	30.63	30.81	48.42	47.74
Acer spp.	16.64	16.16	14.17	17.49	16.50	17.13	17.04	23.05	21.44
Ulmus spp.	6.38	6.19	5.78	6.36	8.32	7.07	6.53	10.45	10.47
Tilia spp.	19.59	19.02	18.93	18.35	21.63	23.40	20.06	27.66	24.71
Salix spp.	6.32	6.13	5.48	6.55	6.28	8.22	6.47	9.95	8.43
Pinus spp.	0.74	0.72	1.41	0.00	0.00	2.09	0.76	3.06	2.80
Populus spp.	20.32	19.73	17.37	21.29	28.96	28.19	20.80	27.11	23.26
Robinia spp.	168.74	199.28	252.20	181.90	190.09	187.09	190.14	164.27	155.19
Other species	20.38	19.78	17.98	20.79	27.52	22.09	20.86	17.08	16.17
Total	**368.62**	**393.34**	**432.47**	**381.98**	**420.20**	**415.37**	**394.79**	**430.10**	**390.92**
Species	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Quercus spp.	59.84	59.35	65.69	79.64	83.02	98.39	106.84	100.82	103.58
Carpinus spp.	27.73	26.27	30.17	34.86	40.26	43.26	45.93	44.15	44.61
Fraxinus spp.	49.05	52.75	62.33	51.55	63.35	71.66	76.71	74.44	73.67
Acer spp.	23.48	23.33	23.79	22.06	12.98	21.90	17.27	31.63	30.81
Ulmus spp.	8.55	9.90	12.74	20.56	21.48	20.25	19.15	15.12	17.29
Tilia spp.	25.19	22.43	22.98	22.18	28.72	29.86	30.30	31.28	38.27
Salix spp.	7.85	4.75	5.42	7.79	9.24	10.71	10.90	12.82	11.92
Pinus spp.	2.74	3.91	4.78	10.27	8.92	10.87	17.02	5.59	4.91
Populus spp.	25.04	23.82	26.00	30.91	33.72	39.37	42.69	40.88	41.78
Robinia spp.	153.64	148.00	156.80	182.12	200.93	208.77	208.91	222.77	164.35
Other species	18.74	22.32	19.20	23.51	38.85	32.16	48.61	27.82	36.23
Total	**401.84**	**396.83**	**429.89**	**485.45**	**541.47**	**587.20**	**624.33**	**607.32**	**567.42**

Source: Statistical Records/Reports of "Moldsilva" Agency and of the State Ecological Inspectorate for the 1990-2016 time series; Arcadie Capcelea, Aurel Lozan, Ion Lupu et al. (2011), Analytical study on wood mass consumption in the RM. "Moldsilva" Agency, Chisinau, 48 pages; Statistical Yearbooks of the ATULBD for 2000-2017.

The conversion to forest land during the reference period included afforestation under the Moldova Soil Conservation Project (MSCP) and Moldova Community Forestry Development Project (MCFDP). Both projects are implemented under the Clean Development Mechanism (CDM) of the Kyoto Protocol, and have completed all national and international validation and registration procedures. Several goals are achieved within the respective projects: restoration of degraded land, improvement of local population supply with forest products and GHG absorption gain. The total area planted within these projects represent circa 28.8 thousand ha (Table 1-73).

Table 1-73: Annual Afforestation under the CDM Projects in the RM within 2002-2015 periods, ha

Afforestation Area	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
MSC Project	4894.7	4736.6	4219.6	4029.6	891.2	71.9	475.8	152.8	211.3	276.7	98.8	116.5	45.7	68.8	20289.9
MCFD Project	0.0	0.0	0.0	0.0	2009.6	2959.3	2190.4	1224.4	10.0	12.0	8.0	52.6	2.5	0.0	8468.8
Total	**4894.7**	**4736.6**	**4219.6**	**4029.6**	**2900.8**	**3031.2**	**2666.2**	**1377.2**	**221.3**	**288.7**	**106.8**	**169.1**	**48.2**	**68.8**	**28758.7**

Source: PDD for MSCP and MCFDP; Annual Reports from "Moldsilva" Agency to the World Bank for 2004-2015 time series; Monitoring Reports from "Moldsilva" Agency for MSCP and MCFDP (2012; 2013; 2017; 2018).

In addition to harvested forest products, the net decrease of CO_2 emissions into the atmosphere will account for circa 4.8 million tons (MSCP – 3.6 million t; MCFDP – 1.2 million t). The main participants in the implementation process of these projects are "Moldsilva" Agency, the World Bank, the Forestry Research and Development Institute (FRDI), territorial forestry entities, public authorities that have allocated land for afforestation (over 500).

Activity data on forest land affected by fires are available in Statistical Yearbooks of the Republic of Moldova and those of the ATULBD (Table 1-74). Most fires are located in young forests or stands, in particular in the vicinity of croplands.

Table 1-74: Forest Land Areas Affected by Fires in the RM 1990-2016

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Right bank of Dniester river	120.10	20.10	22.00	1.50	33.50	1.40	0.00	0.00	9.70
Left bank of Dniester river	IE	IE	IE	IE	IE	0.53	11.20	3.40	24.00
Total - RM	**120.10**	**20.10**	**22.00**	**1.50**	**33.50**	**1.93**	**11.20**	**3.40**	**33.70**
	1999	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Right bank of Dniester river	0.00	0.00	41.60	12.50	10.50	42.00	5.50	32.60	683.30
Left bank of Dniester river	25.20	0.90	15.40	18.10	23.00	46.00	2.90	58.20	108.00
Total - RM	**25.20**	**0.90**	**57.00**	**30.60**	**33.50**	**88.00**	**8.40**	**90.80**	**791.30**
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Right bank of Dniester river	31.00	126.00	20.00	25.90	636.60	460.00	9.50	338.20	119.00
Left bank of Dniester river	24.00	8.20	26.90	36.90	35.80	7.10	28.90	18.00	59.8
Total - RM	**55.00**	**134.20**	**46.90**	**62.80**	**672.40**	**467.10**	**38.40**	**356.20**	**178.8**

Source: Statistical Yearbooks of the RM for 1994 (page 38), 1999 (page 20), 2007 (page 22), 2011 (page 22), 2014 (page 22), 2015 (page 22); NBS, Statistics for Geography and Environment (Forest Fires, as of November 1 (2010-2016); Statistical Yearbooks of the ATULBD for 2000 (page 88), 2002 (page 91), 2007 (page 81), 2009 (page 80), 2011 (page 82), 2014 (page 78), 2015 (page 88), 2016 (page 88), 2017 (page 91).

CHAPTER 2. NATIONAL GREENHOUSE GASES INVENTORY

2.1. Introduction

2.1.1. Convention, Kyoto Protocol and Party's Commitments

The ultimate objective of the United Nations Framework Convention on Climate Change (UNFCCC) is aimed *"to achieve stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system"*. To-date 196 countries are Parties to the Convention. The Republic of Moldova signed the UNFCCC on June 12, 1992 and it was ratified by the Parliament on March 16, 1995.

Article 4, paragraph 1(a) and Article 12, paragraph 1(a) of the UNFCCC stipulate that each Party has to make available to the Conference of the Parties (COP) *"a national inventory of anthropogenic emissions by sources and removals by sinks, of all greenhouse gases uncontrolled by the Montreal Protocol, to the extent its capacities permit, using comparable methodologies to be agreed upon by the Conference of the Parties; also a general description of steps taken or envisaged by the Party to implement the Convention; and any other information that the Party considers relevant to the achievement of the objective of the Convention and suitable for inclusion in its communication, including, if feasible, relevant data for calculations of global emission trends"*.

The main mechanism for making this information available is national communications. COP 2 (Geneva, 1996) adopted the Guidelines on national communications for non-Annex I Parties (Decision 10/CP 2). In conformity with the respective Guidelines, during 1998 to 2000, under the *UNDP-GEF Project "Enabling Activities for the preparation of the First National Communication under the UNFCCC"*, Republic of Moldova developed its FNC to UNFCCC, submitted to the COP 6 (Hague, 2000).

The COP 8 (New Delhi, 2002) adopted new Guidelines on national communications for non-Annex I Parties (Decision 17/CP 8). In conformity with these Guidelines, during 2005-2009 time period, Republic of Moldova developed its Second National Communication (NC2) under the UNFCCC (2010), within 2010-2013 period – the Third National Communication (NC3) under the UNFCCC (2014), and from 2014 to 2017, the Fourth National Communication (NC4) under the UNFCCC (2018).

With reference to UNFCCC implementation instruments it should be noted that the COP 3 (Kyoto, 1997) adopted the Kyoto Protocol[37], representing an instrument setting binding targets for the Parties under Convention, by committing industrialized countries and economies in transition (in total, 37 industrialized countries and the European Union) included in Annex I to Convention, to reduce total emissions of direct GHG by at least 5 per cent, against 1990 levels over the five-year period: January 1, 2008 – December 31, 2012 (the first period of the Protocol commitment). The Republic of Moldova ratified the Kyoto Protocol on February 13, 2003. As a non-Annex I Party, the Republic of Moldova had no commitments to reduce GHG emissions under this Protocol.

According to the Bali Action Plan, adopted at the 13th Conference of Parties to the UNFCCC (Bali, 2007), developing countries agreed for the first time to develop and implement *National Appropriate Mitigation Actions* (NAMA) in the context of sustainable development, supported by technology transfer, adequate financing and capacity-building actions.

The COP 15 held in Copenhagen in December 2009, approved and proposed for implementation a policy statement adopted in support of limiting global warming to no more than 2°C compared to pre-industrial level, in the context of equity and sustainable development. This statement, known as the *Copenhagen Accord*, reaffirms development issues in the context of climate change, inclusive through the implementation of *Low Emission Development Strategies* (LEDS).

The Republic of Moldova associated itself to the Copenhagen Accord on January 2010 and submitted an emissions reduction target that is specified in Annex II of this Agreement "*National Appropriate Mitigation Actions in Developing Countries*". The target of mitigation actions for Republic of Moldova under this Agreement is "*to reduce, to not less than 25% compared to the base year (1990), the total national level of greenhouse gas emissions by 2020, by implementing economic mechanisms focused on global climate change mitigation, in accordance with the principles and provisions of the Convention*". This target is presented without indicating specific national appropriate mitigation actions, identified and quantified, and without further clarification of the necessary support to achieve it. Simultaneously, it is recognized that achieving this target will require significant financial, technological and capacity-building support, which can be provided through the UNFCCC mechanisms.

In the same context, during 2010-2012, it was drawn the *Low Emissions Development Strategy of the Republic of Moldova until 2020*, a strategic document that was to allow the country to adjust its development path towards a low carbon economy and to achieve a green sustainable development, based on the socio-economic and development priorities of the country. Also, LEDS was supposed to support overall objectives, provide strategic national context for the mitigation efforts, for which countries would receive international support. LEDS was developed in accordance with the Republic of Moldova's Governance Programme "European Integration: Freedom, Democracy, Welfare"

[37] The Kyoto Protocol entered into force on February 16, 2005, 90 days after its ratification by the Russian Federation in November 2004, thus covering at least 55 Parties to the Convention, including Annex I countries, which encompass 55 per cent of total carbon dioxide emissions recorded in 1990.

(2011-2014) and the provisions of chapter "Climate Change" of the European Union Association Agreement.

The Strategy contained a set of measures that would reduce greenhouse gas emissions, quantifying the corresponding reduction of GHG emissions for each measure, and the financial requirements for their implementation. The measures proposed in the prioritized list of NAMAs, an Annex to LEDS, included national appropriate mitigation actions, as provided for non-Annex I Parties to the UNFCCC. LEDS also provided information on implementation procedures and timeframes, as well as provisions on monitoring, measurement, reporting and assessment of the results. The Strategy was drafted by the Ministry of Environment of the Republic of Moldova, the process being guided by the Inter-Ministerial Working Group on Climate Change with support from the UNDP country office. This process involved wide consultations with all parties, represented by ministries, research institutions, donor organizations, NGOs and civil society. It was anticipated that LEDS would be approved by the Government by the end of 2013, which did not happen until the end of 2016[38].

The COP 16 held in Cancun in December 2010, adopted the *Cancun Agreements*, which encourages developing countries to prepare Low Emission Development Strategies for sustainable development and to undertake National Appropriate Mitigation Actions. The Cancun Agreements highlights the fact that "*stopping climate change requires a paradigm shift towards building a low-carbon emissions society, which offers substantial opportunities and ensures continued economic growth and sustainable development*".

At COP 16 it was also established the periodicity of national communications for the countries non-Annex I (Decision 1/CP.16). In line with this, the non-Annex I Parties should prepare and submit to the UNFCCC Secretariat *National Communications (NCs)* every four years and *Biennial Update Reports (BUR)* every two year. The inventory section of the BUR should consist of a *National Inventory Report (NIR)* as a summary or a technical annex; this section is expected to present in a detailed and transparent manner the procedures of national inventory for anthropogenic GHG emissions by sources or removals of carbon dioxide through sequestration, including information on emissions trends, key categories, activity data, emissions factors, assessment methodologies, quality assurance and quality control, uncertainties, recalculations and planned improvements, for each source or sink category included in the national inventory.

The COP 17 that took place in Durban in 2011 adopted the *UNFCCC biennial update reporting guidelines for Parties not included in Annex I to the Convention* (Decision 2/CP.17 and Annex 3 to this Decision). According to this decision, developing countries, non-Annex I Parties, consistent with their capabilities and the level of international support provided for reporting, were expected to submit their first BUR to the Secretariat of the UNFCCC by December, 2014. The Report should be submitted to the Secretariat at every two years as a stand-alone report or as a summary of the National Communications, where their reporting years coincides.

The Republic of Moldova initiated the process of preparing the First Biennial Update Report in July 2014, and managed to present it to the Secretariat of the UNFCCC on April 5, 2016. The First Biennial Update Report of the RM under the UNFCCC (2016) was presented to the Secretariat of the UNFCCC together with two technical annexes: the National Inventory Report: 1990-2013, Greenhouse Gas Sources and Sinks in the Republic of Moldova (2015) and the Report on the National GHG Inventory System in the Republic of Moldova (2015).

Regarding the non-Annex I Parties, the COP 17 in Durban approved (Decision 2/CP.17 and Annex IV) the Modalities and Guidelines for International Consultation and Analysis (ICA) consisting of two steps: (i) the technical analysis of BURs and (ii) a facilitative sharing of views among Parties on BURs content and the results of technical analysis. The process aims to enhance the transparency and accountability of information reported in BURs by non-Annex I Parties. The technical analysis is conducted by a team of technical experts (TTE) and is initiated within six months of BUR submission to the Secretariat.

As for the First Biennial Update Report of the RM under the UNFCCC, its technical analysis by the technical expert team took place between 19 and 23 of September 2016, with the summary report being published by the Secretariat on the UNFCCC web page on February 20, 2017[39]. The Facilitative Sharing of Views (FSV) among Parties on the BUR1 content and the results of technical analysis was carried out during the 3rd FSV workshop, organized by the UNFCCC Secretariat on 15th of May 2017 in Bonn, Germany[40].

The COP 18 (Doha, 2012) adopted the *Doha Amendment to the Kyoto Protocol* which establishes a second commitment period (January 1, 2013 – December 31, 2020) for the Parties included in Annex I to the Kyoto Protocol; adds a revised list of greenhouse gases to be reported; and a series of amendments to several articles of the Kyoto Protocol regarding the first commitment period. By December 21, 2012, the UN General Secretary, acting as depositary, presented the Doha Amendment to the Kyoto Protocol to all Parties of the UNFCCC, in accordance with provisions of Articles 20 and 21 of the Protocol. Under Doha Amendment, within the second commitment period, the developed countries should reduce their greenhouse gas emissions by at least 18 per cent compared to 1990 levels. By 28 September, 2018[41], 117 countries had ratified the Doha Amendment to the KP, most of which are non-Annex I Parties to the UNFCCC and the KP.

At COP 19 (Warsaw, 2013), the Parties agreed to communicate their intended nationally determined contributions (INDC) (Decision 1/CP.19), in order to include them in the new Climate Agreement to be considered and adopted by the COP 21 in 2015, in Paris. The new climate agreement establishes a new commitment period (1st of January 2021 – 31st of December 2030) for reducing the GHG emissions. Also, COP 19 adopted *General guidelines for domestic measurement, reporting and verification of domestically supported nationally appropriate mitigation actions by developing country Parties* (Decision 21/CP.19). This document provides a solid foundation for the new Climate Agreement 2015.

The COP 20 took place in Lima (2014). The Parties agreed over *Lima Call for Climate Action* and were repeatedly invited to communicate to the Secretariat their intended nationally determined contributions, in order to facilitate clarity, transparency and understanding. The INDC may include, as appropriate, inter alia: (i) quantifiable information on the reference point; (ii) time frames and/or periods for implementation; (iii) scope and coverage; (iv) planning processes; (v) assumptions and methodological approaches

[38] <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=369528>

[39] <http://unfccc.int/files/national_reports/non-annex_i_parties/biennial_update_reports/submitted_burs/application/pdf/mda.pdf>

[40] The conclusions of the 3rd FSV workshop regarding the BUR1 of the RM under the UNFCCC and the results of the technical analysis are available on the web page: <http://unfccc.int/files/national_reports/non-annex_i_parties/ica/facilitative_sharing_of_views/application/pdf/20170529_mda_v04.pdf>; RM's presentation at the 3rd FSV workshop is available on: <http://unfccc.int/files/national_reports/non-annex_i_parties/ica/facilitative_sharing_of_views/application/pdf/moldova_fsv_workshop_presentation_15.05.2017.pdf>, while the video recording of the presentation and the interventions from the Parties are available on: <https://www.youtube.com/playlist?list=PL-m2oy1bnLzpmdRpG2pTBzUeOH3qrXlZt>

[41] <https://unfccc.int/process/the-kyoto-protocol/the-doha-amendment>

including those for estimating and accounting for anthropogenic greenhouse gas emissions and, as appropriate, removals; and (vi) how the Party considers that its national circumstances, and how it contributes towards achieving the objective of the Convention as set out in its Article 2. According to *Lima Call for Climate Action*, countries were invited to communicate their intended nationally determined contributions by March 31, 2015, the deadline for the presentation being September 30, 2015. The request to the Secretariat was to prepare by 1st of November 2015 a synthesis report on the aggregate effect of the INDC communicated by Parties.

The Republic of Moldova was fully committed to the UNFCCC negotiation process towards adopting at COP 21 the Paris Agreement – a document with legal force under the Convention, applicable to all Parties, in line with keeping global warming below 2°C by 2100 compared to the preindustrial era. The Paris Agreement was signed by the Prime Minister of the Republic of Moldova in New York on September 21, 2016, and was subsequently ratified by the Parliament through Law No. 78 from 04.05.2017 for the ratification of the Paris Agreement (Official Monitor No. 162-170 from 26.05.2017)[42].

At 25th of September 2015, the Republic of Moldova communicated its Intended Nationally Determined Contribution (INDC)[43] and the accompanying information to facilitate clarity, transparency, and understanding, with reference to decisions 1/CP.19 and 1/CP.20.

According to its NDC, the Republic of Moldova intends to achieve an economy-wide unconditional target of reducing its greenhouse gas emissions by 64-67 per cent below its 1990 level in 2030 and to make best efforts to reduce its emissions by 67 per cent.

The reduction commitment expressed above could be increased up to 78 per cent below 1990 level conditional to, a global agreement addressing important topics including low-cost financial resources, technology transfer, and technical cooperation, accessible to all at a scale commensurate to the challenge of global climate change. GHG emissions reduction targets have been set in an emission budget covering the period from January 1, 2021 to December 31, 2030.

The GHG emission reduction targets set out in the national contribution intentionally determined of the Republic of Moldova were subsequently officially approved at national level by the Government Decision No. 1470 from 30.12.2016 regarding the approval of the Low Emissions Development Strategy of the Republic of Moldova by 2030 and the Action Plan for its implementation (Official Monitor No. 85-91 from 24.03.2017)[44].

2.1.2. Greenhouse Gases

The most important greenhouse gas in atmosphere is water vapors (H_2O), responsible for approximately 2/3 of the total greenhouse effect. The content of water in atmosphere is not directly influenced by anthropogenic activities, but rather is determined by the cycle of water in nature, expressed in a simpler way, as the difference between evaporation and precipitations.

Carbon dioxide (CO_2) has a 30 per cent share in the greenhouse effect, while methane (CH_4), nitrous oxide (N_2O) and ozone (O_3) taken together account for 3 per cent. The group of artificial substances (man-made): chlorofluorocarbons (CFC) and their substitute, hydrofluorocarbons (HCFC, HFC) and other substances, as well as perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6) are also attributed to direct GHG. There are other photochemically active gases, such as carbon monoxide (CO), nitrogen oxides (NO_x) and non-methane volatile organic compounds (NMVOC) (include substances such as: propane, butane and ethane), which are not attributed to direct GHG, but have an indirect contribution to greenhouse effect. Such gases influence the formation and destruction of ozone in the atmosphere in the presence of solar rays (ultraviolet radiation) and are considered to be ozone precursors in the troposphere.

Though GHG are considered to be natural components of the air, their presence in atmosphere is strongly affected by anthropogenic activities. Increased concentrations of GHG in atmosphere (caused by emissions of anthropogenic origin) contribute to strengthening of greenhouse effect thus leading to additional warming of the atmosphere. The GHG concentration in atmosphere is determined by the difference between GHG emissions and removals. It has been stated with certainty that GHG concentration in atmosphere have increased significantly in comparison with pre-industrial level. Thus, from 1750 to the end of 2016, the concentration of CO_2 increased by circa 144 per cent, concentration of CH_4 – by 256.6 per cent, while N_2O concentration – by circa 121.8 per cent[45] (Table 2-1). To a great extent these trends can be attributed to human activities — in particular, to fossil fuels combustion and continuous deforestation of forest lands.

[42] <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=370323>
[43] <http://www4.unfccc.int/submissions/INDC/Published%20Documents/Republic%20of%20Moldova/1/INDC_Republic_of_Moldova_25.09.2015.pdf>
[44] <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=369528>
[45] <http://cdiac.ornl.gov/pns/current_ghg.html>, <https://public.wmo.int/en/media/press-release/green-house-gas-concentrations-surge-new-record>

Table 2-1: Tropospheric Concentration (in the Northern Hemisphere), Concentration Change Rate and Direct GHG Lifetime in Atmosphere[46]

Greenhouse Gases	Preindustrial tropospheric concentration (1850-1900)	Recent tropospheric concentration (end of 2016)	GWP (100-yr time horizon) (IPCC, 2013)	Tropospheric lifetime (years)	Increased radiative forcing[46] (W/m^2)
Concentration in parts per million (ppm)					
Carbon dioxide (CO_2)	280	403.3	1	~ 100-300	1.94
Concentration in parts per billion (ppb)					
Methane (CH_4)	722	1853	28	12.4	0.50
Nitrous oxide (N_2O)	270	328.9	265	121	0.20
Tropospheric ozone (O_3)	237	337	n.a.	Hours-days	0.40
Concentration in parts per trillion (ppt)					
CFC-11 (CCl_3F)	zero	232	4660	45	0.060
CFC-12 (CCl_2F_2)	zero	516	10200	100	0.166
CF-113 (CCl_2CClF_2)	zero	72	5820	85	0.022
HCFC-22 ($CHClF_2$)	zero	233	1760	11.9	0.049
HCFC-141b (CH_3CCl_2F)	zero	24	782	9.2	0.0039

[46] The "radiative forcing" term refers to the amount of any given GHG heat-trapping potential and it is measured in power units (watt) per surface units (m^2).

Greenhouse Gases	Preindustrial tropospheric concentration (1850-1900)	Recent tropospheric concentration (end of 2016)	GWP (100-yr time horizon) (IPCC, 2013)	Tropospheric lifetime (years)	Increased radiative forcing[46] (W/m^2)
HCFC-142b (CH_3CClF_2)	zero	22	1980	17.2	0.0041
Halon 1211 ($CBrClF_2$)	zero	3.6	1750	16	0.0010
Halon 1301 ($CBrClF_3$)	zero	3.3	6290	65	0.0010
HFC-134a (CH_2FCF_3)	zero	84	1300	13.4	0.0134
Carbon tetrachloride (CCl_4)	zero	82	1730	26	0.0140
Sulphur hexafluoride (SF_6)	zero	8.6	23500	3200	0.0049

By the end of 2016, globally, the amount of annual emissions of carbon dioxide represented circa 36.8 Gigatons (Gt)[47], which in the past 45 years has increased more than significantly (by circa 5 times). The most important sources of carbon dioxide emissions are fossil fuel combustion, deforestation and industrial processes (for example, cement production). The carbon dioxide lifetime in atmosphere varies between 100 and 300 years. It can be removed from atmosphere through a complex set of natural sinks mechanisms. Also, it is considered that circa 40 per cent of the emitted carbon dioxide can be absorbed by oceans. Photosynthesis, in particular in sea vegetation and plankton is an important, though transitory, mechanism of CO_2 emissions removal, because after the perishing of plants, carbon dioxide is again emitted into the atmosphere.

Concentration of methane in atmosphere is affected in proportion of circa 60 per cent by anthropogenic activities such as rice cultivation, animal breeding (enteric fermentation and manure management), coal, oil and natural gas extraction, transportation and distribution of natural gases, solid waste disposal on lands, biomass combustion, etc. The breakdown of methane in the atmosphere takes place through chemical reactions (by means of OH radicals). The lifetime of CH_4 in atmosphere is circa 12.4 years. The annual accumulation rate of CH_4 in atmosphere is about 40 and 60 Mt, from which approximately 11.5 per cent are generated from anthropogenic activities (in 2010, the global methane emissions represented circa 6.885 Mt and it is anticipated that, by 2020, will increase to 7.904 Mt[48]).

It has been stated that circa 40 per cent of the atmospheric N_2O is of anthropogenic origin[49], coming from use of synthetic nitrogen fertilizer, soil cultivation, animal breeding (manure management), wastewater handling, adipic acid and nitric acid production, fossil fuels combustion, waste incineration and biomass burning. The other 60 per cent of the atmospheric N_2O comes from the soil and denitrification of water in anaerobic conditions. N_2O breaks down photochemically in atmosphere. Global annual N_2O emissions from anthropogenic activities are estimated at circa 9 Mt[50].

PFCs (perfluorocarbons), HFCs (hydrofluorocarbons) and SF_6 (sulphur hexafluoride) are GHG of anthropogenic origin. HFCs are preponderantly used to replace ozone depleting chemical substances, but it is also emitted in the process of HCFC-22 production. PFCs and SF_6 are emitted in various industrial processes, including aluminum and magnesia production, production of semiconductors, in transmission and distribution of electric power, etc. All these gases have a long lifetime in atmosphere and are characterized by a considerable infrared radiation absorption capacity, so that in the future it might have a considerable impact on the global warming.

2.1.3. Global Warming Potential

The radiative forcing effect of a gas in the atmosphere is the reflection of its ability to cause atmospheric warming. Direct effects occur when the gas itself is a GHG, while indirect radiative forcing occurs when chemical transformation of the original gas produces a gas or gases that are GHGs or when a gas influences the atmospheric lifetimes of other gases.

The concept of "Global Warming Potential" (GWP) has been developed to allow scientists and policy-makers to compare the ability of each GHG to trap heat in the atmosphere. By definition, a GWP is the time-integrated change in radiative forcing due to the instantaneous release of 1 kg of gas expressed relative to the radiative forcing from the release of 1 kg of CO_2. In other words, GWP is a relative measure of a warming effect that the emission of a radiative gas (i.e., GHG) might have on troposphere. The GWP of a GHG considers both the instantaneous radiative forcing due to an incremental concentration increase in the atmosphere and the lifetime of these gases in the atmosphere.

This report relates to the GWP for a period of 100 years recommended by the IPCC in IPCC Fourth Assessment Report (IPCC, 2007) for use in GHG emissions inventory under UNFCCC (Table 2-2).

[47] <https://www.carbonbrief.org/analysis-global-co2-emissions-set-to-rise-2-percent-in-2017-following-three-year-plateau>
[48] <https://www.globalmethane.org/documents/analysis_fs_en.pdf>
[49] <https://www.wmo.int/pages/mediacentre/press_releases/pr_1002_en.html>
[50] <http://edgar.jrc.ec.europa.eu/part_N2O.php#1overview>, <http://edgar.jrc.ec.europa.eu/ingos/JRC-INGOS-report.pdf>

Table 2-2: GWP for a Period of 100 Years and Direct GHG Atmospheric Lifetimes[51]

GHGs	Chemical formula	Lifetime, according to AR5	SAR	TAR	AR4	AR5
Carbon dioxide	CO_2	50-200	1	1	1	1
Methane	CH_4	12.4	21	23	25	28
Nitrous oxide	N_2O	121	310	296	298	265
Nitrogen trifluoride	NF_3	500	NA	10800	17200	16100
Sulphur hexafluoride	SF_6	3200	23900	22200	22800	23500
Hydrofluorcarbons (HFC)						
HFC-23	CHF_3	222	11700	12000	14800	12140
HFC-32	CH_2F_3	5.2	650	550	675	677
HFC-125	C_2HF_5	28.2	2800	3400	3500	3170
HFC-134a	$C_2H_2F_2$ (CH_2FCF_3)	13.4	1300	1300	1430	1300
HFC-143a	$C_2H_3F_3$ (CF_3CH_3)	47.1	3800	4300	4470	4800
HFC-152a	C_2H4F_2 (CH_3CHF_2)	1.5	140	120	124	138
HFC-227ea	CF_3CHFCF_3	38.9	2900	3500	3220	3350
HFC-236fa	$CF_3CH_2CF_3$	242	6300	9400	9810	8060
HFC-245fa	$CHF_2CH_2CF_3$	7.7	NA	950	1030	858

[51] <http://www.epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2014-Annex-6-Additional-Information.pdf>

GHGs	Chemical formula	Lifetime, according to AR5	SAR	TAR	AR4	AR5
HFC-365mfc	$CH_3CF_2CH_2CF_3$	8.7	NA	890	794	804
HFC-43-10mee	$CF_3CHFCHFCF_2CF_3$	16.1	1300	1500	1640	1650
Perfluorcarbons (PFC)						
Perfluoromethane	CF_4	50000	6500	5700	7390	6630
Perfluoroethane	C_2F_6	10000	9200	11900	12200	11100
Perfluoropropane	C_3F_8	2600	7000	8600	8830	8900
Perfluorobuthane	C_4F_{10}	2600	7000	8600	8860	9200
Perfluoropenthane	C_5F_{12}	4100	7500	8900	9160	8550
Perfluorohexane	C_6F_{14}	3100	7400	9000	9300	7910

Source: SAR – Second Assessment Report (IPCC, 1996), TAR – Third Assessment Report (IPCC, 2001) and AR4 – Fourth Assessment Report (IPCC, 2007) and AR5 – Fifth Assessment Report (IPCC, 2013).

2.1.4. Republic of Moldova's Relative Contribution to Global Warming

The Republic of Moldova historic contribution to global warming is low. In 2016, the country contributed with circa 14.6 Mt CO_2 equivalent (without LULUCF) and 13.7 Mt CO_2 equivalent (with LULUCF), representing less than 0.04 per cent of total global GHG emissions.

Total and net emissions per capita, respectively, were less than half of the global average (3.8 t CO_2 equivalent per capita compared to 6.4 t CO_2 equivalent per capita, respectively 3.6 t CO_2 equivalent per capita compared to 6.8 t CO_2 equivalent per capita).

Also, the RM's share in global GHG emissions recorded since 1990 is low, under 0.05 per cent (without LULUCF) and less than 0.04 per cent (with LULUCF).

Within 1990-2015 time series, the total national GHG emissions (without LULUCF) decreased by circa 68.0 per cent, which is much more than in most industrialized countries and economies in transition included in Annex I to Convention (Figure 2-1).

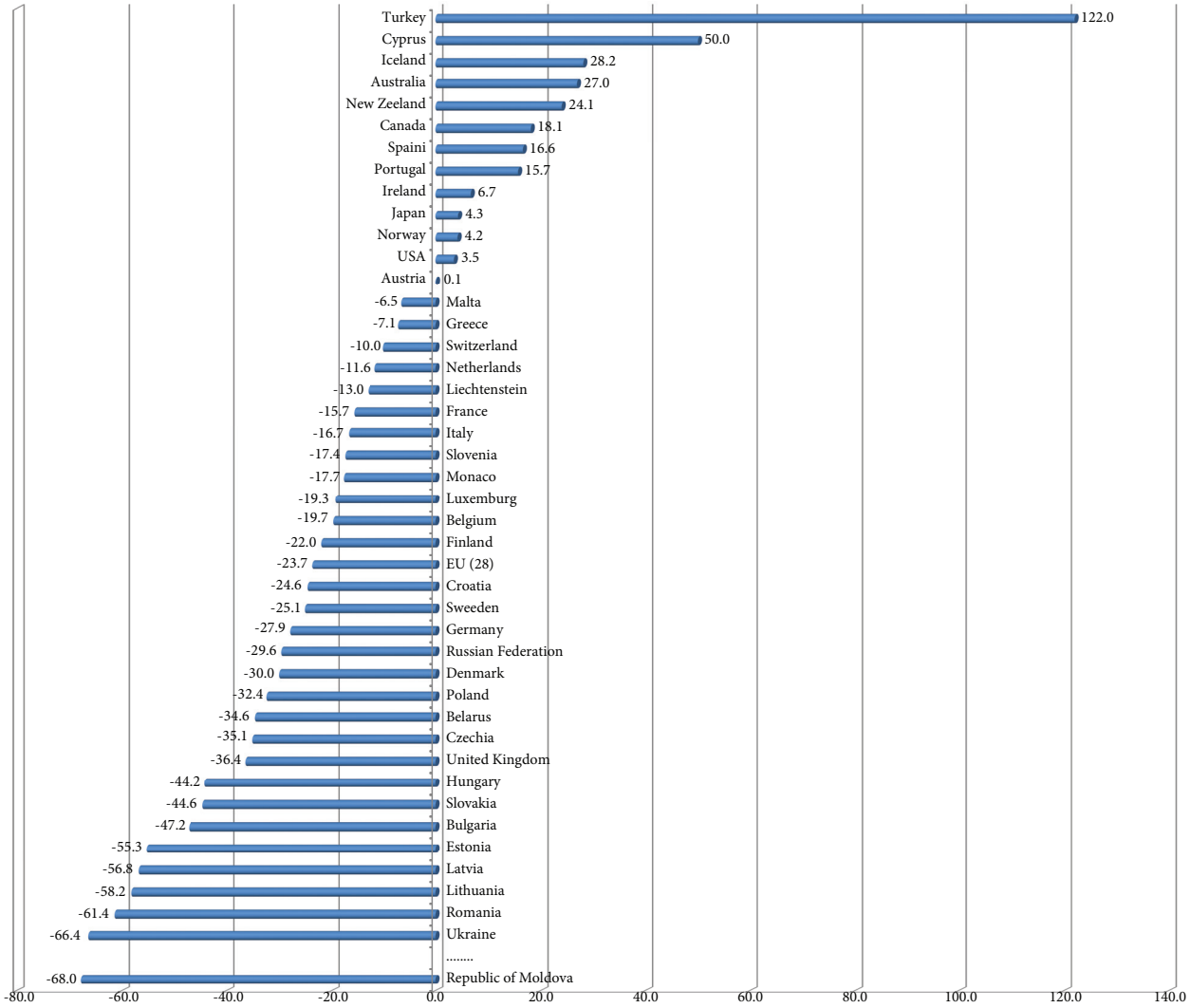


Figure 2-1: Total GHG Emissions from the Republic of Moldova (without LULUCF) and Annex I Parties to the Convention in 2015[52] (% compared to 1990).

[52] <http://unfccc.int/resource/docs/2017/sbi/eng/18.pdf >

Table 2-3: Republic of Moldova's Total Direct GHG Emissions, 1990-2016

GHG SOURCES	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
	CO_2 equivalent (kt)										
1. Energy	**36 610.5147**	**12 157.3676**	**7 288.8600**	**9 248.7805**	**10 194.9848**	**10 498.5364**	**10 036.1910**	**9 025.7218**	**9 656.8992**	**10 063.7869**	**9 927.2284**
A. Fuel Combustion	35 805.3520	11 474.2307	6 648.5584	8 412.7248	9 542.0407	9 758.6253	9 299.4662	8 319.8178	8 972.4391	9 409.2857	9 225.9040
1. Energy Industries	21 308.2056	7 160.4871	3 613.2428	3 760.8597	4 983.8288	4 614.9116	4 603.3054	3 686.7824	4 358.3979	4 744.8255	4 526.0607
2. Manufacturing Industries and Construction	2 212.4085	440.6772	531.7932	599.2226	443.8184	598.2152	457.4388	599.3992	468.8030	534.6373	501.9962
3. Transport	4 479.4542	1 539.2813	942.9727	1 767.1186	2 054.1180	2 164.9327	1 901.8722	2 021.7651	2 090.0531	2 203.3296	2 382.9261
4. Other Sectors	7 689.7135	2 207.2356	1 523.7452	2 259.2406	2 030.0705	2 358.9684	2 328.2713	2 007.9234	2 051.8469	1 923.5784	1 812.7922
5. Other	115.5701	126.5495	36.8044	26.2833	30.2051	21.5974	8.5786	3.9478	3.3383	2.9147	2.1288
B. Fugitive Emissions from Fuels	805.1627	683.1369	640.3016	836.0558	652.9441	739.9111	736.7247	705.9040	684.4601	654.5012	701.3244
1. Solid Fuels	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2. Oil and Natural Gas	805.1627	683.1369	640.3016	836.0558	652.9441	739.9111	736.7247	705.9040	684.4601	654.5012	701.3244
C. CO_2 Transport and Storage	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2. Industrial Processes and Product Use	**1 572.3005**	**450.5308**	**314.1033**	**591.9260**	**592.3056**	**695.9553**	**713.2218**	**762.6073**	**794.8503**	**784.2010**	**761.8649**
A. Mineral Industry	1 306.2407	342.6866	237.9796	440.2134	411.0616	492.3783	498.5638	551.2987	547.8150	510.8250	500.5774
B. Chemical Industry	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
C. Metal Industry	28.5023	26.2369	36.2689	41.9358	9.6985	12.8556	12.6973	7.6569	13.8464	17.2792	5.2203
D. Non-energy Products From Fuels and Solvent Use	234.3591	76.5608	30.6392	67.8400	67.0530	72.3407	75.8897	70.9399	88.9627	86.3698	78.6128
E. Electronic Industry	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
F. Product Use as Substitutes for ODS	NO	3.9514	8.3038	40.7988	102.8657	116.5249	124.2123	130.5506	142.0853	167.8122	175.5848
G. Other Product Manufacture and Use	3.1983	1.0950	0.9118	1.1379	1.6268	1.8557	1.8588	2.1611	2.1409	1.9148	1.8696
H. Other	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3. Agriculture	**5 220.5740**	**3 602.9153**	**2 480.8483**	**2 578.3718**	**2 255.0151**	**2 207.9339**	**1 760.0998**	**2 252.5504**	**2 492.3149**	**2 091.1781**	**2 428.4639**
A. Enteric Fermentation	2 190.6944	1 620.7325	1 085.6403	926.4666	712.5704	671.0063	632.8347	643.3105	680.9618	653.4004	649.2698
B. Manure Management	1 611.7134	939.2484	553.2408	557.5205	503.1437	461.3574	425.8809	401.7558	440.1394	426.9623	441.0611
C. Rice Cultivation	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
D. Agricultural Soils	1 417.5842	1 042.8737	841.5274	1 094.2109	1 037.5567	1 071.8950	695.7934	1 203.3001	1 361.0079	999.5751	1 325.8583
E. Prescribed Burning of Savannas	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
F. Field Burning of Agricultural Residues	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE
G. Liming	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
H. Urea Application	0.5820	0.0607	0.4397	0.1739	1.7443	3.6752	5.5908	4.1840	10.2058	11.2402	12.2747
I. Other Carbon-containing Fertilizers	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO,NE
J. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
4. LULUCF	**-1 527.5846**	**-1 868.9465**	**-1 880.6877**	**-1 410.9177**	**-961.9499**	**-908.0226**	**-939.5632**	**-802.7329**	**-453.6371**	**-902.1771**	**-920.0136**
A. Forest Land	-2 563.0889	-2 045.0615	-2 307.4358	-2 409.4945	-2 484.0285	-2 390.3914	-2 292.8969	-2 140.5328	-2 134.6291	-2 158.4241	-2 113.0348
B. Cropland	2 521.8498	1 489.1801	1 468.9958	1 530.1956	1 538.8733	1 493.3618	1 496.7899	1 409.0609	1 446.5623	1 393.2012	1 394.0679
C. Grassland	-1 205.6938	-1 601.1004	-1 291.9495	-1 058.1239	-691.9874	-638.1726	-562.7510	-360.1740	-341.1085	-418.4569	-402.3693
D. Wetlands	-555.3798	-469.4389	-328.4245	-187.4101	-46.3958	-75.3129	-15.4700	-106.0998	-139.7535	-82.7917	-82.7917
E. Settlements	244.5446	350.3734	393.7945	338.5239	302.9075	313.1448	243.7754	229.6814	220.6246	228.2398	197.5866
F. Other Land	152.3638	401.1281	178.5246	416.5012	441.4824	393.7285	114.1449	103.4500	436.6463	86.8192	85.6461
G. Harvested Wood Products	-122.1804	5.9727	5.8073	-41.1098	-22.8014	-4.3808	76.8444	61.8814	58.0208	49.2353	0.8816
H. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
5. Waste	**1 515.3675**	**1 594.7260**	**1 541.7515**	**1 428.7535**	**1 483.2997**	**1 500.9112**	**1 491.1032**	**1 437.5505**	**1 436.0537**	**1 431.2923**	**1 460.2737**
A. Solid Waste Disposal	1 046.7277	1 209.1757	1 169.5330	1 064.3081	1 137.8491	1 155.0806	1 143.6162	1 084.7685	1 083.0800	1 087.1715	1 115.1732
B. Biological Treatment of Solid Waste	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
C. Incineration and Open Burning of Waste	27.7249	27.7458	27.5796	25.6447	25.6241	25.7171	25.6814	25.6468	25.5716	25.3128	25.0183
D. Wastewater Treatment and Discharge	440.9149	357.8046	344.6389	338.8006	319.8265	320.1134	321.8055	327.1351	327.4022	318.8081	320.0822
E. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
6. Other	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Memo Items											
International Bunkers	**218.9336**	**42.4672**	**66.9765**	**68.4023**	**83.5573**	**96.4069**	**108.7812**	**131.8213**	**156.0913**	**220.6372**	**316.1867**
Aviation	218.9336	42.4672	66.9765	68.4023	83.5573	96.4069	108.7812	131.8213	156.0913	220.6372	316.1867
Navigation	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Multilateral Operations	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
CO_2 Emissions from Biomass	**232.8093**	**230.0480**	**272.3720**	**307.3920**	**341.0480**	**384.6400**	**403.3840**	**429.2796**	**1 314.4896**	**1 439.5226**	**1 561.9690**
CO_2 Captured and Stored	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Long-term Storage of C in waste disposal sites	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Indirect N_2O	585.1195	360.0057	255.1670	306.3316	289.6907	289.5234	217.0970	308.0323	351.5434	273.9260	340.0142
Indirect CO_2	207.3247	65.3743	26.5388	60.5990	60.0215	65.1556	69.6839	64.7797	82.6825	79.5560	71.4341
Total (without LULUCF)	**44 918.7567**	**17 805.5396**	**11 625.5631**	**13 847.8319**	**14 525.6052**	**14 903.3367**	**14 000.6158**	**13 478.4300**	**14 380.1181**	**14 370.4582**	**14 577.8310**
Total (with LULUCF)	**43 391.1722**	**15 936.5931**	**9 744.8755**	**12 436.9142**	**13 563.6553**	**13 995.3141**	**13 061.0526**	**12 675.6971**	**13 926.4810**	**13 468.2811**	**13 657.8174**

Abbreviations: IE – Included Elsewhere; NE – Not Estimated; NO – Not Occurring.

2.2. Institutional Arrangements, Inventory Process

2.2.1. Arrangements for Inventory Preparation

The Ministry of Agriculture, Regional Development and Environment (MARDE) of the Republic of Moldova is the state authority responsible for development and promotion of policies and strategies addressing agriculture, food production and food safety, regional and rural development, use of territory, environment protection, climate change and natural resources. On behalf of the Government of Republic of Moldova, MARDE is in charge for implementation of international environment treaties to which the Republic of Moldova is a Part (including Rio Conventions). The representative of the MARDE is also the UNFCCC National Focal Point.

In view of implementing and accomplishing the UNFCCC provisions, as well as mechanisms and provisions of Kyoto Protocol, based on Order No. 21 as of February 11, 2004, the Climate Change Office (CCO) was established under the Ministry of Ecology, Constructions and Territory Development of the Republic of Moldova (reorganized initially into Ministry of Environment and Natural Resources, and later into Ministry of Agriculture, Regional Development and Environment).

The main tasks of the CCO are: (a) providing logistical support to the Government, central and local public administration authorities, non-government and academic organizations, in activities implemented and promoted by the RM under the UNFCCC and Kyoto Protocol; and (b) implementing climate change related projects and programs providing for such activities as: *GHG emissions evaluations and national inventory reports preparation*; development and implementation of GHG emissions mitigation activities; development and implementation of measures aimed to adapt to climate change; assessment of the climate change impact on biological and socio-economic components; cooperation, promotion and implementation of activities and projects under the Clean Development Mechanism (CDM) of the Kyoto Protocol; implementation and facilitation of activities aimed at building awareness and information among civil society, relevant experts and decision makers in climate change related issues etc.

In the above context, it is worth noting that the Climate Change Office was and remains fully responsible for activities related to the preparation of National Communications, and starting with 2014, of the Biennial Update Reports of the Republic of Moldova under the UNFCCC.

The role of CCO is also specified within the Government Decision No. 141 dated 24.02.2014 on creating the energy statistical system. Thus, Chapter 2.1, Paragraph 3(h) notes that the Climate Change Office is responsible for developing national inventories of direct (CO_2, CH_4, N_2O, HFC, PFC and SF_6) and indirect greenhouse gases (NO_x, CO, NMVOC and SO_2), originated from six sectors (Energy, Industrial Processes, Solvents and Other Products Use, Agriculture, LULUCF and Waste).

The National Inventory System (NIS) includes all institutional and legal arrangements associated with the national greenhouse gas inventory preparation and reporting process on the national and international level, National Inventory Reports, Biennial Update Reports and National Communications. This process implies preliminary planning and preparation activities such as for example, defining specific responsibilities within the inventory preparation process - such responsibilities are described in section 2.2.2 'Institutional and Legal Arrangements', while Section 2.3 'Process for Inventory Preparation' provides more details about the inventory preparation process.

2.2.2. Institutional and Legal Arrangements

Within the MARDE, the Climate Change Office (CCO) is totally responsible for the activities related to preparation of National Communications (NCs), Biennial Update Reports (BURs), National Inventory Reports (NIRs) and National GHG Emission Inventory Reports. Figure 2-2 reveals the responsibilities and arrangements for the National Inventory System (NIS) of the RM.

Within the CCO the National Inventory Team (NIT) is responsible for estimating emissions by source categories and removals by categories of sinks, Key Categories Analysis (KCA), Quality Assurance (QA) and Quality Control (QC) procedures, uncertainties assessment, documentation, reporting and archiving of data related to GHG inventory, BURs and NCs preparation process.

Below is a brief description of functional responsibilities of the participants in the process:

- The Coordinator / Compiler of the National GHG Inventory is responsible for the inventory preparation process coordination, including supervision of estimating emissions by individual categories of sources and removals by individual categories of sinks, KCA, uncertainty analysis interpretation, QA&QC activities coordination, documentation and archiving the data used in the inventory preparation process, synthesis of sectoral reports – serving as basis for the NIR compilation, respectively Chapter 2 "GHG National Inventory" from the BURs and NCs;
- The national experts (hired on a contract basis) are responsible for estimating emissions by individual categories of sources and removals by individual categories of sinks at sectoral level (Sector 1 "Energy", Sector 2 "Industrial Processes and Product Use", Sector 3 "Agriculture", Sector 4 "LULUCF" and Sector 5 "Waste"); national experts are responsible for the activity data (AD) collection, application of decision trees in terms of selecting suitable assessment methods and EFs, estimating emission uncertainties by individual categories of sources, as well as for taking correction measures as a response to QA&QC activities.

The AD needed for developing the national GHG inventories are available in the Statistical Yearbooks (SY), Energy Balances (EBs) sectoral statistic publications, as well as in the on-line database of the National Bureau of Statistics (NBS) of the Republic of Moldova.

For the period until 1992, the information is available for the whole territory of the Republic of the Moldova, while since 1993 only for the right bank of Dniester (without Transnistria, further referred as Administrative Territorial Units on the Left Bank of Dniester). The statistical data for the left bank of Dniester are available in the Statistical Yearbooks of the ATULBD and in other relevant sectorial statistical publication, as compiled by the State Statistical Service beside the Ministry of Economy of the ATULBD[53].

[53] Ministry of Economy of the ATULBD: <http://www.mepmr.org/gosudarstvennaya-statistika/informacziya>

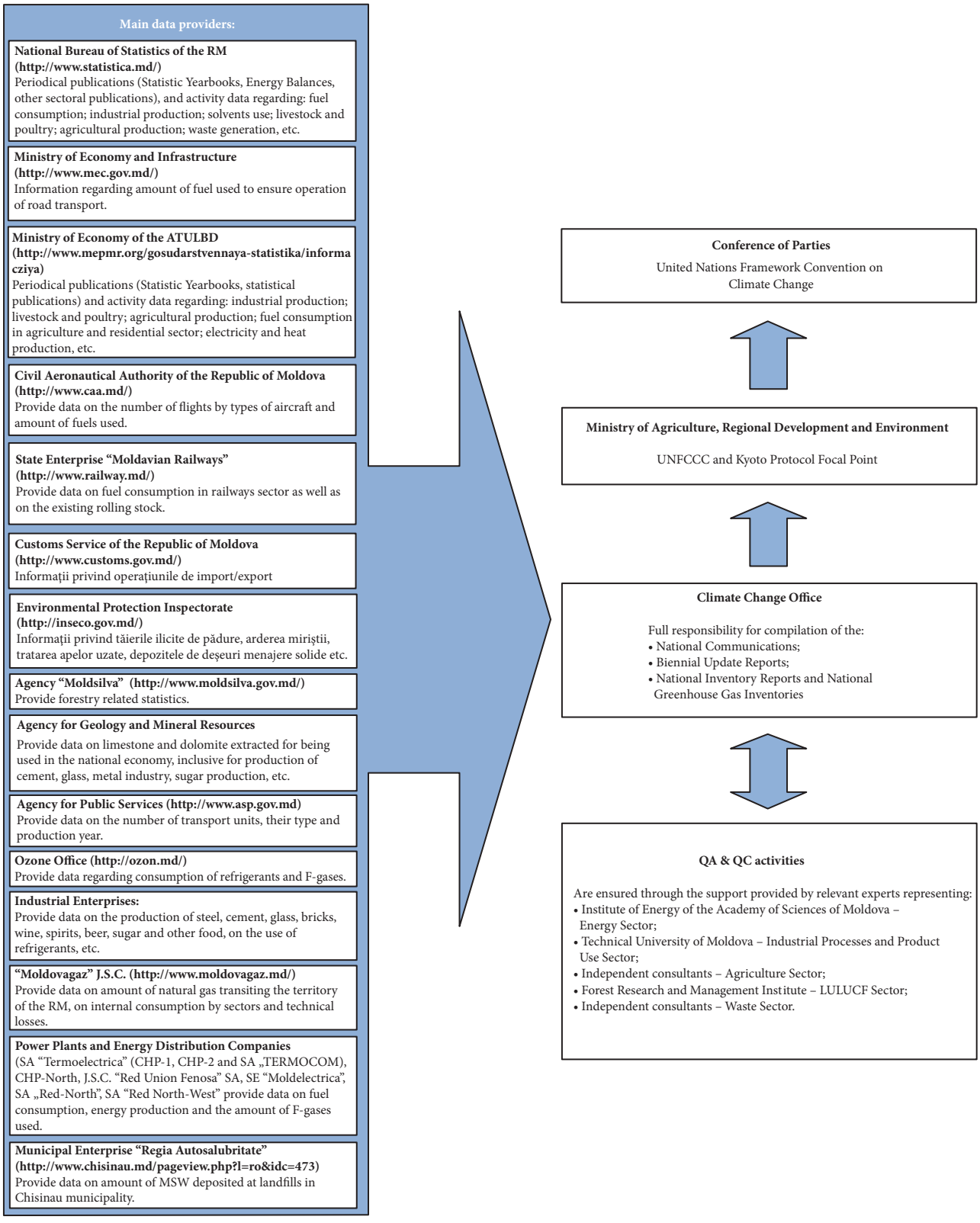


Figure 2-2: Institutional Arrangements under the National Inventory System of the Republic Moldova.

Additional statistical data (inclusive, unpublished data) may be provided at request, in conformity with provisions of the *Law No. 93 as of 26.05.2017 on "Official Statistics"*. Thus, according to Article 23, item (1), (2) and (6): „the official statistics authorities must disseminate statistical data to users in the terms specified in the statistical works programme and calendar", „the dissemination of the statistical data provided in the statistical works programme to all categories of users will be free of charge and under equal conditions of access in terms of volume, quality and terms", and „it may be disseminated data collected from legal persons or from individual entrepreneurs regarding the economic situation or the environment, if it is necessary to inform the society about the major issues and the statistical works programme foresees its dissemination"; Article 24, items (1) and (2): „the dissemination of official statistical data shall be carried out in compliance with the fundamental principles of official statistics, in particular with regard to the protection of statistical confidentiality and the guarantee of equal access in accordance with the principle of impartiality", respectively „the dissemination of official statistical data

shall be carried out by the central authority in the field of statistics and by other providers of official statistics within their activity fields", and Article 25, items (1) and (2): „providers of official statistics have the right to disseminate for a certain payment statistical data produced outside the statistical works programme, through additional special processing, at the request of users", respectively "central statistical authority and its territorial subdivisions are authorized to perform, on a contractual basis, at the request of internal or external beneficiaries, research and special statistical works, including publications, which are not covered by the statistical works programme".

Other relevant activity data is collected from various partner based on the provisions of the *Law on Access to Information*, adopted by the Decision of the Parliament No. 982-XIV as of 11.05.2000:

- from Ministry of Economy and Infrastructure (has recently taken over the responsibilities of the former Ministry of Transport and Road Infrastructure): information on the amount of fuel used to ensure operation of road transport;
- from the Agency for Public Services: information on the number of transport units registered, their type and production year;
- from State Enterprise "Moldavian Railways": information of fuel used for rail transport, as well as on the rolling stock used by the enterprise;
- from the Naval Agency of the RM and State-Owned Enterprises „Ungheni River Port" and „Bacul Molovata": information on the amount of fuel used to ensure operation of naval transport;
- from Civil Aeronautical Authority: information on the amount of fuels used in air transportation (civil and international aviation) and the number of flights by type of aircrafts;
- from the Ministry of Defense: information on the amount of fuels used for military transportation;
- from the Ministry of Health, Labor and Social Protection and Medicines and Medical Devices Agency: information on the use of N_2O for anesthesia purposes as well as the use of medicines which contains aerosols (specifically on HFCs);
- from Land Relations and Cadaster Agency: information on land use by categories type;
- from Agency "Moldsilva": information on forestry related statistics;
- from Environmental Protection Inspectorate: information on illegal felling and stubble fields burning;
- from Customs Service: statistics on import/export operations in the Republic of Moldova;
- from Agency for Geology and Mineral Resources: information on limestone and dolomite extraction and use;
- from Ozone Office by the MARDE: information on import/export of freons in bulk and type of freons used in the imported refrigeration and air-conditioning equipment;
- from State Owned Enterprise State Road Administration: information on the amount of asphalt produced and used in the country;
- from Municipal Enterprise "Regia Autosalubritate": information on landfill storage of solid household waste generated in Chisinau municipality;
- from "Moldovagaz" J.S.C.: information on the amount of natural gas transited through the territory of the Republic of Moldova, on the consumption of natural gas in the national economy by sector, as well as on technical losses;
- from Power Plants ("TERMOELECTRICA" J.S.C. in Chisinau [CHP-1 J.S.C., CHP-2 J.S.C. and "TERMOCOM" J.S.C.], CHP-North J.S.C. in Balti: information on the amount of fuel used for electricity and heat production;
- from enterprises specialized in transportation and distribution of electricity (S.O.E. "Moldelectrica", I.C.S. "RED UNION FENOSA" J.S.C, "Red-North" J.S.C., "Red North-West" J.S.C.) – information on the amount of PFCs and SF_6 used in electrical equipment;
- from a range of industrial enterprises ("Lafarge Cement (Moldova)" J.S.C., "Macon" J.S.C., Glass Factory No. 1 in Chisinau, "Glass-Container" Company in Chisinau, etc.) – information on the amount of fuel used, industrial output and amount of mineral resources used.

It should be mentioned that the Article 1 of the *Law on Access to Information* regulates the relationships between information providers and individual / legal entity in the process of ensuring and implementing the constitutional right of access to information; principles, conditions, ways and manner of accomplishing access to official data owned by information providers; aspects of access to and protection of personal information within the scope of access to such data; rights of data solicitants, including petitioners of personal data; obligations of information providers in the process of ensuring access to official information; ways to protect the right to access to information.

Article 4 (1) stipulates that "anyone, under this law's conditions, has the right to look for, receive and make public official information". According to Article 6 (1), "official information are deemed to be all information owned and available to information providers, developed, selected, processed, consolidated and/or adopted by authorities or official persons or made available to them by other legal entities". This Article is a review of information bearing documents as stipulated by the provisions of this law. Article 7 refers to cases of limited access to official information. Rights of data solicitants are reflected in Article 10, while Article 11 refers to the obligations of information provider.

According to Article 13 (1), ways of access to information are the following: hearing of information which can be provided verbally; document review on the premises of the institution; issuing a copy of the requested document or information; issuing a copy of the document, information translated into a different language than the language of the original, for an additional charge; sending by mail (including e-mail) of a copy of the document, information, a copy of the translated document, information into a different language, at the solicitant's request, for a charge. Article 13(2) stipulate that extracts from registers, documents, information, as per solicitant's request, can be made available to the solicitant in a reasonable and acceptable to the solicitant form.

Article 16 of the Law refers to the requirements that have to be met to ensure access to information: the requested information or documents shall be made available to the solicitant from the moment it becomes available for issuing, but not later than 15 working days from the date the application for access to information is registered; the leadership of the public institution may extend the term of providing the information, or document by 5 working days if: (1) the request refers to a very big volume of information requiring their selection; (2) additional consultations are needed to satisfy the request. The solicitant will be informed about any extension of the information delivery term and about the reasons for such extension 5 days prior to the expiry of the initial term. The Law also refers to cases when access to information is denied, to payments for official information provision, to modalities of protecting the right

for access to information and prosecution in court of information providers' actions.

Also, a series of laws contain provisions pertaining to wide public to environment protection related information. So, Article 29 (3) of the *Law on Natural Resources*, adopted by the Parliament Decision No. 1102-XIII as of 06.02.1997, stipulates that *„Government, local public administration authorities, state bodies assigned with natural resources management and environment protection, as well as businesses, shall make public valid and accessible information regarding natural resources use and environment protection activities".*

Article 23 of the *Forestry Code*, adopted by the Parliament Decision No. 887 as of 21.06.1996, stipulates that *"citizens and NGOs are entitled to receive information from the state forestry authorities and environment protection bodies about forestry and hunting resources, planned and accomplished conservation measures and use of such resources".*

The *Regulation regarding trading and regulated use of halogenated hydrocarbons that deplete the ozone layer*, approved by the *Law No. 852-XV as of 14.02.2002*, stipulates the procedure of presenting by the MoEN of information regarding production, import, export, trading and use (recycled and reclaimed quantities of controlled substances) of halogenated hydrocarbons that deplete the ozone layer, regulated by Montreal Protocol.

2.3. Process for Inventory Preparation

The Climate Change Office adopted a centralized approach to the process of preparing the national inventory comprising the NIR and Common Reporting Format Tables (CRF) as approved by the Decision 24/CP.19 (Annex 1). The National Inventory preparation process is outlined in Figure 2-3.

The Coordinator / Compiler of the National GHG Inventory is responsible for compiling the estimations and ensuring consistency and quality of the inventory by producing the NIR and Chapters 2 "National GHG Inventory" from the Biennial Update Reports and the National Communications.

Estimation of emissions by individual source categories and removals by individual sink categories is the responsibility of national experts who have more competences about individual features of source/sink categories.

The national experts, under direct guidance of the Coordinator of the National GHG Inventory, decide, by applying decision trees, on employing the best estimation methodology, and collect AD needed for emissions estimation. For most source and sink categories methodologies used in the previous inventory cycle are applied. It is needed to collect new AD for a more recent period under review or for the entire period under review if historical AD were amended or recalculated. If a new source/sink category was to be assessed, or a higher Tier methodology had to be used, then the Coordinator of the National GHG Inventory with the national experts would decide on which assessment methodology to use, collect most reasonable AD and EFs, calculate GHG emissions, assess uncertainties, ensured implementation of verification, QA/QC procedures acting on behalf of research and academic institutions, ministries and subordinated institutions, central administrative authorities and/or private sector.

National experts produce explanatory texts for the research on estimation of emissions by individual source categories and removals by individual sink categories, as well as provided the bibliography used.

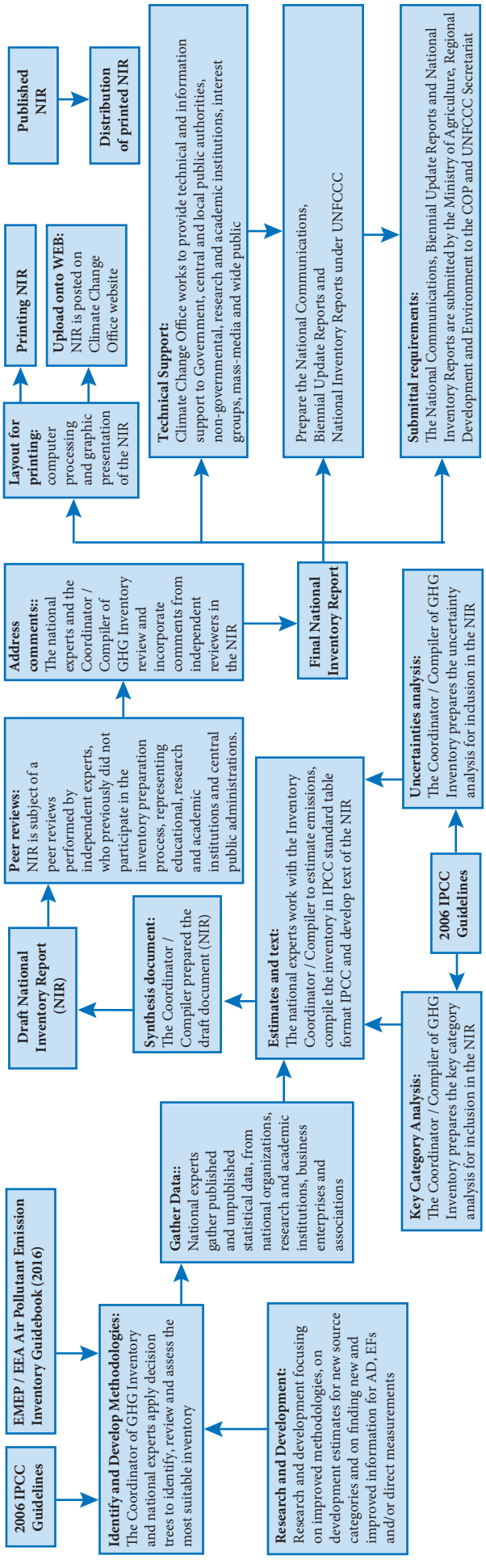


Figure 2-3: Inventory Process in the Republic of Moldova.

The Coordinator / Compiler of the National GHG Inventory is responsible for collecting and reviewing these materials, used in drafting the NIR sectoral chapters (Chapter 3 "Energy", Chapter 4 "Industrial Processes and Product Use", Chapter 5 "Agriculture", Chapter 6 "LULUCF", Chapter 7 "Waste"). The Coordinator / Compiler is also responsible for drafting other chapters (Executive Summary, Chapter 1 "Introduction", Chapter 2 "Trends in National GHG Emissions", Chapter 8 "Recalculations", "Bibliography" and "Annexes"), as well as for checking the correctness of the key category analysis, compatible with the 2006 IPCC Guidelines.

The NIR is produced in compliance with the general structure of the National Inventory Reports (NIR), as was established in the Decision 24/CP.19. In addition to NIR, the Common Reporting Format (CRF) Tables are filled-in (see Annex 1). The Coordinator / Compiler of the National GHG Inventory has the task to monitor the process of producing the Sectoral and Summary CRF Tables, to ensure the consistency of results. The national experts accomplished the uncertainties analysis, as well as verification and QA/QC activities, in close cooperation with the Coordinator / Compiler of the National GHG Inventory.

The first QA/QC Plan was produced in 2006 within the UNDP-GEF Regional Project "Capacity Building for Improving the Quality of the National GHG Inventories (Central Europe and CIS region)", and complied with the 2006 IPCC Guidelines requirements. Subsequently, it was periodically updated during the national GHG inventory processes.

During the peer reviews, the draft version of the NIR is sent to a group of independent experts (who did not previously participate in the national inventory preparation). The purpose of the inventory peer reviews is to receive from relevant experts in the areas of major interest comments on quality of the work done, in particular on relevance of methodological approaches, EFs and AD used. The received comments are reviewed and estimations and explanatory notes to them are corrected.

Following the final review, after the incorporation of comments received in the process of peer reviews, the Climate Change Office prepares the MS Word final version of the National Inventory Report, which is then sent for approval to the MARDE. When the Report is approved, the final version is electronically processed, printed and published.

Once published, the National Inventory Report, the Biennial Update Reports and/or the National Communications are submitted by the MARDE to the Secretariat, in conformity with international commitments of the RM under the UNFCCC.

2.4. Methodological Issues

2.4.1. Methodologies, Emissions Factors and Data Sources

The national inventory is structured to match the reporting requirement of the UNFCCC and is divided into five main sectors: (1) Energy, (2) Industrial Processes and Product Use, (3) Agriculture, (4) Land Use, Land-Use Change and Forestry and (5) Waste. Each of these sectors is further subdivided, within the inventory, by source categories (Table 2-4).

Table 2-4: Summary of Methods and Emission Factors Used for Inventory Preparation Process in the Republic of Moldova

Categories by sources and sinks	CO_2		CH_4		N_2O		HFC		PFC		SF_6	
	Methods	EF	Methods	EF	Methods	EF	Methods	EF	Methods	EF	Methods	EF
1. Energy												
A. Fuel Combustion	T1	D, CS	T1	D	T1	D						
1. Energy Industries	T1	D, CS	T1	D	T1	D						
2. Manufacturing Industries and Construction	T1	D, CS	T1	D	T1	D						
3. Transport	T1	D, CS	T1	D	T1	D						
4. Other Sectors	T1	D, CS	T1	D	T1	D						
5. Other	T1	D, CS	T1	D	T1	D						
B. Fugitive Emissions from Fuels	T1	D, CS	T1	D	T1	D						
1. Solid Fuels	NO	NO	NO	NO	NO	NO						
2. Oil and Natural Gas	T1	D, CS	T1	D	T1	D						
C. CO_2 Transport and Storage	NO	NO										
2. Industrial Processes and Product Use												
A. Mineral Industry	T2, T1	D, CS	NA	NA	NA	NA						
B. Chemical Industry	NO	NO	NO	NO	NO	NO						
C. Metal Industry	T2	CS, D	NO	NO	NO	NO						
D. Non-energy Products From Fuels and Solvent Use	T2, T1	D	NA	NA	NO	NO						
E. Electronic Industry	NA	NA	NA	NA	NA	NA	NA	NA	NO	NO	NO	NO
F. Product Use as Substitutes for ODS	NA	NA	NA	NA	NA	NA	T2, T1	CS, D	NA	NA	NA	NA
G. Other Product Manufacture and Use	T2, T1	D	NA	NA	T1	D	NA	NA	T1	D	T1	D
H. Other	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3. Agriculture												
A. Enteric Fermentation			T2, T1	D, CS	NA	NA						
B. Manure Management			T2, T1	D, CS	T2, T1	D, CS						
C. Rice Cultivation			NO	NO	NA	NA						
D. Agricultural Soils			NA	NA	T1, T3	D, CS						
E. Prescribed Burning of Savannas			NO	NO	NA	NA						
F. Field Burning of Agricultural Residues			IE	IE	IE	IE						
G. Liming	NO	NO	NA	NA	NA	NA						
H. Urea Application	T1	D	NA	NA	NA	NA						
I. Other Carbon-containing Fertilizers	NO	NO	NA	NA	NA	NA						
J. Other	NO	NO	NO	NO	NO	NO						

Categories by sources and sinks	CO_2		CH_4		N_2O		HFC		PFC		SF_6	
	Methods	EF	Methods	EF	Methods	EF	Methods	EF	Methods	EF	Methods	EF
4. LULUCF												
A. Forest Land	T3, T2, T1	D, CS	T1	D	T1	D						
B. Cropland	T2, T1	D, CS	T1	D	T1	D						
C. Grassland	T2	CS	NE	NE	NE	NE						
D. Wetlands	T2, T1	D, CS	NE	NE	NE	NE						
E. Settlements	T2, T1	D, CS	NE	NE	T1	D						
F. Other Land	T2, T1	D, CS	NE	NE	NE	NE						
G. Harvested Wood Products	T1	D	NA	NA	NA	NA						
H. Other	NO	NO	NO	NO	NO	NO						
5. Waste												
A. Solid Waste Disposal	NA	NA	T3	D, CS	NA	NA						
B. Biological Treatment of Solid Waste	NA	NA	NO	NO	NO	NO						
C. Incineration and Open Burning of Waste	T1	D	T1	D	T1	D						
D. Wastewater Treatment and Discharge	NA	NA	T1	D, CS	T1	D						
E. Other	NO	NO	NO	NO	NO	NO						
6. Other	NO	NO	NO	NO	NO	NO						
Memo Items												
International Bunkers	T2, T1	D, CS	T1	D	T1	D						
Multilateral Operations	NO	NO	NO	NO	NO	NO						
CO_2 Emissions from Biomass	T1	D, CS	IE	IE	IE	IE						
CO_2 Captured and Stored	NO	NO	NA	NA	NA	NA						

Abbreviations: T1 – Tier 1 Method; T2 – Tier 2 Method; C – EMEP/EEA; CS – Country Specific; D – Default; IE – Included Elsewhere; NA – Not Applicable; NE – Not Estimates; NO – Not Occurring.

Emissions of direct (CO_2, CH_4, N_2O, HFCs, PFCs and SF_6) (no NF_3 emissions have been registered in the Republic of Moldova so far) greenhouse gases were estimated based on methodologies contained in the 2006 IPCC Guidelines, while the indirect emissions (NOx, CO, NMVOC and SO_2) were estimated based on methodologies according to the EEA/EMEP Air Pollutant Emission Inventory Guidebook (2016).

Generally, a GHG inventory can be defined as *a "comprehensive account of anthropogenic sources of emissions and removals by sinks and associated data from source and sink categories within the inventory area over a specified time frame"*.

It can be prepared "top-down", "bottom-up", or using a combination approach. The Republic of Moldova's national inventory is prepared using a "top-down" approach, providing estimates of GHG emissions at a national level. Ideally, a GHG inventory should be developed by using direct measurements of emissions and removals from individual categories of sources or sinks in the country, considering the methodological approach "bottom-up".

The national inventory team is continuously working to improve accuracy, completeness and transparency of its inventory. Comprehensive bottom-up inventory is neither practicable nor possible at the present time, although for some sectors, estimates are derived from individual source specific data.

To the extent possible, AD used in this report are based on officially published data: national (Statistical Yearbooks of the RM, respectively of the Administrative-Territorial Units from the Left Bank of Dniester River (Transnistria), Energy Balances etc.) and international statistical publications (UN FAO on-line database), publications of academic, research and development institutions (Institute of Pedology, Agrochemistry and Soil Protection "Nicolae Dimo" of the ASM, Institute of Ecology and Geography of the ASM, Institute of Power Engineering of the ASM, Forest Research and Management Institute, etc.), AD provided by ministries and subordinated institutions (Ministry of Economy and Infrastructure; MARDE; Ministry of Defense; Ministry of Health, Labor and Social Protection), AD provided by administrative authorities subordinated to ministries (Environment Agency, Environmental Protection Inspectorate, Customs Service; Agency „Moldsilva", State Hydrometeorological Service, Agency for Geology and Mineral Resources), data from central administrative authorities (National Bureau of Statistics, Agency for Land Relations and Cadaster, Public Services Agency, Naval Agency, Civil Aeronautical Authority, Medicines and Medical Devices Agency, National Food Safety Agency), data obtained from enterprises and businesses associations (State Enterprise "Moldavian Railways", "Moldovagaz" J.S.C., "Lafarge Cement (Moldova)" J.S.C., "Macon" J.S.C., "Glass Plant No.1" J.S.C., "Glass Container Company" J.S.C., M.E. "Cristal-Flor" J.S.C., etc.).

2.4.2. Key Categories

According to 2006 IPCC Guidance, it is good practice to identify key categories, as it helps prioritize efforts and improve the overall quality of the national inventory. A "key category" is defined as a "source or sink category, that is prioritized within the national inventory system because its estimate has a significant influence on a country's total inventory of direct greenhouse gases in terms of the absolute level of emissions, the trend in emissions, or both".

Table 2-5, respectively Annex 1, presents the key categories for the RM's National GHG Inventory, 1990-2016, without LULUCF – based on the Tier 1 methodological approach – 14 key categories by level (L) and 16 key categories by trend (T): based on a Tier 2 approach – 13 key categories by level (L) and 13 key categories by trend (T); with LULUCF, based on the Tier 1 methodological approach – 20 key categories by level (L) and 20 key categories by trend (T), respective, based on a Tier 2 approach – 18 key categories by level (L) and 17 key categories by trend (T).

Following the recommendations set in the 2006 IPCC Guidelines, the inventory was first disaggregated by source categories which further were used to identify key categories.

Source and sink categories were defined in conformity with the following guidelines: (1) emissions / removals from individual source/sink categories identified according to standard classification, were expressed CO_2 equivalent units, estimated by using the GWP;

(2) a category should be identified for each gas emitted by the sources and sinks, since the methods, emission factors, and related uncertainties differ for each gas; (3) source and sink categories that use the same emission factors based on common assumptions were aggregated before analysis.

Key categories were identified from two perspectives: (1) the first analysis the emission contribution that each category makes to the national total; and (2) the second perspective analysis the trend of emission contributions from each category to identify where the greatest absolute changes (either increases or reductions) have taken place over a given time.

The per cent contributions to both levels (L), and trends (T), in emissions are calculated and sorted from greatest to least (see also Annex 1 of the NIR). When a Tier 1 approach was used, a 95 per cumulative contribution threshold has been used in this analysis to define an upper boundary for the key category identification, respectively when a Tier 2 approach was used (considering AD and EFs uncertainties used to estimate GHG emissions for individual source/sink categories), a 90 per cumulative contribution threshold has been used in this analysis to define an upper boundary for the key category identification.

Table 2-5: Summary Overview of the Republic of Moldova's Key Categories for 1990-2016, Based on a Tier 1 and Tier 2 Approaches

IPCC classification	Key Categories	Gas	Without LULUCF				With LULUCF			
			T1		T2		T1		T2	
			L	T	L	T	L	T	L	T
1A1	Energy Industries	CO_2	X	X	X	X	X	X	X	X
1A2	Manufacturing Industries and Construction	CO_2	X		X		X	X	X	
1A3b	Road Transportation	CO_2	X	X	X	X	X	X	X	X
1A3c	Railways	CO_2	X	X			X			
1A4	Other Sectors	CO_2	X	X	X	X	X	X	X	X
1A4	Other Sectors	CH_4	X		X		X		X	
1B2	Fugitive Emissions from Oil and Natural Gas	CH_4	X	X	X	X	X	X	X	X
2A1	Cement Production	CO_2	X	X			X	X		
2A2	Lime Production	CO_2		X						
2F1	Product Uses as Substitutes for ODS – Refrigeration and Air Conditioning	HFC		X		X				X
2F2	Product Uses as Substitutes for ODS – Foam Blowing	HFC	X	X	X	X	X	X		X
3A	Enteric Fermentation	CH_4	X	X	X		X		X	
3B	Manure Management	CH_4	X	X	X	X	X	X	X	
3Ba	Direct N_2O Emissions from Manure Management	N_2O	X		X	X	X		X	
3Bb	Indirect N_2O Emissions from Manure Management	N_2O			X				X	
3Da	Direct N_2O Emissions from Managed Soils	N_2O	X	X	X	X	X	X	X	X
3Db	Indirect N_2O Emissions from Managed Soils	N_2O	X		X	X	X	X	X	X
4A1	Forest Land Remaining Forest Land	CO_2					X	X	X	X
4A2	Land Converted to Forest Land	CO_2					X	X	X	X
4B1	Cropland Remaining Cropland	CO_2					X	X	X	X
4B2	Land Converted to Cropland	CO_2					X	X	X	
4C2	Land Converted to Grassland	CO_2					X	X	X	X
4D2	Land Converted to Wetlands	CO_2					X	X		X
4E2	Land Converted to Settlements	CO_2					X	X	X	X
4G	Harvested Wood Products	CO_2						X		X
5A	Solid Waste Disposal	CH_4	X	X	X	X	X	X	X	X
5Da	Wastewater Treatment and Discharge – Domestic Wastewater	CH_4	X	X	X	X	X	X	X	X
5Da	Wastewater Treatment and Discharge – Domestic Wastewater	N_2O				X				

Abbreviations: L – Level Assessment; T – Trend Assessment; T1 – Tier 1; T2 – Tier 2.

The Key Category Analysis was carried out using the Key Category Calculation Tool developed by the United States Environment Protection Agency (US EPA v2.5).

2.4.3. Quality Assurance and Quality Control

Following the recommendations from the 2006 IPCC Guidelines, national inventories have to be transparent, well documented, consistent, complete, comparable, assessed for uncertainties, subject to verification and QA/QC. The 2006 IPCC Guidelines defines the QA/QC terms as follows:

- *Quality Control* (QC) is a system of routine technical activities to measure and control the quality of the inventory as it is being developed. A basic QC system should provide routine and consistent checks to ensure data integrity, correctness, and completeness; identify and address errors and omissions; and document and archive inventory material and record all QC activities.
- *Quality Assurance* (QA) comprises a planned system of review procedures conducted by personnel not directly involved in the inventory compilation and development process.

As a part of continuous efforts to develop a transparent and reliable inventory, the Republic of Moldova developed a "*Quality Assurance and Quality Control Plan*". The key attributes of the "*Quality Assurance and Quality Control Plan*" include detailed specific procedures (Figure 2-4) and standard verification and quality control forms and checklists (see Annex 4 of the NIR), by using Tier 1 (general procedures) and Tier 2 (source-specific procedures), that serve to standardize the process of implementing quality assurance and quality control activities meant to ensure the quality of the national inventory; peer review carried out by experts not directly involved in the national inventory development process; data quality check including by comparing the sets of data obtained from different sources; inventory planning and coordination at an inter-institutional level; as well as the continuous documentation and archiving of all materials used in inventory preparation process.

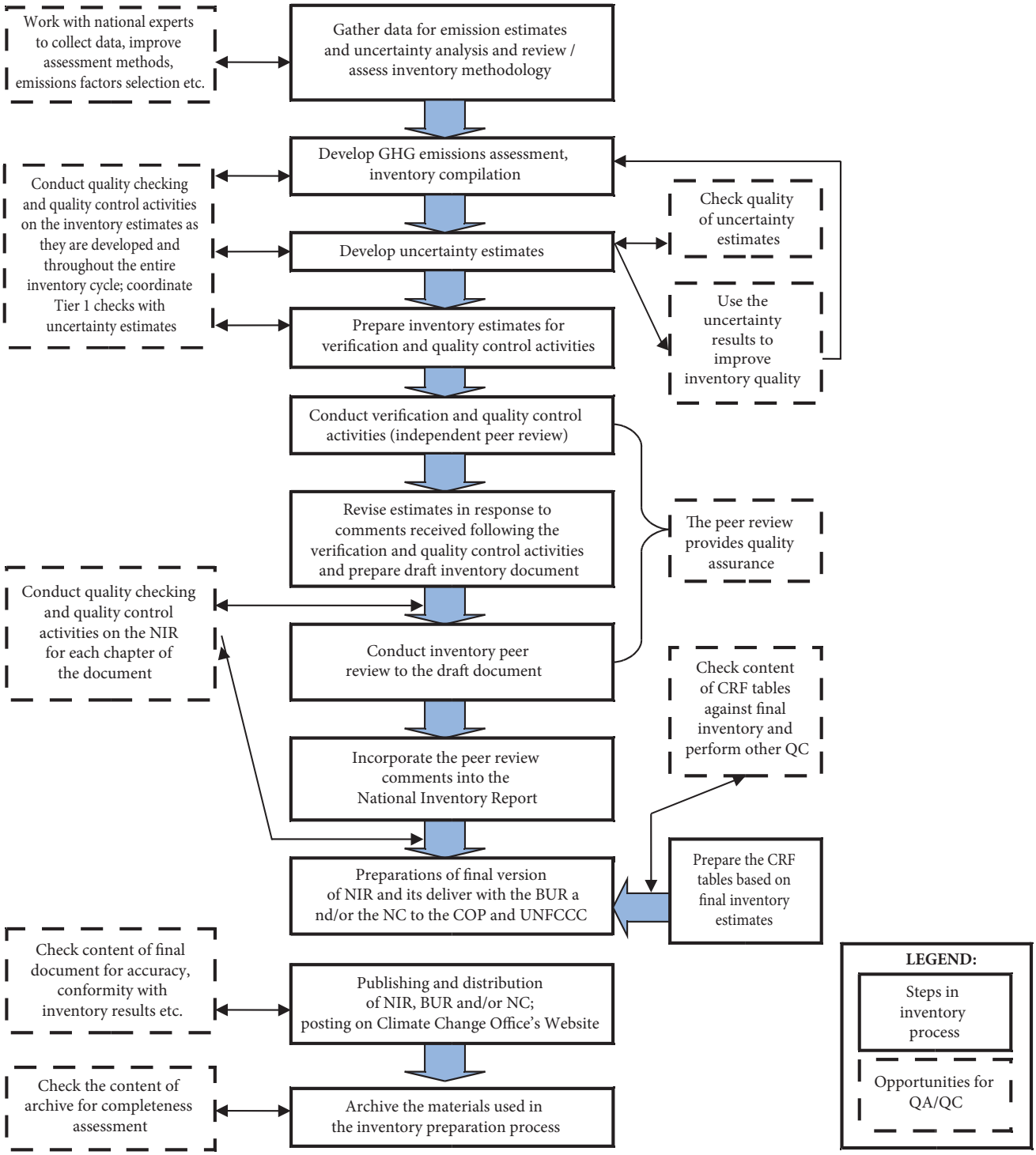


Figure 2-4: The Role of QA/QC Activities in the Inventory Preparing Process.

It is well known that inventory development implies huge amounts of information that has to be gathered, handled and stored. The process sustainability is ensured through a good management and archiving of materials used along the inventory process.

In the Republic of Moldova, the National Inventory Team has a sufficiently transparent documentation allowing to fully reproducing the GHG emissions estimates. A standard system for documenting and archiving numeric and qualitative information, in compliance with the 2006 IPCC Guidelines recommendations was used. The activity data sources were documented by inserting references to these into the inventory document text. Estimation methods & emission factors sources and their selection justification are documented in the corresponding chapters of the NIR.

Recalculations made are documented and argued both in sectoral Chapters (3-7), as well as in the Chapter 8 "Recalculations and Improvements" of the NIR.

Individual source and sink categories related documentation include: (1) list of personnel responsible for estimates and individual responsibilities as per Terms of Reference; (2) reference sources for the activity data used; (3); justification of emission factors estimation methods selection; (4) samples of GHG emissions estimation process (in Excel format); (5) uncertainties analysis results by individual source and sink categories; (6) annexes; (7) references.

Materials used in the inventory development process were archived both electronically and on hard copies. As the entity responsible

for the national inventory development, the Climate Change Office holds all documentation used for its compilation.

Summing up, one can assert that transparency and credibility of a national inventory are ensured through: (1) the ability to demonstrate, through appropriate documentation, transparency of inventory development process; (2) further improvements of the inventory process and its basic products; and (3) ensuring that the inventory process employed consistent approaches allowing to obtain comparable results for all source and sink categories.

It is obvious that in comparison with the previous inventory cycles, by continuous integration of QA/QC activities, the Republic of Moldova ensures a better-quality inventory.

2.4.4. Recalculations

The national inventory team revised and recalculated GHG emissions and CO_2 removals for each calendar year covered by the inventory for the period from 1990 through 2015, a component part of the Fourth National Communication of the Republic of Moldova under the UNFCCC (2018).

These activities were carried out during the on-going process of improving the quality of the National GHG Inventory (including, by considering the updated activity data, higher tier methodological approaches available in the 2006 IPCC Guidelines, updating country-specific emission factors used, and errors correcting actions). Under the current inventory cycle, improvements were made in all sectors (move to higher tier methodologies, revision of emission factors, activity data, etc.), entailing the need to make recalculations of national GHG emissions for the time period from 1990 through 2015, reflected in the Fourth National Communication of the Republic of Moldova under the UNFCCC (Chapter 2 „National GHG Inventory").

In comparison with the results reported under the NC4 of the RM under the UNFCCC (2018), the changes made during the development of the current inventory, resulted in increased values of total direct GHG emissions (without LULUCF) in 1990-1993, 1995 and 1999-2015 years, respectively revealed a decreasing trend in 1994 and 1996-1998 years (Table 2-6).

Table 2-6: Recalculations of Total GHG Emissions (without LULUCF) included into the NC4 of the Republic of Moldova under the UNFCCC, Mt CO_2 equivalent

	1990	1991	1992	1993	1994	1995	1996	1997	1998
NC4	43.4000	38.9878	28.3850	22.9386	21.2027	17.6498	17.7123	16.3028	14.4061
BUR2	44.9188	40.7762	32.9006	24.7408	21.0382	17.8055	17.5224	16.1683	14.3515
Difference, %	3.5	4.6	15.9	7.9	-0.8	0.9	-1.1	-0.8	-0.4
	1999	2000	2001	2002	2003	2004	2005	2006	2007
NC4	12.1228	11.2078	11.9762	11.8020	12.2221	12.9717	13.4141	12.5625	12.2087
BUR2	12.5913	11.6256	12.4024	12.1971	12.5502	13.5394	13.8478	12.9467	12.7101
Difference, %	3.9	3.7	3.6	3.3	2.7	4.4	3.2	3.1	4.1
	2008	2009	2010	2011	2012	2013	2014	2015	2016
NC4	13.4685	13.4743	14.2635	14.5031	13.7486	11.4349	14.1995	13.9533	
BUR2	13.8693	14.4220	14.5256	14.9033	14.0006	13.4784	14.3801	14.3705	14.5778
Difference, %	3.0	7.0	1.8	2.8	1.8	17.9	1.3	3.0	

Abbreviations: NC4 – Fourth National Communication; BUR2 – Second Biennial Update Report.

With reference to the total net GHG emissions (with LULUCF) reported into the NC4 of the RM under the UNFCCC (2018), changes made in the development of the current inventory, resulted in increased emissions between 1990 and 2015, varying from a minimum of 15.5 per cent in 1990 to a maximum of 89.2 per cent in 2000 (Table 2-7).

Table 2-7: Recalculations of Total Net GHG Emissions (with LULUCF) included into the NC4 of the Republic of Moldova under the UNFCCC, Mt CO_2 equivalent

	1990	1991	1992	1993	1994	1995	1996	1997	1998
NC4	37.5804	31.4104	21.3336	15.8020	14.8571	11.1677	11.4861	10.2141	8.2647
BUR2	43.3912	38.1864	30.9290	22.7398	19.1372	15.9366	15.2393	14.2949	12.4608
Difference, %	15.5	21.6	45.0	43.9	28.8	42.7	32.7	40.0	50.8
	1999	2000	2001	2002	2003	2004	2005	2006	2007
NC4	6.0108	5.1507	6.1833	6.9351	7.2948	9.0870	8.6497	7.5270	7.1845
BUR2	10.9940	9.7449	10.8863	10.5938	11.0170	11.8371	12.4369	11.4159	10.9829
Difference, %	82.9	89.2	76.1	52.8	51.0	30.3	43.8	51.7	52.9
	2008	2009	2010	2011	2012	2013	2014	2015	2016
NC4	8.9809	9.6222	11.0334	11.8591	10.8034	8.8878	11.5384	11.1079	
BUR2	12.4489	13.3888	13.5637	13.9953	13.0611	12.6757	13.9265	13.4683	13.6578
Difference, %	38.6	39.1	22.9	18.0	20.9	42.6	20.7	21.2	

Abbreviations: NC4 – Fourth National Communication; BUR2 – Second Biennial Update Report.

2.4.5. Uncertainty Assessment

Uncertainty estimates are an essential element of a complete and transparent emissions inventory. Uncertainty information is not intended to challenge the validity of inventory estimates, but to help prioritize efforts to improve the accuracy of future inventories and guide future decisions on methodological choice. While the Republic of Moldova's National Inventory Team calculates the emission estimates with the highest possible accuracy, uncertainties are associated to a varying degree with the development of emission estimates for any inventory.

Some of current estimates, such as those for CO_2 emissions from fossil fuels combustion or from cement production are considered to have minimal uncertainty associated with them. For some other categories of emissions, however, a lack of data, the use of emission factors used by default or an incomplete understanding of how emissions are generated increases the uncertainty surrounding the estimates presented.

Additional research in the following areas could help reduce uncertainty in the RM's Inventory:

- *Incorporating excluded emission sources.* Quantitative estimates for some of the sources and sinks of GHG emissions are not available at this time (for example, GHG emissions from source category 5B "Biological Treatment of Solid Waste").
- *Improving the accuracy of emission factors.* Further research is needed in some cases to improve the accuracy of emission factors used to calculate emissions from a variety of sources (for example, the accuracy of current emission factors applied to CH_4 fugitive emissions from oil and natural gas, emissions of CO_2 from solvents and other products, indirect N_2O emissions from manure management and indirect N_2O emissions from agricultural soils etc., is highly uncertain).
- *Collecting more detailed activity data.* Although methodologies for estimating emissions for some sources exist, problems arise in obtaining activity data at a level of detail in which aggregate emission factor can be applied, in particular the ability to estimate emissions of F-gases within Sector 2 "Industrial Processes and Product Use".

The overall inventory uncertainty was estimated using a Tier 1 methodological approach. An estimate of the overall quantitative uncertainty (±7.27 per cent level uncertainty and, respectively ±2.23 per cent trend uncertainty) are shown in Table 2-8, as well as in the Annex 5 of the NIR.

Table 2-8: Estimated Overall National Inventory Quantitative Uncertainty in the RM

	CO_2	CH_4	N_2O	Total
Level Uncertainty	±6.20	±22.26	±26.21	±7.27
Trend Uncertainty	±1.70	±11.78	±14.66	±2.23

Emissions evaluated under the RM's National GHG Inventory reflect current best estimates; in some cases, however, estimates are based on approximate methodologies, assumptions, and incomplete data. As new information become available in the future, the RM's inventory team will continue to improve, revise and recalculate its GHG emission estimates.

2.4.5. Completeness Assessment

Republic of Moldova's National GHG Inventory is, mostly, a complete inventory of the following direct GHG – CO_2, CH_4, N_2O, HFC, PFC and SF_6. The national inventory includes also the indirect GHGs such as: CO, NO_x, NMVOC and SO_2.

Despite the effort to cover all existent sources and sinks, the inventory still has some gaps, most being determined by lack of activity data needed to estimate certain emissions and removals, such as:

- emissions of HFCs from source categories 2F3 "Fire Protection", 2F5 "Solvents" and 2F6 "Other Applications";
- CH_4 emissions from source category 5B "Biological Treatment of Solid Waste".

As part of the inventory improvement plan, during the future inventory activities, the inventory team will continue the efforts to identify new and relevant data for the GHG emissions/removals assessment from the respective categories.

2.5. Reporting Greenhouse Gas Emissions

2.5.1. Summary of Direct GHG Emission Trends

Between 1990 and 2016, the total direct greenhouse gas emissions dynamic expressed in CO_2 equivalent, revealed a decreasing trend in the Republic of Moldova, reducing by circa 67.5 per cent: from 44.9 Mt CO_2 equivalent in 1990 to 14.6 Mt CO_2 equivalent in 2016 (Figure 2-5).

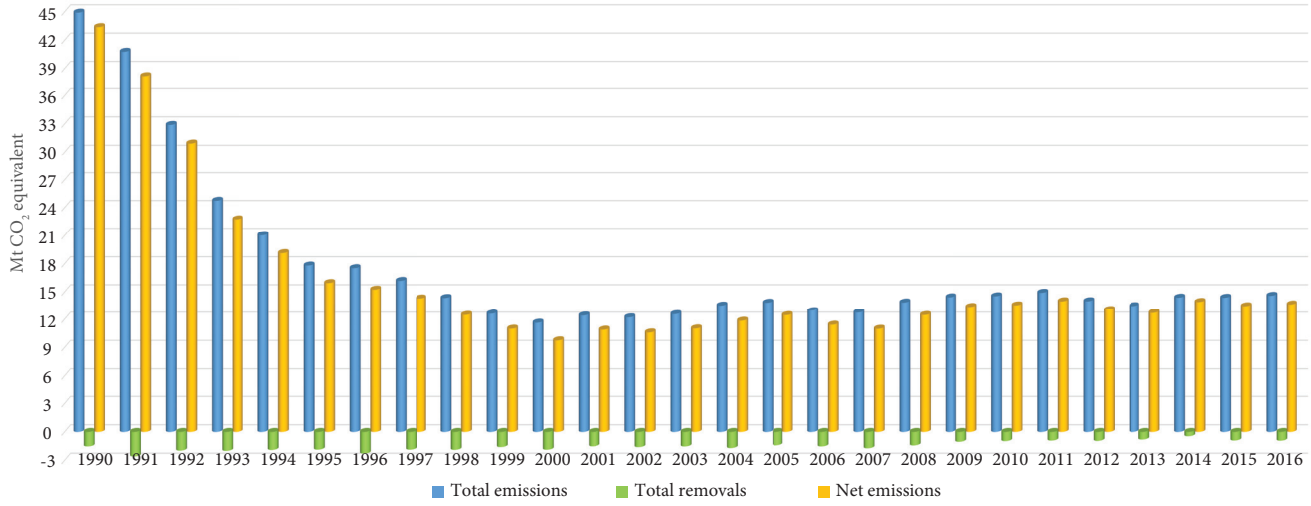


Figure 2-5: Greenhouse Gas Emission and Removals Trends in the Republic of Moldova within 1990-2016 time series.

The most significant direct GHG emissions reductions have been registered under the following source categories: 4G "Harvested Wood Products" (-100.7 per cent), 1A5 „Other" (-98.2 per cent), 2C „Metal Industry" (-81.7 per cent), 1A1 „Energy Industry" (-78.8 per cent), 1A2 „Manufacturing Industries and Construction" (-77.3 per cent), 1A4 „Other Sectors" (-76.4 per cent), 3B „Manure Management" (-72.6 per cent), 3A „Enteric Fermentation" (-70.4 per cent) 4C „Grassland" (-66.6 per cent), 2D „Non-energy Products from Fuels and Solvent Use" (-66.5 per cent), 2A „Mineral Industry" (-61.7 per cent), 1A3 „Transport" (-46.8 per cent), 4B „Cropland" (-44.7 per cent), 4F „Other Land" (-43.8 per cent) and 5D „Wastewater Treatment and Discharge" (-27.4 per cent).

Between 2015 and 2016, total direct GHG emissions increased by circa 1.4 per cent, including due to increasing emissions from the following source categories: 3D „Agricultural Soils" (+32.6 per cent), 3H „Urea Application" (+9.2 per cent), 1A3 „Transport" (+8.2 per cent), 1B2 „Fugitive Emissions from Oil and Natural Gas" (+7.2 per cent), 2F „Product Uses as Substitutes for ODS" (+4.6 per cent), 3B „Manure Management" (+3.3 per cent) and 5A „Solid Waste Disposal" (+2.6 per cent).

2.5.2. Emission Trends by Gas

Within 1990-2016 time periods, the total CO_2 emissions (without LULUCF) decreased by circa 73.8 per cent (from 36.9 Mt in 1990 to 9.6 Mt in 2016). CH_4 and N_2O decreased by circa 44.1 per cent (from 5.1 Mt CO_2 equivalent in 1990 to 2.8 Mt CO_2 equivalent in 2016), respectively by 35.5 per cent (from 3.0 Mt CO_2 equivalent in 1990 to 1.9 Mt CO_2 equivalent in 2016) (Table 2-9).

Table 2-9: Direct GHG Emissions in the Republic of Moldova within 1990-2016, Mt CO_2 equivalent

	1990	1991	1992	1993	1994	1995	1996	1997	1998
CO_2 (without LULUCF)	36.8708	32.9724	25.8671	18.0917	14.9511	11.8367	11.6817	10.6765	9.1782
CO_2 (with LULUCF)	35.1701	30.1962	23.6888	15.8652	12.8119	9.7140	9.1348	8.5282	7.0007
CH_4 (without LULUCF)	5.0725	5.0001	4.7216	4.3607	4.2749	4.0442	3.9842	3.5956	3.4538
CH_4 (with LULUCF)	5.0752	5.0025	4.7238	4.3636	4.2766	4.0464	3.9857	3.5983	3.4563
N_2O (without LULUCF)	2.9754	2.8038	2.3118	2.2884	1.8122	1.9207	1.8522	1.8911	1.7134
N_2O (with LULUCF)	3.1458	2.9877	2.5164	2.5110	2.0487	2.1722	2.1144	2.1633	1.9978
HFCs	NO	NO	NO	NO	NO	0.0040	0.0043	0.0051	0.0061
PFCs	NO	NO	NO	NO	NO	NO	NO	NO	NO
SF_6	NO	NO	NO	NO	NO	NO	NO	NO	NO
Total (without LULUCF)	**44.9188**	**40.7762**	**32.9006**	**24.7408**	**21.0382**	**17.8055**	**17.5224**	**16.1683**	**14.3515**
Total (with LULUCF)	**43.3912**	**38.1864**	**30.9290**	**22.7398**	**19.1372**	**15.9366**	**15.2393**	**14.2949**	**12.4608**
	1999	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
CO_2 (without LULUCF)	7.6797	6.9073	7.5065	7.1902	7.8726	8.6153	8.8852	8.1810	8.6850
CO_2 (with LULUCF)	5.7861	4.7293	5.6925	5.2897	6.0450	6.6226	7.1875	6.3674	6.6783
CH_4 (without LULUCF)	3.3443	3.2629	3.2477	3.3012	3.2065	3.1722	3.1798	3.0564	2.8926
CH_4 (with LULUCF)	3.3467	3.2639	3.2490	3.3015	3.2065	3.1724	3.1801	3.0567	2.8941
N_2O (without LULUCF)	1.5605	1.4471	1.6378	1.6912	1.4503	1.7227	1.7419	1.6553	1.0642
N_2O (with LULUCF)	1.8544	1.7434	1.9343	1.9881	1.7446	2.0129	2.0285	1.9379	1.3423
HFCs	0.0068	0.0083	0.0105	0.0145	0.0208	0.0292	0.0408	0.0536	0.0678
PFCs	NO	NO	NO	NO	NO	NO	NO	0.0000	0.0000
SF_6	NO	NO	NO	NO	0.0000	0.0000	0.0001	0.0003	0.0004
Total (without LULUCF)	**12.5913**	**11.6256**	**12.4024**	**12.1971**	**12.5502**	**13.5394**	**13.8478**	**12.9467**	**12.7101**
Total (with LULUCF)	**10.9940**	**9.7449**	**10.8863**	**10.5938**	**11.0170**	**11.8371**	**12.4369**	**11.4159**	**10.9829**
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
CO_2 (without LULUCF)	9.2429	9.6332	9.9495	10.2529	9.8055	8.8651	9.4851	9.8737	9.6455
CO_2 (with LULUCF)	7.5496	8.3344	8.7292	9.0928	8.6313	7.8442	8.8289	8.7806	8.5458
CH_4 (without LULUCF)	2.8743	2.8064	2.8209	2.8784	2.8205	2.7464	2.8143	2.7589	2.8351
CH_4 (with LULUCF)	2.8751	2.8067	2.8210	2.8786	2.8217	2.7472	2.8144	2.7596	2.8355
N_2O (without LULUCF)	1.6695	1.8905	1.6517	1.6547	1.2496	1.7354	1.9375	1.5688	1.9205
N_2O (with LULUCF)	1.9415	2.1558	1.9099	1.9067	1.4830	1.9527	2.1399	1.7591	2.0997
HFCs	0.0821	0.0914	0.1029	0.1165	0.1242	0.1306	0.1421	0.1678	0.1756
PFCs	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SF_6	0.0005	0.0006	0.0007	0.0007	0.0008	0.0010	0.0011	0.0011	0.0011
Total (without LULUCF)	**13.8693**	**14.4220**	**14.5256**	**14.9033**	**14.0006**	**13.4784**	**14.3801**	**14.3705**	**14.5778**
Total (with LULUCF)	**12.4489**	**13.3888**	**13.5637**	**13.9953**	**13.0611**	**12.6757**	**13.9265**	**13.4683**	**13.6578**

Abbreviations: NA – Not Applicable; NO – Not Occurring.

Fluorinated gases emissions have been recorded beginning with 1995, considered as a starting year for monitoring F-gases (HFCs, PFCs, SF_6) (no NF_3 emissions were recorded so far in the Republic of Moldova). Evolution of these emissions denotes a steady trend towards increase in the last years, though their share in the total national emissions structure is insignificant for now.

CO_2 continues to be the most important source of total national direct greenhouse gas emissions in the Republic of Moldova.

Figure 2-6 reveals the variation of direct GHG emissions share by gas in the structure of total national emissions in 1990 and 2016.

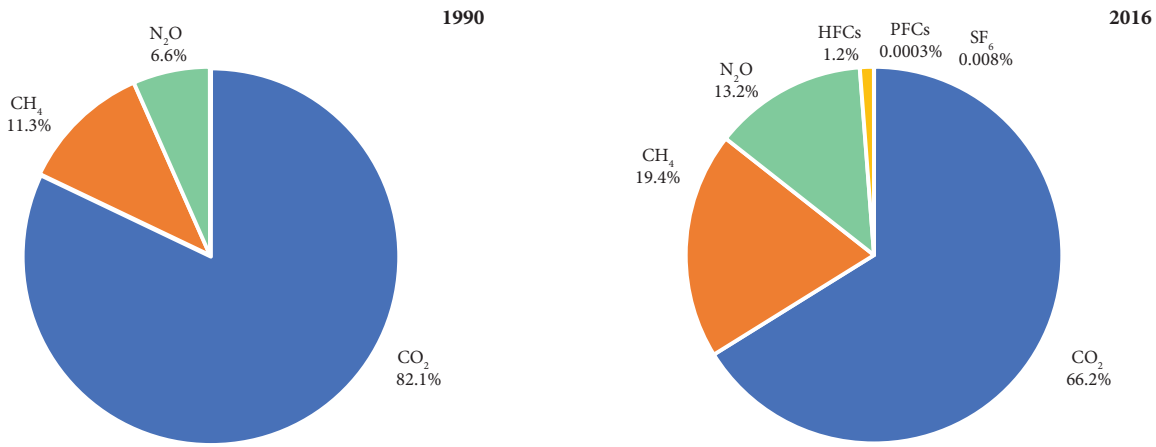


Figure 2-6: Direct GHGs share in the structure of total GHG emissions in the Republic of Moldova in 1990 and 2016 years.

In 2016, the source categories having the biggest share in the total dioxide of carbon emissions in the Republic of Moldova were: 1A1 "Energy Industries" (52.9 per cent of the total), 1A3 „Transport" (27.3 per cent of the total), 4A „Forest Land" (-24.7 per cent of the total), 1A4 „Other Sectors" (19.6 per cent of the total), 4B „Cropland" (16.3 per cent of the total), 1A2 „Manufacturing Industries and Constructions" (5.9 per cent of the total), 2A „Mineral Industry" (5.9 per cent of the total) and 4C „Grassland" (-4.7 per cent of the total) (Figure 2-7).

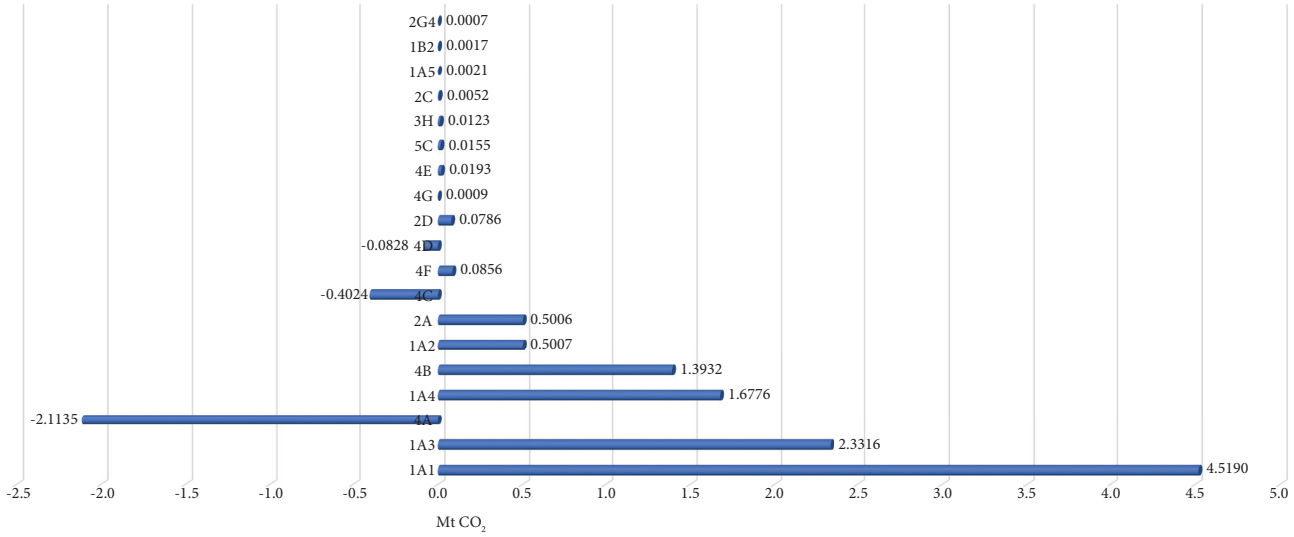


Figure 2-7: Source and Sink Categories of CO_2 in the Republic of Moldova in 2016.

In 2016, the source categories having the biggest share in the total methane emissions in the Republic of Moldova were: 5A "Solid Waste Disposal" (39.3 per cent of the total), 3A „Enteric Fermentation" (22.9 per cent of the total), 1B2 „Fugitive Emissions from Oil and Natural Gas" (21.6 per cent of the total), 5D „Wastewater Treatment and Discharge" (8.9 per cent of the total), 1A4 „Other Sectors" (4.1 per cent of the total) and 3B „Manure Management" (2.4 per cent of the total) (Figure 2-8).

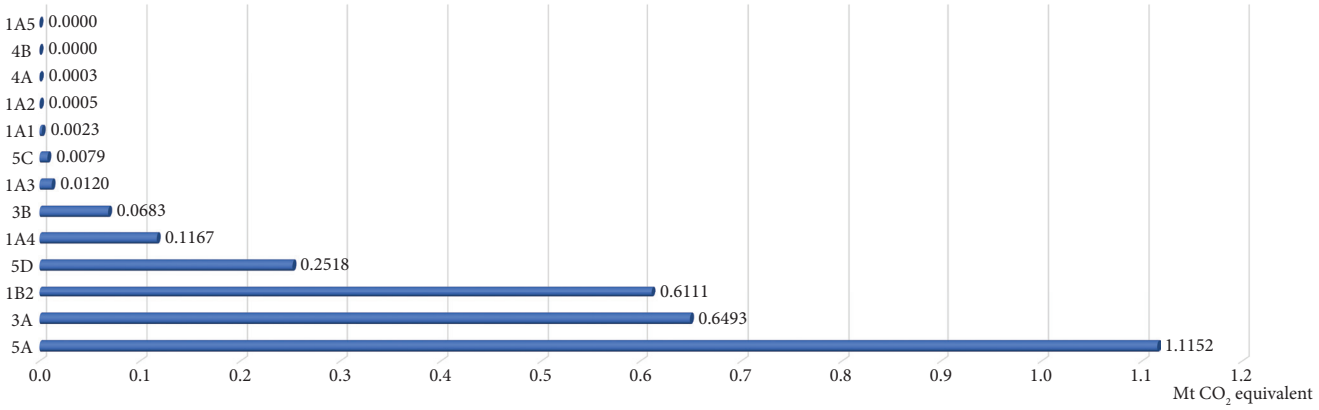


Figure 2-8: Source Categories of CH_4 in the Republic of Moldova in 2016.

In 2016, the source categories having the biggest share in the total nitrous oxide emissions in the Republic of Moldova were: 3D "Agricultural Soils" (63.1 per cent of the total), 3B „Manure Management" (17.8 per cent of the total), 4E „Settlements" (8.5 per cent of the total), 1B2 „Fugitive Emissions from Oil and Natural Gas" (4.2 per cent of the total), 5D „Wastewater Treatment and Discharge" (3.3 per cent of the total), 1A3 „Transport" (1.9 per cent of the total) and 1A4 „Other Sectors" (0.9 per cent of the total) (Figure 2-9).

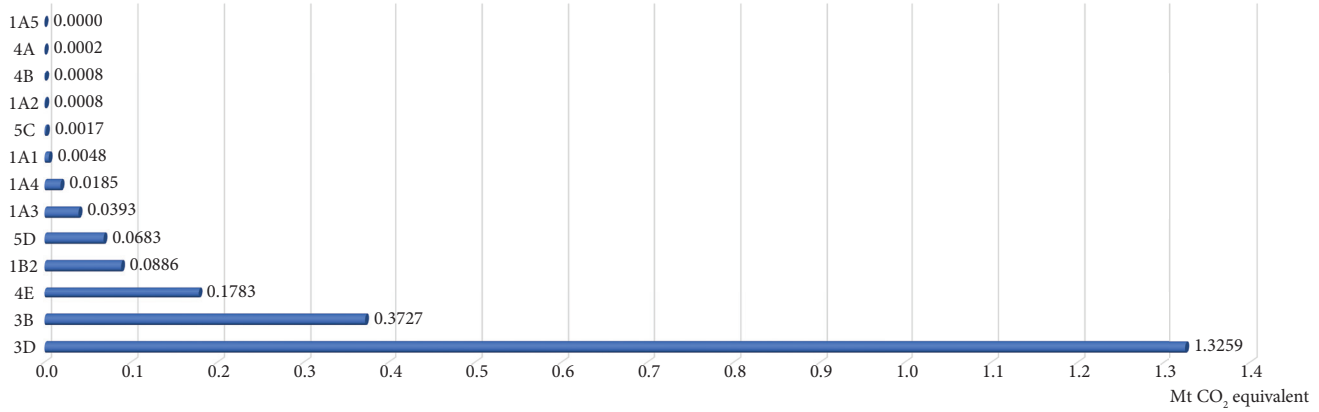


Figure 2-9: Source Categories of N_2O in the Republic of Moldova in 2016.

2.5.3. Emission Trends by Sources

Emissions estimates were grouped into five sectors: (1) "Energy", (2) "Industrial Processes and Product Use", (3) "Agriculture", (4) "Land Use, Land-Use Change and Forestry" (LULUCF) and (5) "Waste". Interpretation of GHG emissions inventory results under LULUCF Sector is different from other sectors: positive figures indicate that this sector is a net source of emissions, while negative figures state that the sector is a net sink of CO_2 removals.

Within 1990-2016 time series, total GHG emissions in the Republic of Moldova tended to decrease, thus emissions under Energy Sector decreased by circa 72.9 per cent, those under the IPPU Sector – by circa 51.5 per cent, under the Agriculture Sector – by 53.5 per cent, under the LULUCF Sector – by 39.8 per cent, while under the Waste Sector – by 3.6 per cent (Table 2-10).

Table 2-10: Direct Greenhouse Gas Emissions in the Republic of Moldova by Sector within 1990-2016, Mt CO_2 equivalent

	1990	1991	1992	1993	1994	1995	1996	1997	1998
1. Energy	36.6105	32.9696	26.1405	18.1730	15.1473	12.1574	12.1291	10.9364	9.4505
2. Industrial Processes and Product Use	1.5723	1.3947	0.8089	0.7249	0.5488	0.4505	0.4097	0.4514	0.3771
3. Agriculture	5.2206	4.8628	4.4000	4.2297	3.7460	3.6029	3.3846	3.1852	2.9525
4. LULUCF	-1.5276	-2.5899	-1.9715	-2.0010	-1.9010	-1.8689	-2.2831	-1.8735	-1.8907
5. Waste	1.5154	1.5491	1.5512	1.6132	1.5962	1.5947	1.5990	1.5953	1.5714
	1999	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
1. Energy	7.9883	7.2889	7.8927	7.5977	8.2968	9.0248	9.2488	8.3586	8.6524
2. Industrial Processes and Product Use	0.3410	0.3141	0.3190	0.3723	0.4065	0.4854	0.5919	0.7020	0.9616
3. Agriculture	2.6962	2.4808	2.6761	2.7449	2.3999	2.5926	2.5784	2.4664	1.6768
4. LULUCF	-1.5973	-1.8807	-1.5162	-1.6033	-1.5332	-1.7023	-1.4109	-1.5308	-1.7272
5. Waste	1.5658	1.5418	1.5146	1.4823	1.4471	1.4366	1.4288	1.4196	1.4194
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
1. Energy	9.1322	9.9117	10.1950	10.4985	10.0362	9.0257	9.6569	10.0638	9.9272
2. Industrial Processes and Product Use	1.0553	0.5558	0.5923	0.6960	0.7132	0.7626	0.7949	0.7842	0.7619
3. Agriculture	2.2434	2.5018	2.2550	2.2079	1.7601	2.2526	2.4923	2.0912	2.4285
4. LULUCF	-1.4205	-1.0332	-0.9619	-0.9080	-0.9396	-0.8027	-0.4536	-0.9022	-0.9200
5. Waste	1.4385	1.4527	1.4833	1.5009	1.4911	1.4376	1.4361	1.4313	1.4603

Energy Sector is the most important source of total national direct GHG emissions, its share varying over the time series from 1990 through 2016 from 81.5 per cent and 68.1 per cent. Other relevant sources are represented by Agriculture, Waste and IPPU Sectors (Figure 2-10). During the entire period under review, the LULUCF Sector represented a net source of carbon removals. With the decrease of national direct GHG emissions, the importance of this sector in the structure of net GHG emissions at the national level increased: in 1990 – the removals represented circa 3.4 per cent of the total national GHG emissions, while in 2016 it represented already circa 6.3 per cent of the total.

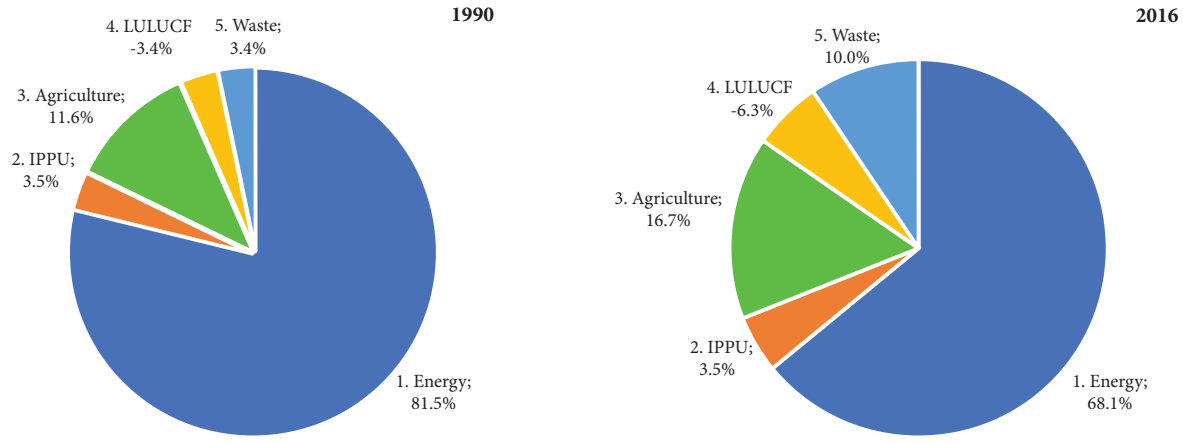


Figure 2-10: Sectoral Breakdown of the Republic of Moldova's total GHG Emissions in 1990 and 2016.

Energy Sector

Energy-related activities are by far the largest source of GHG emissions in the Republic of Moldova. The Energy Sector includes emissions of all GHGs from fuel combustion (stationary and mobile combustion) for the primary purpose of delivering energy (93 per cent of total emissions per sector in 2016), as well as fugitive releases defined as intentional or unintentional releases of GHGs from the production, processing, transmission, storage, and delivery of fossil oil and natural gas (7 per cent of total emissions per sector in 2016) (Figure 2-11, Table 2-11).

Overall, these emissions accounted, in 2016 circa 68.1 per of total Republic of Moldova's direct GHG emissions. Between 1990 and 2016, total GHG emissions from Energy Sector decreased by circa 72.9 per cent: from 36.6 Mt CO_2 equivalent in 1990 to 9.9 Mt CO_2 equivalent in 2016.

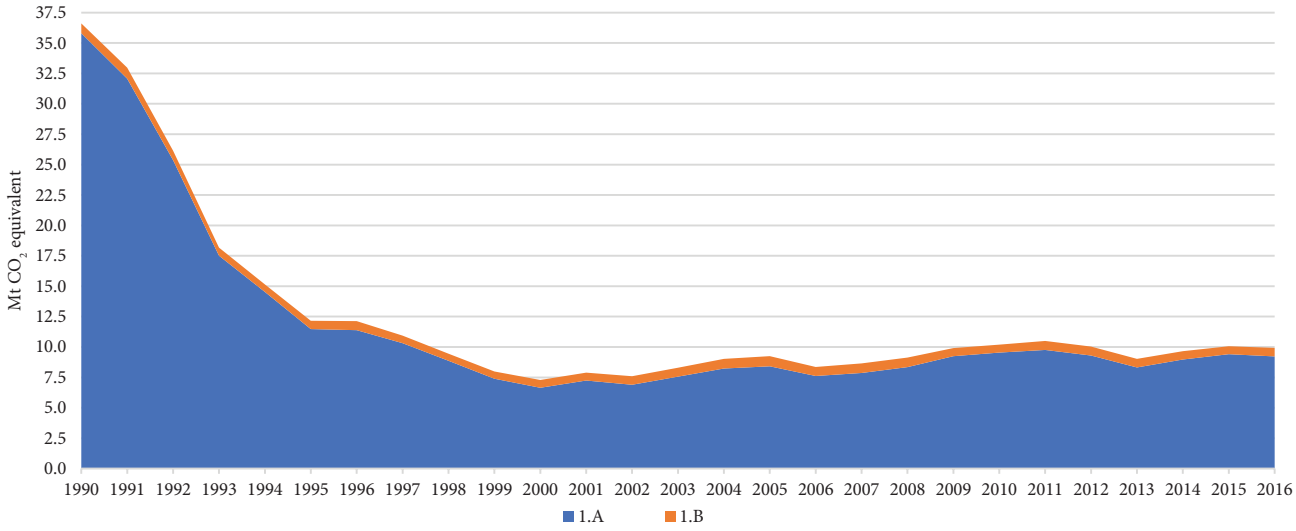


Figure 2-11: GHG Emissions from Energy Sector in the Republic of Moldova within 1990-2016 periods.

Table 2-11: GHG Emissions from Energy Sector within 1990-2016 periods, Mt CO_2 equivalent

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
1. Energy	**36.6105**	**12.1574**	**7.2889**	**9.2488**	**10.1950**	**10.4985**	**10.0362**	**9.0257**	**9.6569**	**10.0638**	**9.9272**
1A. Fuel Combustion	**35.8054**	**11.4742**	**6.6486**	**8.4127**	**9.5420**	**9.7586**	**9.2995**	**8.3198**	**8.9724**	**9.4093**	**9.2259**
1A.1. Energy Industries	21.3082	7.1605	3.6132	3.7609	4.9838	4.6149	4.6033	3.6868	4.3584	4.7448	4.5261
1A.2. Manufacturing Industries and Construction	2.2124	0.4407	0.5318	0.5992	0.4438	0.5982	0.4574	0.5994	0.4688	0.5346	0.5020
1A.3. Transport	4.4795	1.5393	0.9430	1.7671	2.0541	2.1649	1.9019	2.0218	2.0901	2.2033	2.3829
1A.4. Other Sectors	7.6897	2.2072	1.5237	2.2592	2.0301	2.3590	2.3283	2.0079	2.0518	1.9236	1.8128
1A.5. Other	0.1156	0.1265	0.0368	0.0263	0.0302	0.0216	0.0086	0.0039	0.0033	0.0029	0.0021
1B. Fugitive Emissions from Fuels	**0.8052**	**0.6831**	**0.6403**	**0.8361**	**0.6529**	**0.7399**	**0.7367**	**0.7059**	**0.6845**	**0.6545**	**0.7013**
1B.1. Solid Fuels	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
1B.2. Oil and Natural Gas	0.8052	0.6831	0.6403	0.8361	0.6529	0.7399	0.7367	0.7059	0.6845	0.6545	0.7013
1C. CO_2 Transport and Storage	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

Abbreviations: NO – Not Occurring

The 1A1 "Energy Industries" contribute more than any other category to the Republic of Moldova's emissions under Energy Sector, accounting for circa 45.6 per cent of the total per sector in 2016 (58.2 per cent in 1990). Other relevant categories are represented by 1A3 "Transport" accounting for circa 24.0 per cent of the total per sector (12.2 per cent in 1990), 1A4 "Other Sectors", accounting for 18.3 per cent of the total (21.0 per cent in 1990) and 1A2 "Manufacturing Industries and Construction" accounting for circa 5.1 per cent of the total (6.0 per cent in 1990) (Figure 2-12).

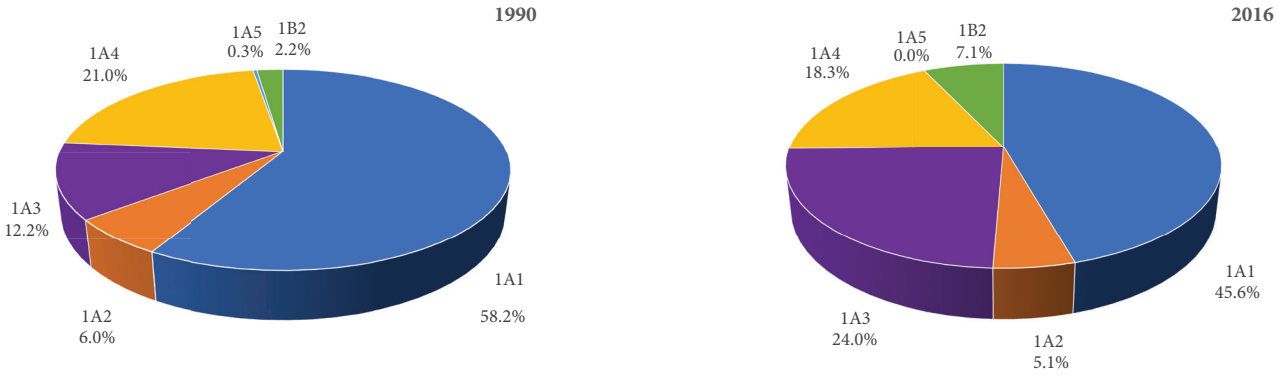


Figure 2-12: Energy Sector Greenhouse Gas Sources in the Republic of Moldova in 1990 and 2016.

Industrial Processes and Product Use Sector

The IPPU Sector represents an important GHG emission source in the Republic of Moldova that includes emissions generated by non-energy industrial activities. In 2016, this sector accounted for circa 5.2 per cent of the total national GHG emissions (3.5 per cent in 1990). During 1990-2016 time periods, total sectoral GHG emissions decreased by 51.5 per cent: from circa 1.6 Mt CO_2 equivalent in 1990 to circa 0.8 Mt CO_2 equivalent in 2016 (Figure 2-13).

Between 2008 and 2009, the respective emissions decreased by 47.3 per cent as a consequence of the economic crises that significantly affected the industrial sector in the Republic of Moldova. Subsequently, in 2010-2014 time series, direct sectoral GHG emissions tended to increase slowly, in particular due to the increase in cement, lime, glass, steel production, as well as due to the increased use of halocarbons. Between 2015 and 2016, total GHG emissions from this sector decreased by 2.8 per cent (Table 2-12).

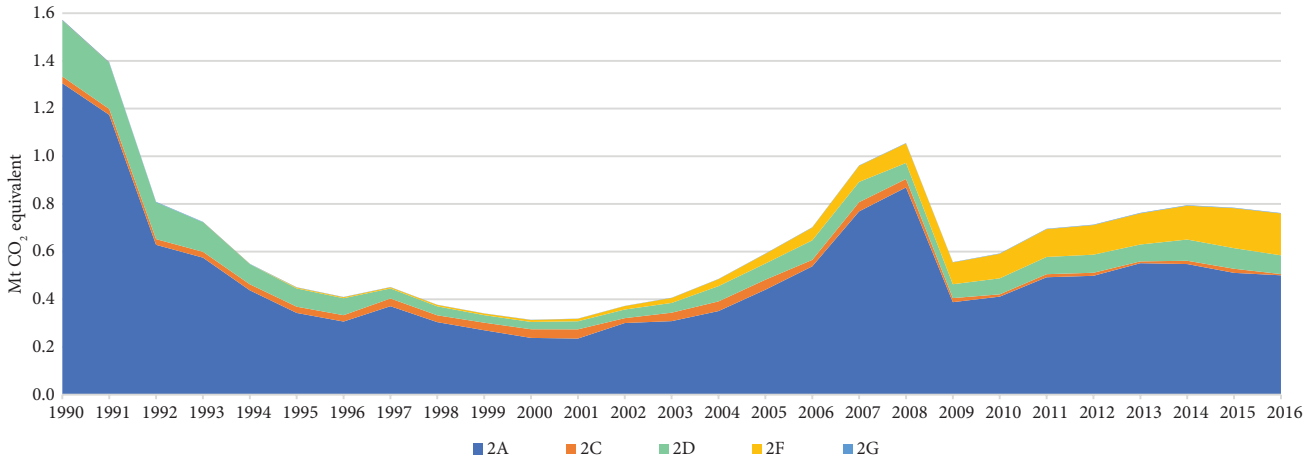


Figure 2-13: Total GHG Emissions from IPPU in the Republic of Moldova within 1990-2016 periods.

Table 2-12: Direct GHG Emissions from IPPU Sector within 1990-2016, Mt CO_2 equivalent

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
2. Industrial Processes and Product Use	**1.5723**	**0.4505**	**0.3141**	**0.5919**	**0.5923**	**0.6960**	**0.7132**	**0.7626**	**0.7949**	**0.7842**	**0.7619**
A. Mineral Industry	1.3062	0.3427	0.2380	0.4402	0.4111	0.4924	0.4986	0.5513	0.5478	0.5108	0.5006
B. Chemical Industry	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
C. Metal Industry	0.0285	0.0262	0.0363	0.0419	0.0097	0.0129	0.0127	0.0077	0.0138	0.0173	0.0052
D. Non-energy Products from Fuels and Solvent Use	0.2344	0.0766	0.0306	0.0678	0.0671	0.0723	0.0759	0.0709	0.0890	0.0864	0.0786
E. Electronic Industry	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
F. Product Uses as Substitutes for ODS	NO	0.0040	0.0083	0.0408	0.1029	0.1165	0.1242	0.1306	0.1421	0.1678	0.1756
G. Other Product Manufacture and Use	0.0032	0.0011	0.0009	0.0011	0.0016	0.0019	0.0019	0.0022	0.0021	0.0019	0.0019
H. Other	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Abbreviations: NA – Not Applicable; NO – Not Occurring

The most important source of emission in this sector is represented by 2A1 "Cement Production", with a share of circa 57.0 per cent of the total sectoral emissions in 2016 (61.8 per cent in 1990). Other relevant sources in 2016 were represented by 2F2 "Foam Blowing Agents" with a share of 13.8 per cent of the total, 2D3 "Solvent Use" – 9.3 per cent of the total (13.0 per cent in 1990), 2F1 „Refrigeration and Air Conditioning" – 9.3 per cent of the total, 2A3 „Glass Production" – 4.0 per cent of the total (1.6 per cent in 1990), 2A2 „Lime Production" – 2.8 per cent of the total (14.8 per cent in 1990) and 2A4 „Other Process Uses of Carbonates" – 2.0 per cent of the total (4.9 per cent in 1990) (Figure 2-14).

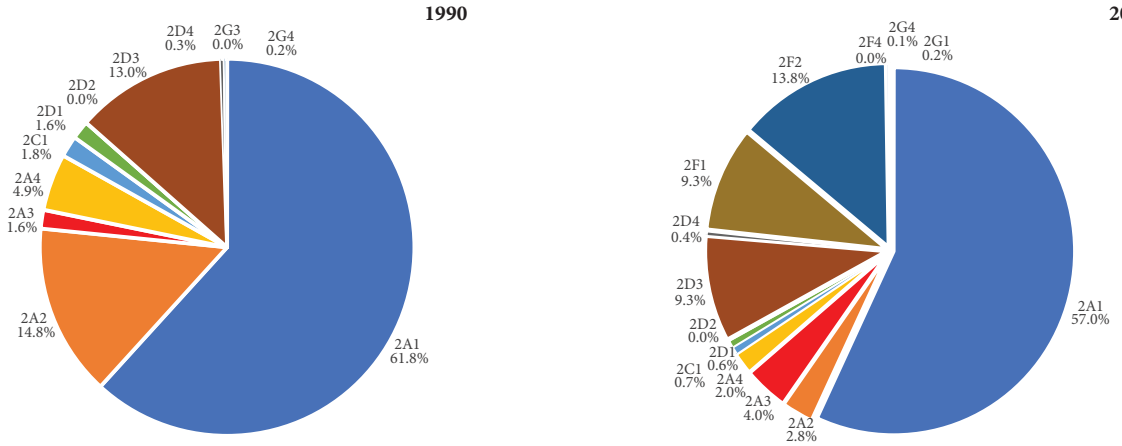


Figure 2-14: Breakdown of IPPU Sector GHG Emissions by Category in the RM in 1990 and 2016.

Agriculture Sector

The Agriculture Sector represents an important source of direct GHG emissions in the Republic of Moldova: CH_4 emissions, in particular from "Enteric fermentation" (category 3A) and "Manure management" (category 3B); N_2O emissions from "Manure management" (category 3B) and "Agricultural soils" (category 3D), respectively CO_2 emissions from "Urea application" (category 3H).

In the Republic of Moldova there are no registered emissions from 3C "Rice cultivation", 3E "Prescribed burning of savannas", 3G "Liming", 3I "Other carbon-containing fertilizers" and 3J "Other", as for the emissions from 3F "Field burning of agricultural residues", these are monitored in the LULUCF Sector, under the category 4B "Cropland".

In 2016, Agriculture Sector accounted for circa 16.7 per cent of the total national direct GHG emissions (11.6 per cent in 1990). Between 1990 and 2016, total GHG emissions originated from this sector decreased by circa 53.5 per cent: from 5.2 Mt CO_2 equivalent in 1990 to 2.4 Mt CO_2 equivalent in 2016 (Table 2-13), in particular, due to a sharp drop in such indicators as: domestic livestock and poultry population, amounts of synthetic nitrogen and organic fertilizers applied to soils, amounts of agricultural crop residues returned to soils, carbon losses from mineral soils and changes of tillage practices.

Table 2-13: Direct GHG Emissions from Agriculture Sector within 1990-2016, Mt CO_2 equivalent

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
3. Agriculture	**5.2206**	**3.6029**	**2.4808**	**2.5784**	**2.2550**	**2.2079**	**1.7601**	**2.2526**	**2.4923**	**2.0912**	**2.4285**
A. Enteric fermentation	2.1907	1.6207	1.0856	0.9265	0.7126	0.6710	0.6328	0.6433	0.6810	0.6534	0.6493
B. Manure management	1.6117	0.9392	0.5532	0.5575	0.5031	0.4614	0.4259	0.4018	0.4401	0.4270	0.4411
C. Rice cultivation	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
D. Agricultural soils	1.4176	1.0429	0.8415	1.0942	1.0376	1.0719	0.6958	1.2033	1.3610	0.9996	1.3259
E. Prescribed burning of savannas	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
F. Field burning of agricultural residues	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE
G. Liming	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
H. Urea application	0.0006	0.0001	0.0004	0.0002	0.0017	0.0037	0.0056	0.0042	0.0102	0.0112	0.0123
I. Other carbon-containing fertilizers	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
J. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO

Abbreviations: IE – Included Elsewhere; NO – Not Occurring.

Between 2015 and 2016, direct GHG emissions from Agriculture Sector increased by circa 16.1 per cent (Figure 2-15), in particular as a result of the increasing use of synthetic nitrogen fertilizers.

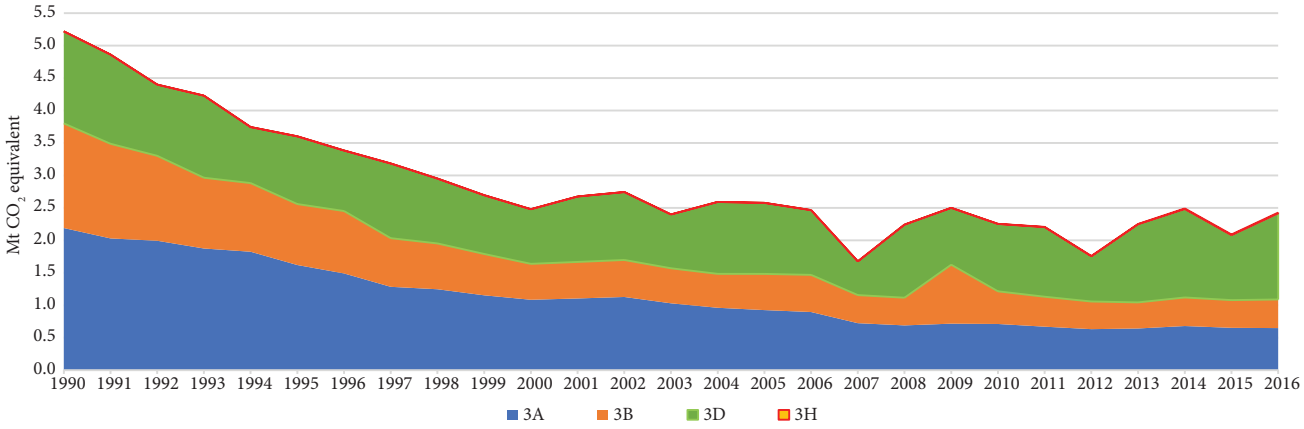


Figure 2-15: Total Direct GHG Emissions from Agriculture Sector in the Republic of Moldova within 1990-2016 periods.

In 2016, the largest source of emission was 3D "Agricultural Soils", accounting for circa 54.6 per cent of the total per sector (27.0 per cent in 1990) (Figure 2-16). Other relevant sources are represented by 3A "Enteric Fermentation" accounting for 26.7 per cent of the total (42.0 per cent in 1990) and 3B "Manure Management" accounting for circa 18.2 per cent of the total (30.9 per cent in 1990). The share of 3H "Urea Application" category is insignificant at the sectoral level.

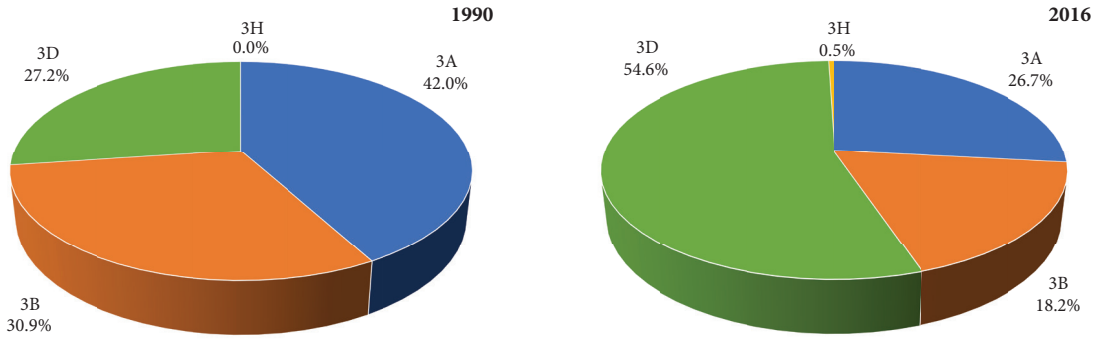


Figure 2-16: Breakdown of Agriculture Sector GHG Emissions by Category in the RM in 1990 and 2016.

Land Use, Land-Use Change and Forestry Sector

Between 1990 and 2016, the LULUCF Sector represented a sink of net carbon removals. Within the respective period, net CO_2 removals registered a decreasing trend, reducing by circa 39.8 per cent, from circa -1.53 Mt CO_2 equivalent recorded in 1990 to circa -0.92 Mt CO_2 equivalent in 2016 (Table 2-14, Figure 2-17).

Table 2-14: Emissions and Removals in LULUCF Sector within 1990-2016 periods, Mt CO_2 equivalent

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
4. LULUCF	**-1.5276**	**-1.8689**	**-1.8807**	**-1.4109**	**-0.9619**	**-0.9080**	**-0.9396**	**-0.8027**	**-0.4536**	**-0.9022**	**-0.9200**
A. Forest Land	-2.5631	-2.0451	-2.3074	-2.4095	-2.4840	-2.3904	-2.2929	-2.1405	-2.1346	-2.1584	-2.1130
B. Cropland	2.5218	1.4892	1.4690	1.5302	1.5389	1.4934	1.4968	1.4091	1.4466	1.3932	1.3941
C. Grassland	-1.2057	-1.6011	-1.2919	-1.0581	-0.6920	-0.6382	-0.5628	-0.3602	-0.3411	-0.4185	-0.4024
D. Wetlands	-0.5554	-0.4694	-0.3284	-0.1874	-0.0464	-0.0753	-0.0155	-0.1061	-0.1398	-0.0828	-0.0828
E. Settlements	0.2445	0.3504	0.3938	0.3385	0.3029	0.3131	0.2438	0.2297	0.2206	0.2282	0.1976
F. Other Land	0.1524	0.4011	0.1785	0.4165	0.4415	0.3937	0.1141	0.1035	0.4366	0.0868	0.0856
G. Harvested Wood Products	-0.1222	0.0060	0.0058	-0.0411	-0.0228	-0.0044	0.0768	0.0619	0.0580	0.0492	0.0009
H. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO

Abbreviations: IE – Included Elsewhere; NO – Not Occurring.

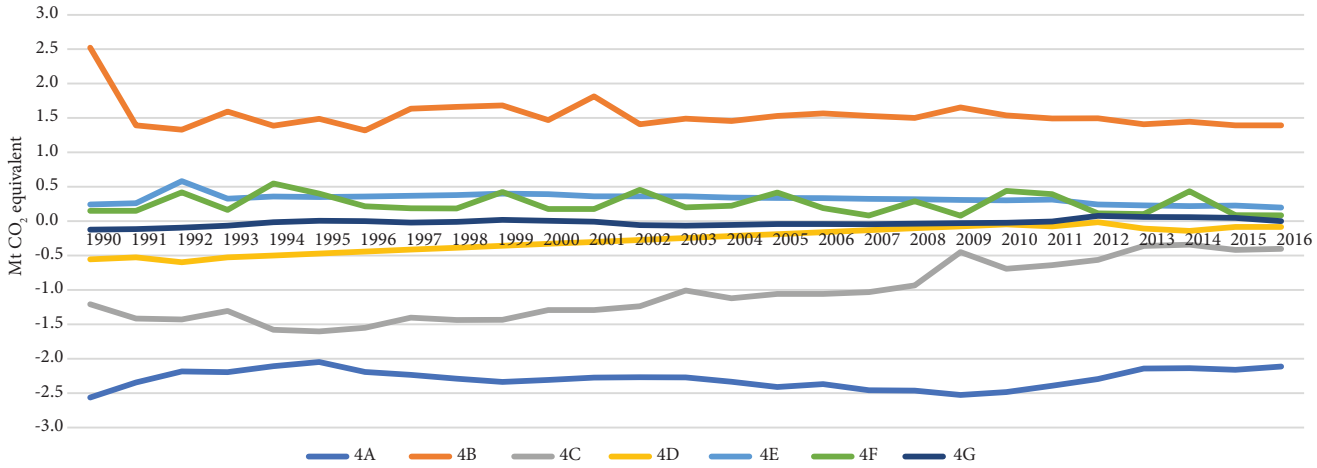


Figure 2-17: Direct GHG Emissions/Removals in LULUCF Sector by Source/Sink Categories within 1990-2016 periods.

This situation can be explained, in particular, due to changes in the use and management of agricultural soils (category 4B), that contributed to the substantial decrease of organic carbon from the agricultural soils[54], thus changing the humus balance from a positive one to a negative and/or profoundly negative balance. This process was also influenced by some changes in the maintenance and use of forests (category 4A), authorized increased amounts of harvested wood, substantial increase of illegal felling, increased conversion of cropland into forest land etc.

In the Republic of Moldova, in 2016, the largest source of carbon removals under LULUCF Sector was 4A „Forest Land" (forests, protective forests etc.) accounting for 49.4 per cent (34.8 per cent in 1990), followed by 4C „Grassland" accounting for circa 9.4 per cent of the total (16.4 per cent in 1990) and 4D „Wetlands" accounting for circa 1.9 per cent of the total (7.5 per cent in 1990). Category 4B „Cropland" represents a net source of emissions under LULUCF Sector, accounting in 2016 for 32.6 per cent of the total net removals/emissions within the respective sector (34.2 per cent in 1990) (Figure 2-18).

[54] The organic carbon and nitrogen in soil are highly dependent within the humus content in soil; carbon losses through the oxidation process due to changes in the use and management of agricultural soils are accompanied by the simultaneous mineralization (biochemical decomposition) of nitrogen.

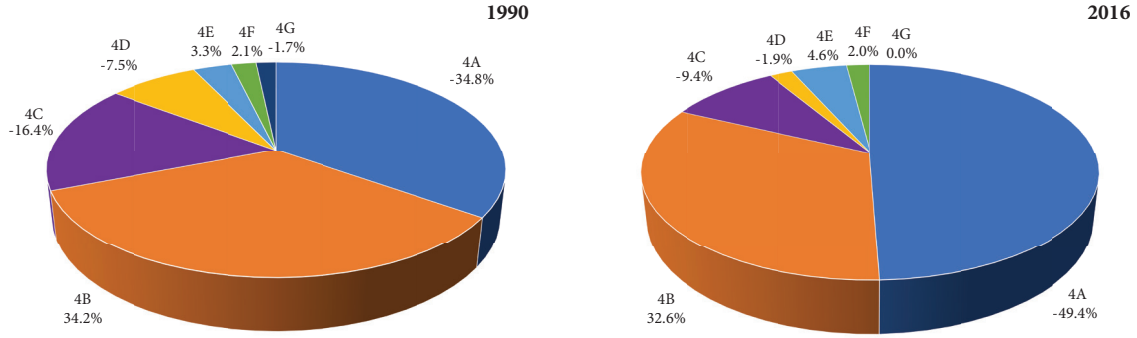


Figure 2-18: Breakdown of GHG Emissions and Removals by Source and Sink Categories in LULUCF Sector in 1990 and 2016.

Waste Sector

Waste Sector is an important source of GHG emissions in the Republic of Moldova: CO_2 emissions from "Incineration and Open Burning of Waste" (category 5C), methane emissions from "Solid Waste Disposal" (category 5A), "Incineration and Open Burning of Waste" (category 5C) and "Wastewater Treatment and Discharge" (category 5D), respectively N_2O emissions from "Incineration and Open Burning of Waste" (category 5C) and "Wastewater Treatment and Discharge" (human manure) (category 5D). At the moment, in RM there are no any emissions registered in 5B "Biological Treatment of Solid Waste" and 5E "Other" categories.

In 2016, Waste Sector accounted for circa 10.0 per cent of the total national direct GHG emissions (3.4 per cent in 1990). Within 1990-2016 time periods, total GHG emissions from this sector decreased by circa 3.6 per cent: from 1.52 Mt CO_2 equivalent in 1990 to 1.46 Mt CO_2 equivalent in 2016 (Table 2-15). Between 2015 and 2016, direct GHG emissions from this sector increased by circa 2.0 per cent.

Table 2-15: GHG Emissions from Waste Sector within 1990-2016 periods, Mt CO_2 equivalent

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
5. Waste	**1.5154**	**1.5947**	**1.5418**	**1.4288**	**1.4833**	**1.5009**	**1.4911**	**1.4376**	**1.4361**	**1.4313**	**1.4603**
A. Solid Waste Disposal	1.0467	1.2092	1.1695	1.0643	1.1378	1.1551	1.1436	1.0848	1.0831	1.0872	1.1152
B. Biological Treatment of Solid Waste	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
C. Incineration and Open Burning of Waste	0.0277	0.0277	0.0276	0.0256	0.0256	0.0257	0.0257	0.0256	0.0256	0.0253	0.0250
D. Wastewater Treatment and Discharge	0.4409	0.3578	0.3446	0.3388	0.3198	0.3201	0.3218	0.3271	0.3274	0.3188	0.3201
E. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO

Abbreviations: NE – Not Estimated; NO – Not Occurring.

Reduction of total GHG emissions from the Waste Sector, in particular until 2000, could be explained by the economic decline that occurred in the Republic of Moldova during the respective period, by a significant drop in the wellbeing of population, and respectively, capacity to generate wastes. At the same time, starting with 2006, there has been a slight growing trend of direct GHG emissions from the "Waste Sector" (Figure 2-19).

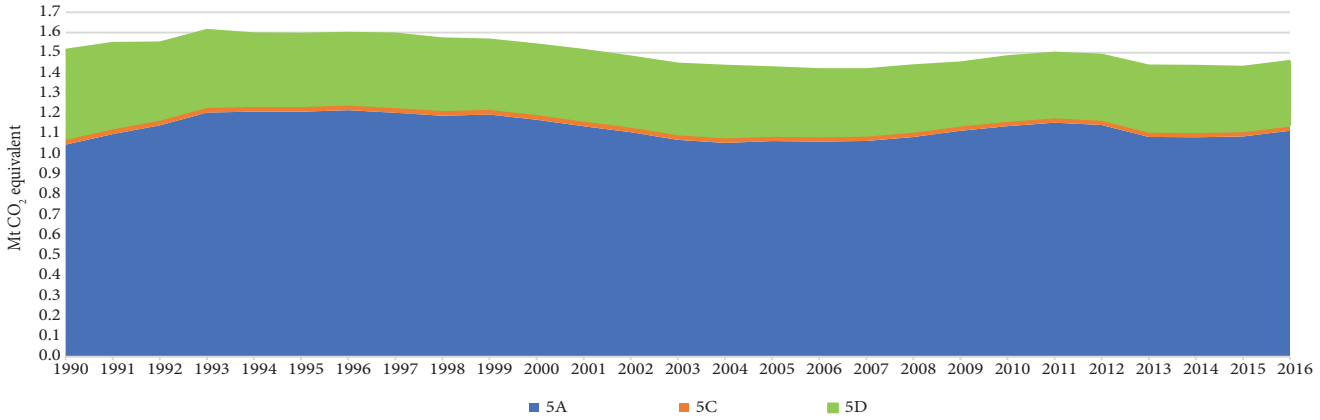


Figure 2-19: Total Waste Sector GHG Emissions Trends in the RM within 1990-2016 periods.

In 2016, the largest source of GHG emissions within the Waste Sector was 5A "Solid Waste Disposal", accounting for circa 76.4 per cent of the total sectoral emissions (69.1 per cent in 1990), followed by 5D "Wastewater Treatment and Discharge", accounting for circa 21.9 per cent of the total (29.1 per cent in 1990), respectively from category 5C "Incineration and Open Burning of Waste", with a share of circa 1.7 per cent of the total (1.8 per cent in 1990) (Fig. 2-20).

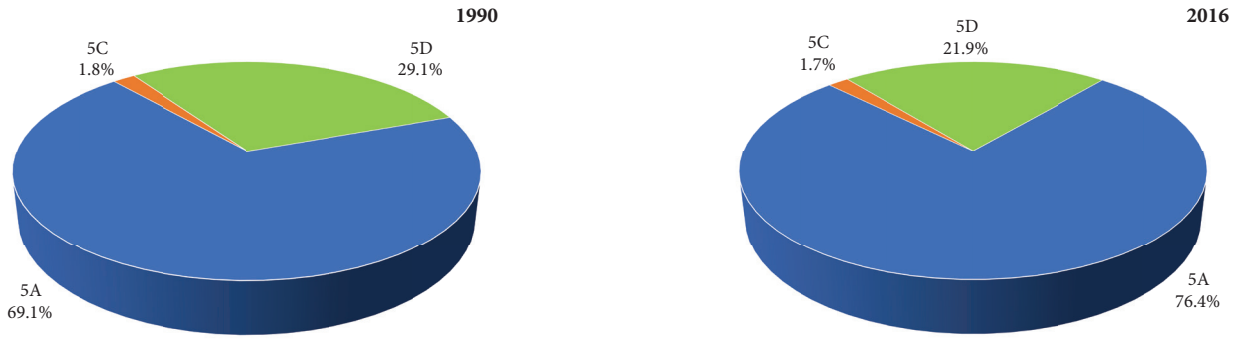


Figure 2-20: Breakdown of Waste Sector GHG Emissions by Category in the RM in 1990 and 2016.

2.5.4. Emission Trends for Ozone and Aerosol Precursors

Though not considered greenhouse gases, photochemically active gases like carbon monoxide (CO), nitrogen oxides (NO_x) and non-methane volatile organic compounds (NMVOC), have an indirect global warming effect. These gases are considered as ozone precursors influencing the formation and destruction of tropospheric and stratospheric ozone. In particular, they are emitted from transportation, fossil fuel combustion, consumption of solvents and other household products, etc. Thus, the national GHG inventory of the Republic of Moldova includes emissions of the following ozone and aerosol precursors: NOx, CO, NMVOC and SO_2.

Between 1990 and 2016, total nitrogen oxides emissions decreased by circa 74.7 per cent: from 94.9 kt in 1990 to 24.0 kt in 2016, total carbon monoxide emissions decreased by circa 68.1 per cent: from 279.8 kt in 1990, to 89.3 kt in 2016, non-methane volatile organic compounds emissions decreased by circa 62.6 per cent: from 141.4 kt in 1990 to 52.9 kt in 2016, while sulphur dioxide emissions decreased by circa 92.3 per cent: from 157.1 kt in 1990 to 12.0 kt in 2016 (Table 2-16).

Table 2-16: Ozone and Aerosol Precursors (NO_x, CO and NMVOC) and SO_2 Emission Trends in the RM within 1990-2016 periods, kt

	1990	1991	1992	1993	1994	1995	1996	1997	1998
NO_x	94.8503	83.6784	61.5984	49.3910	37.5579	31.7755	29.6012	26.5722	22.3525
CO	279.8219	262.9974	144.6734	67.9779	73.8756	63.8267	77.1933	71.0192	54.7183
NMVOC	141.4089	120.3062	91.5110	70.7995	52.0801	48.9688	47.0827	32.2721	28.2124
SO_2	157.0987	142.3319	102.2872	75.3756	59.9048	34.4348	34.2863	19.0834	14.3869
	1999	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
NO_x	17.2357	15.9945	17.3397	18.1234	19.0540	20.3723	21.1615	20.2740	21.1621
CO	42.4575	40.5859	39.6065	45.7546	55.7082	52.6429	54.3501	55.0501	49.5847
NMVOC	22.3883	21.9813	23.3836	26.0647	28.5055	40.4511	43.0595	48.1839	48.3704
SO_2	11.4081	9.8641	9.3435	10.3207	11.8437	11.1920	10.9930	10.9383	9.7668
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
NO_x	22.0226	21.1854	22.8056	23.3555	21.9438	20.9647	22.0749	23.4640	24.0397
CO	52.3105	50.4097	52.0155	55.6497	53.3805	55.3389	80.7555	86.4182	89.2990
NMVOC	42.1097	36.3792	40.8325	44.0445	45.6689	45.2815	57.7562	55.4304	52.8600
SO_2	11.5680	13.7619	12.8153	13.0829	11.4909	14.5122	12.0378	13.0690	12.0308

In 2016, the source categories having the biggest share in the total nitrogen oxides emissions in the Republic of Moldova were: 1A3 "Transport" (40.6 per cent of the total), 1A1 „Energy Industries" (29.9 per cent of the total), 1A4 „Other Sectors" (18.5 per cent of the total), 2A „Mineral Industry" (6.6 per cent of the total) and 1A2 „Manufacturing Industries and Constructions" (3.5 per cent of the total) (Figure 2-21).

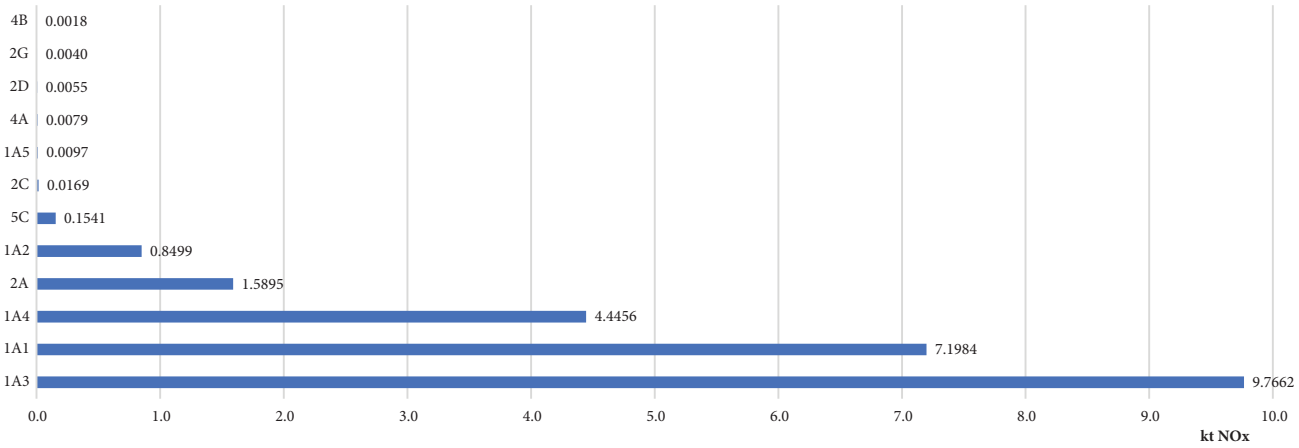


Figure 2-21: Source Categories of NO_x in the Republic of Moldova in 2016.

In 2016, the source categories having the biggest share in the total carbon monoxide emissions in the Republic of Moldova were: 1A4 „Other Sectors" (68.9 per cent of the total), 1A3 „Transport" (21.4 per cent of the total), 1A1 „Energy Industries" (3.1 per cent of the total), 5C „Incineration and Open Burning of Waste" (3.0 per cent of the total), 1A2 „Manufacturing Industries and Constructions" (1.4 per cent of the total) and 2A „Mineral Industry" (1.4 per cent of the total) (Figure 2-22).

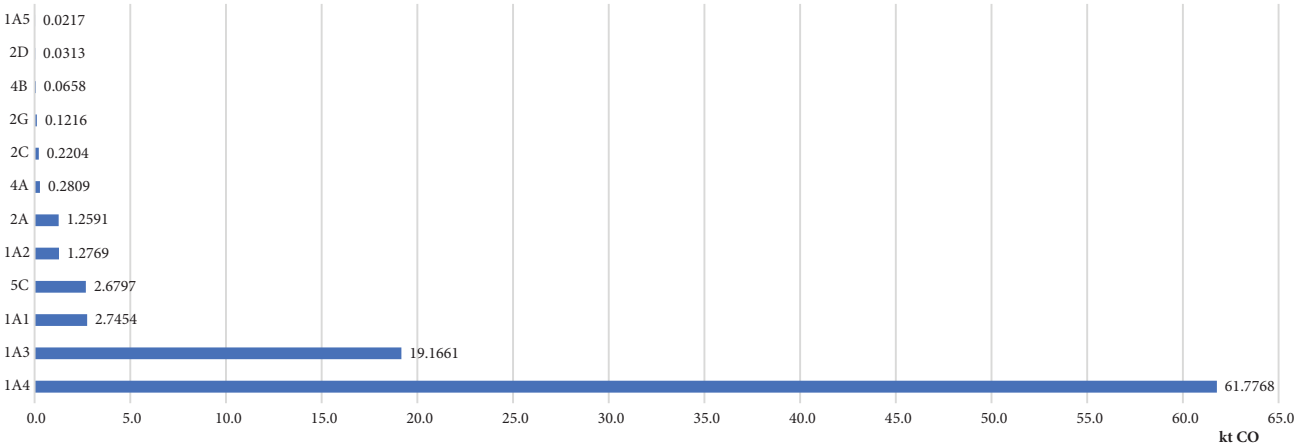


Figure 2-22: Source Categories of CO in the Republic of Moldova in 2016.

In 2016, the source categories having the biggest share in the total non-methane volatile organic compounds emissions in the RM were: 2D "Non-energy Products from Fuels and Solvent Use" (61.2 per cent of the total), 1A4 „Other Sectors" (17.4 per cent of the total), 2H „Other" (food and alcoholic beverages) (9.8 per cent of the total), 1A3 „Transport" (4.8 per cent of the total), 5A „Solid Waste Disposal" (3.8 per cent of the total), 1B2 „Fugitive Emissions from Oil and Natural Gas" (1.3 per cent of the total), 2G „Other Product Manufacture and Use" (0.6 per cent of the total), 1A2 „Manufacturing Industries and Constructions" (0.5 per cent of the total) and 1A1 „Energy Industries" (0.4 per cent of the total) (Figure 2-23).

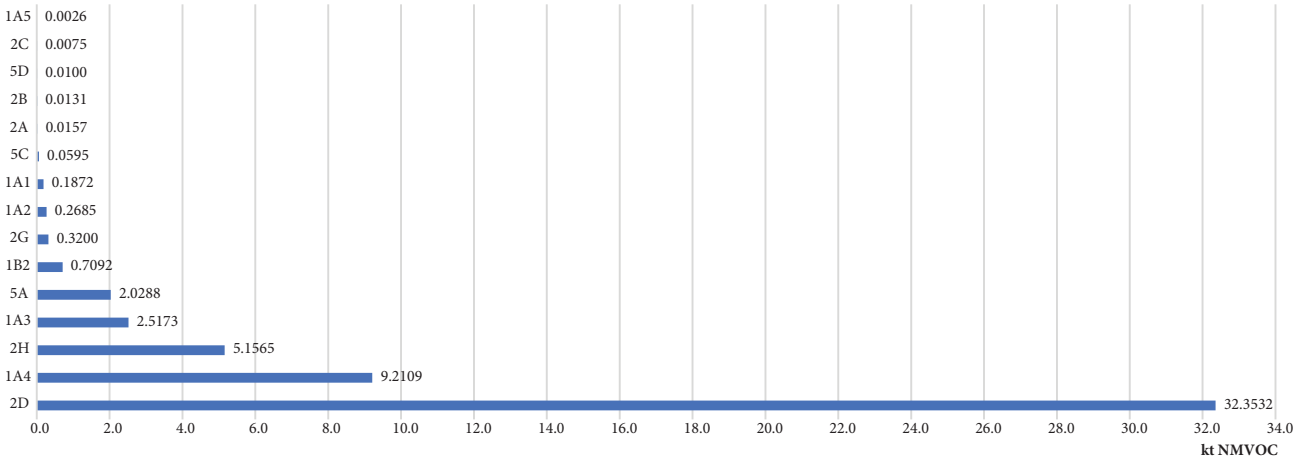


Figure 2-23: Source Categories of NMVOC in the Republic of Moldova in 2016.

In 2016, the source categories having the biggest share in the total sulphur dioxide emissions in the Republic of Moldova were: 1A1 „Energy Industries" (36.0 per cent of the total), 1A3 „Transport" (30.0 per cent of the total),1A4 „Other Sectors" (19.7 per cent of the total), 1A2 „Manufacturing Industries and Constructions" (8.6 per cent of the total) and 2A „Mineral Industry" (5.5 per cent of the total) (Figure 2-24).

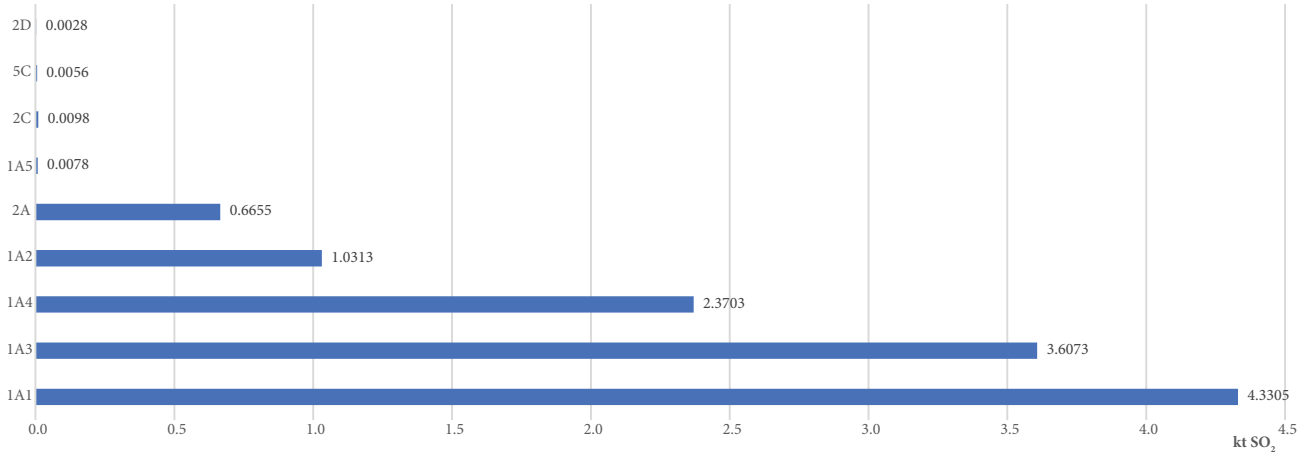


Figure 2-24: Source Categories of SO_2 in the Republic of Moldova in 2016.

CHAPTER 3. INFORMATION ON MITIGATION ACTIONS AND THEIR EFFECTS

3.1. Quantified Economy-Wide Emissions Targets

In September 2015, at the 21st Conference of Parties in Paris, the RM presented its ambitious targets for reducing GHG emissions by 2030, expressed in the Intended National Determined Contribution (INDC). The 21st Conference of the Parties approved and submitted for signing and ratification a new international treaty, which comes to take over the activities of the Kyoto Protocol and which has been named the Paris Agreement of the United Nations Framework Convention on Climate Change. This Agreement aims to strengthen the global response to the climate change threat in the context of sustainable development and poverty eradication efforts, including by:

- maintaining a global average temperature rise well below 2°C above pre-industrial levels and sustaining efforts to limit the temperature rise by 1.5°C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change;
- increasing the ability to adapt to the adverse climate change impacts and encouraging climate change resilience and low GHG emissions development in a way that does not threaten production; and
- harmonizing financial flows with evolution towards low GHG emissions and climate change-resilient development.

The Republic of Moldova signed the Paris Agreement on 21 September 2016 at the 71st session of the UN General Assembly and ratified it on 4 May 2017 (Law no. 78).[55] In accordance with the Regulation on the mechanism for the conclusion, enforcement and termination of international treaties, approved by the GD no. 442 of 17.07.2015 for the Republic of Moldova, this Agreement entered into force on 20 July 2017. Aiming at implementing the National Determined Contribution (NDC), on 24 March 2017 the Low Emissions Development Strategy of the Republic of Moldova until 2030 (LEDS) and the Action Plan for its Implementation[56] was published and came into force. Based on a study of the low carbon economic development constraints, this paper provides an integral vision over the change in Moldovan economic development paradigm in the medium and long term run towards a green economic development. The approach set out in the LEDS looks to increase financial coverage to promote adequate GHG mitigation policies in the national economy without compromising economic growth.

The overall objective of LEDS is the same as the one set out in the National Determined Contribution for the Paris Agreement.[57] According to this objective, the Republic of Moldova committed to achieve the unconditional target of 64-67% of GHG emissions reduction by 2030 relative to the reference year level (1990). The 64% reduction complies with the energy system development scenario under which the domestic electricity consumption can be fully covered by its own generation sources, while the 67% reduction implies the need for up to 30% electricity imports. The commitment to reduce GHG emissions could potentially increase to 78% provided the availability of low-cost financial resources, technology transfer and multilateral technical cooperation, accessed to the extent global climate change challenge.

The overall target until 2030 is supported by interim targets set for 2020 and 2025, including by sectors. The GHG emission reduction targets set in the LEDS for 2020 are in line with those planned in the 2014-2023 Environmental Strategy and the Action Plan for its Implementation[58], the second normative act of the Republic of Moldova expressly stating the state policy on combating greenhouse gas emissions. The LEDS interim targets provide for reducing total GHG emissions by at least 65% (by 2020) and 69% (by 2025), respectively, relative to 1990 levels. These targets can be enhanced with greater financial support through international mitigation mechanisms planned to be developed and approved within UNFCCC. The targets for 2030 and intermediate targets for each sector are shown in Tab. 3-1.

Table 3-1: GHG reduction targets by sector, %[59]

Sectors	Until 2020		Until 2025		Until 2030	
	Uncondi-tional	Condi-tional	Uncondi-tional	Condi-tional	Uncondi-tional	Condi-tional
Energy	78	82	76	82	71-74	82
Transport	49	56	41	48	30	40
Buildings	78	79	79	81	77	80
Industry	58	62	51	59	45	56
Agriculture	48	50	43	45	37	41
LULUCF	12	18	43	54	62	76
Waste	23	26	46	51	38	47
TOTAL	65	71	69	76	64-67	78

LEDS will enable the Republic of Moldova to adjust its development path towards a low-carbon economy and achieve green sustainable development based on the country's socio-economic and development priorities.

3.2. Activities related to Nationally Appropriate Mitigation Actions

Aiming at achieving overall and specific objectives of the LEDS, Nationally Appropriate Mitigation Actions (technologies and/or measures) were identified for each sector under review (Energy, Transport, Buildings, Industry, Agriculture, LULUCF and Waste), prioritized by applying Multicriteria Decision Analysis.

[55] <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=370323>
[56] The Low-Emission Development Strategy of the Republic of Moldova until 2030 and the Action Plan for its implementation. GD no. 1470 of December 30, 2016. Official Gazette 2017, no. 85-91.
[57] <www.clima.md>
[58] The Environmental Strategy for 2014-2023 and the Action Plan for its implementation. GD no. 301 of April 24, 2014. Official Gazette 2014, no. 104-109, art. 328.
[59] According to LEDS.

Actions were divided into three categories:

1. Unilateral: Mitigation actions undertaken by the country on its own account;
2. Supported: mitigation actions supported by funding, technology transfer and capacity building by the UNFCCC Annex I countries; and
3. Credited: mitigation actions that can generate credits for the carbon market.

According to the LEDS, the NDC unconditional target can be achieved by implementation of 44 NAMAs, while the conditional target – by implementation of 22 NAMAs, 12 of which are registered in the UNFCCC's NAMA Register[60]. The list of supported NAMA registered in the UNFCCC's NAMA Register is provided in Annex 3 to this Report. The largest contribution towards the NDC conditional target is expected to be accomplished through the financial mechanisms of the Paris Agreement, including the Green Climate Fund (GCF). Starting February 2018, the RM is developing the GCF Country Program. This activity is carried out within the framework of the project "Support to the Republic of Moldova in establishment and strengthening the NDA, development of strategic framework, and preparation of country programme". In an aggregated form, the measures identified to achieve the NDC targets are presented in Annex 2 to this Report, set out in the format specified in Annex III of the Decision 2/CP.17 of the Conference of the Parties in Durban. The financial, technological transfer and capacity building needs for achieving the NDC targets are fully reflected in Chapter 5 of this Report.

3.3. Clean Development Mechanism of the Kyoto Protocol

With Measures (WM) and With Additional Measures (WAM) scenarios described in more detail in Chapter 4 of the NC4 of the RM under the UNFCCC, shows that the RM is on track to meet its commitments made at the COP 21 in December 2015 in Paris, set out in the National Determined Contribution for the Paris Agreement, the objectives of which are specified above. According to the NDC document, the RM acknowledged that the Clean Development Mechanism (CDM) of the Kyoto Protocol contributes and could further play a significant role in accomplishing the undertaken commitments.

Aiming at capitalizing on the GHG emissions reduction potential through the CDM of the Kyoto Protocol and the new Paris Climate Agreement, the necessary institutions, regulatory and information frameworks have been set up in the country. Thus, the National Designated Authority[61] under the Clean Development Mechanism of the Kyoto Protocol, tasked to implement the UNFCCC provisions as well as the mechanisms and provisions of the Kyoto Protocol, has been established under the Ministry of Agriculture, Regional Development and Environment (MARDE).

Two institutions are effectively involved in promoting projects under the Clean Development Mechanism of the Kyoto Protocol:

- The Climate Change Office by the Ministry of Agriculture, Regional Development and Environment, which is the knowledge center in the field of policy analysis and national GHG emissions assessment[62];
- The Carbon Finance Office by the Ministry of Agriculture, Regional Development and Environment which participates in some CDM projects implementation in the RM.

To date, 10 CDM project proposals have been made, of which eight were registered by the CDM Executive Committee[63].

The Republic of Moldova does not have a carbon trading market and there is no dedicated budget for carbon reductions. A feasibility study was carried out to assess the possibility of creating such a market [64]. The finding of the study was that implementation of the EU scheme for the trading the GHG emissions reductions in the RM will only be possible when the Republic of Moldova becomes part of the EU[65].

3.4. Economic Instruments

The contents of this chapter have not been altered compared to the same chapter of the NC4 of the RM under the UNFCCC (2018). At the same time, aiming at supporting the ecologically clean vehicles with a hybrid engine, an amendment was made to the Fiscal Code, whereby starting 01.01.2017 the excise tax for hybrid motor cars decreased by 50%.

3.5. Climate Change Mitigation Policies and Measures by Sectors

3.5.1. Energy Sector

Most of the policies of this sector set out in the NC4 of the Republic of Moldova to the UNFCCC (2018) are still current. Given the 74.6%[66] energy dependence on imported energy, the energy policies of the state are geared towards increasing energy security in two ways: in terms of energy production – by attracting renewable energy sources in the energy balance, and in terms of energy demand – by promoting energy efficiency. Thus, by 2020, 10% of energy demand is expected to be covered from own renewable sources[67], and energy efficiency is expected to improve by 8.2%[68]. Achieving these targets will obviously result in imminent corresponding GHG emissions reduction. The current legal framework aimed at achieving the set-out objectives covers mostly the whole range of regulations needed in this respect: from laws to action plans. The most important of these are listed below.

The Law on Promotion of the Use of Energy from Renewable Sources 10/2016, updated March 2018[69]

The Law creates the framework for the implementation of Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources. It aims to establish a legal framework for the promotion and use of renewable energy. The document defines the rules for support schemes, guarantees of origin, administrative procedures, access of renewable energy producers to the grid. The Law provides for at least 17% share of renewable energy in gross final consumption of energy by 2020 and at least 10% share of renewable energy in final energy consumption in transport.

[60] <http://www4.unfccc.int/sites/nama/SitePaGHG/NamaImplementation.aspx>
[61] Government Decision no. 1574 of 26.12.2003 on the establishment of the National Commission for Implementation of the climate change related Provisions of the United Nations Framework Convention on Climate Change, as well as the Kyoto Protocol mechanisms and provisions. Official Gazette no. 6-12 of 01.01.2004.
[62] <www.clima.md>
[63] <https://cdm.unfccc.int/Projects/projsearch.html> (click "Database for PAs and PoAs").
[64] <http://www.undp.org/content/dam/moldova/docs/Publications/ETS_Feasibility_Study_UNDP.pdf>
[65] <http://www.mfa.gov.md/img/docs/Annex_6_to_Progress_Report.pdf>
[66] Energy Balance of the Republic of Moldova. Statistical Yearbook 2016. National Bureau of Statistics of the Republic of Moldova. Chisinau, 2017.
[67] Official Gazette of the RM no 27-30 of 08.02.2013, Government Decision no. 102 of 05.02.2013 on the Energy Strategy of the Republic of Moldova until 2030.
[68] Official Gazette of the RM no. 68-76 of 02.03.18, Government Decision no. 160 of 21.02.2018 on promoting the Green Economy Program in the Republic of Moldova for the years 2018-2020 and the Action Plan for its implementation.
[69] Official Gazette of the RM no. 69-77 / 117 of 25.03.2016, Parliament of the Republic of Moldova. Law no. 10 of 26.02.2016 on the Promotion of the Use of Energy from Renewable Sources.

It is important to emphasize that the support scheme for renewable energy proposed by investors – the ceiling price auctions looking at the lowest price and the most advanced technologies, has been approved, requiring suppliers to purchase the entire amount of energy produced by the eligible renewable electricity producer for a period of 15 years.

GHG concerned: CO_2, CH_4, N_2O
Category of the measure: regulatory and economic
Status: effective since 2018
Considered in: With Additional Measures (WAM) Scenario

The Program Promoting the Green Economy in the Republic of Moldova for the years 2018-2020 and the Action Plan for its Implementation, GD no.160/2018[70]

The Program integrates the priorities of promoting the green economy according to the Final Declaration of the United Nations Conference on Sustainable Development "The Future We Want" (Rio de Janeiro, 20-22 June 2012) and the provisions of the National Development Strategy "Moldova 2020", approved by the Law no. 166 of 11 July 2012. The aim of the Program is to promote the implementation of the green economy principles in the Republic of Moldova in harmony with economic development and social welfare. The implementation of the Program will ensure the development of the necessary capacities of all those involved in the planning activities provided the following specific objectives are implemented by 2020:

1) ensuring the conditions for good governance and strengthening the institutional and management potential of promoting the "green" economy by 30% nation-wide;
2) ensure the promotion of measures aimed at implementing the green economy principles so that 17% of gross final consumption of energy would be covered by renewable sources and energy efficiency would be improved by 8.2%;
3) ensure the green development of about 30% small and medium enterprises by adequately supporting implementation of the green economy principles;
4) ensure the promotion of organic farming by implementing green economy principles and extending the area of farmlands used for organic farming by about 20%;
5) reduce air pollution by 30% by developing sustainable transport;
6) ensure promotion of measures aimed at implementing the "green" economy principles in construction by 15%;
7) ensure implementation of the resource efficiency and cleaner production principles in about 30% of enterprises and organizations;
8) ensure at least 15% of all public procurement comply with sustainable procurement criteria;
9) increase the level of knowledge about green economy and sustainable development among students by at least 30%;
10) raise public awareness of the green economy and sustainable development by at least 30%;
11) create a "green" growth indicator monitoring system.

GHG concerned: CO_2, CH_4, N_2O
Category of the measure: planning
Status: effective since 2 March 2018
Considered in: With Additional Measures (WAM) Scenario

[70] Official Gazette no. 68-76 of 02.03.2018. GD no. 160 of February 21, 2018 regarding the approval of the "green" economy promotion program in the Republic of Moldova for the years 2018-2020 and the Action Plan for its implementation.

Energy Roadmaps for the 2015-2030, GD no. 409/2015[71]

The energy roadmaps include the Roadmap for the Electricity Sector of the Republic of Moldova and the Roadmap for the Natural Gas Sector of the Republic of Moldova. The objective of the Roadmaps for the electricity and natural gas sectors in the Republic of Moldova is to create the normative, institutional and organizational framework in the electricity and natural gas sector, as well as to ensure the security of the electricity and natural gas supply as a result of achieving the specific objectives stipulated in the Energy Strategy of the Republic of Moldova until 2030, approved by the Government Decision no. 102 of 5 February 2013. The Roadmaps also identify work packages, tasks and specific actions, assign responsibilities among key stakeholders, assess the terms associated with the proposed actions, assess the type of costs and quantify the indicative costs of the most important investment projects.

GHG concerned: CO_2, CH_4, N_2O
Category of the measure: regulatory and economic
Status: effective since 2015
Considered in: With Measures (WM) Scenario

Energy Efficiency Law no.142/2010[72]

The purpose of the law is to regulate activities aimed at reducing energy intensity in the national economy and to diminish the negative impact of the energy sector on the environment. The Law is aimed at creating energy efficiency improvement prerequisites, including by establishing and supporting the structures involved in the developing and implementing programs, plans, energy services, other energy efficiency measures. The Law establishes basic energy efficiency principles; the public authority in the field of energy efficiency and its duties; framework principles on energy efficiency programs and action plans, etc.

The basic principles of the energy efficiency are:

a) promoting energy efficiency by supporting energy efficiency improvement programs that provide for the implementation of energy efficient technologies such as cogeneration and trigeneration, distribution, transport and energy and fuel consumption by introducing energy efficiency standards for installations, buildings, appliances and equipment, and by overseeing compliance with these standards;
b) promoting private initiative and developing energy service companies to help optimize the operation of energy systems based on energy performance contracts;
c) monitoring by the State, through the competent authority, of the evolution of the overall energy consumption per economy, including per unit of product;
d) supporting cooperation between producers, carriers, distributors, suppliers and energy consumers in order to reconcile their interests and the achievement of the state energy efficiency policy objectives;
e) cooperation with other countries to promote state-of-the-art technologies, implement scientific achievements and best practices in the field of energy use;
f) providing information support to energy efficiency activities, including public information on the initiation, deployment, benefits and costs of projects aimed at significant reduction of energy intensity, impact on the environment;

[71] Official Gazette no. 177-184 of 10.07.2015. GD no. 409 of 16.06.2015 on Energy Road Map for the period 2015-2030.
[72] Official Gazette of the RM no. 155-158 of 03.09.2010, Parliament of the RM. Law no. 142 of 02.07.2010 on Energy Efficiency.

g) training of all levels decision makers to identify and implement energy efficiency measures;

h) raising awareness and engaging civil society in decision-making processes and implementation of energy efficiency improvement measures.

The National Energy Efficiency Action Plan, developed in accordance with the National Program, is approved by Government Decision for a period of 3 years.

GHG concerned: CO_2, CH_4, N_2O
Category of the measure: regulation
Status: effective since 2010
Considered in: With Measures (WM) Scenario

National Energy Efficiency Program for 2011-2020, GD no. 833/2011[73]

The Program sets out the priority policies and actions to be implemented in 2011-2020 to meet the challenges of rising energy prices, dependence on energy imports and the impact of the energy sector on climate change. The Program will be supported by National Energy Efficiency Action Plans, adopted every three years.

In order to reduce dependence on the imported energy resources and the impact of the energy sector on climate change, the Program looks at the following global objectives for the Republic of Moldova, related to the base year 2009:

- making primary energy consumption more efficient by 20% by 2020;
- increasing the share of renewable energy in the total energy mix from 6% in 2010 to 20% in 2020;
- increasing the share of biofuels to at least 10% of all fuels used in 2020;
- reducing GHG emissions by at least 25% by 2020 compared to the base year 1990.

The Program also sets specific targets for energy efficiency improvement as follows:

a) promoting cogeneration, as a more efficient mode than production of electricity and heat separately; the overall efficiency of the new, combined heat and power plants shall not be less than 80%, and power only efficiency – 45-50%;

b) revising the Concept of the Republican Heat Supply System, approved by the Government Decision no. 189 of February 20, 2003, to give priority to electricity production from cogeneration, use of renewable energy sources potential and use of the existing heat supply system (accomplished);

c) reducing distribution networks losses from 13% in 2011 to 7-10% in 2020, which requires annual reduction of losses by 0.52%-0.82%;

d) metering natural gas consumption at 100% rate by 2020;

e) certification of the energy performance of buildings;

f) increasing the number of buildings with "almost zero" energy consumption; as of 31 December 2018, new buildings used and owned by public authorities shall be zero consumption buildings;

g) training of energy managers to monitor consumption in the public sector;

h) developing by the local public administration authorities of their own energy efficiency plans every three years;

i) drafting a national program for the development of heat distribution networks to be implemented by all distribution companies, regardless of the form of ownership, as established in the Energy Strategy of the Republic of Moldova until 2030;

j) setting energy and environmental performance standards for the energy-consuming products used by the end-users;

k) developing and approving the Law on Heat, as well as of the secondary legislation framework for its implementation (accomplished);

l) continuing and finalizing by 2016, the installation of the heat measuring equipment for 100% of buildings in the Republic of Moldova;

m) amending, in 2012 of the regulatory frameworks governing the relationships between the heating service providers and final consumers;

n) introducing in 2012 of inspection of individual and building boilers;

o) providing by 2012, mechanisms to finance heating, cooling and hot water heating installations based on renewable energy;

p) drafting and adopting the draft law on the energy performance of buildings, as well as regulations on energy performance of buildings and periodic inspection of boilers and heating systems (accomplished);

q) developing an energy efficiency program for the industrial sector.

The economic impact expected from the implementation of the Program aims at achieving the following targets, as compared to the base year 2009 and taking into account the increase in energy consumption by 2020, calculated based on the last five years trends:

a) the national energy saving target:

in line with the European Union's energy efficiency objectives and based on Moldova's commitments to align with the *Acquis Communautaire*, the Program sets the national target of 20% long-term energy savings by 2020, which makes 14,167.857 TJ and will contribute to reducing GHG emissions by 761,498.7 tons CO_2 eq;

b) the interim energy-saving target:

the interim energy savings target will be reached by 2016, is set at 9%, equivalent to 6,021.350 TJ and will contribute to reducing GHG emissions by 323,637.5 tons of CO_2eq;

c) the annual energy savings target is set at 1.8%, as compared to the base year 2009.

GHG concerned: CO_2, CH_4, N_2O
Category of the measure: regulation
Status: effective since 2011
Considered in: With Measures (WM) Scenario

Moldova 2020 National Development Strategy: 8 solutions for economic growth and poverty reduction. Law no. 166/2012, amended by the Law no. 121/2014[74]

One of the 8 solutions of the Strategy concern the energy sector: "Energy: secure supply, efficient use". The strategic vision for the development of the energy sector is based on the following pillars: (i) energy security of the country and (ii) energy efficiency. For the latter, mainly the following is planned to be achieved by 2020: reducing energy intensity by 10%; 20% of energy demand to be covered from RES; reducing GHG emissions by 25% (compared to 1990).

[73] <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=340940>

[74] <http://lex.justice.md/index.php?action=view&view=doc&id=345635>

GHG concerned: CO_2, CH_4, N_2O
Category of the measure: regulatory and economic
Status: effective since 2012, amended in 2014
Considered in: With Measures (WM) Scenario

Energy Strategy of the Republic of Moldova until 2030, GD no. 102/2013[75]

The document provides concrete benchmarks for the energy sector development in the Republic of Moldova, including in the field of energy efficiency and renewable energy sources, and its objectives match the National Development Strategy "Moldova 2020". The Strategy has three main objectives: security of energy supply, under the circumstances when the country is importing about 74.6%[76] of the necessary energy resources; developing competitive markets and their regional and European integration; environmental sustainability and combating climate change. Under the "Environmental sustainability and climate change", it is intended to increase energy efficiency and use of renewable energy sources - by creating a modern regulatory framework.

The targets set for the period until 2020 are:

- reducing energy intensity by 20% by 2020;
- reducing losses in transmission and distribution networks: up to 11% for electricity, by 39% for natural gas, and by 5% for thermal energy by 2020;
- reducing GHG emissions by 25% by 2020;
- reducing energy consumption in buildings by 20% by 2020;
- renovation of 10% public buildings by 2020;
- reaching the annual 10% share of electricity generation from renewable energy sources by 2020;
- ensuring 10% share of biofuels in the total fuel mix by 2020.

GHG concerned: CO_2, CH_4, N_2O
Category of the measure: regulatory and economic
Status: effective since 2013
Considered in: With Measures (WM) Scenario

National Action Plan on Renewable Energy Sources for 2013-2020, GD no. 1073/2013[77]

The Energy Strategy until 2030, with its global target for consumption of energy from renewable sources for 2020, harmonized the provisions of current Moldovan legislation providing for 20% of energy consumption covered from renewable sources, with sectoral targets of 10% for electricity and 10% for energy used in transport, and 27% of energy consumed for heating and cooling as renewable energy. The overall renewable energy target of 17% and the 10% target of renewable energy in transports are the commitments of the Republic of Moldova resulting from its status of the Energy Community party, established by the Decision D/2012/04/MC-EnC Ministerial Council of the Energy Community.

GHG concerned: CO_2, CH_4, N_2O
Category of the measure: regulation
Status: effective since 2013
Considered in: With Measures (WM) Scenario

Law on Heat and Promotion of Cogeneration no. 92/2014[78]

The Law regulates the activities carried out in the heat and power sector; establishes the principles and objectives of state policy in the district heating systems; management by the state of the heating sector; mitigation of the negative impact of the heat sector on the environment; establishes and approves the regulated tariffs for heat; licensing activities in the thermal power sector, etc. Among the most important objectives of the law are:

- promoting production of heat in cogeneration mode;
- ensuring the security, quality and reliability of heat supply;
- accessibility of tariffs for heat consumers;
- promotion of district heating systems;
- the efficient use of energy resources and mitigation of its impact on the environment.

GHG concerned: CO_2, CH_4, N_2O
Category of the measure: regulatory and economic
Status: effective since 2014
Considered in: With Measures (WM) Scenario

The Law on the Energy Performance of Buildings no. 128/2014, amended by the Law no.160/2016[79]

The Law promotes improvement of energy performance of buildings and establishes requirements towards: the general methodology for calculation of energy performance of buildings and units thereof; compliance with minimum energy performance requirements for buildings; certification of the energy performance of buildings; periodic inspection of the heating system and of the air conditioning system in buildings; respective monitoring systems, etc. After 30 June 2019, new public buildings should be almost zero energy consumption buildings.

Certification of the energy performance of buildings is mandatory for:

a) new buildings and units thereof;
b) the existing buildings and units thereof which are put up for sale or for lease, with the exceptions set out in paragraph (3);
c) existing public buildings with a total useful area over 500 m^2. Starting September 30, 2016, the threshold of 500 m^2 shall be reduced to 250 m^2;
d) existing buildings frequently visited by the public, with a total useful area of over 500 m^2. Starting September 30, 2016, the threshold of 500 m^2 shall be reduced to 250 m^2;
e) existing buildings and their units undergoing major renovation;
f) existing public buildings that have an energy performance certificate and have undergone changes (reconstructions, extensions, upgrades, etc.) that have significantly influenced their energy performance.

GHG concerned: CO_2, CH_4, N_2O
Category of the measure: regulation
Status: effective since 2015
Considered in: With Measures (WM) Scenario

The Law on Energy Labeling no. 44/2014[80]

The Law sets the regulatory framework for some national measures on energy labeling and standard product information for end-users, in particular on energy consumption and, where appropriate, other essential resources use, and additional energy-related information about products.

[75] <http://lex.justice.md/md/346670/>
[76] Energy Balance of the Republic of Moldova Statistical Yearbook 2016. National Bureau of Statistics of the Republic of Moldova. Chisinau, 2017.
[77] Decision no. 1073 of 27.12.2013 on the approval of the National Action Plan on Renewable Energy for 2013-2020. Published on 10.01.2014 in the Official Gazette no. 4-8 art. 1. <http://lex.justice.md/viewdoc.php?action=view&view=doc&id=351034&lang=1>
[78] Law no. 92 of 29.05.2014 on Heat and Cogeneration. Published: 11.07.2014 in the Official Gazette no. 178-184. <Http://lex.justice.md/viewdoc.php?action=view&view=doc&id=353698&lang=1>
[79] Law no. 128 of 11.07.2014 on Energy Performance of Buildings. Published on 10.10.2014 in the Official Gazette no. 297-309 art. 609 Date of entry into force: 01.01.2015. <http://lex.justice.md/viewdoc.php?action=-view&view=doc&id=354929&lang=1>
[80] Law no. 44 of 27.03.2014 on Energy Labelling. Published: 25.04.2014 in the Official Gazette no. 99-102 <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=352631>

GHG concerned: CO_2, CH_4, N_2O
Category of the measure: regulation
Status: effective since 2014
Considered in: With Measures (WM) Scenario

Establishment of the Energy Efficiency Fund, GD no. 401/2012[81]

Government Decision no. 401/2012 provides for the Regulation on organization and operation of the Energy Efficiency Fund. The objective of the Fund is to attract and manage financial resources to finance and implement energy efficiency and renewable energy projects in line with the strategies and programs developed by the Government of the Republic of Moldova. For year 2018, 50 million MDL were earmarked in the state budget for the Energy Efficiency Fund[82].

GHG concerned: CO_2, CH_4, N_2O
Category of the measure: economic
Status: effective since 2012
Considered in: With Measures (WM) Scenario

National Action Plan for implementing the Moldova-EU Association Agreement 2017-2019, GD no.1472/2016, amended by GD no.1089/2017[83]

In the field of energy, cooperation includes the following objectives: developing energy strategies and policies, promoting energy efficiency and energy saving, inter alia with reference to energy performance of buildings, as well as developing and supporting renewable energy sources economically and ecologically, reducing greenhouse gas emissions, including through energy efficiency and renewable energy projects, etc. Cooperation also covers the environment.

GHG concerned: CO_2, CH_4, N_2O
Category of the measure: regulatory and economic
Status: effective since 2017
Considered in: With Measures (WM) Scenario

The Law on Energy no.174/2017[84]

The Law establishes the legal framework for organizing, regulating and ensuring efficient and secure operation of energy sectors.

GHG concerned: CO_2, CH_4, N_2O
Category of the measure: regulatory and economic
Status: effective since 2017
Considered in: With Measures (WM) Scenario

The Electricity Law no. 107/2016[85]

The purpose of the law is to establish a general legal framework for the organization, regulation, efficient operation and monitoring of the electricity sector aimed at ensuring accessibility, availability, reliability, continuity, quality and transparency of electricity supply for consumers; free access to the electricity market; promoting electricity production; ensuring adequate balance between supply and demand, appropriate level of interconnection lines capacity to facilitate cross-border electricity exchanges; development of the electricity market and integrating it into a competitive electricity market; implementing measures designed to guarantee the security of electricity supply; proper fulfilment of public service obligations; enforcement of consumer rights, and environmental protection standards.

GHG concerned: CO_2, CH_4, N_2O
Category of the measure: regulation and competitiveness
Status: effective since 2016
Considered in: With Measures (WM) Scenario and With Additional Measures (WAM) Scenario

Action Plan on Implementation of the National Regional Development Strategy for 2016-2020, GD no.485 of 2017[86]

It plans to increase the energy efficiency of public buildings by implementing 11 projects worth 928.2 million MDL by developing and strengthening regional economies.

GHG concerned: CO_2, CH_4
Category of the measure: regulation and economics
Status: effective since 29 June 2017
Considered in: With Measures (WM) Scenario

3.5.2. Industrial Processes and Products Use Sector

Over the last twenty years, a number of policies related to monitoring and reduction of GHG emissions in the IPPU sector have been approved and are in the process of being developed. The most relevant are listed below. The list does not include policies promoting energy efficiency and green economy mentioned above that also have an impact on the industrial sector.

Law no. 1540 of 25.02.1998 on Environmental Pollution Payments[87]

According to the amendment of 2017[88] to the Law, *fluorides and iodides* – imported substances, which are alternatives and transition in relation to ozone-depleting substances, are excluded from the list of goods which if used, cause environmental pollution. As a result, they are not subject to taxation and are therefore there is a motivation to import and use them in larger quantities. At the same time, the composite primary packaging made of various materials, such as paper, uncoated cardboard, plastic and/or polyethylene and/or aluminum, which cannot be manually separated, has been classified as exempted from taxes.

GHG concerned: fluorinated gases
Policy type: regulatory, economic
Status: effective since 1998
Considered in: With Measures (WM) Scenario

Law no. 852 of 14.02.2002 on approval of the Regulation on commercial regime and the regulation on use of ozone-depleting halogenated hydrocarbons,[89] and Law no. 119 of 18.05.2006 on Accession of the Republic of Moldova to the Amendment of the Montreal Protocol on Ozone Layer Depleting Substances[90]

[81] GD no. 401 of 12.06.2012 on the Energy Efficiency Fund. Published on 22.06.2012 in the Official Gazette no. 126-129. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=343683>
[82] Official Gazette of the RM no. 464-470 of 29.12.2017. Parliament of the Republic of Moldova Law no. 289 of 15.12.2017 on the State Budget for 2018.
[83] GD no. 1472 of 30.12.2016 approving the National Action Plan for the implementation of the Moldova-EU Association Agreement between 2017-2019. Published on 31.03.2017 in the Official Gazette no. 103-108 art. 271. Adjusted GD no. 1089 of 18.12.17, OG440/20.12.17, art. 1213. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=369730>
[84] Law no. 174 of 21.09.2017 on Energy Published: 20.10.2017 in the Official Gazette no. 364-370 art. 620. <http://lex.justice.md/md/371969/>
[85] Law no. 107 of 27.05.2016 on Electricity. Published on 08.07.2016 in the Official Gazette no. 193-203 art. 413. Amended: PL185 of 21.09.17, OG no. 371-382 / 27.10.17, art. 632; in force 27.10.17, LP no. 178 of 21.07.17, OG no. 301-315 / 18.08.17, art.537 http://lex.justice.md/md/365659%20/>
[86] Law no. 239 of 13.10.2016 on Approval of the National Strategy for Regional Development for 2016-2020. Published on 03.02.2017 in the Official Gazette no. 30-39 art. 65. <http://lex.justice.md/index.php?action=-view&view=doc&lang=1&id=368696>
[87] Law no. 1540 of 25.02.1998 on Environmental Pollution Payments. Official Gazette no. 54-55 of 18.06.1998. <http://lex.justice.md/viewdoc.php?action=view&view=doc&id=311615&lang=1>
[88] Law no. 313 of 22.12.2017 amending and supplementing Law no.1540/1998 on Payment for Environmental Pollution. Official Gazette no. 471-472 of 30.12.2017. <http://lex.justice.md/index.php?action=view&-view=doc&lang=1&id=373657>
89 Law no. 852 of 14 February 2002 on Approval of the Regulation on the Commercial Regime and Regulation of the Use of Halogenated Hydrocarbons Destroying the Ozone Layer. Official Gazette no. 54-55 of 18.04.2002. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=313251> Law no. 852 of 14 February 2002 on Approval of the Regulation on the Commercial Regime and Regulation of the Use of Halogenated Hydrocarbons Destroying the Ozone Layer was subsequently amended by Law no. 185 of 21.09.2017, OG no. 371-382 of 27.10.2017; Law no. 245 of 03.11.2016, OG no. 441-451 of 16.12.2016; Law no. 228, 10.10.2013, OG no. 258-261 of 15.11.2013; Law no. 109 of 04.06.2010, OG no. 131-134 of 30.07.2010; Law no.72 of 22.03.2007, OG no. 54-56 of 20.04.2007.
[90] Law no. 119 of 18.05.2006 on the Accession of the Republic of Moldova to the Amendment to the Montreal Protocol on Ozone Layer Depleting Substances. Official Gazette no. 87-90 of 09.06.2006. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=316216>

According to these laws, ozone layer depleting substances are banned or have a strict record and management regime in the Republic of Moldova. Their provisions apply to production, import, export, re-export, transit, placing on the market, marketing, use, recovery, recycling and regeneration of ozone layer depleting substances, in pure state or in mixtures with a concentration exceeding 1% if they are in bulk or in transport containers, as well as in equipment containing these substances.

GHG concerned: fluorinated gases
Policy type: regulatory, economic
State: effective since 2002
Considered in: With Measures (WM) Scenario

Innovation Strategy of the Republic of Moldova for 2013-2020 "Innovations for Competitiveness", GD no. 952/2013[91]

The strategy addresses three specific objectives: technological development of enterprises, including small and medium-sized enterprises, development of support infrastructure for innovation and providing the conditions for building a knowledge-based economy.

GHG concerned: CO_2, CH_4, N_2O, HFC, PFC, SF_6
Category of the measure: regulatory
Status: effective over 2013-2020
Considered in: With Measures (WM) Scenario

National Energy Efficiency Program for 2011-2020, GD no. 833/2011[92]

In addition to the objectives set for the country as a whole, the Program also sets targets for the industrial sector. Thus, to reduce energy demand and to exploit the energy saving potential by using advanced equipment, machinery and technologies, the following measures are designed:

- developing and proposing voluntary agreements to achieve energy savings in industry. According to estimates, long-term agreements allow for 10-20% energy savings. Voluntary agreements shall be transparent and shall contain, where appropriate, quantified, monitoring and reporting objectives;
- developing an energy efficiency program for the industrial sector;
- considering the possibility of including white certificate schemes;
- avoiding the use of high-purity fluorinated gases if this is possible and cost-effective.

The Environmental Strategy for 2014-2023 and the Action Plan for its Implementation, GD no. 301/2014[93]

For the IPPU sector, by 2020, a 20% reduction in GHG emissions is expected compared to the baseline scenario.

GHG concerned: CO_2, CH_4, N_2O, HFC, PFC, SF_6
Policy type: regulatory
Statute: effective over 2014-2023
Considered in: With Measures (WM) Scenario

The Association Agreement between the Republic of Moldova, and European Union and European Atomic Energy Community and Member States, Law no. 112/2014[94]

According to Annex XII (Chapter 17, Climate Policies) of the Association Agreement, RM has committed to progressively approximate its national legislation to the EU legislation, including regulating the production, import, use and treatment of regulated substances. Aiming at fulfilling the Agreement, the RM shall:

- set certain bans on production of regulated substances, with the exception of certain uses and, until 2019, hydrochlorofluorocarbons (HCFCs);
- set certain bans on placing on the market and use of regulated substances, with the exception of regenerated HCFCs, which may be used as a refrigerant until 2015;
- by end of 2018 year – establish a reporting system to obtain emission data in relevant sectors;
- by 2023, set up a system for identifying relevant installations for identifying greenhouse gases as well; set up a system for monitoring, reporting, verifying and ensuring implementation and public consultation procedures.

GHG concerned: CO_2, CH_4, N_2O, HFC, PFC, SF_6
Policy type: regulatory
Status: effective since 2014
Considered in: With Measures (WM) Scenario

National Energy Efficiency Action Plan for 2016-2018, GD no. 113/2016[95]

The Plan provides for 15% or circa 72 ktoe energy savings for the industry by 2020.

GHG concerned: CO_2, CH_4, N_2O, HFC, PFC, SF_6
Category of the measure: regulatory
Status: effective over 2016-2018
Considered in: With Measures (WM) Scenario

Regulation on reducing sulfur content in certain liquid fuels, GD no. 414/2016[96]

The Regulation sets out the requirements towards the use of certain liquid fuels, including marine fuels, aimed to reduce sulfur dioxide emissions from their combustion in order to reduce the negative effects of these emissions on human health and the environment. Regulation prohibits placing on the market:

- heavy fuel oil with a sulfur content exceeding 1% by weight; diesel oil, including marine diesel oil with a sulfur content exceeding 0.10% by weight, marine fuels with a sulfur content exceeding 3.5% by weight excluding fuels intended for supply of ships that use closed-loop emission reduction methods; and marine diesel fuel with a sulfur content exceeding 1.5% by weight;
- starting 1 January 2020, use by passenger ships operating on a regular basis in the territorial seas, exclusive economic zones and pollution control zones falling within the SO_x Emission Control Areas, of marine fuels which the content of sulfur exceeding 1.5%; use by the ships docked in ports in the Republic of Moldova of marine fuels with a sulfur content exceeding 0.1% by weight.

The Regulation has an impact on direct GHG emissions reduction.

[91] Government Decision no. 952 of 27.11.2013 approving the Innovation Strategy of the Republic of Moldova for 2013-2020 "Innovations for Competitiveness" Published on 06.12.2013 in the Official Gazette no. 284-289, art. 1063. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=350541>
[92] Government Decision no. 833 of 10.11.2011 on the National Energy Efficiency Program 2011-2020. Published on 18.11.2011 in the Official Gazette no. 197-202, art. 914. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=340940>
[93] Government Decision no. 301 of 24.04.2014 approving the Environmental Strategy for 2014-2023 and the Action Plan for its implementation. Published on 06.05.2014 in the Official Gazette no. 104-109, art. 328. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=352740>
[94] Law no. 112 of 02.07.2014 on Ratification of the Association Agreement between the Republic of Moldova and the European Union and the European Community of the Atomic Energy and Member States, on the other. Published on 18.07.2014 in the Official Gazette no. 185-199, art. 442. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=353829>
[95] Government Decision no. 1471 of 30.12.2016 approving the National Action Plan for Energy Efficiency for 2016-2018. Published on 31.03.2017 in the Official Gazette no. 92-102, art. 257. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=369635>
[96] Government Decision no. 414 of 08.04.2016 approving the Regulation on the reduction of the sulphur content of certain liquid fuels. Published on 15.04.2016 in the Official Gazette no. 100-105, art. 467. Date of entry into force: 15.07.2016.

GHG concerned: CO_2, CH_4, N_2O, CO, NO_x, NMVOC, SO_2
Category of measure: regulatory
Status: effective since 2016
Considered in: With Measures (WM) Scenario

Regulation on measures to reduce emissions from air conditioning systems of motor vehicles, GD no. 1242/2016[97]

The Regulation partially transposes Directive 2006/40/EC of the European Parliament and of the Council of 17 May 2006 on emissions from air conditioning systems and transposes Annex no. I of Regulation (EU) no. 517/2014 of the European Parliament and of the Council of 16 April 2014 on fluorinated greenhouse gases. The Regulation lays down provisions for the installation of air conditioning systems for motor vehicles for placing on the market and recharging air conditioning systems for any fluorinated greenhouse gas vehicle with a global warming potential higher than 150. With effect from 1 January 2021, it shall be prohibited to install on vehicles designed and manufactured for the carriage of passengers and their luggage which have not more than eight seats in addition to the driver's seat, or vehicles designed and manufactured for the carriage of goods a maximum mass not exceeding 3.5 tons of air-conditioning systems designed to contain fluorinated greenhouse gases with a global warming potential for 100 years (hereafter - GWP100) higher than 150. With effect from 1 January 2025, it shall be prohibited to charge air conditioning systems with fluorinated greenhouse gas having a GWP100 greater than 150, on any vehicle except re-charging air conditioning systems containing such gases, but installed on vehicles before 1 January 2021.

GHG concerned: HFC with GWP>150
Category of the measure: regulatory and economic
Status: effective over 2017 - 2025
Considered in: With Measures (WM) Scenario

Halogenated Hydrochlorofluorocarbons Phase-Out Management Plan for 2016-2040 and Action Plan for its Implementation in 2016-2020, GD no. 856/2016[98]

The overall objective of the Program is to completely eliminate consumption of hydrochlorofluorocarbons (listed in Group I of Annex C to the Montreal Protocol) by 2040, reducing by 35% the permissible consumption of ozone depleting substances listed in Group I of Annex C to the Montreal Protocol (2016-2020).

GHG concerned: ozone-depleting substances (HCFCs), partially fluorinated gases
Policy type: regulatory, economic
Status: effective since 2016
Considered in: With Measures (WM) Scenario

Law no. 209 of 29.07.2016 on Waste[99]

The Law establishes sets legal bases, defines the state policy and measures to protect the environment and public health by preventing or reducing the adverse effects of waste generation and management, and by reducing the overall impact of resource use and increasing the efficiency of its use, including the ozone depletion effects and increased GHG emissions that it can cause. In particular, producers of products that fall under the extended responsibility rules are required to ensure, individually or through collective schemes, the achievement of targets for the collection and recycling of products that have become waste. In order to comply with the provisions of the Law and ensure a highly efficient use of resources, the following state policy objectives were set:

- by 2018 – introducing separate collection systems for paper, glass, metals and plastics;
- by 2020 – preparedness for re-using and recycling of waste, for at least paper, glass, metals and plastics coming from household waste and, possibly, from other sources, to the extent that these waste streams are similar to household waste, grows to a minimum of 30% of the total mass;
- by 2020 – preparedness for re-using and other material recovery operations, including backfilling, that use waste to replace other substances, non-hazardous construction and debris waste, with the exception of natural geological materials, grows to a minimum of 55% of the total mass.

Recycling waste will also entail the GHG reduction effect.

GHG concerned: CO_2, F-gases
Policy type: regulatory and economic
Status: effective since 23.12.2017
Considered in: With Measures (WM) Scenario

Cooperation Strategy between the Republic of Moldova and Sweden, through the Swedish Agency for International Development and Cooperation (SIDA) for 2014-2020[100]

The strategy will also focus on building a better environment, reducing climate impact of human activities and strengthening the resilience of society and the economy to extreme climatic phenomena and global climate change. The total amount of Swedish assistance is € 100 million for Eastern Europe, Western Balkans and Turkey for 2014-2020.

GHG concerned: CO_2, CH_4, N_2O, HFC, PFC, SF_6
Type of instrument: economic
Status: effective over 2014-2020
Considered in: With Measures (WM) Scenario

Environmental Impact Assessment for the Co-Incineration of Alternative Fuels (Biomass and Solid Waste) in the Lafarge Ciment (Moldova) (member of the LafargeHolcim Group) clinker furnace as waste to energy operation"(2015)[101, 102]

The decision to carry out this activity was based on the principle of aligning the waste management practices of the Republic of Moldova to the ones of the European Union.

The implemented environmental projects allow to increase the weight of alternative fuel used, thus fulfilling the plant's commitment on the efficient use of natural resources, especially non-renewable ones.

Domestic solid waste and biomass collected in the Republic of Moldova are shipped to a special deposit site on the territory of SA Lafarge Cement (Moldova). Subsequently, waste is burnt in the combustion chamber installed in the upstream chamber of the

[97] Government Decision no. 1242 of 14.11.2016 approving the Regulation on measures to reduce emissions from air conditioning systems of motor vehicles. Published on 25.11.2016 in the Official Gazette no. 405-414, art. 1353. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=367710>
98 Government Decision no. 856 of 13.07.2016 approving the Halogenated Hydrochlorofluorocarbons Phase-out Management Plan for 2016-2040 and the Action Plan for its implementation in 2016-2020 Published: 22.07.2016 in the Official Gazette no. 217-229, art. 942. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=365905>
[99] Law no. 209 of 29.07.2016 on Waste. Published: 23.12.2016 in the Official Gazette no. 459-471, art. 916. In force since 23.12.2017. http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=368030>

[100] Cooperation Strategy between the Republic of Moldova and Sweden through the Swedish Agency for Development and International Cooperation (SIDA) for 2014-2020. <http://www.infoeuropa.md/suedia/>
[101] Environmental Impact Assessment for the Co-Incineration of Alternative Fuels (Biomass and Domestic Solid Waste) in the Lafarge Ciment (Moldova) (member of the LafargeHolcim Group) clinker furnace as waste to energy operation"(2015). <http://www.lafarge.md/Programul_de_realizare_a_evaluarii_impactului_asupra_mediului.pdf>
[102] Documentation regarding the environmental impact assessment of the co-incineration of alternative fuels (biomass and domestic solid waste) in the clinker furnace: SA "Lafarge Ciment (Moldova)". Viitorului str., no. 1, Rezina. Beneficiary SA "Lafarge Ciment (Moldova). Executor SRL "Fortel-Grup". Chisinau, 2015. <http://www.lafarge.md/Documentatie_EIM_Lafarge_Moldova.pdf>

furnace cooler head, for co-incineration. Aiming at reducing dust and gas emissions into the air, additionally to the strict control of the technological process, efficient filters are installed at all sources.

Compared to 1990, by the end of 2010, CO_2 emissions reduction per ton of cement was 21.7%[103], and in 2015 - 24%. In order to reduce GHG, LafargeHolcim focused on the use of alternative fuels. Specific targets of mitigating CO_2 emissions per ton of cement, declared by the LafargeHolcim Group for the years 2020, 2025 and 2030, are 33%, 37% and 40%, respectively, relative to 1990 level 104.

GHG concerned: CO_2, CH_4, N_2O
Category of the measure: regulatory, economic
Status: effective since 2015
Considered in: With Measures (WM) Scenario

Cooperation Agreement between the Republic of Moldova and the United States Agency for International Development (USAID) and the Government of Sweden, through the Swedish Agency for International Development and Cooperation (SIDA) for 2016-2020[105]

It provides for supporting 450 businesses to contribute to new sales exceeding US$ 145 million. During the first year of the Project, 250 businesses across the country were supported to adopt new technologies and business models, invest in equipment and increase quality in line with Western standards, and move forward on new markets. These investments generated new revenues which exceeded US$ 28 million from sales on the local markets and exports to more than 10 markets, such as Romania, Poland, the Czech Republic, Kazakhstan, Japan, and China. The technical support provided through the Competitiveness Project amounts to US$ 21.7 million of non-reimbursable funding, of which US$ 16.7 million will be funded by the USAID and US$5 million by the Swedish Government (SIDA). The Competitiveness Project supports the main industries of the RM which will be promoting advanced technologies, which also have a GHG reduction effect. Under the labor force development component of the Competitiveness Project, 18,000 Moldovans will improve their skills at the industrial excellence centers and innovation hubs supported by the USAID and the Swedish Government, thus contributing to the development of the country's capacities and achievement of the LEDS objectives.

GHG concerned: CO_2, CH_4, N_2O, HFC, PFC, SF_6
Type of the instrument: economic
State: effective over 2015-2020
Considered in: With Measures (WM) Scenario

The Program for Promoting Green Economy in the Republic of Moldova for 2018-2020 and the Action Plan for its Implementation, GD no.160/2018[106]

With reference to the industry specific objective of "ensuring, by 2020, the implementation of resource efficiency and cleaner production principles in about 30% of enterprises and organizations", the following actions will be taken to achieve this goal: (1) creation of regional centers for resource efficiency and cleaner production in the three development regions (North, Center, South); (2) promotion, establishment and deployment of regional clubs to increase resource efficiency and cleaner production; (3) drafting self-assessment reports on resource efficiency and cleaner production by businesses and organizations; (4) designing regional programs and plans (regional development agencies, local public administration authorities) and sectoral policies to promote and implement the principles of resource efficiency and cleaner production; (5) encouraging banks to provide attractive credit lines (lower interest rate, higher repayment period, etc.) to industrial enterprises for resource efficiency and cleaner production projects; (6) streamlining resource efficiency and cleaner production principles into the local development plans; (7) promoting the 10th anniversary of the Sustainable Consumption and Production Framework in the Republic of Moldova; (8) developing and promoting regulations on gradual removal of plastic bags (except biodegradable ones) and plastic bottles; (9) promoting the principle of extended producer responsibility.

Kigali Amendment to the Montreal Protocol on progressive reduction of the use of hydrofluorocarbons worldwide, 15.10.2016[107]

According to the Amendment, the Republic of Moldova would be required to estimate its baseline level of HFCs (production/consumption) as an average of 2020, 2021, 2022 +65% of the baseline level of HCFCs (production / consumption). The schedule for the suppression is as follows: 2024 – freezing consumption at baseline level (average of 2020, 2021, 2022 +65% of HCFCs baseline level (production/consumption)); 2029 (Stage I) - reducing consumption by 10%; 2035 (Stage II) – reducing consumption by 30%; 2040 (Stage III) - reducing consumption by 50%; 2045 (Stage IV) – reducing consumption by 80%. Moldova has not yet ratified the Kigali Amendment to the Montreal Protocol (ratification is planned for 2019).

GHG concerned: HFC
Category of the measure: regulatory
Status: the policy is planned to be approved in 2019
Considered in: With Additional Measures (WAM) Scenario

Draft GD for Approving the Regulation on Packaging and Packaging Waste, 02.11.2017[108]

The draft Regulation transposes the provisions of the European Parliament and Council Directive 94/62/EC of 20 December 1994 on Packaging and Packaging Waste, the provisions of the Commission Decision of 28 January 1997 establishing the identification system for packaging materials and is designed to implement the provisions of the National Action Plan for Implementation of the Moldova-EU Association Agreement in 2017-2019, approved by the Government Decision no. 1472 of 30.12.2016, Chapter 3 - Barriers to trade, standardization, metrology, accreditation and conformity assessment.

The objectives aiming at recovery and recycling of packaging waste, to be achieved at national level, stepped up, according to Tab. 3-2 not later than 2025, are the following: (a) the recovery of at least 50% of the packaging waste weight; (b) recycling of at least 45% of the total weight of packaging materials contained in the packaging waste, achieving the following minimum values for recycling of each type of packaging material: 50% by weight for glass, 50% by weight for paper/cardboard, 45% by weight for metal, 10% by weight for wood, 20% by weight for plastic, considering only recycled plastic material.

[103] <http://www.lafarge.md/wps/portal/md/7_3-TheNews_Detail?WCM_GLOBAL_CONTEXT=/wps/wcm/connectlib_md/Site_md/AllPR2/PressRelease_1327993713495/PR_Header>
[104] LafargeHolcim <https://www.lafargeholcim.com/climate>
[105] Cooperation Agreement between the Republic of Moldova and the United States Agency for International Development (USAID) and the Government of Sweden through the Swedish Agency for International Development and Cooperation (SIDA). <http://agora.md/stiri/26138/video--agentia-sua-pentru-dezvoltarea-internationala-si-guvernul-suediei-au-semnat-un-acord-de-cooperare>
[106] GD no. 160 of 21.02.2018 approving the Program for the Promotion of the Green Economy in the Republic of Moldova for 2018-2020 and the Action Plan for its implementation Published on 02.03.2018 in the Official Gazette no. 68-76 art. 208. <http://lex.justice.md/viewdoc.php?action=view&view=doc&id=374523&lang=1>
[107] The Kigali Amendment to the Montreal Protocol for the Progressive Reduction of Hydrofluorocarbons Globally. <http://conf.montreal-protocol.org/meeting/oewg/oewg-39/presession/briefingnotes/ratification_kigali.pdf>, <https://europa.eu/capacity4dev/unep/document/full-text-kigali-amendment-pt-1>
[108] Draft GD for approval of the Regulation on Packaging and Packaging Waste. Published on 02.11.2017. <http://www.particip.gov.md/proiectview.php?l=ro&idd=4641>

Table 3-2: Phased achievement of recovery and recycling targets, global and by type of packaging material at national level for 2019-2025

Year	Minimum recycling target / Type of material (%)					Global recycling target *) (%)	Global recovery target **) (%)
	Paper and cardboard	Plastic materials	Glass	Metal	Wood		
2019	15	10	15	10	5	15	17
2020	20	11	20	20	5	20	22
2021	25	12	25	25	5	25	27
2022	30	14	30	30	5	30	32
2023	40	16	40	35	10	35	37
2024	45	18	45	40	10	40	42
2025	50	20	50	45	10	45	50

Note: Composite packaging are classified by the main material. *) Minimum percentage of the total mass of packaging materials contained in packaging waste; **) Minimum percentage of packaging waste mass.

In 2016, circa 116.35 thousand tons of municipal packaging waste, circa 49.87 thousand tons of industrial and commercial packaging waste were generated across the country, totaling to about 166.22 thousand tons; of which, paper and cardboard – 66.49 thousand tons, glass – 33.24 thousand tons, plastic – 31.58 thousand tons, wood – 24.93 thousand tons, and metal – 9.97 thousand tons. These figures indicate a high potential for the re-use and/or recovery by recycling of certain types of packaging. For example, re-use by recycling of glass waste (colorless, green and brown) at glass plants in the country will contribute to a substantial reduction of production costs, i.e. to reducing GHG emissions from the glass production process.

GHG concerned: CO_2
Category of the measure: regulatory and economic
Status: the policy is planned to be approved in 2019
Considered in: With Additional Measures (WAM) Scenario

3.5.3. Agriculture Sector

Over the past twenty years, a number of policies related to GHG emissions reduction in agriculture have been approved and are in the process of being developed. The most relevant of these are listed below.

In 2018, policies approved in the Republic of Moldova and explicitly geared towards reducing greenhouse gas emissions from agriculture (covering plant growing, soil resources, and animal husbandry) are the Environmental Strategy for 2014-2023 and the Action Plan for its implementation, and the Low-Emission Development Strategy of the Republic of Moldova until 2030 and the Action Plan for its implementation, the objectives of which, including in agriculture, are set forth in Chapter 3.5.1.

Animal husbandry

The legal framework for animal husbandry in the Republic of Moldova is made of a number of organic laws, including:

- Law no. 371 of 15.02.1995 on Livestock Selection and Breeding[109];
- Law no. 412 of 27.05.1999 on Animal Husbandry[110];
- Law no. 78 of 18.03.2004 on Foodstuffs [111];
- Law no. 243 of 08.07.2004 on Subsidized Insurance of Production Risks in Agriculture[112];
- Law no. 221 of 19.10.2007 on Sanitary-Veterinary Activity[113];
- Law no. 276 of 16.12.2016 on Agricultural Producers Subsidizing Principles[114];
- Draft Law on Animal Husbandry (new version) / 2016[115].

The main animal husbandry policies with direct or indirect impact on trends in GHG emissions are reviewed further for two source categories 3A "Enteric fermentation" and 3B "Manure management":

Enteric Fermentation

Government Decision no. 1095 of 08.09.2003 on some measures for swine genetic pool regeneration [116]

Aiming at regeneration, conservation and rational use of swine genetic resources, efficient integration of science and production, provision of adequate conditions for producing goods competitive on domestic and foreign markets, the Government of the Republic of Moldova created in 2003 the State Enterprise for Research in Selection and Hybridization of swine "Moldsuinhibrid" by merging the Swine Breeding Branch of the National Institute for Animal Husbandry and Veterinary Medicine and the State Enterprise "Suintest" Republican Station.

GHG concerned: CH_4 and N_2O
Policy Type: regulatory and economic
Status: effective since 2003
Considered in: With Measures (WM) Scenario

Dairy Cattle Improved Breeding Program for 2014-2020[117]

According to the Program, by 2020 the total number of pedigreed cattle stocks will increase to 14.4 thousand heads, including cows – 7.2 thousand heads with an average lactation yield of about 7 thousand kg. The breeding farms will have the capacity to sell about 2.3 thousand joined heifers annually to those who want to start milk production business, which makes about 8 new farms opened each year.

GHG concerned: CH_4 and N_2O
Policy type: regulatory and economic
State: effective over 2014-2020
Considered in: With Measures (WM) Scenario

Sheep and Goats Improved Breeding Program for 2014-2020[118]

The document contains the Program implementation plan, the responsible organizations, the minimum number of pedigreed sheep and goat to maintain and develop indigenous and imported breeds to meet the needs of the sheep and goats' breeders in valuable genetic material and improve productivity at country level.

By the year 2020, it is expected that the total number of sheep will reach 1300 thousand heads, and goats – 200 thousand heads; sheep and goat meat production (live weight) will reach 36 thousand tons; production of meat (sheep and goats) as slaughtered mass will reach

[109] Law no. 371 of 15.02.1995 on Livestock Selection and Breeding. Published on 14.04.2010 in the Official Gazette no. 52-53, art. 160. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=334253>
[110] Law no. 412 of 27.05.1999 on Animal Husbandry. Published on 15.07.1999 in the Official Gazette no. 73-77, art. 347. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=311663>
[111] Law no. 78 of 18.03.2004 on Foodstuffs. Published on 28.05.2004 in the Official Gazette no. 83-83, art. 431. Effective since 28.05.2005. hHttp://lex.justice.md/index.php?action=view&view=doc&lang=1&id=313238>
[112] Law no. 243 of 08.07.2004 on Subsidized Insurance of Production Risks in Agriculture. Published on 06.08.2004 in the Official Gazette no. 132-137, art. 704. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=313052>
[113] Law no. 221 of 19.10.2007 on Sanitary-Veterinary Activity. Published on 14.03.2008 in the Official Gazette no. 51-54, art. 153. Effective since 14.09.2008. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=327196>
[114] Law no. 276 of 16.12.2016 on Principles of Subsidizing Agricultural Producers. Published on 03.03.2017 in the Official Gazette no. 67-71, art. 93. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=369204>
[115] The Law on Animal Husbandry (new version). Published on 24.11.2016 on the platform: <http://particip.gov.md/projectview.php?l=en&idd=3693>
[116] Government Decision no. 1095 of 08.09.2003 on some measures for swine genetic pool regeneration. Published on 19.09.2003 in the Official Gazette no. 200, art. 1149. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=297556>
[117] Dairy Cattle Improved Breeding Program of the Republic of Moldova for 2014-2020, approved for implementation by the Zooveterinary Commission of the Technical-Scientific Council of the Ministry of Agriculture and Food Industry of the Republic of Moldova, Minutes no.2 of 17.10.2013. Focşa, V., Constandoglo, A. Chişinău, Tipogr. "Print-Caro". 2013, 22 pp., ISBN 978-9975-56-122-8.
[118] Sheep and Goats Improved Breeding Program of in the Republic of Moldova for 2014-2020, approved for implementation by the Zootechnical Commission of the Technical and Scientific Council of the Ministry of Agriculture and Food Industry of the Republic of Moldova, Minutes no.3 of 18.12.2013. Mașner, O., Liuțcanov, P., Evtodienco, S., Dănuță, A. Chișinău, Tipogr. "Print-Caro". 2014, 34 pp. ISBN 978-9975-56-197-6.

16.2 thousand tons; Estimated production of sheep milk will reach 53 thousand tons, goat – 56 thousand tons; production of wool (Tsigay + Karakul) - 2.6 thousand tons; production of Karakul skins (I grade quality) – 280 thousand pieces.

GHG concerned: CH_4 and N_2O
Policy Type: regulatory and economic
State: effective over 2014-2020
Considered in: With Measures (WM) Scenario

National Strategy for Agricultural and Rural Development for 2014-2020, GD no. 409/2014[119] and the Action Plan for Implementation of the National Strategy for Agricultural and Rural Development for 2014-2020, GD no. 742/2015[120]

The Strategy was approved to achieve the provisions of the Government Activity Program "European Integration: Freedom, Democracy, Welfare" for 2009-2013 and provides for: increasing meat and milk production output and export capacity; ensuring the sufficiency of national genetic resources; improving the safety of the food and feed chain in the animal husbandry sector. The overall objectives of the Strategy are: a) to increase competitiveness of the agri-food sector by market restructuring and modernization; b) ensuring sustainable management of natural resources in agriculture; c) improving living standards in rural areas.

GHG concerned: CH_4 and N_2O
Policy type: regulatory and economic
Status: effective over 2014-2020
Considered in: With Measures (WM) Scenario

FAO Project "Development of the National Strategy and Action Plan for Animal Genetic Resources and the Program of Genetic Improvement of Dairy Cows" [121]

The Project, funded with a 320 thousand Euro grant by the United Nations Food and Agriculture Organization (FAO), was implemented between 2015-2017. Under the Project, more than 50 artificial insemination operators were trained and equipped with performance kits, and as FAO Technical Assistance a milk analysis laboratory was created within the State Agrarian University, to complete another EU-funded cross-border cooperation project.

GHG concerned: CH_4 and N_2O
Policy type: regulatory and economic
State: effective over 2015-2017 (currently completed)
Considered in: With Measures (WM) Scenario

Government Decision no. 455 of 21.06.2017 on allocation of funds from the National for Agriculture and Rural Development Fund[122]

The allocation of the Fund's resources is aimed at achieving the general and specific objectives set out in the National Strategy for Agricultural and Rural Development for 2014-2020[123], including to stimulate investment for operation and technological upgrading of livestock farms. In 2017, circa 153 requests for financial support for renovation and technological development of farms, amounting to 45.1 million MDL were submitted. About 12.3 million MDL were requested in 2017 to stimulate procurement of breeding animals and maintaining their genetic pool.

GHG concerned: CH_4 and N_2O
Policy type: regulatory
Status: effective over 2017-2021
Considered in: With Measures (WM) Scenario

Draft National Program for the Development of the Dairy Sector in the Republic of Moldova for 2017-2025[124]

The Program provides for improving the situation by gradual transfer of cattle people's homes to the outer sites, revitalization and upgrading of existing farms and construction of new capacities. The Program will be implemented in three phases: 2017-2020, when the dairy cows productivity will increase to 4564 kg by 2020 and the annual milk output will reach 630 thousand tons of milk, plus 53 thousand tons of sheep milk and 56 thousand tons of goat milk; 2020-2022, when the number of cows will reach about 155.8 thousand heads with an average productivity of 5705 kg and the milk output will reach 753 thousand tons; and 2023-2025 when cattle farms will reach the number of 450, which about 109 thousand dairy cows with an average productivity of not less than 7000 kg and the needs of the processing enterprises for local raw material will be fully met.

GHG Concerned: CH_4 and N_2O
Policy type: regulatory and economic
Status: pending approval in the near future
Considered in: With Additional Measures (WAM) Scenario

Implementation of the above-mentioned policies will contribute to the revitalization of the animal husbandry sector, but also increase of GHG emissions from this sector, especially as a result of the increased livestock and poultry numbers. However, it is anticipated that specific emissions per unit of production will have a downward trend.

Manure Management

Policies geared towards stimulating the use of soil conservation technologies provide for manure to become more valuable as organic fertilizer which is obtained by storing manure on specially designed and properly equipped platforms and/or by processing manure by composting.

The Land Recovery and Soil Fertility Enhancement Program (Part II, Soil Fertility Enhancement), GD no. 841/2004[125], repealed by GD no. 796/2012[126]

The Program specifies that waste from the animal husbandry sector is the most important and common local source of organic matter and nutrients for restoring soil fertility and increasing the productivity of agricultural crops, the content of organic substances and nutrients in manure amounting to about 6-7 million tons annually. It is also noted that the waste waters from animal husbandry sector contain significant amounts of nutrients, especially potassium and nitrogen, in forms easily accessible to plants; though using it for crop fertilization, require complex testing to avoid pollution of soil and agricultural products with harmful substances.

[119] Government Decision no. 409 of 04.06.2014 approving the National Strategy for Agricultural and Rural Development for 2014-2020. Published on 10.06.2014 in the Official Gazette no. 152, art. 451. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=353310>
[120] Government Decision no. 742 of 21.10.2015 approving the Action Plan for implementation of the National Strategy for Agricultural and Rural Development for 2014-2020. Published on 30.10.2015 in the Official Gazette no. 297-300, art. 835. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=361669>
[121] The FAO Project "Development of the National Strategy and Action Plan for Animal Genetic Resources and the Program of Genetic Improvement of Dairy Cows". <http://www.madrm.gov.md/ro/content/moldova-%C3%AE%C8%99i-consolideaz%C4%83-sectorul-cre%C8%99terii-vacilor-de-lapte-cu-suportul-fao>, <http://maia.gov.md/ro/categorii/proiecte-de-asistenta-externa-sectorul-agroalimentar>
[122] Government Decision no. 455 of 21.06.2017 on Allocation of funds from the National Fund for Agriculture and Rural Development. Published on 23.06.2017 in the Official Gazette no. 201-213, art. 537. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=370674> Amended by the Government Decision no. 903 of 07.11.2017 on the amendment and completion of the Government Decision no. 455 of 21 June 2017. Published on 10.11.2017 in the Official Gazette no. 390-395, art. 1012. <http://lex.justice.md/md/372416%2/>
[123] Decree of the President of the Republic of Moldova no. 1815 of 12.11.2015 on promulgation of the Law on ratification of the Financing Agreement between the Government of Moldova and the European Commission relating to the implementation of the ENPARD – Moldova Program - Support for Agriculture and Rural Development. Published on 27.11.2015 in the Official Gazette no. 317-323, art. 575. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=361905>
[124] Draft National Program for the Development of the Dairy Sector in the Republic of Moldova for 2017-2025. <https://www.scribd.com/document/364789593/Programul-National-Lapte>
[125] Government Decision no. 841 of 26.07.2004 approving the Land Recovery and Soil Fertility Enhancement Program (Part II, Soil Fertility Enhancement). Published on 13.08.2004 in the Official Gazette no. 138-146, art. 1066. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=305055>
[126] Government Decision no. 796 of 25.10.2012 on the abrogation of some normative acts of the Government. Published on 31.10.2012 in the Official Gazette no. 228, art. 858. <http://lex.justice.md/md/345192/>

The costs related to manure management and use of local organic fertilizers and composting organic waste were expected to amount to about 180 million MDL annually and had to be borne by the owners of livestock and farmlands.

GHG Concerned: CH_4 and N_2O
Policy type: regulatory and economic
Status: effective over 2004-2012 (currently abrogated)
Considered in: With Measures (WM) Scenario

Soil Conservation and Fertility Enhancement Program for 2011-2020, GD no. 626/2011[127], the Action Plan for implementation of the Soil Conservation and Fertility Enhancement Program for 2014-2016, GD no. 138/2014[128], and the Action Plan for implementation of the Soil Conservation and Fertility Enhancement Program for 2017-2020, GD no. 554/2017[129]

The objective of the Program is the long-term preservation of the soil quality and production capacity in order to ensure food security of the country. The soil quality largely determines the productivity of agricultural crops, *development of animal husbandry*, export of agri-food products, the well-being of the population and the ecological situation in the country. Regarding manure management, it is worth mentioning that the Program provides for implementation of measures for soil conservation and fertility enhancement by compensating the humus losses in soil through complex fertilization with organic fertilizers (manure and composts).

GHG Concerned: CH_4 and N_2O
Policy type: regulatory
State: effective over 2011-2020
Considered in: With Measures (WM) Scenario

Waste Management Strategy of the Republic of Moldova for 2013-2027, GD no. 248/2013[130]

The Action Plan for the implementation of the Strategy provides for development of separate collection of vegetal residues, manure and wood processing waste (to be implemented in 2014-2017).

GHG concerned: CH_4 and N_2O
Policy type: regulatory and economic
State: effective over 2013-2027
Considered in: With Measures (WM) Scenario

The country's policies aimed at stimulating use of renewable energy sources, providing for production of biogas from manure, with the possibility of further using it as fuel for production of electricity and heat, are reviewed in Chapter 3.5.1.

Horticulture and land resources

The legal framework regulating plant cultivation and land resources sector in the Republic of Moldova contains a number of legislative acts, including:

- Land Code no. 828/1991;
- Law no. 1515 of 16.06.1993 on Environment Protection[131];
- Law no. 728 of 06.02.1996 on Horticulture[132];
- Law no. 1308 of 25.07.1997 on the Normative Price and Sell-Purchase of Land[133];
- Law no. 658 of 29 October 1999, on Nut Crops[134];
- Law no. 78 of 18.03.2004 on Foodstuffs [135];
- Law no. 119 of 22.06.2004 on Plant Protection Products and Fertilizers[136;]
- Law no. 238 of 08.07.2004 on Single Agricultural Tax[137];
- Law no. 243 of 08.07.2004 on Subsidized Insurance of Production Risks in Agriculture [138];
- Law no. 57 of 10.03.2006 on Viticulture and wine[139];
- Law no. 278 of 14.12.2007 on Tobacco and Tobacco Products[140];
- Law no. 39 of 29.02.2008 on Plant Varieties Protection[141];
- Law no. 228 of 23.09.2010 on Plant Protection and Phytosanitary Quarantine[142];
- Law no. 276 of 16.12.2016 on Principles of Subsidizing Agricultural Producers[143].

The main policies in horticulture and land resources, with a direct or indirect impact on GHG emission trends are further examined for two categories of sources 3D "Agricultural Soils" and 3H "Urea Application":

Agricultural Soils

The main policies in horticulture and land resources, with an impact on GHG emission trends are reflected in a number of strategies, programs and action plans.

National Program on Establishment of the National Ecological Network for 2011-2018, GD no. 593/2011[144]

With reference to land relations, the Program provides for creation of stabilizing ecological elements for agricultural lands.

GHG concerned: CO_2 and N_2O
Policy type: regulatory and economic
Status: effective over 2011-2018
Considered in: With Measures (WM) Scenario

[127] Government Decision no. 626 of 20.08.2011 approving the Soil Conservation and Fertility Enhancement Program for 2011-2020. Published on 26.08.2011 in the Official Gazette no. 139-145, art. 696. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=339882>
[128] Government Decision no. 138 of 24.02.2014 approving the Action Plan on implementation of the Soil Conservation and Fertility Enhancement Program 2014-2016. Published on 28.02.2014 in the Official Gazette no. 49-52, art. 154. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=351879>
[129] Government Decision no. 554 of 14.07.2017 approving the Action Plan on Implementation of the Soil Conservation and Fertility Enhancement Program for 2017-2020. Published on 21.07.2017 in the Official Gazette no. 253-264, art. 650. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=371387>
[130] Government Decision no. 248 of 10.04.2013 approving the Waste Management Strategy of the Republic of Moldova for 2013-2027. Published on 12.04.2013 in the Official Gazette no. 82 art. 306. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=347341>
[131] Law no. 1515 of 16.06.1993 on Environment Protection. Published on 01.10.1993 in Parliament Monitor no. 10, art. 283. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=311604>
[132] Law no. 728 of 06.02.1996 on Horticulture. Published: 14.04.2010 in the Official Gazette no. 52-53, art. no: 161. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=334255>
[133] Law no. 1308 of 25.07.1997 on the Normative Price and Sell–Purchase of Land. Published on 06.12.2001 in the Official Gazette no. 147-149, art. 1161. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=313289>
[134] Law no. 658 of October 29, 1999, Nuts Crops. Published on 29.12.1999 in the Official Gazette no. 153-155, art. 749. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=311709>
[135] Law no. 78 of 18.03.2004 on Foodstuffs. Published on 28.05.2004 in the Official Gazette no. 83-83, art. 431. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=313238>
[136] Law no. 119 of 22.06.2004 on Plant Protection Products and Fertilizers. Published on 25.06.2004 in the Official Gazette no. 100-103, art. 510. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=312742>
[137] Law no. 238 of 08.07.2004 on the Single Agricultural Tax. Published on 06.08.2004 in the Official Gazette no. 132, art. 702. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=312800>
[138] Law no. 243 of 08.07.2004 on the Subsidized Insurance of Production Risks in Agriculture. Published on 06.08.2004 in the Official Gazette no. 132-137, art. 704. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=313052>
[139] Law no. 57 of 10.03.2006 on Viticulture and Wine. Published on 19.05.2006 in the Official Gazette no. 75-78, art. 314. Effective since 19.07.2006. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=316207>
[140] Law no. 278 of 14.12.2007 on Tobacco and Tobacco Products. Published on 07.03.2008 in the Official Gazette no. 47-48, art. no: 139. Effective since 07.03.2008. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=327126>
[141] Law no. 39 of 29.02.2008 on Plant Varieties Protection. Published on 06.06.2008 in the Official Gazette no. 99-101, art. no: 364. Effective since 06.09.2008. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=328050>
[142] Law no. 228 of 23.09.2010 on Plant Protection and Phytosanitary Quarantine. Published on 10.12.2010 in the Official Gazette no. 241-246, art. no: 748. Effective since 10.06.2011. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=336925>
[143] Law no. 276 of 16.12.2016 on the Principles of Subsidizing Agricultural Producers. Published on 03.03.2017 in the Official Gazette no. 67-71, art. no: 93. Effective since 01.01.2017. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=369204>
[144] Government Decision no. 593 of 01.08.2011 approving the National Program for establishing the National Ecological Network for 2011-2018. Published on 12.08.2011 in the Official Gazette no. 131-133, art. 664. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=339794>

Soil Conservation and Fertility Enhancement Program for 2011-2020, GD no. 626/2011[145], Action Plan for the implementation of the Soil Conservation and Fertility Enhancement Program for 2014-2016, GD no. 138/2014[146], and the Action Plan for the implementation of the Soil Conservation and of Fertility Enhancement Program for 2017-2020, GD no. 554/2017[147]

The main purpose of the Program is to address four major objectives: (1) create and improve the technical-scientific basis to ensure implementation of the land improvement works until 2013, and constantly upgrading it; (2) creation, by the end of 2013, of the Soil Quality Information System and continuously updating its database; (3) halting active forms of soil degradation on 877 thousand ha of arable land by the end of 2020; (4) implementation of soil conservation and fertility enhancement measures on 1.7 million hectares by 2020.

Within the limits of the financial means provided for in the Action Plan, *implementation of soil fertility enhancement methods will be carried out annually on 100 thousand ha of agricultural lands*. This objective is planned to be achieved by undertaking simple actions (*soil conservation cultivation techniques, crop rotation, rational structure of agricultural crops surfaces, complex fertilization with organic and mineral fertilizers, implementation of hydro-amelioration facilities, etc.*).

Objective 4 of the Program is to be achieved by the following: *(a) implementation of the regional crop rotations; (b) soil conservation cultivations techniques (no-till, mini-till);* (c) implementation of anti-erosion crop rotations and cultivation of crops in alternating stripes on the slopes; *(d) compensation of humus losses by producing and using manure, composting, incorporation of crop residues (straw, other organic waste) treated with 10 kg of nitrogen per 1 ton of organic waste; (e) cultivation of leguminous at a rate of 20-25% of the area of arable land for the accumulation of biological nitrogen; (f) use of mineral fertilizers to prevent drainage of nutrients from soil and get the expected yields;* (g) implementation of anti-erosion systems on irrigated lands.

The Action Plan for the implementation of the Soil Conservation and Fertility Enhancement Program for 2017-2020 provides for organization and anti-erosion and hydrological planning of farmlands on 1200 ha, organic fertilization works and soil conservation cultivation technologies (2017 – 1200 ha, 2018 – 1000 ha, 2019 – 1000 ha and in 2020 – 1000 ha) to make the agricultural products more ecological.

GHG concerned: CO_2 and N_2O
Policy type: regulatory and economic
Status: effective over 2011-2020
Considered in: With Measures (WM) Scenario

National Development Strategy "Moldova 2020", Law no. 166/2012[148]

The Strategy is focused on 8 development priorities, including *increasing the agricultural and food products competitiveness and sustainable rural development*. The priority implementation of this Strategy will result in: restructured and modernized competitive agribusiness sector, improved living and working conditions in rural areas, existing agri-food activities in harmony with the natural environment by maintaining biodiversity, cultural values and traditions for future generations. Policies implemented in the agricultural sector will have the following strategic goals: 1. Diversified agricultural production with high added value; 2. Food security and safety; 3. Preservation of natural and land resources; 4. Providing sustainable foundation for the rural economy and increased employment in rural areas. The achievement of the goals will be underpinned by three main priorities: (i) increasing competitiveness by market modernization and integration; (ii) ensuring sustainable management of natural resources in agriculture; (iii) improving living standards in rural areas.

GHG concerned: CO_2 and N_2O
Policy type: regulatory and economic
Status: effective over 2012-2020
Considered in: With Measures (WM) Scenario

National Strategy for Agricultural and Rural Development for 2014-2020, GD no. 409/2014[149] and the Action Plan for the Implementation of the National Strategy for Agricultural and Rural Development for 2014-2020, GD no. 742/2015[150]

The Strategy has three overall objectives: (1) increasing the agri-food sector competitiveness by market restructuring and modernization; (2) ensuring sustainable management of natural resources in agriculture; (3) improving living standards in rural areas.

It is planned to increase areas cultivated using sustainable land management practices by up to 10% annually; expand areas intended for organic agriculture by 60%; increase areas under energy crops by 7500 ha; rehabilitate circa 2200 ha of forest belts, rehabilitate, with the support of the Competitive Agriculture Project (MACP) circa 50 thousand ha of land protected by robust anti-erosion strips.

It is worth mentioning that the areas cultivated with use of no-till / mini-till technologies have expanded from 85 thousand ha in 2013 to 150 thousand ha in 2014 and remained the same level in 2015. In 2015, of the 150 thousand ha the share of mini-till technology was 79%, no-till – 20% and strip-till – 1%. According to the MAFI Activity Report, this increase was largely due to the subsidies allocated for the purchased agricultural machinery and implementation of the programs under IFAD and 2KR projects[151]. It should also be noted that in 2016, about 30 businesses were successfully implementing new agricultural technologies (mini-till and no-till) to increase soil fertility on a surface of about 139.7 thousand hectares of farmlands, in all regions of the country, mainly in the northern part, which resulted in savings of about 2 million liters of diesel oil or 34 mil. MDL annually, with corresponding impact on GHG reduction.

GHG concerned: CO_2 and N_2O
Policy type: regulatory and economic
Status: effective over 2014-2020
Considered in: With Measures (WM) Scenario

Inclusive Rural Economic and Climate Resilience Program (IFAD VI) – conservation agriculture and value chains for 2014-2020[152]

[145] Government Decision no. 626 of 20.08.2011 approving the Soil Conservation and Fertility Enhancement Program for 2011-2020. Published on 26.08.2011 in the Official Gazette no. 139-145, art. 696. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=339882>

[146] Government Decision no. 138 of 24.02.2014 approving the Action Plan for implementation of the Soil Conservation and Fertility Enhancement Program for the years 2014-2016. Published on 28.02.2014 in the Official Gazette no. 49-52, art. 154. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=351879>

[147] Government Decision no. 554 of 14.07.2017 approving the Action Plan on implementation of the Soil Conservation and Fertility Enhancement Program for 2017-2020. Published on 21.07.2017 in the Official Gazette no. 253-264, art. 650. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=371387>

[148] Law no. 166 of 11.07.2012 approving the National Development Strategy "Moldova 2020". Published on 30.11.2012 in the Official Gazette no. 245-247, art. 791. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=345635> Modified by Law no. 121 of 03.07.2014 amending and supplementing the annex to the Law no. 166 of July 11, 2012 approving the National Development Strategy "Moldova 2020". Published on 03.10.2014 in the Official Gazette no. 293-296, art. 603. <http://lex.justice.md/md/354876/>

[149] Government Decision no. 409 of 04.06.2014 approving the National Strategy for Agricultural and Rural Development for 2014-2020. Published on 10.06.2014 in the Official Journal no. 152, art. 451. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=353310>

[150] Government Decision no. 742 of 21.10.2015 approving the Action Plan on implementation of the National Strategy for Agricultural and Rural Development for 2014-2020. Published on 30.10.2015 in the Official Gazette no. 297-300, art. 835. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=361669>

[151] Ministry of Agriculture and Food Industry (2017), External assistance projects in the agri-food sector - 2017. <http://maia.gov.md/en/categories/project-support-external-agro-food sector>

[152] Inclusive Rural Economic and Climate Resilience Program (IFAD VI) – Conservation agriculture and value chains for 2014-2020. <http://aipa.gov.md/ro/content/programul-rural-de-rezilien%C8%9B%C4%83-econo-

The program implementer is the International Fund for Agricultural Development (IFAD). The objectives of the Program – grants and investment loans expected to enhance the capacity of agricultural enterprises to adapt to climate change. The main activities carried out under the Program include financing and subsidization of activities and the measures undertaken by agricultural businesses to mitigate the negative effects of climate change and protecting soils in the agricultural production process. The total budget of the Program is US$4.6 mil. Other facilities offered by the Program include training and free technical assistance in the field of conservation agriculture, and value chain development.

GHG Concerned: CO_2 and N_2O
Policy type: economic
Status: effective over 2014-2020
Considered in: With Measures (WM) Scenario

Inclusive Rural Economic and Climate Resilience Program (IFAD VI) - Inclusive Rural Financing for 2014-2020[153]

The objective of the Program – financing business and capacity development of rural micro-entrepreneurs. The target group of the Program – micro-entrepreneurs who are members of Savings and Credit Associations. Total budget of the Program – US$3.7 mil. The investment loans value - up to 100 thousand MDL. Term – up to 3 years, grace period – up to 1 year.

GHG concerned: CO_2 and N_2O
Policy type: economic
Status: effective over 2014-2020
Considered in: With Measures (WM) Scenario

Inclusive Rural Economic and Climate Resilience Program (IFAD VI) - for SMEs for 2014-2020[154]

The objective of the Program – Preferential credits for financing agricultural investments. Target groups of the Program – groups of rural SMEs engaged in agricultural activities, associations, cooperatives and other agricultural producer organizations. The total budget of the Program is US$ 4.8 mil., up to a maximum of US$150 thousand/project. The beneficiary's contribution must be at least 25% of the loan amount. Interest rate: 8.9% in MDL; 4.85% in US$; 4.85% in EUR. Term: up to 8 years. Grace period: up to 4 years.

GHG concerned: CO_2 and N_2O
Policy type: economic
Status: effective over 2014-2020
Considered in: With Measures (WM) Scenario

Inclusive Rural Economic and Climate Resilience Program (IFAD VI) - Infrastructure for 2014-2020[155]

The objective of the Program - Partial Grants for the Development of Rural Public Infrastructure for Rural Resilience and Growth. Target groups of the Program – groups of rural SMEs engaged in agricultural activities, associations, cooperatives and other agricultural producer organizations. Total program budget – US$ 3.8 mil., with a maximum of US$ 200,000 / project. Beneficiaries' contribution – at least 15%.

GHG concerned: CO_2 and N_2O
Policy type: economic
Status: effective over 2014-2020
Considered in: With Measures (WM) Scenario

Government Decision no. 455 of 21.06.2017 on allocation of funds from the National Fund for Agriculture and Rural Development[156]

The Fund's resources are used within the limits of allowances approved annually by the State Budget Law, in accordance with the provisions of the Law on the Principles of Subsidizing Agricultural Producers and the provisions of the respective Regulation. The effectiveness of the Regulation extends over 2017-2021. The allocation of the Fund's resources aims at achieving the overall and specific objectives set out in the National Strategy for Agricultural and Rural Development for 2014-2020[157].

Under these circumstances, it was possible to attract investments worth 4.3 billion MDL in the agro-industrial sector and create about 4299 jobs. By the end of 2017, it was possible to fund 5,000 applications, while 2,700 applications for a total amount of 240 million MDL, will be funded by the FNDAMR for 2018. Efforts have been channeled, including towards stimulating investment for purchasing conventional agricultural machinery and equipment, including no-till and mini-equipment. For example, in 2016 for 1378 beneficiaries applied for *"Stimulating investments for procurement of conventional agricultural machinery and equipment"* for a total amount of 110.6 million MDL for purchasing 1431 units of conventional agricultural machinery and equipment, and 107 beneficiaries applied for *"Stimulating investment to purchase no-till and mini-up equipment"* for a total amount of 18.2 million MDL for purchasing various types of no-till and mini-till machinery.

GHG concerned: CO_2 and N_2O
Policy type: regulatory and economic
Status: effective over 2017-2021
Considered in: With Measures (WM) Scenario

Green Economy Promotion Program in the Republic of Moldova for 2018-2020 and the Action Plan for its Implementation, GD no. 160/2018[158]

The purpose of the Program is to promote implementation of the green economy principles in the Republic of Moldova, including increasing the share of organic agriculture. It provides for ensuring the conditions for good governance by 2020 and strengthening the institutional and management potential in promoting "green" economy by 30% at national level; promoting green agriculture by implementing green economy principles and expanding the area of agricultural land used for organic farming by about 20%. More detailed information on this Program is presented in chapter 3.5.1.

GHG Concerned: CO_2 and N_2O
Policy Type: regulator
Status: effective over 2018 - 2020
Considered in: With Additional Measures (WAM) Scenario

mico-%E2%80%93-climatic%C4%83-incluziv%C4%83-ifad-vi-agricultura>

[153] Inclusive Rural Economic and Climate Resilience program (IFAD VI) - Inclusive Rural Financing for 2014-2020. <http://aipa.gov.md/ro/content/programul-rural-de-rezilien%C8%9B%C4%83-economico-%E2%80%93-climatic%C4%83-incluziv%C4%83-ifad-vi-finan%C8%9Bare-rural%C4%83>

[154] Inclusive Rural Economic and Climate Program (IFAD VI) - for SMEs for 2014-2020. <http://aipa.gov.md/ro/content/programul-rural-de-rezilien%C8%9B%C4%83-economico-%E2%80%93-climatic%C4%83-incluziv%C4%83-ifad-vi-pentru-imm>

[155] Inclusive Rural Economic and Climate Program (IFAD VI) - Infrastructure for 2014-2020. <http://aipa.gov.md/ro/content/programul-rural-de-rezilien%C8%9B%C4%83-economico-%E2%80%93-climatic%C4%83-incluziv%C4%83-ifad-vi-infrastructur%C4%83>

[156] Government Decision no. 455 of 21.06.2017 on allocation of funds from the National Fund for Agriculture and Rural Development. Published on 23.06.2017 in the Official Gazette no. 201-213, art. 537. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=370674> Amended by the Government Decision no. 903 of 07.11.2017 on amendment and completion of the Government Decision no. 455 of 21 June 2017. Published on 10.11.2017 in the Official Gazette no. 390-395, art. 1012. <http://lex.justice.md/md/372416%20/>

[157] Decree of the President of the Republic of Moldova no. 1815 of 12.11.2015 on promulgation of the Law for the ratification of the Financing Agreement between the Government of the Republic of Moldova and the European Commission on implementation of the ENPARD Moldova Program - support for agriculture and rural development. Published: 27.11.2015 in the Official Gazette no. 317-323, art. 575. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=361905>

[158] Government Decision no. 160 of 21 February 2018 approving the Green Economy Promotion Program in the Republic of Moldova for 2018-2020 and the Action Plan for its implementation. Published: 02.03.2018 in the Official Gazette no. 68-76, art. 208. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=374523>

Government Decision no.691 of 11 July 2018 approving the Regulation on conditions and procedures for implementing land improvements, soil fertility protection, conservation and enhancement[159]

This Regulation was developed to implement the provisions of the Land Code no.828-XII of December 25, 1991. The document sets up the mechanism for the selection of objects to be included in the List of objects and financial means necessary for implementation of the Action Plan for the implementation of the Soil Conservation and Fertility Enhancement Program for 2017-2020, approved by the Government Decision no. 554 of 14.07.2020.

GHG Concerned: CO_2 and N_2O
Policy type: regulatory
Status: effective over 2018 and 2020
Considered in: With Additional Measures (WAM) Scenario

The overview of the sectoral policies related to horticulture and soil resources allows to conclude that the most effective measures to achieve the objective of reducing greenhouse gas emissions from the horticulture and soil resources sector, are the following:

- *land use by default intended for different agricultural use*, assessed based on pedological study and local relief and climate conditions;
- *introducing conservation tillage system,* based on the implementation of the Soil Conservation Systems (SCS) - "mini-till" and "no-till" technologies based on scientifically grounded crop rotations; on harmless fertilization and protection systems;
- *using green fertilizers (leguminous crops mixed with grasses)*: introducing intermediate vegetation into the soil in between basic crops vegetation periods;
- *incorporating crop residues into the soil*: increased carbon content in the soil is assured by incorporating the crop residues remaining in the field after the harvest of the main crop;
- *optimizing use of fertilizers*: reducing use of nitrogenous chemical fertilizers and replacing them with green fertilizers will particularly lead to the GHG emissions reduction;
- *crop rotation*: using crop rotation on the slopes, with the predominant participation of sown crops can greatly increase the carbon sequestration in soil and erosion control;
- *including leguminous crops in crop rotation*: including nitrogen-fixing leguminous crops such as beans, peas, soybeans, vetch, alfalfa, sparsete in crop rotation contributes to reducing the need for nitrogen fertilizers, respectively reducing related GHG emissions, increasing organic carbon content in soil and restoration of the structure and the overall quality of the arable layer.

3.5.4. Land Use, Land Use Change and Forestry Sector

The legislative framework underpinning the state policy promoted in the LULUCF Sector includes the Constitution of the Republic of Moldova, more than 30 laws and a set of Government Decisions that refer, directly or indirectly, to forestry and land use. The Forestry Code of the Republic of Moldova (no. 887/1996) is the basic document governing the use of forests, protection of land and water, and use and conservation of flora and fauna. Since its entry into force, the Forest Code was amended in 2001, 2003, 2005, 2009, 2011, 2012, 2017. Another main document related to the LULUCF sector is the Land Code (no. 828/1991), which regulates the land relations, establishes the ways the land destination and land use categories are assigned and changed, regulates the land ownership regime, land protection and land improvement. During its effectiveness, the Land Code has undergone several changes / updates (more than 20). Policies in the LULUCF sector are reflected in the following documents:

Law no. 440-XIII/1995 on Protection Zones and Strips of River Flows and Water Basins [160]

The Law establishes the dimensions of riparian zones, rivers, forest belts protecting rivers, and water basins, which depend on the length / area of rivers and water basins. The terrain of riparian water protection strips is used for forest belts and hay fields.

GHG concerned: CO_2 (indirect)
Type of measure: regulatory
Status: effective since 1995
Considered in: With Measures (WM) Scenario

Law no. XIV-1041/2000 on Reclamation of Degraded Lands through Afforestation[161]

The Law contains all aspects relating to allocation and afforestation of degraded lands. The provisions of the Law target degraded lands irrespective of the type of ownership. The main purpose of the Law is to boost the process of expanding areas with forest vegetation, primarily on degraded lands.

GHG concerned: CO_2 (indirect)
Type of measure: regulatory
Status: effective since 2000
Considered in: With Measures (WM) Scenario

The Law no. 412/1999 on Animal Husbandry[162]

The Law establishes the legal and economic bases for the organization of animal husbandry, regulates the relations between the state and livestock owners, including pasture management practices. According to the Law, grassland owners are required to maintain them in proper condition, to ensure safeguarding, to systematically increase soil fertility and productivity of pastures, observe the provisions of pastoral arrangements and annual maintenance, improvement and exploitation plans.

GHG concerned: CO_2 (indirect)
Type of measure: regulatory
Status: effective since 2001
Considered in: With Measures (WM) Scenario

The Law no. 239/2007 on Vegetable Kingdom[163]

The Law establishes the legal framework for conservation, protection, restoration and use of vegetable kingdom objects. With regard to the LULUCF sector, the law provides for: grass harvesting and grazing shall be done using methods that ensure the rational use of vegetable kingdom resources, biodiversity conservation, soil protection and aquatic objectives. The limits of the special use of the plant kingdom are set by the central authority empowered to manage natural resources and protect the environment.

[159] Draft Government Decision approving the Regulation on conditions and procedures for soil protection, land improvement, conservation and soil fertility enhancement activities. <http://particip.gov.md/proiectview.php?l=ro&idd=4682>

[160] Law no. 440 of 27.04.1995 on Protection Zones and Strips of River Flows and Water Basins. Published on 03.08.1995 in the Official Gazette no. 43, art. 482 Date of entry into force: 03.08.1995. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=311668>

[161] Law no. 1041 of 15.06.2000 on Reclamation of Degraded Land. Published on 09.11.2000 in the Official Gazette no. 141, art. 1015. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=312730>

[162] Law no. 412 of 27.05.1999 on Animal Husbandry. Published on 15.07.1999 in the Official Gazette no. 73-77, art. 347. Effective since 22.06.2001. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=311663>

[163] Law no. 239 of 08.11.2007 on Plant Kingdom. Published on 26.02.2008 in the Official Gazette no. 40-41, art. 114. Effective since 26.02.2009. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=327015>

GHG concerned: CO_2 (indirect)
Type of measure: regulatory
Status: effective since 2007
Considered in: With Measures (WM) Scenario

Law on Water no. 272/2011[164]

The Law provides the legal framework for the efficient management, protection and use of water. The Law prohibits the drainage, use and conversion of wetlands (ponds, marshes, natural or artificial waters less than 6 m. deep). They must be used in a sustainable way so as to protect the nature and essential characteristics.

GHG concerned: CO_2 (indirect)
Type of measure: regulatory
Status: effective since 2013
Considered in: With Measures (WM) Scenario

Government Decision no. 595/1996 on improving forest management and protection of forest vegetation[165]

The Decision was issued to substantially improve the situation around forestry management, use of forest resources, safeguarding of stands, preservation and increasing fertility of arable lands, the extension of the forest covered areas and improving the ecological situation, including the transferring all forests and trees and shrubs plantations owned by municipalities and agricultural enterprises under the administration of "Moldsilva" Agency, considerable extension of the forest covered areas and increasing afforestation of lands in the RM, etc.

GHG concerned: CO_2 (indirect)
Type of measure: regulatory
Status: effective since 1996
Considered in: With Measures (WM) Scenario

Government Decision no. 32/2001 on measures for establishment of riparian zones and strips for waterflows and water basins protection[166]

The Decision was drafted for to enact Law no. 440-XIII above and provides for establishing the size of riparian zones and strips protecting the waterflows and water basins of the Republic of Moldova (84 thousand ha), marking the borders thereof on land, as well as t afforestation of water protection riparian zones and strips on 23 thousand ha.

GHG concerned: CO_2
Type of measure: regulatory
Status: effective since 2001
Considered in: With Measures (WM) Scenario

National Strategy and Action Plan for Conservation of Biological Diversity, PD no. 112/2001, amended in 2007[167]

The scope of the document is conservation, rehabilitation, reconstruction and rational use of biological and landscape diversity, including by expanding the forest fund by up to 15% by afforestation of waterflows and water basins protection areas and degraded lands by creating ecological connection corridors, etc.

GHG Concerned: CO_2
Type of measure: regulatory
Status: effective since 2001
Considered in: With Measures (WM) Scenario

Sustainable Forest Development Strategy, PD no. 350/2001 and GD no. 739/2003 on Implementation of the National Forest Sector Sustainable Development Strategy (GD no. 739/2003 repealed by GD 796/2012)[168]

The documents provide for the improving the policies, legislation and institutional framework; regeneration and afforestation of forest fund lands on the area of 95.1 thousand ha; ecological reconstruction of 24.5 thousand hectares of forests; expansion of the areas covered with forest vegetation by128 thousand ha.

GHG concerned: CO_2
Type of measure: regulatory
Status: effective since 2001 and 2003, respectively
Considered in: With Measures (WM) Scenario

New Lands Use and Soils Fertility Enhancement Program for 2003-2010, GD no. 636/2003[169]

According to the Program, about 56.4% of agricultural land is affected by different degradation processes. The Program provides for a set of anti-erosion works and measures for the period 2003-2010, including planting new forest protection belts and reconstruction of existing ones; afforestation of degraded lands on 133.1 thousand ha; land planning, agrotechnical, hydromeliorative (hydro-technical) works to combat soil erosion; agrotechnical anti-erosion measures on pastures on about 328.3 thousand ha; hydro-melioration works to stop landslides on 38.2 thousand ha.

GHG concerned: CO_2
Type of measure: regulatory
Status: effective since 2003
Considered in: With Measures (WM) Scenario

Forest Fund Lands Regeneration and Afforestation Program for 2003-2020, GD no. 737/2003[170]

Regeneration and afforestation work on the forest fund lands will cover a total area of 95.2 thousand ha by 2020.

GHG concerned: CO_2
Type of measure: regulatory
Status: effective since 2003
Considered in: With Measures (WM) Scenario

Possibilities of harvesting wood in the process of main products cuttings for 2006-2010, GD no. 1337/2005[171]**; for 2011-2015, GD no. 1184/2010**[172]**; for 2016-2020, GD no. 890/2015**[173]**; approval of additional cuttings for 2006-2007, GD no. 1360/2006**[174]

[164] Law no. 272 of 23.12.2011 on Water. Published on 26.04.2012 in Official Gazette no. 81, art. 264. Effective since 26.10.2013. <http://lex.justice.md/md/342978/>
[165] GD no. 595 of 29.10.1996 on improving forest management and protection of forest vegetation. Published on 05.12.1996 in the Official Gazette no. 078. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=303277>
[166] GD no. 32 of 16.01.2001 on measures for establishment of riparian zones and strips for waterflows and water basins protection. Published on 31.05.2001 in the Official Gazette no. 57-58, art. 366. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=301052>
[167] GD no. 112 of 27 April 2001 approving the National Strategy and Action Plan for Conservation of Biological Diversity. Published on 02.08.2001 in the Official Gazette no. 090. <http://lex.justice.md/viewdoc.php?action=view&view=doc&id=307364&lang=1 >
[168] GD no. 350 of 12.07.2001 approving the Strategy for Sustainable Development of the Forestry Sector of the Republic of Moldova. Published on 08.11.2001 in the Official Gazette no. 133, art. 1021. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=308876 >
[169] GD no. 636 of 26.05.2003 approving the New Lands Use and Soil Fertility Enhancement Program. Published on 06.06.2003 in the Official Gazette no. 99-103, art. 675. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=303581>
[170] GD no. 737 of 17.06.2003 approving the State Program for Regeneration and Afforestation of Forest Fund Lands for 2003-2020. Published on 01.07.2003 in the Official Gazette no. 132-133 art. 788. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=304349>
[171] GD no. 1337 of 16.12.2005 approving the possibility of harvesting wood mass in the process of main products cutting for 2006-2010. Published on 23.12.2005 in the Official Gazette no. 172-175, art. 1436. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=298872>
[172] GD no. 1184 of 22.12.2010 on approving the possibility of harvesting wood mass in the process of main products cutting for 2011-2015. Published on 24.12.2010 in the Official Gazette no. 254-256, art.: 1299. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=337115 >
[173] GD no. 890 of 28.12.2015 on approving the possibility of harvesting wood mass in the process of main products cutting for 2016-2020. Published on 31.12.2015 in the Official Gazette no. 370-376, art. 996. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=362647>
[174] GD no. 1360 of 28.11.2006 on approving the volume of additional forest cuttings. Published on 01.12.2006 in the Official Gazette no. 184-185, art.no: 1453.
<http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=318597>

These documents provide for harvesting a total volume of 1359.3 thousand m^3 or 272 thousand m^3 of wood mass annually over 2006-2010; an additional volume of 23.4 thousand m^3 in 2006-2007; 1940.0 thousand m^3 or 388 thousand m^3 annually over 2011-2015; 1871.5 thousand m^3 or 374.3 thousand m^3 annually over 2016-2020.

GHG concerned: CO_2
Type of measure: regulatory
Status: effective over 2006-2020
Considered in: With Measures (WM) Scenario

National Program on Establishment of the National Ecological Network, GD no. 593/2011[175]

The Program provides for afforestation of riparian zones and strips protecting waterflows and water basins on 30.4 thousand ha by the end of 2018.

GHG Concerned: CO2
Type of measure: regulatory
Status: effective over 2011-2018
Considered in: With Measures (WM) Scenario

Soil Conservation and Fertility Enhancement Program for 2011-2020, GD no. 626/2011[176]

The objectives of the Program include: halting active forms of degradation of the soil cover on 877 thousand ha of arable land by the end of 2020. In this sense, land improvement works will be extended to minimize surface and deep erosion processes, stabilize landslides, ravines. According to the Action Plan for implementation of the Soil Conservation and of Fertility Enhancement Programme for 2011-2013 (hereinafter referred to as the Action Plan), soil degradation processes will be reduced on 100 thousand hectares of agricultural lands by: updating the antierosion and floods protection maps; re-parcelling of 1700 plots of agricultural land on 2600 hectares for land consolidation purposes; antierozion planning of consolidated lands on 6000 ha; hydrologic planning of consolidated lands by building 100 km of canals, dams, disposal outlets for directed drainage of the rainwater surplus from the slopes; stabilization of 50 hectares of land slides through afforestation; draining and dewatering of 270 ha of soils with excess moisture on the slopes; reconstruction of the 100 km of drainage pipes on the meadows; reclamation of 400 ha of fallow lands; grubbing degraded orchards and vineyards on 1500 hectares; re-cultivation of anthropically damaged land on 15 ha; clearing of 100 km of small rivers riverbeds; re-construction of 15 antierosion water basins.

GHG concerned: CO_2
Type of measure: regulatory
Status: effective over 2011-2020
Considered in: With Measures (WM) Scenario

Strategy for Development of Rural Extension Services in the Republic of Moldova (2012-2022), GD no. 486/2012[177]

The actions set out in the Strategy are in line with the following general and specific objectives:

General objectives: a) developing the rural economy and increasing productivity in agriculture; b) contributing to increasing the competitiveness of agribusiness by providing rural extension services.

Specific objectives: a) developing rural extension network from 40% in 2011 to 65% in 2022; b) increasing the number of beneficiaries by 20% by 2022; c) increasing the income of rural extension service beneficiaries by about 15% annually.

It is expected that in 2020 the number of private commercial ownerships will reduce by 100,000, of which 40-50 thousand will be ownerships larger than 5 ha.

The issue of rural extension services development became a strategic dimension by being addressed in both national and sectoral policy documents. Thus, the document was included in the Government Action Plan for 2012-2015, approved by the GD no. 289 of 7 May 2012, as well as in the National Strategy for Agribusiness Sustainable Development in the Republic of Moldova (2008-2015), approved by the GD no. 282 of 11 March 2008.

GHG concerned: CO_2, CH_4 and N_2O
Policy type: regulatory and instructive-methodological
Status: effective over 2012-2022
Considered in: With Measures (WM) Scenario

National Plan for Expanded Wooded Areas for 2014-2018, GD no. 101/2014[178]

The plan provides for expansion of forest vegetation on 13.041 thousand hectares on the account of degraded lands, as well as provision of the necessary planting material for the expansion works.

GHG concerned: CO_2
Type of measure: regulatory
Status: effective since 2014
Considered in: With Measures (WM) Scenario

Action Plan for Implementation of the Soil Conservation and Fertility Enhancement Program for 2014-2016, GD no. 138/2014[179]

The main objective of the document is long term maintenance of the soil quality and productive capacity to ensure the country's food security. One of the main actions of the Plan is aimed at clearing of degraded multiannual plantations (2014 – 200 ha, 2015 – 200 ha, 2016 – 400 ha) with subsequent replanting according to new systems.

GHG concerned: CO_2
Type of measure: regulatory
Status: effective since 2014
Considered in: With Measures (WM) Scenario

Environmental Strategy for 2014-2023 and the Action Plan for its implementation, GD no. 301/2014[180]

The Strategy and the Plan provide for expansion of forests up to 15% of the country's territory, state-protected natural areas up to 8.1% of the country's territory, ensuring the effective and sustainable management of natural ecosystems, improving soil quality and ecological reconstruction of degraded lands affected by landslides and forest belts for protection of agricultural lands, including by developing a program of additional and compensatory measures of clearing, restoration and/or ecologic reconstruction of degraded soils. At the same time, the documents provide for improving the quality of at least 50% of surface waters by implementing the water basins management system; rehabilitation of about 150 thousand ha of degraded wetlands, and including them in the country's

[175] GD no. 593 of 01.08.2011 on approving the National Program for Establishment of the National Ecological Network for 2011-2018. Published: 12.08.2011 in the Official Gazette no. 131-133, art. 664. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=339794>
[176] GD no. 626 of 20.08.2011 on approving the Soil Conservation and Fertility Enhancement Program for 2011-2020. Published on 26.08.2011 in the Official Gazette no. 139-145, art. 696. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=339882>
[177] Official Gazette no. 143-148 of 13.07.2012. GD no. 486 of 04.07.2012 approving the Strategy for Development of Rural Extension Services for 2012-2022. <http://lex.justice.md/index.php?action=view&-view=doc&lang=1&id=344026>
[178] GD no. 101 of 10.02.2014 approving the National Plan for Extension of Areas with Forest Vegetation for 2014-2018. Published on 14.02.2014 in the Official Gazette no. 35-41 art. 118. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=351561>
[179] GD no. 138 of 24.02.2014 approving the Action Plan on Implementation of the Soil Conservation and Fertility Enhancement Program for 2014-2016. Published on 28.02.2014 in the Official Gazette no. 49-5,2 art. 154. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=351879>
[180] GD no. 301 of 24.04.2014 approving the Environmental Strategy for 2014-2023 and the Action Plan for its implementation. Published on 06.05.2014 in the Official Gazette no. 104-109, art. 328. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=352740 >

economic circuit. In Agriculture sector, GHG emissions reduction will be achieved by: creating the most favorable carbon balance in the soil and maintaining long-term soil fertility so that the by-products of agricultural crops (straw and other crop residues) is predominantly incorporated in the soil, and less used as a source of energy; efficient manure management; the use of sidereal fertilizers and soil conservation cultivation technologies.

GHG concerned: CO_2
Type of measure: regulatory
Status: effective since 2014
Considered in: With Measures (WM) Scenario

National Strategy for Agricultural and Rural Development for 2014-2020, GD no. 409/2014[181]

Regarding the LULUCF sector, the Strategy provides for use of modern agricultural lands and water management practices, afforestation of low-quality agricultural land to increase biodiversity and to reduce soil erosion, while contributing to the conservation of water resources.

GHG concerned: CO_2, CH_4 and N_2O
Type of measure: regulatory
Status: effective since 2014
Considered in: With Measures (WM) Scenario

Action Plan for Implementation of the National Strategy for Agricultural and Rural Development for 2014-2020, GD no.742/2015[182]

Regarding the LULUCF sector, the Plan provides for the establishment of 24.5 thousand modern viticulture plantations by 2020. At the same time, it provides for improving energy efficiency and increasing use of renewable energy sources by planting 7,500 ha of energy crops. As a measure aimed at protection of 50 thousand ha of farmlands, it is proposed to rehabilitate 2,199 ha of forest belts by 2020.

GHG concerned: CO_2, CH_4 and N_2O
Type of measure: regulatory
Status: effective since 2015
Considered in: With Measures (WM) Scenario

Climate Change Adaptation Strategy until 2020 and Action Plan for its Implementation, GD no. 1009/2014[183]

As pilot measures aimed at risk reduction and adaptation to climate change in the LULUCF sector, it is planned to afforest 20,000 ha of land, create green islands, plant/restore 3,000 ha of forest belts, and plant energy plantations on 5,000 of ha by 2020. At the same time, it is planned to create new accumulation lakes, infrastructure for collecting rainwater, as well as develop wetland.

GHG concerned: CO_2, CH_4 and N_2O
Type of measure: regulatory
Status: effective since 2014
Considered in: With Measures (WM) Scenario

Low-Emission Development Strategy until 2030 and the Action Plan for its implementation, GD no. 1470/2016[184]

The specific objective of the LULUCF Sector Strategy provides for: unconditional increase by the year 2030, of carbon removal capacity up to 62% and conditional removal of GHG up to 76% compared to 1990; greater promotion of agroforestry and silvopastoral practices, improving the quality of meadows; community support for sustainable and integrated forest management, including by improving productivity of 800 ha of communal grasslands. At the same time, it provides for implementing the "no-till" soil conservation tillage system with 5 fields crop rotation and incorporation of green fertilizer (autumn vetch) into the soil; and "mini-till" soil conservation tillage system with incorporation of green manure cultivated as intermediate crop and/or associated by-product into the soil.

GHG concerned: CO_2, CH_4 and N_2O
Type of measure: regulatory
Status: effective since 2017
Considered in: With Measures (WM) Scenario and Additional Measures (WAM) Scenario

The Biological Diversity Strategy of the Republic of Moldova for 2015-2020 and the Action Plan for its Implementation, GD NR. 274/2015[185]

The Strategy provides for rehabilitation of forest belts for protection of agricultural fields on of 3000 ha by 2020; restoration of riparian forest belts for protection of waterflows and water basins on 3000 ha; planting forests on degraded lands, promoting indigenous species on 500 ha (central and northern zones); promoting good agricultural practices to stop the degradation of steppe and grassland sectors due to intensive grazing and mowing activities; identification and delimitation of water bodies.

GHG concerned: CO_2, CH_4 and N_2O
Type of measure: regulatory
Status: effective since 2017
Considered in: With Measures (WM) Scenario

Forestry Climate Change Adaptation Strategy for 2017-2025 and the Action Plan for its Implementation, Draft GD[186]

It provides for expansion of the forest vegetation covered areas which are not part of the forest fund by 13.5 thousand ha, in the context of the promoting agroforestry and silvopastoral practices to a larger extent; creating rural and urban green areas (5 thousand ha); planting energetic forest crops using rapidly growing species, on about 10 thousand ha; strengthening the rapid forest fires response signaling systems.

GHG concerned: CO_2, CH_4 and N_2O
Type of measure: regulatory
Status: in the process of promotion
Considered in: With Additional Measures (WAM) Scenario

Regulation on conditions and procedures for carrying out land improvement, protection, conservation and soil fertility enhancement activities, Draft GD [187]

The Regulation was developed for implementation of Art. 8-10, 78-79 and 81 of the Land Code (no. 828-XII of December 25, 1991). It provides for the approval of the mechanism and the procedure for carrying out land improvement activities and requirement to carry out scientific expertise. At present, there is no clear mechanism for selecting objects to be included in the list of objects and financial means needed for implementation of the Action Plan of the Soil

[181] GD no. 409 of 04.06.2014 approving the National Strategy for Agricultural and Rural Development for 2014-2020. Published on 10.06.2014 in the Official Gazette no. 152 art. 451. <http://lex.justice.md/md/353310/>
[182] GD no. 742 of 21.10.2015 approving the Action Plan for Implementation of the National Strategy for Agricultural and Rural Development for 2014-2020. Published on 30.10.2015 in the Official Gazette no. 297-300, art. 835. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=361669>
[183] GD no. 1009 of 10.12.2014 approving the Climate Change Adaptation Strategy until 2020 and the Action Plan for its implementation. Published on 19.12.2014 in the Official Gazette no. 372-384, art. 1089. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=355945>
[184] GD no. 1470 of 30.12.2016 approving the Low-Emission Development Strategy until 2030 and the Action Plan for its implementation. Published on 24.03.2017 in the Official Gazette no. 85-91, art. 222. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=369528>
[185] GD no. 274 of 18.05.2015 approving the Biological Diversity Strategy of the Republic of Moldova for 2015-2020 and the Action Plan for its implementation. Published on 29.05.2015 in the Official Gazette no. 131-138, art. 321. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=358781>
[186] <http://adapt.clima.md/public/files/publication/STRATEGIA_SECTORIALA_FORESTIER.pdf>
[187] <http://maia.gov.md/en/proiecte-discutie/proiectul-de-hotarire-de-guvern-pentru-aprobarea-regulamentului-privind-conditiile>

Conservation and of Fertility Enhancement Program for 2017-2020. This Regulation regulates soil protection, land improvement and soil fertility enhancement activities, including on degraded soils, which, due to erosion, pollution or action of other anthropogenic factors, have totally or partially lost their production capacity, and where conservation, or fertility enhancement works have to be carried out.

GHG concerned: CO_2, CH_4 and N_2O
Type of measure: regulatory
Status: in the process of promotion
Considered in: With Additional Measures (WAM) Scenario

Action Plan for 2018-2022 for Implementation of the Rural Extension Services Development Strategy in the Republic of Moldova (2012-2022), Draft GD [188]

The Plan provides for increasing the profitability of the agro-industrial sector, which will be closely linked to the growing pressure on the environment and nature. The document provides for provision of services for environmental protection, animal welfare, food safety and improvement of working and living conditions of rural population, contributing to the balanced development of the agricultural sector. For the period 2018-2022, three new specific objectives are set: developing the network of rural extension services focused on specialized sectors; transfer of extension capacity from subsistence farming to production farming, for marketing and increasing revenues of extension services companies from payments for services.

GHG concerned: CO_2, CH_4 and N_2O
Type of measure: regulatory
Status: in the process of promotion
Considered in: With Additional Measures (WAM) Scenario

3.5.5. Waste Sector

In the Republic of Moldova, the legal framework related to environmental protection is being updated in accordance with the National Action Plan for the implementation of the Moldova-EU Association Agreement. Policies with an impact on the GHG emissions evolution in the Waste sector, described below cover the following source categories: 5A "Solid Waste Disposal", 5C "Incineration and Open Burning of Waste" and 5D "Wastewater Treatment and Discharge".

The Environmental Strategy for 2014-2023 and the Action Plan for its Implementation, GD no. 301/2014.[189]

The overall objective of the Strategy is to create an effective environmental management system, including "Developing an integrated air quality management system, reducing by 30% pollutant emissions into the atmosphere by 2023 and at least by 20% by 2020, relative to the BAU scenario". In the waste sector, it is expected to achieve a 15% GHG emissions reduction by 2020 relative to the BAU scenario.

GHG concerned: CH_4 and N_2O
Policy category: regulatory
Status: effective over 2014-2023
Considered in: With Measures (WM) Scenario

Waste Management Strategy of the Republic of Moldova for 2013-2027, GD no. 248/2013

The Strategy promotes a new way of collecting household and industrial waste, recovery of reusable materials, protecting the environment, and achieving a unitary street sanitation program that will help reduce the amount of deposited waste by establishing appropriate treatment system for each type of waste in order to protect the environment. The overall objectives of the Strategy are the development of integrated municipal waste management systems by harmonizing relevant regulations; territorial division of the country into 8 waste management regions; increasing the amount of recycled and recovered waste by 20-30% by 2025; reducing the amount of landfilled biodegradable waste; development of regional waste disposal infrastructure by building 7 SWD sites and 2 mechanical-biological treatment plants (MBT) in Chisinau and Balti municipalities; re-cultivation of at least 50% of the non-compliant landfills by 2027.

GHG concerned: CH_4 and N_2O
Policy type: regulatory
Status: effective over 2013-2027
Considered in: With Measures (WM) Scenario

The Law no. 209 of 29.07.2016 on Waste[190]

The Law transposes Directive 2008/98/EC of the European Parliament and a number of provisions of about nine EU acts and imposes new regulations, including separate collection of biowaste for composting and fermentation; treating biowaste in a way that ensures a high level of environmental protection; use of environmentally safe materials from biowaste. At the same time, biodegradable waste from parks and gardens should be collected separately and transported to composting stations or individual composting platforms. Detailed information on the timing of the state policy implementation in this field is provided in the same law, Chapter 3.5.2.

GHG concerned: CH_4 and N_2O
Policy category: regulatory
Status: effective since 23.12. 2017
Considered in: With Measures (WM) Scenario

Moldova's Low-Emission Development Strategy until 2030 and the Action Plan for its implementation, GD no. 1470 of 30.12.2016[191]

With regard to waste management, the Strategy provides for unconditional reduction by the year 2030, of GHG emissions from the waste sector by 38% and conditional reduction of GHG emissions to 47% compared to 1990. More detailed information on the Strategy is provided in Chapter 3.5.1.

GHG concerned: CH_4 and N_2O
Policy type: regulatory
Status: effective over 2013-2027
Considered in: With Additional Measures (WAM) Scenario

The Program Promoting Green Economy in the Republic of Moldova for 2018-2020 and the Action Plan for its Implementation, GD no. 160 of 21.02.2018[192]

The purpose of the Program is to promote the implementation of the green economy principles in the Republic of Moldova in harmony with the economic development and social welfare, medium-term national planning policies on promoting green economy in the social and economic development sectors of the country. More detailed information on the Program and the Plan is provided in Chapter 3.5.1.

[188] <http: //www.maia.gov.md>
[189] GD no. 301 of 24.04.2014 approving the Environmental Strategy for 2014-2023 and the Action Plan for its implementation. Published on 06.05.2014 in the Official Gazette no. 104-109 art. 328. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=352740>
[190] Law no. 209 of 29.07.2016 on Waste, Official Gazette no. 459-471 / 916 of 23.12.2016.
[191] GD no. 1470 of December 30, 2016 approving the Low-Emission Development Strategy of the Republic of Moldova until 2030 and the Action Plan for its implementation. Published on 24.03.2017 in the Official Gazette no. 85-91, art. 222. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=369528>
[192] GD no. 160 of 21.02.2018 approving the Program for the Promotion of the Green Economy in the Republic of Moldova for the years 2018-2020 and the Action Plan for its implementation. Published on 02.03.2018 in the Official Gazette no. 68-76, art. 208. <http://lex.justice.md/viewdoc.php?action=view&view=doc&id=374523&lang=1>

GHG concerned: CH_4 and N_2O
Policy type: regulatory
Status: effective over 2013-2027
Considered in: With Additional Measures (WAM) Scenario

The normative acts regulating waste water treatment:

- The Water Code of the Republic of Moldova no. 1532/1993[193] (repealed from 26.10.13 by PL 272 of 23.12.11, GD 81/26.04.12 art. 264;
- The Law no. 1402/2002[194] on Public Services for Communal Management;
- The Law no. 272/2011[195] on Water;
- The Law no. 303/2013[196] on Public Service of Water Supply and Sewerage.

The approved strategic documents and programmes, geared toward promoting investment for of medium- and long-term development of water supply and sanitation infrastructure also include the Strategy for modernization and development of municipal water supply and sanitation systems, the Decision no. 7/1 of 14.05.1999[197] of the Ministry of Construction Territorial Development and Utilities, also.

The list of normative acts with impact on the evolution of GHG emissions from the sewage treatment sector includes:

Regulation on requirements for collection, treatment and discharge of sewage water in sewerage system and/or water emissaries for urban and rural settlements, GD no. 950/2013[198]

The Regulation partially transposes the provisions of the EC Directive no. 91/271/EEC of 21 May 1991 concerning urban waste-water treatment and encourage measures for employment of best available techniques for banning or reducing discharging wastewater referring to the use of liquid industrial residues, and conditions when these may be used for isolation of animal feed, fertilizer, creation of soil structuring correctives or energy production.

GHG concerned: CH_4 and N_2O
Policy type: regulatory
Status: effective since 2013
Considered in: With Measures (WM) Scenario

Water Supply and Sanitation Strategy (2014-2028), GD no. 99/2014[199]

One of the specific objectives of the Strategy is to extend centralized water supply and sanitation systems and to increase the access of the population to these services. The objective will be achieved by extending the existing aqueducts (Dniester-Soroca-Balti and Dniester-Vadul lui Voda-Chisinau-Straseni-Calarasi), planning a new aqueduct (Prut-Cimislia-Ceadir-Lunga) and maintenance of grouped aqueducts. The target for the first five years was to ensure water supply and sanitation infrastructure coverage for 30% of the non-connected population in urban areas and 20-25% in the rural areas.

The actions and timelines for improving the water supply and sanitation infrastructure include the following:

By year 2018 – connecting 61,957 new people to drinking water supply systems; rehabilitation of 42 water treatment plants to make the water potable; construction of 9 new water treatment plants; rehabilitation of 890 km of network; construction of 508 km of new network; connecting 101,077 new people to sewage systems; rehabilitation of 29 waste water treatment plants; construction of 20 new water treatment plants; rehabilitation of 511 km of sewerage network; construction of 566 km of new sewerage network. By year 2028 – connecting 652,892 new people to drinking water supply and sewage systems; construction of 344 new water treatment plants; construction of 1,959 km of new sewerage network.

GHG concerned: CH_4 and N_2O
Policy type: regulatory
Status: effective over 2014-2028
Considered in: With Additional Measures (WAM) Scenario

National Program for the Implementation of the Protocol on Water and Health in the Republic of Moldova for 2016-2025, GD no. 1063/2016[200]

The specific target indicators of the Program include:

- access to improved drinking water systems: 99% of all urban population and 85% of the rural population until 2025 and 100% of the institutions until 2020;
- access to improved sanitation systems, with access to a sewage system: 100% of the whole population with access to improved sanitation systems, including access to sewage system for up to 85% urban population and 25% rural population until 2025, 100% of institutions until 2020 and up to 150 villages until 2025.

GHG concerned: CH_4 and N_2O
Policy type: regulatory
Status: effective over 2014-2028
Considered in: With Measures (WM) Scenario

Action Plan for the years 2018-2028 for regionalization of the water supply and sewerage service (draft)[201]

The plan is designed to implement the provisions of the Water Supply and Sanitation Strategy for 2014-2028 and the National Program for the Implementation of the Protocol on Water and Health in the Republic of Moldova for 2016-2025. One of the major objectives is reorganization and strengthening the institutional capacities of the existing licensed operators by expanding the area of water supply and sanitation service provision to other administrative-territorial units. Another major objective is to optimize the number of operators by grouping them territorially, so as to create viable regional operators by reducing the number of operators to 5 regional operators in accordance with the following administrative-territorial criterion: North-West, Acva-Nord, Center, South-West and ATU.

GHG concerned: CH_4 and N_2O
Policy type: regulatory
Status: in the process of promotion
Considered in: With Additional Measures (WAM) Scenario

[193] Code no. 1532 of 22.06.1993 approved by the Parliament of the Republic of Moldova, published on October 1, 1993 in Parliament Monitor no. 10, art. no: 287, Repealed on 26.10.13 by PL 272 of 23.12.11, OG 81/26.04.12 art.264. <http://lex.justice.md/md/327987/>

[194] The Law on Public Services for Communal Management no. 1402 of 24.10.2002, approved by the Parliament of the Republic of Moldova, published on 07.02.2003 in the Official Gazette no. 14-17, art. 49. <http://lex.justice.md/index.php?action=view&view=doc&id=312769>

[195] Law no. 272 of 23.12.2011 on Water approved by the Parliament of the Republic of Moldova, published on 26.04.2012 in the Official Gazette no. 81 art. 264. <http://lex.justice.md/md/342978/>

[196] Law no. 303 of 13.12.2013 on Public Service of Water Supply and Sewerage, published on 4.03.2014 in the Official Gazette no. 60-65 art. 123. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=352073>

[197] Decision of the Ministry of Territorial Development, Construction and Utilities of the Republic of Moldova no. 7/1 of 14.05.1999 approving the Strategy for the modernization and development of communal water supply and sewerage systems, published on 25.11.1999 in the Official Gazette no. 130. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=291271>

[198] Government Decision no. 950 of 25.11.2013 approving the Regulation on Requirements for waste water collection, treatment and discharge in the sewage system and/or water emissaries for urban and rural settlements, published on 06.12.2013 in the Official Gazette no. 284-289, art. 1061. <http://lex.justice.md/md/350537/>

[199] Government Decision of the Republic of Moldova no. 199 of 20.03.2014 approving the Water Supply and Sanitation Strategy (2014-2028). Published on 28.03.2014 in the Official Gazette no. 72-77, art. 222. <http://lex.justice.md/md/352311/>

[200] Government Decision of the Republic of Moldova no. 1063 of 16.09.2016 approving the National Program for the Implementation of the Protocol on Water and Health in the Republic of Moldova for the years 2016-2025 Published on 20.09.2016 in the Official Gazette no. 314, art. 1141. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=366749>

[201] <http://particip.gov.md/projectview.php?l=en&idd=4693>

CHAPTER 4. GHG EMISSIONS PROJECTIONS

4.1. Assumptions and Tools Used

4.1.1. Introduction

The climate change mitigation analysis for the BUR2 of the RM is a continuation of the respective analysis carried out under the NC4 of the RM under the UNFCCC (2018).

In the BUR2 of the RM under the UNFCCC, the GHG emissions projections were made for two scenarios: With Measures (WM) and With Additional Measures (WAM). The need to develop the Business-as-Usual (BAU) scenario has been dropped due to the fact that when identifying the mitigation targets in the context of the National Determined Contribution (NDC), the RM has chosen the emissions target relative to the 1990 reference year. Thus, the GHG emissions in the WM and WAM scenarios are compared to emissions registered in 1990, and not to emissions under the BAU scenario.

The scenarios were generated for the following sectors: (1) Energy, (2) Industrial Processes and Product Use, (3) Agriculture, (4) Land Use, Land Use Change and Forestry and (5) Waste.

Under these scenarios, emissions of the following direct greenhouse gases were considered: CO_2, CH_4, N_2O and F-gases. GHG emissions projections are also expressed in aggregate form (CO_2 equivalent).

Projections were made for years 2020, 2025 and 2030. The GHG emissions for years 1990-2015 corresponds to the historical emissions as reported in the *National Inventory Report: 1990-2016, Greenhouse Gas Sources and Sinks in the Republic of Moldova* (2018).

Emissions from combustion of fuels in international bunkers are also presented in this chapter, but they are not accounted in total national emissions.

4.1.2. Scenarios Considered

As mentioned above, GHG emissions projections were developed for the years 2020, 2025 and 2030 for the following scenarios, which also include the historical emissions of 1990, 1995, 2000, 2005, 2010 and 2015: (1) WM scenario – reflects the projections complying with the policies and measures implemented or adopted before 01.01.2018; (2) WAM scenario – reflects policies and measures adopted or under development since 01.01.2018.

4.1.3. Methodologies and Tools Used

The content of this chapter is based on the UNFCCC Biennial Update Reporting Guidelines for Parties not included in Annex I (Decision 2/CP.17, Annex III, Chapter 4)[202].

Top-down and bottom-up methodologies as well as computer based tools were used to measure the GHG emissions mitigation potential. Mitigation scenarios were developed for each individual sector (Energy, IPPU, Agriculture, LULUCF, Waste), and GHG emissions were estimated separately for CO_2, CH_4, N_2O and F-gases. The list of tools considered, and tools selected to be used, along with a brief argument to support the selection, is presented in Table 4-1.

[202] UNFCCC Biennial Update Reporting Guidelines for Parties not included in Annex I to the Convention (Decision 2 / CP.17, Annex 3, Chapter 4).

Table 4-1: Tools used to assess the GHG emissions reduction potential in the Republic of Moldova

Sector	Recommended tools	Tools used	Notes
Energy	MESSAGE, MARKAL ENPEP -BALANCE LEAP RETScren	ENPEP, together with WASP, IMPACT 2006 IPCC Guidance	1) For the electricity subsector the electricity sources development scenarios were calculated using WASP module, while the GHG emissions mitigation potential - using the IMPACT module; 2) For the thermal power and transport sub-sectors, the GHG emission mitigation potential was assessed using Excel–based calculation tools developed by sectoral experts.
Industry	LEAP	2006 IPCC Guidance	For the Industry, Agriculture and LULUCF subsectors, the GHG emissions mitigation potential was assessed using the Excel-based calculation tools developed by sectoral experts, and the 2006 IPCC Guidance methodologies (Tier 1 and Tier 2).
Agriculture	STAIR		
LULUCF	COPATH		
Waste	LEAP	First Order Decay Method from 2006 IPCC Guidance	The potential for mitigation of methane emissions from solid waste deposits was assessed using the Excel-based calculation tool developed by sectoral experts, and the First Order Decay Methodology (Tier 3) from the 2006 IPCC Guidelines; The potential for mitigation of methane and nitrous oxide emissions from wastewater treatment was assessed by using the 2006 IPCC Guidelines methodologies (Tier 1 and Tier 2), and the Excel-based calculation tools developed by the sectoral experts.

4.1.4. Key Parameters and Assumptions

Table 4-2 presents the projected key parameters of the national economy and Table 4-3 presents the specific key parameters used for projections made by sectors.

Table 4-2: Key parameters used in scenarios

Parameters	UM	2000	2005	2010	2015	2020	2025	2030
Real GDP	mil. US$	1 289	2 988	5 813	6 514	10 407	15 037	21 700
Annual GDP growth	%	-2.2	18.3	14.2	2.3	9.8	7.6	7.6
Average annual population	thousand people	3 640	3 595	3 562	3 554	3 538	3 519	3 505
Population growth	%	0.21	-0.25	-0.18	-0.04	-0.09	-0.11	-0.08
Price of imported natural gas	$ / 1000m^3	NA	67	273	293	241	278	321
Price of imported electricity	cents / kWh	2.75	2.39	5.83	6.8	5.96	5.65	5.94

Table 4-3: Key parameters used in projections for relevant sectors

Parameters	UM	2000	2005	2010	2015	2020	2025	2030
Power Production								
Electricity demand under the WM	billion kWh	5.3	6.6	6.0	5.8	7.4	9.1	10.9
Annual increase in electricity demand under the WM	%	NA	4.5	-2.0	-0.4	4.9	4.3	3.7
Electricity demand under the WAM	billion kWh	5.3	6.6	6.0	5.8	6.0	6.7	7.4
Annual increase in electricity demand under the WAM	%	NA	4.8	-2.0	-0.6	0.8	2.1	2.2
Transport								
Number of private cars	Units	NA	NA	NA	637	745	845	945
Fuel consumption under the WM	(PJ)	NA	NA	NA	26.1	26.6	29.6	32.3
Fuel consumption under the WAM	(PJ)	NA	NA	NA	26.1	26.0	28.5	30.7
Buildings (residential, commercial and tertiary)								
Area of the buildings	mil m^2	87.97	89.64	92.20	94.20	98.87	107.67	122.20
IPPU								
Cement production, WM	kt	431.9	772.8	861.4	964.8	1 180.0	1 470.0	1 830.0
Cement production, WAM	kt	431.9	772.8	861.4	964.8	1 200.0	1 500.0	1 850.0
Steel production, WM	kt	908.1	1 049.4	242.4	431.8	496.9	670.3	1 004.5
Steel production, WAM	kt	908.1	1 049.4	242.4	431.8	507.7	697.6	1 080.2
Agriculture								
Areas where the conservative agriculture system will be used, WM	thousands ha	NO	NO	NO	150	200	300	400
Areas where the conservative agriculture system will be used, WAM	thousands ha	NO	NO	NO	150	300	400	500
LULUCF								
Areas of annual successful afforestation, WM	ha	NA	NA	NA	578.9	5 019.7	5 019.7	5 019.7
Areas of annual successful afforestation, WAM	ha	NA	NA	NA	578.9	7 751.3	7 751.3	7 751.3
Waste								
Municipal solid waste, WM	kt	523.8	602.5	1 075.1	1 270.7	1 535.3	1 535.3	1 460.0
Municipal solid waste, WAM	kt	523.8	602.5	1 075.1	1 270.7	1 535.3	1 325.9	1 250.7

4.2. Projections of Aggregate Direct GHG Emissions

Following the promotion of GHG emissions mitigation policies and measures described in Chapter 3 and underlying the WM and WAM scenarios concepts, the assumed impact was calculated for 5 IPCC sectors, expressed in CO_2 equivalent. The results apply to the entire country, including ATULBD and are shown in Table 4-4 and Figure 4-1.

Table 4-4: Projected aggregate GHG emissions in the RM, kt CO_2 equivalent

	1990	1995	2000	2005	2010	2015	2020	2025	2030
WM									
Energy	36 611	12 157	7 289	9 249	10 195	10 064	8 400	8 460	9 124
IPPU	1 572	451	314	592	592	784	918	1 036	1 144
Agriculture	5 221	3 603	2 481	2 578	2 255	2 091	2 477	2 703	2 929
LULUCF	-1 528	-1 869	-1 881	-1 411	-962	-902	-333	-1 024	-1 686
Waste	1 515	1 595	1 542	1 429	1 483	1 431	1 540	1 273	1 309
Total (with LULUCF)	**43 391**	**15 937**	**9 745**	**12 437**	**13 564**	**13 468**	**13 001**	**12 448**	**12 820**
Total (without LULUCF)	**44 919**	**17 806**	**11 626**	**13 848**	**14 526**	**14 370**	**13 334**	**13 472**	**14 506**
WAM									
Energy	36 611	12 157	7 289	9 249	10 195	10 064	7 491	7 257	7 411
IPPU	1 572	451	314	592	592	784	900	995	1 080
Agriculture	5 221	3 603	2 481	2 578	2 255	2 091	2 418	2 597	2 756
LULUCF	-1 528	-1 869	-1 881	-1 411	-962	-902	-1 305	-4 504	-7 507
Waste	1 515	1 595	1 542	1 429	1 483	1 431	1 497	1 224	1 241
Total (with LULUCF)	**43 391**	**15 937**	**9 745**	**12 437**	**13 564**	**13 468**	**11 002**	**7 570**	**4 981**
Total (without LULUCF)	**44 919**	**17 806**	**11 626**	**13 848**	**14 526**	**14 370**	**12 307**	**12 074**	**12 488**

As seen in Figure 4-1, the level of GHG emissions under both WM, and WAM scenarios are lower than the commitments made by the Republic of Moldova in the NDC for the Paris Agreement. The net emissions in 2030 are expected be lower than in 1990 by 70.5% under the WM and by 88.5% under the WAM, as compared to 64-67% according to the unconditional NDC and to 78% according to

conditional NDC. That is, the GHG emissions reduction policies developed and promoted by the country over the past years are on track to achieve higher performances than the targets set in the NDC for the Paris Agreement.

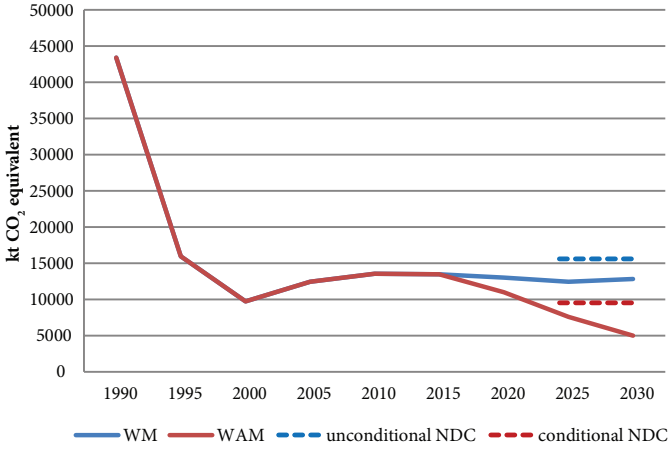


Figure 4-1: Projected net (including LULUCF) total GHG emissions under the considered scenarios.

The most significant contribution towards achieving these objectives comes from the energy and the LULUCF sectors, as seen in Figure 4-2 showing the GHG emissions for the considered sectors.

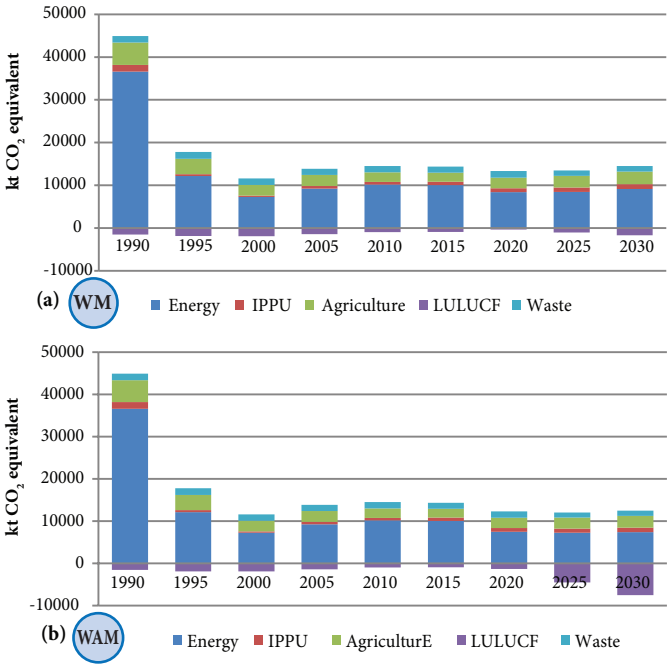


Figure 4-2: Sectors share in total GHG emissions under the WM (a) and WAM (b) scenarios.

Due to the promotion of energy efficiency and the attracting renewable energy sources in the energy balance, the level of GHG emissions from the energy sector tends to decrease slightly compared to 2015 under both WM and WAM scenarios, while the real GDP of the country is expected to grow by 233% to 2030 as compared to 2015. On the other hand, in LULUCF sector, expansion of wooded areas, meadows and implementation of sustainable agricultural practices will result in gradual increase of removed GHGs. These findings are supported by Table 4-5 and Figure 4-3, which show the projected GHG emissions reductions for 2020 and 2030 compared to the reference year (1990), according to WM and WAM scenarios.

Table 4-5: GHG emission reductions anticipated for 2020 and 2030 as compared to 1990, according to WM and WAM scenarios, kt CO_2 equivalent

Sectors	WM 2020	WM 2030	WAM 2020	WAM 2030
Energy	-28 211	-27 487	-29 120	-29 200
IPPU	-655	-428	-672	-492
Agriculture	-2 743	-2 292	-2 803	-2 464
LULUCF	1194	-158	223	-5979
Waste	25	-206	-18	-275
Total (with LULUCF)	**-31 584**	**-30 413**	**-32 612**	**-32 431**
Total (without LULUCF)	**-30 390**	**-30 571**	**-32 390**	**-38 410**

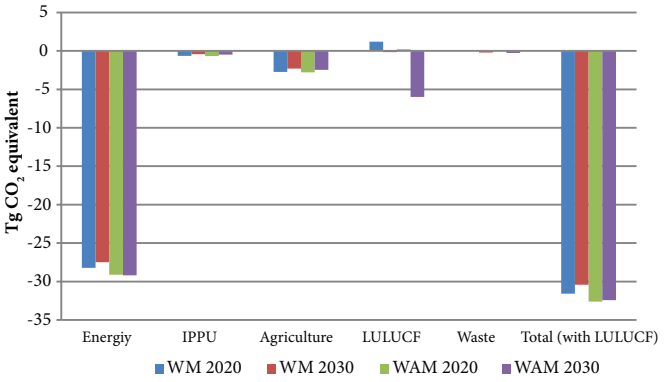


Figure 4-3: GHG emission reductions anticipated by 2020 and 2030, as compared to 1990, according to WM and WAM scenarios.

Figure 4-4 shows the evolution of net GHG emissions under the WM and WAM scenarios, as compared to the 1990 level. Absolute values of GHG emissions amounts for the years under review are shown in Table 4-6. Figure 4-4 does not show F-gases projections due to the fact that such emissions were not registered in 1990. F-gases should not require significant attention, as their share in the total emissions at national level will not exceed 3% during the period under review (until 2030) for both scenarios.

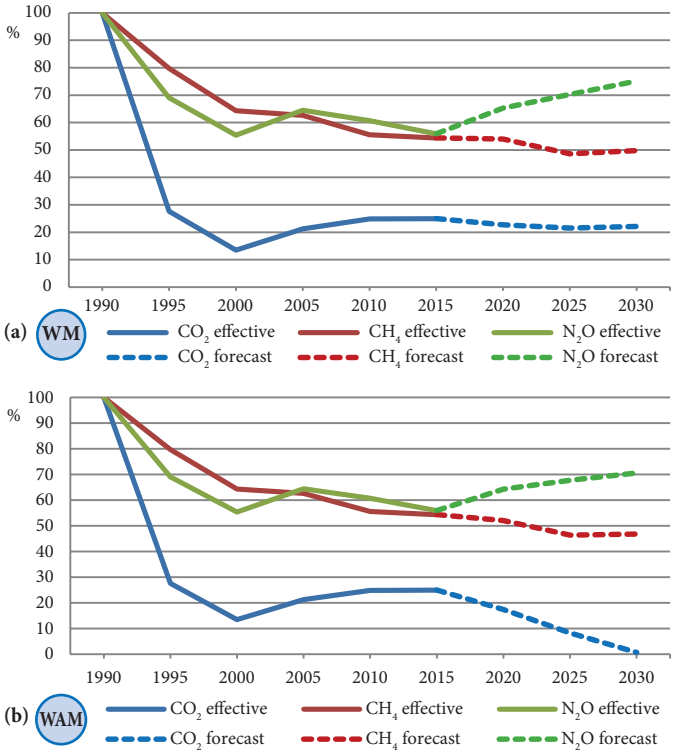


Figure 4-4: GHG emissions under WM (a) and WAM (b) scenarios, by types of GHG, as compared to 1990, %.

As shown in Figure 4-4, in the post-2015 period the amount of CO_2 and CH_4 emissions tends to decrease, while the N_2O, conversely, increase. This evolution is explained by the gradual increase of livestock and poultry over the years up to 2030, as well as carbon loss through the mineralization process due to the change in land use and soil management practices over the years up to 2030, which increases N_2O emissions (in particular, from the 3D source category "Agricultural Soils"). Note that the share of N_2O in the total GHG emissions during 2020-2030 is expected around 14-15% under the WM, respectively around 15-16% under the WAM.

It should also be noted that the WAM shows net CO_2 level of almost zero by 2030, this effect being mainly due to the extensive promotion of conservation agriculture, as well as to the significant increase of grasslands.

Table 4-6: Projections of direct GHG emissions under scenarios considered for the period up to 2030, excluding LULUCF, kt CO_2 equivalent

	1990	1995	2000	2005	2010	2015	2020	2025	2030
WM									
Total CO_2 emissions	36 871	11 837	6 907	8 885	9 949	9 874	8 512	8 786	9 652
Total CH_4 emissions	5 073	4 044	3 263	3 180	2 821	2 759	2 739	2 465	2 525
Total N_2O emissions	2 975	1 921	1 447	1 742	1 652	1 569	1 865	2 019	2 175
Total F-gases emissions	NO	4	8	41	103	168	218	202	154
Total national emissions	**44 919**	**17 806**	**11 626**	**13 848**	**14 526**	**14 370**	**13 334**	**13 472**	**14 506**
WAM									
Total CO_2 emissions	36 871	11 837	6 907	8 885	9 949	9 874	7 625	7 593	7 950
Total CH_4 emissions	5 073	4 044	3 263	3 180	2 821	2 759	2 640	2 352	2 375
Total N_2O emissions	2 975	1 921	1 447	1 742	1 652	1 569	1 832	1 940	2 030
Total F-gases emissions	NO	4	8	41	103	168	210	188	133
Total national emissions	**44 919**	**17 806**	**11 626**	**13 848**	**14 526**	**14 370**	**12 307**	**12 074**	**12 488**

4.3. Projections of Direct GHG Emissions by Sectors

4.3.1. Energy Sector

The energy sector generates GHG emissions by combusting and transforming fossil fuels. Fugitive emissions are generated in the process of extracting, transporting and processing natural gas. The WASP calculation tool was used to develop scenarios for the power sector, and GHG emissions were calculated by using the emission factors reported in the "*National Inventory Report: 1990-2016. GHG Sources and Sinks in the Republic of Moldova*".

WM and WAM scenarios include measures outlined and considered in Chapter 3.5.1. Additionally, WAM scenario contains and considers measures included in the drafts documents and studies, and documents approved after 01.01.2018, including:

1. The new draft of the Energy Strategy of the Republic of Moldova until 2030;
2. The Program for Promoting Green Economy in the Republic of Moldova for 2018-2020 and the Action Plan for its Implementation[203];
3. The Law on Promoting the Renewable Energy Use, updated in 2018[204];
4. World Bank Study "Republic of Moldova: Market Options Survey for Electricity Sector. 25 March, 2015", developed at the request of the Government of the Republic of Moldova.

Measures to mitigate GHG emissions mainly include energy efficiency, efficient power generation technologies, and use of energy from renewable energy sources.

Projections of CO_2 emissions

In the energy sector the share of CO_2 emissions in the structure of total GHG emissions in 2015 accounted for about 91.7%. The CO_2 projections assessment for the energy sector are shown in Table 4-7 and Figure 4-5.

Table 4-7: Projections of CO_2 emissions by 2030 for the energy sector, kt CO_2

	2010	2015	2020	2025	2030
WM					
1. Energy	**9 443.2**	**9 231.6**	**7 797.0**	**7 931.3**	**8 635.0**
1A. Fuel Combustion Activities	**9 441.9**	**9 229.9**	**7 795.3**	**7 929.6**	**8 633.4**
1A1. Energy Industries	4 975.8	4 737.5	3 711.9	3 620.8	4 009.8
1A2. Manufacturing Industries and Construction	443.0	532.9	618.0	659.1	619.5
1A3. Transport	2 008.1	2 158.9	1 731.7	1 925.1	2 105.6
1A4. Other Sectors	1 985.1	1 797.7	1 730.9	1 721.8	1 895.6
1A5. Other	30.0	2.9	2.9	2.9	2.9
1B. Fugitive Emissions from Fuels	**1.3**	**1.7**	**1.7**	**1.7**	**1.7**
1B2. Oil and Natural Gas	1.3	1.7	1.7	1.7	1.7
WAM					
1. Energy	**9 443.2**	**9 231.6**	**6 919.2**	**6 766.5**	**6 977.3**
1A. Fuel Combustion Activities	**9 441.9**	**9 229.9**	**6 917.5**	**6 764.9**	**6 975.6**
1A1. Energy Industries	4 975.8	4 737.5	3 038.3	2 782.4	2 761.6
1A2. Manufacturing Industries and Construction	443.0	532.9	618.0	653.5	562.4
1A3. Transport	2 008.1	2 158.9	1 686.3	1 847.8	1 983.7
1A4. Other Sectors	1 985.1	1 797.7	1 572.0	1 478.3	1 665.1
1A5. Other	30.0	2.9	2.9	2.9	2.9
1B. Fugitive Emissions from Fuels	**1.3**	**1.7**	**1.7**	**1.7**	**1.7**
1B2. Oil and Natural Gas	1.3	1.7	1.7	1.7	1.7

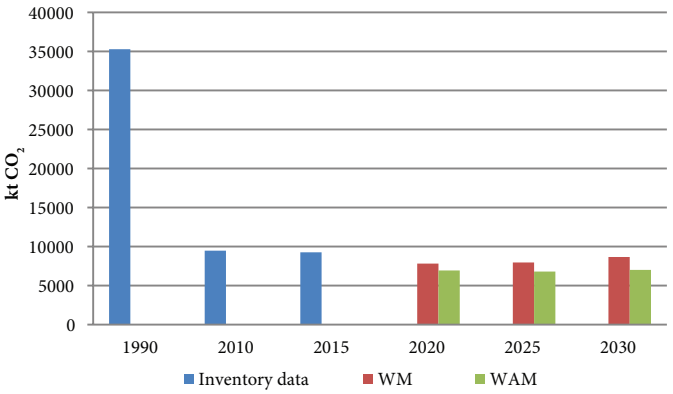


Figure 4-5: Projections of CO_2 emissions until 2030 for the energy sector, kt CO_2.

[203] Official Gazette no. 68-76 of 02.03.2018. GD no. 160 of February 21, 2018 approving the Program promoting "green" economy in the Republic of Moldova for 2018-2020 and the Action Plan for its implementation.
[204] Official Gazette no. 69-77 / 117 of 25.03.2016, the Parliament of the Republic of Moldova, Law no. 10 of 26.02.2016 on Promotion of Use of Renewable Energy.

As seen, under the WM scenario, the CO_2 emissions slightly increase after 2020, driven by GDP growth and hence higher energy demand. At the same time, by 2030, the level of CO_2 emissions is lower by 6.5% than in 2015. Under the WAM scenario, the evolution of CO_2 emissions show even more pronounced downward trend. In 2030, it is by 24.4% lower than in 2015. The main reason for such evolution is that energy demand projection, which is inferior to that under the WM, was taken into account, as well as the latest studies in the field.

Projections of CH_4 emissions

In the energy sector the share of CH_4 emissions in the total GHG emissions at sector level in 2015 amounted to about 6.8%, of which 82.3% are fugitive emissions from oil and gas operations. Projections of CH_4 emissions resulting from burning and transformation of fossil fuels were made based on assumed fossil fuel consumption, and use of calculation methods available in the 2006 IPCC Guidelines, as well as emission factors reported in the "*National Inventory Report: 1990-2016.GHG Sources and Sinks in the Republic of Moldova*". The calculations results are shown in Table 4-8.

Table 4-8: Projections of CH_4 emissions from the energy sector until 2030, kt CO_2 equivalent

	2010	2015	2020	2025	2030
WM					
1. Energy	**633.4**	**688.8**	**483.0**	**406.2**	**362.6**
1A. Fuel Combustion Activities	**53.5**	**122.2**	**29.7**	**29.8**	**31.6**
1A1. Energy Industries	2.5	2.3	1.5	1.4	1.6
1A2. Manufacturing Industries and Construction	0.3	0.7	0.7	0.8	0.8
1A3. Transport	11.3	10.3	9.5	10.4	11.2
1A4. Other Sectors	39.4	108.9	18.0	17.2	18.0
1A5. Other	0.1	0.0	0.0	0.0	0.0
1B. Fugitive Emissions from Fuels	**579.8**	**566.6**	**453.2**	**376.4**	**331.0**
1B2. Oil and Natural Gas	579.8	566.6	453.2	376.4	331.0
WAM					
1. Energy	**633.4**	**688.8**	**453.2**	**370.3**	**310.4**
1A. Fuel Combustion Activities	**53.5**	**122.2**	**27.5**	**26.5**	**28.0**
1A1. Energy Industries	**2.5**	**2.3**	**1.2**	**1.1**	**1.1**
1A2. Manufacturing Industries and Construction	0.3	0.7	0.7	0.8	0.7
1A3. Transport	11.3	10.3	9.5	10.4	11.1
1A4. Other Sectors	39.4	108.9	16.1	14.2	15.1
1A5. Other	0.1	0.0	0.0	0.0	0.0
1B. Fugitive Emissions from Fuels	**579.8**	**566.6**	**425.7**	**343.8**	**282.4**
1B2. Oil and Natural Gas	579.8	566.6	425.7	343.8	282.4

Projections of N_2O emissions

The share of N_2O emissions in the total GHG emissions at sector level is modest, accounting for only 1.4% of the total. Similarly with CH_4 emissions, the N_2O emissions resulting from combusting and transformation of fossil fuels were calculated on the basis of assumed fossil fuel consumption using the calculation methods available in the 2006 IPCC Guidelines. The results of the calculations are shown in Table 4-9.

Table 4-9: Projections of N_2O emissions from the energy sector until 2030, kt CO_2 equivalent

	2010	2015	2020	2025	2030
WM					
1. Energy	**118.4**	**143.4**	**119.6**	**122.6**	**126.2**
1A. Fuel Combustion Activities	**46.6**	**57.1**	**33.4**	**36.3**	**39.9**
1A1. Energy Industries	5.6	5.0	2.1	2.1	2.3
1A2. Manufacturing Industries and Construction	0.5	1.1	1.3	1.4	1.4
1A3. Transport	34.7	34.1	27.7	30.4	33.4
1A4. Other Sectors	5.7	16.9	2.3	2.5	2.9
1A5. Other	0.2	0.0	0.0	0.0	0.0
1B. Fugitive Emissions from Fuels	**71.8**	**86.2**	**86.2**	**86.2**	**86.2**
1B2. Oil and Natural Gas	71.8	86.2	86.2	86.2	86.2
WAM					
1. Energy	**118.4**	**143.4**	**118.4**	**120.4**	**122.9**
1A. Fuel Combustion Activities	**46.6**	**57.1**	**32.1**	**34.2**	**36.6**
1A1. Energy Industries	5.6	5.0	1.7	1.6	1.6
1A2. Manufacturing Industries and Construction	0.5	1.1	1.3	1.4	1.3
1A3. Transport	34.7	34.1	27.0	29.0	31.2
1A4. Other Sectors	5.7	16.9	2.1	2.2	2.6
1A5. Other	0.2	0.0	0.0	0.0	0.0
1B. Fugitive Emissions from Fuels	**71.8**	**86.2**	**86.2**	**86.2**	**86.2**
1B2. Oil and Natural Gas	71.8	86.2	86.2	86.2	86.2

Projections of aggregated total GHG emissions

Table 4-10 and Figure 4-6 show the projections of aggregated total GHG emissions for energy sector, including transport, which can be compared with the respective emissions of 1990, the baseline year, as well as the reference year of the NDC.

The analysis of these data shows that the energy sector, distinguished by the most important contribution to GHG emissions in the Republic of Moldova (70%, 2015), will contribute considerably to achieving the country's GHG reduction commitments. Thus, by 2030, GHG emissions under the WM and WAM scenarios, as compared to 1990, will account for 24.9% and 20.2%, respectively.

Table 4-10: Projections of aggregated total GHG emissions from the energy sector, kt CO_2 eq

	1990	2010	2015	2020	2025	2030
WM						
1. Energy	**36 610.5**	**10 195.0**	**10 063.8**	**8 399.6**	**8 460.0**	**9123.8**
1A. Fuel Combustion Activities	**35 805.4**	**9 542.0**	**9 409.3**	**7 858.5**	**7 995.8**	**8704.9**
1A1. Energy Industries	21 308.2	4 983.8	4 744.8	3 715.4	3 624.3	4013.6
1A2. Manufacturing Industries and Construction	2 212.4	443.8	534.6	620.0	6 61.3	621.7
1A3. Transport	4 479.5	2 054.1	2 203.3	1 768.9	1 965.9	2150.2
1A4. Other Sectors	7 689.7	2 030.1	1 923.6	1 751.3	1741.4	1916.4
1A5. Other	115.6	30.2	2.9	2.9	2.9	2.9
1B. Fugitive Emissions from Fuels	**805.2**	**652.9**	**654.5**	**541.2**	**464.3**	**419.0**
1B2. Oil and Natural Gas	805.2	652.9	654.5	541.2	464.3	419.0
WAM						
1. Energy	**36 610.5**	**10 195.0**	**10 063.8**	**7 490.8**	**7 257.3**	**7 410.5**
1A. Fuel Combustion Activities	**35 805.4**	**9 542.0**	**9 409.3**	**6 977.2**	**6 825.5**	**7 040.3**
1A1. Energy Industries	21 308.2	4 983.8	4 744.8	3 041.2	2 785.1	2 764.2
1A2. Manufacturing Industries and Construction	2 212.4	443.8	534.6	620.0	655.7	564.5
1A3. Transport	4 479.5	2 054.1	2 203.3	1 722.8	1 887.2	2 026.0
1A4. Other Sectors	7 689.7	2 030.1	1 923.6	1 590.3	1 494.7	1 682.7
1A5. Other	115.6	30.2	2.9	2.9	2.9	2.9
1B. Fugitive Emissions from Fuels	**805.2**	**652.9**	**654.5**	**513.6**	**431.7**	**370.3**
1B2. Oil and Natural Gas	805.2	652.9	654.5	513.6	431.7	370.3

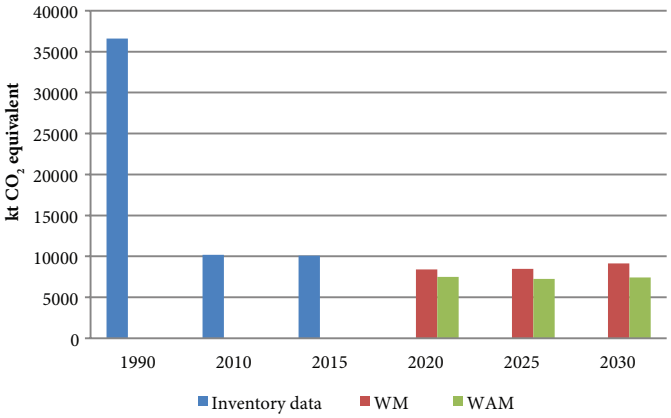


Figure 4-6: Projections of aggregated total GHG emissions from the energy sector, kt CO_2 eq.

4.3.2. Industrial Processes and Products Use Sector

In 2015, the IPPU sector contributed circa 5.5% of total GHG emissions, of which 78.6% were CO_2 and respectively 21.4% – F-gases. The GHG emissions reduction measures taken into account for this sector are described in Chapter 3.5.2. CO_2, HFCs, PFCs and SF_6 emissions were considered under the WM and WAM scenarios.

Projections of CO_2 emissions

In the IPPU sector, CO_2 emissions are generated by source categories 2A "Mineral Industry", 2C "Metal Industry", 2D "Non-Energy Products from Fuels and Solvent Use" and 2G "Other Product Manufacture and Use". Category 2A accounts for about 83% of total sectoral emissions, of which about 87% are generated by cement production.

The scenarios considered show a continuous growth of cement production, which however, will not reach the level of the reference year. By 2030, cement production in the RM will be 20% below 1990 levels (WM) and 19% (WAM), slightly exceeding the level of production achieved in 2008 – 1,776 kt and 1991 – 1,800 kt. Continuous reduction of clinker content in cement brands in the Republic of Moldova is expected (by 7.2% below 1990 levels – WM and 11.7% below the reference year – WAM). Compared to the reference year, CO_2 emissions reduction from cement production in 2030 is anticipated by about 27% under WM and by about 30% under WAM. Results of CO_2 emissions calculations are shown in Table 4-11.

Table 4-11: Projections of CO_2 emissions in the IPPU sector until 2030, kt

	2010	2015	2020	2025	2030
WM					
2. IPPU	**488.7**	**615.2**	**699.2**	**833.6**	**990.5**
A. Mineral Industry	411.1	510.8	569.5	678.6	803.1
C. Metal Industry	9.7	17.3	19.6	26.2	38.7
D. Non-Energy Products from Fuels and Solvent Use	67.0	86.4	107.8	126.3	145.8
G. Other Product Manufacture and Use	0.9	0.7	2.2	2.5	2.8
WAM					
2. IPPU	**488.7**	**615.2**	**690.4**	**807.4**	**947.0**
A. Mineral Industry	411.1	510.8	564.0	660.3	774.5
C. Metal Industry	9.7	17.3	19.6	25.6	37.1
D. Non-Energy Products from Fuels and Solvent Use	67.0	86.4	104.8	119.1	132.7
G. Other Product Manufacture and Use	0.9	0.7	2.1	2.4	2.7

Projections of F-gases emissions

In 2015, the most important sources of F-gases were source categories 2F2 "Foam Blowing" (circa 61%) and 2F1 "Refrigeration and Air Conditioning Equipment" (about 39%). A significant increase in HFC emissions is expected for category 2F "Product Uses as Substitutes for ODS" – about 38.4 times under WM and about 33.3 times under WAM, as compared to the 1995 level. The calculations results are shown in Table 4-12. At the same time, compared to the 2020 emissions level, it is expected that by 2030, HFC emissions will decrease by 29.6% under the WM, and by 36.6% under WAM.

Table 4-12: Projections of F-gases emissions in the IPPU sector by 2030, kt CO_2 equivalent

	1990	1995	2000	2005	2010	2015	2020	2025	2030
WM									
2F1. Refrigeration and Air Conditioning Equipment	NO	3.7	4.1	9.6	23.1	66.2	94.6	92.3	86.6
2F2. Foam Blowing	NO	0.3	4.2	31.2	79.8	101.6	123.8	109.7	67.2
2F. Product Uses as Substitutes for ODS	**NO**	**4.0**	**8.3**	**40.8**	**102.9**	**167.8**	**218.4**	**202.0**	**153.8**
WAM									
2F1. Refrigeration and Air Conditioning Equipment	NO	3.7	4.1	9.6	23.1	66.2	89.7	87.1	79.4
2F2. Foam Blowing	NO	0.3	4.2	31.2	79.8	101.6	120.3	100.9	53.8
2F. Product Uses as Substitutes for ODS	**NO**	**4.0**	**8.3**	**40.8**	**102.9**	**167.8**	**210.0**	**188.0**	**133.2**

Projections of aggregated total GHG emissions

Table 4-13 and Figure 4-7 show projections of aggregated total GHG emissions from the IPPU sector that can be compared with 1990 GHG emissions. The results show that by 2030 the respective emissions will account for about 72.8% of the 1990 year level under the WM and for about 68.7% of the 1990 year level under the WAM. The trend towards a slight increase in GHG emissions in this sector will be maintained until 2030. Implementing mitigation policies in this sector will allow to moderate the growth under the WAM scenario.

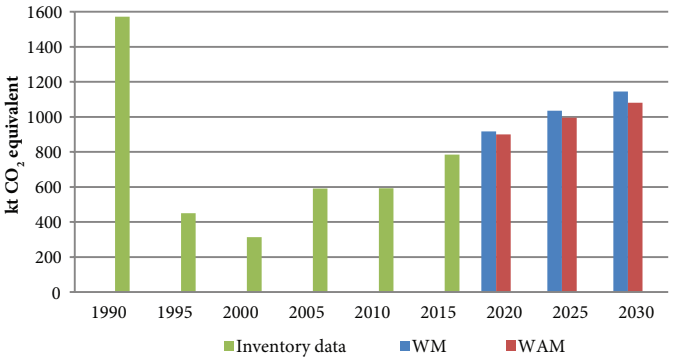


Figure 4-7: Projections of aggregated total GHG emissions from IPPU sector until 2030.

Table 4-13: Projections of aggregated total GHG emissions from IPPU sector by 2030, kt CO_2 eq

	1990	1995	2000	2005	2010	2015	2020	2025	2030
WM									
2. IPPU	**1 572.3**	**450.5**	**314.1**	**591.9**	**592.3**	**784.2**	**917.5**	**1035.6**	**1144.2**
2A. Mineral Industry	1 306.2	342.7	238.0	440.2	411.1	510.8	569.5	678.6	803.1
2C. Metal Industry	28.5	26.2	36.3	41.9	9.7	17.3	19.6	26.2	38.7
2D. Non-Energy Products from Fuels and Solvent Use	234.4	76.6	30.6	67.8	67.0	86.4	107.8	126.3	145.8
2F. Product Uses as Substitutes for ODS	0.0	4.0	8.3	40.8	102.9	167.8	218.4	202.0	153.8
2G. Other Product Manufacture and Use	3.2	1.1	0.9	1.1	1.6	1.9	2.2	2.5	2.8
WAM									
2. IPPU	**1 572.3**	**450.5**	**314.1**	**591.9**	**592.3**	**784.2**	**900.5**	**995.4**	**1080.2**
2A. Mineral Industry	1 306.2	342.7	238.0	440.2	411.1	510.8	564.0	660.3	774.5
2C. Metal Industry	28.5	26.2	36.3	41.9	9.7	17.3	19.6	25.6	37.1
2D. Non-Energy Products from Fuels and Solvent Use	234.4	76.6	30.6	67.8	67.0	86.4	104.8	119.1	132.7
2F. Product Uses as Substitutes for ODS	0.0	4.0	8.3	40.8	102.9	167.8	210.0	188.0	133.2
2G. Other Product Manufacture and Use	3.2	1.1	0.9	1.1	1.6	1.9	2.1	2.4	2.7

4.3.3. Agriculture Sector

Within the agriculture sector, CH_4 emissions are monitored for the animal husbandry sector, in particular for the categories 3A "Enteric Fermentation" and 3B "Manure Management", N_2O emissions are monitored for the source categories 3B "Manure Management" and 3D "Agricultural Soils", as well as CO_2 from category 3H "Urea Application". Policies used for developing mitigation scenarios (WM and WAM) in agriculture sector are described in Chapter 3.5.3.

In the animal husbandry sector (enteric fermentation and manure management), the GHG mitigation measures are based both on the improvement of the livestock and poultry structure, and on the gradual increase of the share of large farms, typical of 1990's in the 20th century, because liquid manure management system of bigger farms allow for CH_4 emissions reduction to a much larger extent than in the small farms, which are predominant now in the RM. At the same time, the share of solid manure management system, which is less responsible for generation of CH_4, will increase. Table 4-14 shows projections of livestock and poultry numbers until 2030.

Table 4-14: Projections of livestock and poultry numbers over1990-2030, thousands of heads

Animal Categories	1990	1995	2000	2005	2010	2015	2020	2025	2030
	WM								
Cattle	1 060.7	729.5	445.4	339.8	236.4	204.5	220.0	230.0	240.0
Dairy cows	395.2	380.8	298.5	233.1	165.8	137.6	145.0	150.0	155.0
Other cattle	665.5	348.7	146.9	106.7	70.5	66.8	75.0	80.0	85.0
Sheep	1 244.8	1 326.6	846.3	827.0	793.1	722.2	735.0	745.0	755.0
Goats	37.1	96.4	115.8	127.3	127.5	158.6	190.0	210.0	220.0
Horses	47.2	61.6	76.0	72.0	53.6	40.2	36.0	35.0	34.0
Asses	1.7	3.2	3.8	3.7	2.8	2.0	2.0	2.0	2.0
Swine	1 850.1	1 016.4	492.7	493.0	511.7	484.5	510.0	540.0	570.0
Rabbits	283.0	209.3	161.3	278.9	277.0	350.2	400.0	440.0	480.0
Poultry	24 625.0	13 746.4	13 624.9	22 773.6	23 782.5	12 590.6	15 000.0	18 000.0	21 000.0
	WAM								
Cattle	1 060.7	729.5	445.4	339.8	236.4	204.5	210.0	220.0	230.0
Dairy cows	395.2	380.8	298.5	233.1	165.8	137.6	140.0	145.0	150.0
Other cattle	665.5	348.7	146.9	106.7	70.5	66.8	70.0	75.0	80.0
Sheep	1 244.8	1 326.6	846.3	827.0	793.1	722.2	730.0	740.0	750.0
Goats	37.1	96.4	115.8	127.3	127.5	158.6	180.0	200.0	210.0
Horses	47.2	61.6	76.0	72.0	53.6	40.2	35.0	34.0	33.0
Asses	1.7	3.2	3.8	3.7	2.8	2.0	2.0	2.0	2.0
Swine	1 850.1	1 016.4	492.7	493.0	511.7	484.5	500.0	525.0	550.0
Rabbits	283.0	209.3	161.3	278.9	277.0	350.2	380.0	420.0	460.0
Poultry	24 625.0	13 746.4	13 624.9	22 773.6	23 782.5	12 590.6	14 000.0	17 000.0	20 000.0

Under the WM scenario, the projections show a slow growth rate in livestock and domestic poultry. The WAM predicts a slower growth rate in livestock and poultry, focusing on increasing productivity and implementing the most effective measures to mitigate GHG emissions at sector level.

CH_4 emissions in the source category 3B "Manure Management" (for cattle and swine) were calculated based on country-specific emission factors and the results of the study carried out in May-June 2015 by the specialists of the Scientific-Practical Biotechnology Institute in Animal Husbandry and Veterinary Medicine and the National Agency for Food Safety (ANSA).

In addition to the above mentioned information on livestock and poultry numbers, respectively on the share of manure management systems (MS%), a number of other indicators, among which the most relevant is the $TAM_{(T)}$ index – the typical weight of an animal of category T or $Nex_{(T)}$ – annual mean excretion of nitrogen for the main categories of livestock and poultry, were considered for the purpose of projecting N_2O emissions in the source category 3B "Manure Management". As for the $N_{rates\,(T)}$ – the rate of nitrogen excretion in kg N/1000 kg of animal mass, default values used for Eastern European countries were applied. It should be noted that N_2O emissions in category 3B "Manure Management" were estimated according to the Tier 2 methodology (2006 IPCC Guidelines).

Consequently, under the WM and WAM scenarios, by 2030, the emission factors used in the assessment of methane emissions and nitrous oxide emissions from the source category 3B "Manure Management" will reach values specific for Eastern European countries and close to those registered in the Republic of Moldova in the 90' of the last century.

With regard to GHG emissions mitigation in 3D category "Agricultural Soils", the emphasis will be on reducing soil mineralization, i.e. promotion of sustainable agriculture, including

use of green manure in parallel with the implementation of "no-till" and "mini-till" soil conservation tillage practices increasing the share of organic fertilizer in the soil, leaving the main crops residues in the field to form the mulch, etc.

Thus, the increasing rhythm of using urea as a fertilizer in the Republic of Moldova proved to be an impressive one. For example, between 2006 and 2016, the quantities applied increased by about 84 times (from about 0.2 thousand tons in 2006 to about 16.7 thousand tons in 2016). Next, by 2030, the amount of urea used will increase approximately twice compared to 2016. In the absence of any nation-wide policies on CO_2 emissions mitigation from urea application, for the WM and WAM scenarios particular emphasis was made on optimizing the doses of urea used, taking into account the recommendations from the best practices on sustainable development of the agricultural sector and employment of the most effective mitigation measures for the agricultural sector, as described in the specialized literature.

Regarding use of organic nitrogenous and organic natural fertilizers until 2030, for the WM scenario, projections were made on the basis of the information available in the Program for Land Reclamation and Soil Fertility Enhancement (Part II: Soil Fertility Enhancement) , and on the basis of the Soil Conservation and Fertility Enhancement Program for 2011-2020, the National for Development Strategy "Moldova 2020", the National Strategy for Agricultural and Rural Development for 2014-2020 and the Low Emissions Development Strategy of the Republic of Moldova until 2030 and the Action Plan for its implementation. In the WAM scenario, particular emphasis was made on optimizing the used doses of mineral and organic fertilizers, increasing the share of crop residues embedded in soil, using green manure and conservation agriculture systems to a larger extent. Account has also been taken of recommendations from the best practice on agricultural sector sustainable development, and the most effective mitigation measures for the agricultural sector, as described in specialized literature.

Taking into account that the GHG emissions from agricultural soils depend on the annual flow of organic matter in the soil, incorporation of green fertilizer into the soil on a larger scale was considered. It is recommended that green mass of annual leguminous crops with highly developed semi-fasciculate radicular system should be used as fertilizer incorporated into the soil. The most suitable leguminous crops that can be used as green fertilizer are vetch and autumn and spring peas. Table 4-15 shows projections for use of green (sidereal) fertilizers in the Republic of Moldova until 2030. It is planned to sow autumn vetch as an intermediate crop used as a green fertilizer. Introducing intermediate crops as a green fertilizer will be carried out in parallel with the implementation of the "no-till" and "mini-till" conservation tillage system. The areas where such technologies will be used are shown in Table 4-3.

Table 4-15: Projected use of green fertilizers in the RM over 1990-2030, kt N

	1990	1995	2000	2005	2010	2015	2016	2020	2025	2030
WM										
Areas where green fertilizers (vetch) will be used, kha	0	0	0	0	0	0	0	25.0	50.0	75.0
Green vetch mass imbedded into soil, kt	0	0	0	0	0	0	0	500	1000	1500
Green fertilizers transferred to equivalent organic fertilizers, kt	0	0	0	0	0	0	0	700	1400	2100
Green Fertilizers - $F_{SIDEREAL}$, kt N	0	0	0	0	0	0	0	3.9	7.8	11.8
WAM										
Areas where green fertilizers (vetch) will be used, kha	0	0	0	0	0	0	0	50.0	75.0	100.0
Green vetch mass imbedded into soil, kt	0	0	0	0	0	0	0	1000	1500	2000
Green fertilizers transferred to equivalent organic fertilizers, kt	0	0	0	0	0	0	0	1400	2100	2800
Green Fertilizers - $F_{SIDEREAL}$, kt N	0	0	0	0	0	0	0	7.8	11.8	15.7

Projections of CO_2 emissions

CO_2 emissions in agriculture sector originates only from category 3H "Urea Application". The results of these calculations are shown in Table 4-16. As seen, CO_2 emissions from category 3H "Urea Application" will increase by about 44.5 times to 2030 as compared to CO_2 registered in the same category in the 1990 year under the WM scenario, and respectively by about 42.2 times under the WAM scenario. At the same time, implementation of good practices and mitigation policies at the sector level will allow to slowdown the growth rate of CO_2 from this category.

Table 4-16: Projections of CO_2 emissions from the category 3H "Urea Application" in the Republic of Moldova under the scenarios analyzed for 1990-2030

	1990	1995	2000	2005	2010	2015	2016	2020	2025	2030
WM										
CO_2 emissions, kt	0.6	0.1	0.4	0.2	1.7	11.2	12.3	14.3	20.5	26.7
CO_2 emissions, % compared to 1990	100.0	10.4	75.6	29.9	299.7	1 931.5	2 109.2	2 458.9	3 524.8	4 590.8
WAM										
CO_2 emissions, kt	0.6	0.1	0.4	0.2	1.7	11.2	12.3	13.6	19.4	25.3
CO_2 emissions, % compared to 1990	100.0	10.4	75.6	29.9	299.7	1 931.5	2 109.2	2 329.4	3 339.3	4 349.2

Projections of CH_4 emission

In the agricultural sector CH_4 emissions originate from categories 3A "Enteric Fermentation" and 3B "Manure Management". Projections of these emissions are shown in Table 4-17.

CH_4 emissions from enteric fermentation exceeded almost 10 times the emissions from manure management, which calls for greater attention to measures to optimize livestock and poultry structure, to be promoted to mitigate GHG emissions from this category. At the same time, manure management generates also N_2O emissions, which by the amount, are at the same level with emissions from enteric fermentation. Thus, the effort to mitigate GHG emissions in the livestock sector has to be divided between these two categories.

Table 4-17: Projections of CH_4 emissions from agriculture sector until 2030, kt CO_2 equivalent

	2010	2015	2020	2025	2030
WM					
3. Agriculture	**789.5**	**724.2**	**785.8**	**854.6**	**923.0**
3A. Enteric Fermentation	712.6	653.4	708.8	752.2	797.3
3B. Manure Management	76.9	70.8	77.0	102.4	125.7
WAM					
3. Agriculture	**789.5**	**724.2**	**759.1**	**826.2**	**892.8**
3A. Enteric Fermentation	712.6	653.4	684.7	727.4	771.8
3B. Manure Management	76.9	70.8	74.4	98.8	121.0

Projections of N_2O emissions

Projections of N_2O emissions in agriculture sector are shown in Table 4-18. N_2O emissions from category 3D "Agricultural Soils" exceed the emissions from category 3B "Manure Management" by three times.

Table 4-18: Projections of N_2O emissions from the agriculture sector until 2030, kt CO_2 equivalent

	2010	2015	2020	2025	2030
WM					
3. Agriculture	**1 463.8**	**1 355.7**	**1 677.0**	**1 827.8**	**1 979.2**
3B. Manure Management	426.3	356.1	416.9	461.4	507.2
3D. Agricultural Soils	1 037.6	999.6	1 260.1	1 366.4	1 472.0
WAM					
3. Agriculture	**1 463.8**	**1 355.7**	**1 645.4**	**1 751.2**	**1 838.3**
3B. Manure Management	426.3	356.1	402.7	444.9	489.2
3D. Agricultural Soils	1 037.6	999.6	1 242.7	1 306.3	1 349.1

Projections of aggregated total GHG emissions

Table 4-19 and Figure 4-8 show the projections of aggregated total GHG emissions from agriculture sector, as compared to 1990 levels. Compared to the reference year, in 2030 GHG emissions will be 56.1 per cent of reference year level under the WM and 52.8 per cent of the reference year level under the WAM.

Table 4-19: Projections of aggregated total GHG emissions from agriculture sector, kt CO_2 eq.

	1990	2010	2015	2020	2025	2030
WM						
3. Agriculture	**5 220.6**	**2 255.0**	**2 091.2**	**2 477.1**	**2 702.9**	**2 928.9**
3A. Enteric Fermentation	2 190.7	712.6	653.4	708.8	752.2	797.3
3B. Manure Management	1 611.7	503.1	427.0	493.9	563.8	632.9
3D. Agricultural Soils	1 417.6	1 037.6	999.6	1 260.1	1 366.4	1 472.0
3H. Urea Application	0.6	1.7	11.2	14.3	20.5	26.7
WAM						
3. Agriculture	**5 220.6**	**2 255.0**	**2 091.2**	**2 418.1**	**2 596.8**	**2 756.4**
3A. Enteric Fermentation	2 190.7	712.6	653.4	684.7	727.4	771.8
3B. Manure Management	1 611.7	503.1	427.0	477.1	543.7	610.2
3D. Agricultural Soils	1 417.6	1 037.6	999.6	1 242.7	1 306.3	1 349.1
3H. Urea Application	0.6	1.7	11.2	13.6	19.4	25.3

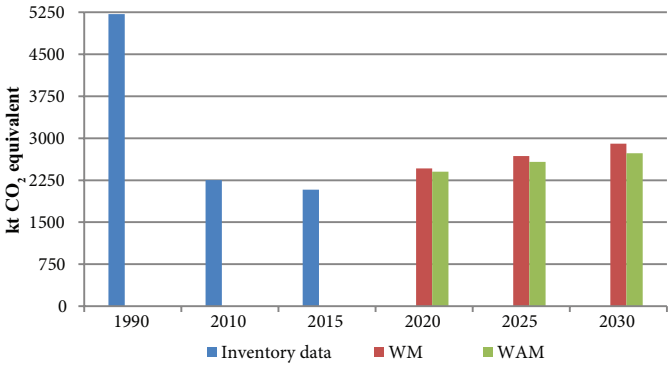


Figure 4-8: Projections of aggregated total GHG emissions from the agriculture sector.

4.3.4. Land Use, Land Use Change and Forestry Sector

Within the LULUCF sector, GHG emissions/removals are monitored in categories 4A "Forest Land", 4B "Cropland", 4C "Grassland", 4D "Wetland", 4E "Settlements", 4F "Other Land" 4G "Harvested Wood Products". CH_4 and N_2O emissions related to LULUCF sector are not considered in this analysis because of low values. At the same time, they were taken into account in calculation of total GHG emissions/removals, expressed in kt CO_2 equivalent in each of the categories mentioned above.

The policies used for development of WM and WAM scenarios for the LULUCF sector are described in Chapter 3.5.4. These policies are aimed at expanding wooded areas, with subsequent increase of the wood mass; diminishing the areas prone to forest fires; gradual increase of protection belts, plantations of trees and shrubs, orchards and vineyards, improving the quality of plantations, etc.

The scenarios considered in LULUCF sector are as follows:

- WM scenario reflects policies and measures approved and published before 01.01.2018;
- WAM scenario reflects policies and measures approved and published after 1 January 2018, as well as policies in the draft phase.

For WM scenario the following assumptions were made:

- forests – 15% of the territory of the RM planted with forests by 2030, equivalent to 525,000 ha of forest lands, including 493,293 ha of forest covered lands; the afforestation rate is 8460.8 ha per year;
- forest belts – 3000 ha new lands by 2030, at a rate of 230.8 ha per year;
- vineyards – by 2030 the area planted with vineyards will increase by 24,500 ha or by 1884.6 ha per year;
- orchards – an increase by 500 ha/year;
- mineralized agricultural soils – gradual expansion of conservation soil cultivation practices and organic fertilization on about 30% of arable soils, which by 2030 will ensure carbon emissions reduction from 0.35 t/ha/year to 0.25 t/ha/year;
- grassland – will be maintained at the level of 2017;
- wetland – will remain at the level of 2017;
- settlements – the area will increase by 1,000 ha annually (roads, infrastructure, residential zones, etc.);
- wood products – the possibility to harvest 45% of the current stands was used as a benchmark.

WAM scenario provides for an increase of expansion indexes for areas with other types of vegetation, based on drafts policy documents, donor financed projects, etc. The main benchmark is the NAMA on Afforestation of Degraded Lands, Riparian and Protection Belts, which aims to reverse the forests and land degradation trend, and to increase carbon sequestration by 261.6 kt CO_2 annually until 2030 by afforestation of 45 thousand ha of degraded, unproductive land; planting 15,000 ha of riparian forest belts; as well as 1,500 ha of forest belts in farming systems. In total, 61.5 thousand ha will be afforested at a rate of 4,393 ha/year.

Thus, the main assumptions for WAM scenario are as follows:

- forests – planting of forest vegetation on the total area of 60 thousand ha or 4,615 ha annually (additional to WM);
- forest belts – according to good agricultural practices the share of PFB should be at least 4% of the area of arable land,[205] or an increase by 43,820 ha compared to the level of 2017, which makes 3370 ha a year (additional to WMS);
- vineyards – the area will be conventionally increased by 500 ha compared to WM;
- orchards – the area will be conventionally increased by 500 ha/year;
- mineralized agricultural soils – gradual expansion of conservation soil cultivation practices and organic fertilization of most arable lands, which by 2030 will ensure the carbon

[205] Galupa D., Talmaci I. et al., (2017), Technical Guidance on Best Agroforestry Practices in the Field of Sustainable Land Management; Institute for Forest Research and Development.- Chisinau: Sn 2017.-148 p.

emissions reduction from 0.35 t/ha/year to 0.15 t/ha/year (coefficient calculated for the period 1970-1989);

- grassland – increasing the grassland area to reach 16% of the country's territory[206] or up to 541,540.6 ha by 2030. Thus the grassland area will increase by 172,703 ha or by 13,285 ha/year;
- settlements – the area will increase by 1500 ha annually;
- wetland – will increase by about 10% (by 146.1 ha/year – swamps, and by 599.2 ha/year – waters);
- wood products – harvested as 60% of the current stands.

To simulate the GHG emissions/removals evolution under both scenarios, the Land Use Matrix for 1970-2016, extended for 2017-2030, was used. This application includes all ratios, emission/removals coefficients, and equations necessary for development of the national GHG inventory and/or projecting for future periods.

Based on the assumptions made under the WM and WAM scenarios, the evolution of the land fund area was simulated, broken down by land use categories (Table 4-20) and GHG emissions/removals in the LULUCF sector (Table 4-21, Figure 4-9).

Table 4-20: Evolution of areas of the main land use categories over 2017-2030, ha

Land Use Categories	2017	2020	2025	2030
WM				
Agricultural land	1 864 217.2	1 831 678.5	1 777 447.4	1 723 216.2
Grassland	368 834.9	368 834.9	368 834.9	368 834.9
Vineyards	135 767.5	141 377.0	150 726.3	160 075.6
Orchards	154 340.1	154 368.0	154 414.5	154 461.1
Forest vegetation	51 589.5	52 281.8	53 435.7	54 589.5
Forests	414 173.2	435 174.1	477 577.1	519 980.3
Areas of annual successful afforestation	578.9	5 019.7	5 019.7	5 019.7
Settlements	239 937.5	242 937.5	247 937.5	252 937.5
Swamps	18 833.2	18 833.2	18 833.2	18 833.2
Waters	77 218.9	77 218.9	77 218.9	77 218.9
Other land	59 135.3	56 902.4	53 180.9	49 459.2
WAM				
Agricultural land	1 864 217.2	1 764 979.1	1 599 582.3	1 434 185.4
Grassland	368 834.9	408 689.9	475 114.9	541 540.2
Vineyards	135 767.5	142 847.3	154 647.0	166 446.7
Orchards	154 340.1	154 886.1	155 796.1	156 706.1
Forest vegetation	51 589.5	62 738.0	81 318.9	99 899.7
Forests	414 173.2	446 287.5	511 765.5	577 243.5
Areas of annual successful afforestation	578.9	7 751.3	7 751.3	7 751.3
Settlements	239 937.5	244 437.5	251 937.5	259 437.5
Swamps	18 833.2	19 271.5	20 025.0	20 807.9
Waters	77 218.9	79 016.4	82 105.77	85 315.9
Other land	59 135.3	53 721.47	44 581.8	35 291.8

Table 4-21: CO_2 emissions/removals in the LULUCF sector, kt CO_2 equivalent

Emission sources and sinks	1990	2010	2015	2020	2025	2030
WM						
4. LULUCF	**-1 527.6**	**-961.9**	**-902.2**	**-333.3**	**-1 023.8**	**-1 686.1**
4A. Forest Land	-2 563.1	-2 484.0	-2 158.4	-1 898.1	-1 939.8	-1 955.0
4B. Cropland	2 521.8	1 538.9	1 393.2	1 584.7	1 552.8	1 523.3
4C. Grassland	-1 205.7	-692.0	-418.5	-398.6	-1 004.9	-1 608.5
4D. Wetlands	-555.4	-46.4	-82.8	-82.8	-82.8	-82.8
4E. Settlements	244.5	302.9	228.2	229.4	239.8	251.4
4F. Other Land	152.4	441.5	86.8	233.7	213.6	188.1
4G. Harvested Wood Products	-122.2	-22.8	49.2	-1.6	-2.5	-2.6
WAM						
4. LULUCF	**-1 527.6**	**-961.9**	**-902.2**	**-1 305.1**	**-4 503.6**	**-7 507.1**
4A. Forest Land	-2 563.1	-2 484.0	-2 158.4	-1 567.6	-1 777.8	-1 978.6
4B. Cropland	2 521.8	1 538.9	1 393.2	799.9	24.5	-563.2
4C. Grassland	-1 205.7	-692.0	-418.5	-1 169.7	-3 342.4	-5 512.4
4D. Wetlands	-555.4	-46.4	-82.8	-114.7	-150.1	-186.9
4E. Settlements	244.5	302.9	228.2	241.6	257.8	275.2
4F. Other Land	152.4	441.5	86.8	507.0	486.9	461.4
4G. Harvested Wood Products	-122.2	-22.8	49.2	-1.6	-2.5	-2.6

As seen in Figure 4-9, under the WAM the CO_2 reductions equivalent will exceed CO_2 reductions under the WM by over 4.4 times by 2030. However, to achieve this performance, donor support is required.

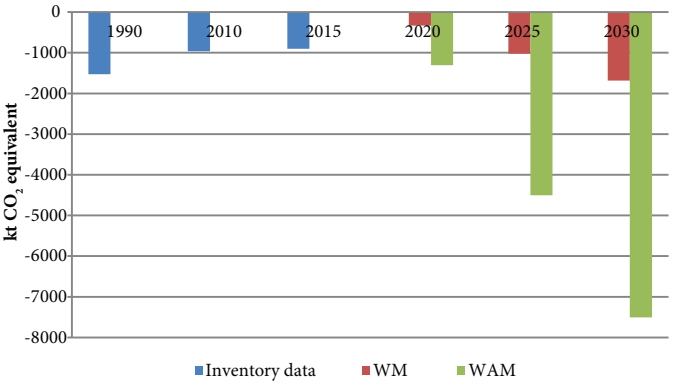


Figure 4-9: CO_2 emissions/removals in the LULUCF sector according to considered scenarios.

4.3.5. Waste Sector

In the waste sector, direct GHG emissions (CH_4 and N_2O) from solid waste management activities are monitored, including industrial waste (categories 5A "Solid Waste Disposal", 5C "Incineration and Open Burning of Waste") and waste water treatment (category 5D "Waste Water Treatment and Discharge"). CO_2 emissions in the waste sector are negligible, but are considered when calculating the aggregated total GHG emissions for this sector. GHG emission projections were made based on the methodological approaches described in the 2006 IPCC Guidelines.

Policies used in mitigation scenarios for the waste sector (WM and WAM) are described in Chapter 3.5.5. GHG emissions mitigation measures for the waste sector include: development of regional waste disposal infrastructure, construction of regional SWDs and transfer stations, in line with the Waste Management Strategy of the Republic of Moldova for 2013-2027 and applying EU and national standards; extending the current system of primary collection and storage of urban waste in rural area; improving the water supply and sanitation infrastructure.

The two GHG mitigation scenarios in the waste sector include:

WM scenario, which provides for measures aimed at mitigation of GHG emissions to be undertaken at the pace of solid waste generation, including promotion and development of recycling systems for recyclable waste in urban areas of the Republic of Moldova, which is already under way. With the 5% annual increase in the amount of waste generated during 2010-2016, the separate collection of paper and cardboard waste is assumed to be 5% in urban areas and 2% in rural areas. When developing the municipal waste generation projections for 2018-2020, a 25% increase in the amount of statistically accounted waste is considered, which does not

[206] Galupa, D., Talmaci, I., et al. (2006), Development of forests and grasslands in the Republic of Moldova. CH. UASM Ed. Center, 2006.-19 p.

include industrial waste. Waste generation stabilization is expected from 2020 to 2025, and over 2025-2030 the total waste generation is expected to decrease by 1%/year, based on demographic trends. The GHG emissions reduction will be calculated under implementation of the NAMA "Promoting Waste to Energy in the Republic of Moldova"[207], which sets for all regional deposits a greenhouse gas emission reduction contribution of about 3,387 kt CO_2 equivalent during their lifetime and an annual average of about 109.3 kt CO_2 equivalent. For this scenario, open burning of waste will be gradually declining as soon as the regional waste management systems are put into operation, along with the promotion of effective sanitation control of settlements. Thus, the share of openly burnt waste will decrease by 2% annually, from 20% to 0% in 2025 in urban areas, and the same approach is proposed for rural settlements, i.e. over 2016-2030 the open burning of waste will be reduced by 2%, reaching 10% in 2030.

For the WM scenario, projections for methane and nitrous oxide emissions from category 5D "Treatment and Discharge of Waste Water" were developed based on the Water Supply and Sanitation Strategy for 2014-2028 (GD no. 99/2014)[208] and the National Program for the Implementation of the Protocol on Water and Health in the Republic of Moldova for 2016-2025, GD no. 1063/2016[209]. The target of the Water Supply and Sanitation Strategy for the first five years is to achieve provision with water supply and sanitation infrastructure for 30% of the non-connected population in urban areas and 20-25% of the non-connected rural population. Regarding connection to the sewerage system, the Strategy provides for connection of 101,077 new customers to sewage systems by 2018 and connection of 652,892 new customers to drinking water systems and treatment systems by 2028. The WM scenario provides connection of 85% of urban population and 25% of rural population to the centralized sewerage system by 2030, as stipulated in the National Program for the Implementation of the Protocol on Water and Health in the Republic of Moldova for 2016-2025. It is also planned to improve access to efficient water treatment systems for industrial wastewater and in those areas where sewage systems are completely absent, to build them and connect both population, and businesses of these areas. This scenario assumes that protein consumption rates will increase by 2% in 2015, by 3% in 2020 and by 3.5% in 2025.

WAM scenario is similar to the WM, but provides for a higher implementation rate of the actions, based on the Waste Management Strategy, approved by GD no. 248 of 10.04.2013. As a deviation from this Strategy, which provides for construction of several mechanical and biological treatment plants (MBTP), now, at the feasibility study stage, construction of only one mechanical-biological waste treatment plant is considered, for the city of Chisinau. The medium-term impact (until 2025) from construction of one only MBTP would be a 20% reduction of direct GHG emissions from the waste sector. As under the WM, in WAM open burning of waste will gradually decrease as regional waste management systems will be put into operation along with promotion of effective settlements sanitation control. Thus, the share of open burning of waste will decrease by 2% annually, from 20% to 0% in 2025 in urban areas, and after 2015, in rural areas, it will decrease annually by 2%, reaching 10% by 2030. Strict adherence to environmental legislation, together with adequate financial coverage, will allow elimination of open burning of medical waste within a shorter period than provided for under the WM scenario for 2016-2025, provided an annual 10% reduction of burnt amounts, and 20% reduction over 2026-2030, which would reduce by 90% the amount of openly burnt medical waste by 2030 as compared to 2015. The WAM scenario for category 5D "Waste Water Treatment and Discharge" provides for the rehabilitation of the sewage treatment plants in Chisinau municipality, with sludge treatment in anaerobic conditions technology starting 2020. Although measures are now being designed to implement the EU Urban Waste Water Treatment Directive, which provides for de-nitrification, it was not considered appropriate to reduce N_2O emissions under the WAM, because their share is insignificant.

Projections of CH_4 emission

Projections of CH_4 emission from the waste sector for WM and WAM scenarios are shown in Table 4-22.

Table 4-22: Projections of CH_4 emissions from the waste sector, kt CO_2 equivalent

	1990	2010	2015	2020	2025	2030
WM						
5. Waste	**1 408.5**	**1 398.1**	**1 345.9**	**1 470.3**	**1 204.2**	**1 239.7**
5A. Solid Waste Disposal	1 046.7	1 137.8	1 087.2	1 220.7	970.2	1 011.9
5C. Incineration and Open Burning of Waste	8.8	8.1	8.0	0.8	0.1	0.0
5D. Waste Water Treatment and Discharge	353.0	252.1	250.7	248.8	234.0	227.8
WAM						
5. Waste	**1 408.5**	**1 398.1**	**1 345.9**	**1 427.6**	**1 155.5**	**1 171.6**
5A. Solid Waste Disposal	1 046.7	1 137.8	1 087.2	1 220.7	970.2	996.1
5C. Incineration and Open Burning of Waste	8.8	8.1	8.0	0.7	0.1	0.0
5D. Waste Water Treatment and Discharge	353.0	252.1	250.7	206.2	185.3	175.5

These emissions come from solid waste disposal sites, as well as domestic and industrial wastewater treatment.

Projections of N_2O emissions

Projections of N_2O emissions from the waste sector for both scenarios (WM and WAM) are shown in Table 4-23. These emissions are generated by human sludge.

Table 4-23: Projections of N_2O emissions from the waste sector, kt CO_2 equivalent

	1990	2010	2015	2020	2025	2030
WM						
5. Waste	**89.8**	**69.4**	**69.8**	**68.3**	**68.7**	**69.2**
5C. Incineration and Open Burning of Waste	1.8	1.7	1.7	0.2	0.0	0.0
5D. Waste Water Treatment and Discharge	87.9	67.7	68.1	68.1	68.7	69.2
WAM						
5. Waste	**89.8**	**69.4**	**69.8**	**68.2**	**68.7**	**69.2**
5C. Incineration and Open Burning of Waste	1.8	1.7	1.7	0.2	0.0	0.0
5D. Waste Water Treatment and Discharge	87.9	67.7	68.1	68.1	68.7	69.2

Projections of aggregated total GHG emissions

Table 4-24 and Figure 4-10 show aggregated total GHG emissions projections from the waste sector as compared to GHG emissions registered in 1990. Relative to the level of emissions registered in the reference year, it is expected that in 2030, the level of GHG emissions from the waste sector will be 86.4% of the reference year

[207] <http://www4.unfccc.int/sites/nama/_layouts/un/fccc/nama/NamaSeekingSupportForImplementation.aspx?ID=196&viewOnly=1>
[208] Government Decision of the Republic of Moldova no. 199 of 20.03.2014 approving the Water Supply and Sanitation Strategy (2014 - 2028), Published on 28.03.2014 in the Official Gazette no. 72-77, art 222, amended by GD1089 of 18.12.17, MO440 / 20.12.17 art.1213, <http://lex.justice.md/md/352311/>
[209] Government Decision of the Republic of Moldova no. 1063 of 16.09.2016 approving the National Program for the Implementation of the Protocol on Water and Health in the Republic of Moldova for 2016-2025 Published on 20.09.2016 in the Official Gazette no. 314, art 1141, amended by GD1090 of 18.12.17, OM440 / 20.12.17 art.1214, <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=366749>

level under WM scenario and 81.9% of the reference year level under WAM scenario.

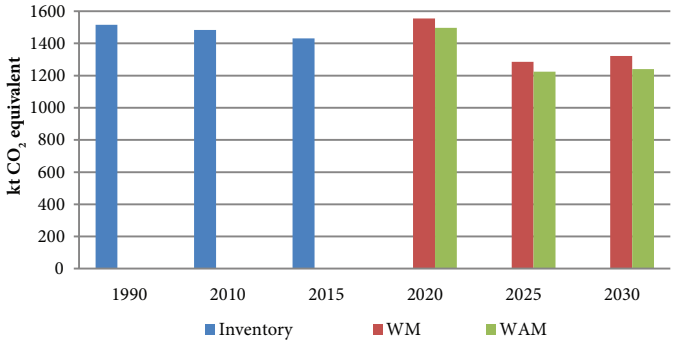


Figure 4-10: Projections of aggregated total GHG emissions from the waste sector, kt CO_2 eq.

Table 4-24: Projections of aggregate GHG emissions from the waste sector, kt CO_2 equivalent

	1990	2010	2015	2020	2025	2030
WM						
5. Waste	**1 515.4**	**1 483.3**	**1 431.3**	**1 540.1**	**1 273.2**	**1 309.0**
5A. Solid Waste Disposal	1 046.7	1 137.8	1 087.2	1 220.7	970.2	1 011.9
5C. Incineration and Open Burning of Waste	27.7	25.6	25.3	2.5	0.3	0.2
5D. Waste Water Treatment and Discharge	440.9	319.8	318.8	316.9	302.7	297.0
WAM						
5. Waste	**1 515.4**	**1 483.3**	**1 431.3**	**1 497.3**	**1 224.3**	**1 240.8**
5A. Solid Waste Disposal	1 046.7	1 137.8	1 087.2	1 220.7	970.2	996.1
5C. Incineration and Open Burning of Waste	27.7	25.6	25.3	2.4	0.2	0.0
5D. Waste Water Treatment and Discharge	440.9	319.8	318.8	274.2	253.9	244.7

4.3.6. Projections of GHG Emissions from International Bunkers

Of the two types of international bunkers, aviation and navigation, only the international aviation is relevant for the Republic of Moldova (international navigation is not occurring).

The projections listed below for international aviation were not considered for calculation of aggregated total national GHG emissions. These projections were developed on the basis of information on international aviation offered by the Civil Aviation Authority of the Republic of Moldova for the period up to 2015. The data for 2000-2015 was subject to regression analysis. Emissions were calculated using the emission factors available in the 2006 IPCC Guidelines. The regression analysis revealed a correlation coefficient R^2 of 0.9287, which is very appropriate to developed projections for the 2016-2030 period.

GHG emissions from international aviation are shown below in Table 4-25. It is estimated that compared to 2010, emissions from international aviation will increase by about 124% to 2020 and by 228% to 2030.

Table 4-25: Projections of GHG emissions from international aviation until 2030, kt CO_2 eq

GHG	2010	2015	2020	2025	2030
CO_2	82.7	218.4	185.6	225.2	271.7
CH_4	0.1	0.1	0.0	0.0	0.0
N_2O	0.8	2.1	1.5	1.9	2.3
TOTAL	**83.6**	**220.6**	**187.2**	**227.1**	**274.0**

CHAPTER 5. FINANCIAL, TECHNICAL AND CAPACITY CONSTRAINTS AND NEEDS

5.1. Climate Change Mitigation Constraints

The climate change mitigation constraints described in the NC4 of the RM under the UNFCCC (2018) remained topical at the time of drafting the BUR2. At the same time, there have been some changes, which are further described for each individual sector.

5.1.1. Energy Sector

The low payment capacity of consumers and the relatively high cost of capital in the Republic of Moldova continue to represent the most important barriers to the construction of new power generation capacities required to ensure energy security and high efficiency of power plants.

There is also lack of interest for the rehabilitation or construction of new, fossil fuels based power plants, given the availability of sources supplying electricity at much lower prices (Ukrainian suppliers and Moldavian Thermal Power Plant in Dnestrovsk) than the price of electricity produced by a new plant.

Apparently, for now, a legal framework enabling the development of renewable energy sources (RES) is in place. The latest amendments (2018) provide for engagement of investors by tendering into construction of RES at capacities pre-established by the authorities, the energy produced being sold at the lowest price proposed during tendering. However, lack of own traditional sources of electricity (82% of the electricity consumed is considered to be imported) makes it problematic to balance energy demand over time as a result of the intermittent production of renewable energy (solar and wind), which delays promotion of energy production from these sources.

5.1.2. Transport Sector

In addition to constrains described in NC4 of the RM under the UNFCCC (2018), the following are also relevant for the sustainable development of the transport sector:

Until now the "RABLA" project, launched by the MARDE, aimed at modernizing the motor vehicle fleet by replacing old vehicles with new ones, has not started yet, and the total cost of the project is unknown. To address the issue of increasing pollution, the authorities intervened with the proposal to halve the customs duties for hybrid vehicles imported in the country. As a result, in 2017 every eighth imported car in the country was a hybrid one. As far as the demand for cutting edge vehicles is concerned, pre-operational costs for electric vehicles remain high. Also, there are no clear economic signals, similar to those for hybrid vehicles, which could facilitate the import of these technologies in the country. The lack of infrastructure for charging electric vehicles is also a barrier.

It should also be noted that energy efficiency in transport can be improved both by improving efficiency in each mode of transport and by using more efficient means of transport. In this respect, rail transport, as a more advanced and less polluting means of transportation, remains weakly developed and low-demanded due to the lack of necessary investments. One of the highlights is the slow development of the cycling infrastructure, a type of transport that can also help reduce GHG emissions in the transport sector.

A major challenge facing public transport infrastructure projects is associated with very high pre-operational costs of capital.

5.1.3. Buildings Sector

In addition to the constraints faced by the building sector, specified in the NC4 of the RM under the UNFCCC (2018), it is worth to mention the following:

- Advanced degree of moral and physical wear and tear of the existing machinery and equipment;
- Emigration of labor force and research staff, resulting in shortage of technical and engineering staff and skilled workers[210];
- Quality of the higher education institutions graduates does not meet the market requirements[211];
- Decline in the number of university students (in 2005-2017, the number of students has fallen by more than 40%, and by 2020 a further 25% decline is expected)[212];
- Poor financing of energy efficiency institutions, including the salaries of the staff;
- Poor motivation of population to implement measures increasing energy efficiency and RES.

5.1.4. Industrial Sector

Alongside the constraints listed in the NC4 of the RM under the UNFCCC (2018) for the industrial sector, the following should also be mentioned:

- The existing machinery and equipment in Moldovan industrial enterprises have a higher degree of moral and physical wear and the state has limited possibilities to financially support the process of restructuring and upgrading industrial enterprises. In industry, there is also a growing shortage of engineering and technically skilled staff and a serious mismatch between the professional training of technical staff and the needs of the industry;

[210] <https://ro.sputnik.md/moldova/20180210/17216677/populatia-moldovei-migratie-depopulare.html>
[211] <https://www.mold-street.com/?go=news&n=7507>
[212] <https://www.mold-street.com/?go=news&n=7507>

- Loans from local and foreign banks for purchasing energy-efficient equipment are still very expensive and few businesses can afford to invest in modern equipment. Availability of collateral for loans granted is also an issue. In many projects to be carried out, companies have to contribute substantial co-financing, which is a barrier to project initiation. At the same time, depreciation of national currency against the main international currencies is significant, which implies a high risk for loan repayment;
- Lack of enabling business environment is also a barrier to technological transfer. The ability of small and medium enterprises to access and absorb information on the best technologies is often limited. Even large companies have little technical resources to interpret and translate the available information;
- The still modest development of industrial parks and limited financial resources for them is an essential barrier to promoting innovation and know-how in the Industry sector;
- Coming into force on 23.12.2017 of the Law no. 209 of 29 July 2016 on Waste[213], resulted in forbidding incineration and co-incineration of any waste, except the waste resulting from the medical activity. At the same time, allowing co-incineration in cement production furnaces with on-line emission control would be a good solution in terms of disposal of hazardous waste, such as medical waste, used oils, tires, etc. This requires amendment of the legal framework.

The main constraints and barriers related to monitoring and reporting F-gases emissions, specifically to assessment of F-gases emissions reductions, in particular HFCs, are the following:

a) There are no separate tariff codes for HFCs and HFCs blends in the Moldovan Commodity Nomenclature, therefore monitoring of consumption of these substances is extremely difficult;

b) There are no quotas and / or licenses / authorizations for import / consumption of HFCs in the RM. Import in any quantities is possible without authorization;

c) To strengthen the F-gases monitoring and reporting capabilities, it is necessary to set up an on-line information collection system, to contain data from importers and service companies, in particular, information on import, use, disposal and recycling of refrigerants (freons) and equipment containing such substances.

5.1.5. Agriculture Sector

In addition to the constraints of the agricultural sector specified in the NC4 of the RM under the UNFCCC (2018), the following should be mentioned:

- The sector competitiveness is greatly reduced. This is indirectly confirmed by the share of foreign direct investments in agriculture, which is only about 1.0% of the total investment[214];
- Soil degradation is estimated at 1.5 billion MDL annual losses[215], including loss of fertile soil through erosion, destruction of the soil cover by landslides and ravines, losses of agricultural production. Maintaining long-term soil quality by increasing the organic content of the soil in the form of humus is the only effective way to reduce GHG emissions from farmlands;
- According to the results of the environmental audit of the sustainable use of agricultural land carried out by the Court of Auditors[216], the field of sustainable land management is vulnerable, with problematic situations and deficiencies. Thus:
  - The soil as a natural resource, is not protected by a legal framework regulating its use, conservation, protection and improvement on the basis of the principles and strategic elements that would guarantee the sustainable use of land, an indispensable condition for the social and economic development of the country;
  - Lack of settlement planning in some settlements result in disparity between environmental policies and sustainable management of agricultural lands;
  - The Soil Conservation and Fertility Enhancement Program for 2011-2020 and activities related to farmlands fertility improvement are not accompanied by objectives prioritization procedures/mechanisms, expert evaluation and assessment, actions and measurable indicators, which increases the risk of failure to produce the expected effects;
  - Agricultural land and associated ecosystems are at risk of pollution as a result of insufficient monitoring and systematic surveillance of fertilizer use;
  - Lack of effective ecological monitoring is determined by irrelevant and disorderly farmland protection activities, as well as lack of data and information on agricultural land situation;
  - Failure to comply with soil cultivation technologies and soil degradation is also the result of excessive fragmentation of agricultural land;
  - Lack of expert evaluation and assessment of soil conservation and fertility enhancement projects, as well as failure to establish measurable indicators, in some cases result in failure to achieve the established objectives, and failure to ensure consistency of the set objectives.
- The multitude of strategies, programs, action plans, as well as lack of a specific legal framework for soil, provide for fragmentation of the executors' responsibilities related to farmland use, and result in lack of integrated land management. The authorities competent in agricultural land management do not have neither sufficient processes nor levers to reduce degradation and negative impact of pollution, nor mechanisms to remove environmental threats, which require activities and tools additional to good agricultural and environmentally friendly practices.

5.1.6. Forestry Sector

Among the main barriers and constraints related to the forestry sector of the Republic of Moldova, which have an impact on its capacity to remove GHG emissions, there are:

- Continuous degradation of forest ecosystems, fragmentation of forest habitats;

[213] Law no. 209 of 29.07.2016 on Waste. Published on 23.12.2016 in the Official Gazette no. 459-471, art. 296. Effective since 23.12.2017. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=368030>

[214] State Tax Service of the Republic of Moldova (2017), Foreign direct investments: data, problems, facilities. The "FISC.MD" Fiscal Monitor. Editorial of 15.11.2017. <https://monitorul.fisc.md/editorial/investitiile-straine-directe-date-probleme-facilitati.html>

[215] Ministry of Agriculture and Food Industry (2017), Informative Note to the Draft Government Decision approving the Action Plan on the implementation of the Program for the Conservation and Enhancement of Soil Fertility for the years 2017-2020. <http://www.gov.md/sites/default/files/document/attachments/intr17_96.pdf>

[216] Decision of the Court of Accounts no. 38 of 15.07.2014 on the Environmental Audit Report on the Sustainable Use of Agricultural Land. Published on 29.08.2014 in the Official Gazette no. 256-260, art. 37. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=354507>

- Shrinking areas and aggravation of the rare and endangered ecosystems situation (beech, fluffy oaks, petrophite formations, etc.);
- Degradation and diminishing the quality of forest stands;
- Insufficient regeneration and ecological reconstruction works aimed at improving the composition by promoting more climate change resilient biotypes, substitution of compromised introduced forest culture species, restoration of fundamental phytocenoses, etc.;
- Lack of interconnection corridors between dispersed forest bodies;
- Continuous erosion of forest biodiversity;
- The low effectiveness of the methods and techniques currently used in tree care and management, regeneration, preservation and reconstruction of forests;
- Continuous degradation, fragmentation, destruction, spontaneous management, lack of planning in compliance with forestry regime of the forests owned by the mayoralties.

Another important aspect is the substantial decrease of the wooded areas expansion rate on the account of degraded agricultural lands. Although the mechanism for allocation of land for afforestation is relatively established[217], it does not work properly, including due to deficient monitoring and failure to sanction the executors responsible for implementation.

The RM does not have a National Forest Inventory, and the data collection process does not exactly meet the international requirements. Exact and up-to-date information on the volume, distribution, composition and overall state of forests (public and private) is of utmost importance for drafting development and monitoring policies, providing assistance and support aimed at sustainable management, and complying with national and international reporting requirements.

The role of perennial plantations in GHG emissions removal is steadily decreasing, primarily due to the fact that between 1990 and 2016 the area occupied by perennial plantations decreased by about 38%. Planting of new vineyards and orchards is a slow process with low chances of reaching the quantitative indicators of 1990.

The extensive grassland management system, providing for minimal, or no care at all, the disproportion between the production capacity of grasslands and cattle grazing load, together with the impact of other degradation factors such as erosion, weed and bushes invasion, have a significant impact on the grasslands quality and productivity. At present there is no clear picture of the grassland degradation state at national, regional, or local level. The proportion of abandoned or overloaded grasslands, the share of grassland affected by bushes, weeds or other restrictive factors, is not known. This makes it difficult to assess at national level the needs to undertake ecological improvement/reconstruction and grasslands capitalization measures in the context of sustainable development and investment needed for this purpose.

The practices of converting different categories of degraded land into grassland, including as a major GHG removal factor, are declining, and are practically overlooked by local and regional authorities.

With regard to horticulture and soil resources, the long-term preservation of soil quality by increasing the organic content of the soil in the form of humus is the only effective way to reduce GHG emissions from farmland. The sectoral strategies and programs approved so far have not produced the necessary changes to improve the situation. As a result, in the past 20-25 years the agriculture of the Republic of Moldova has been based mainly on the exploitation of the natural fertility of soils (the existing humus content in soils accumulated over millennia). As a result, any increase in harvest caused by the climatic factor, not followed by compensation for losses of organic matter in the soil, used to produce the crop, has led to an increase in GHG emissions into the atmosphere. Thus, intensification of humus loss processes due to subsistence agriculture has led to decreasing the removed carbon reserves in the soil, increasing of CO_2 emissions and diminishing the quality and fertility of agricultural soils.

5.1.7. Waste Sector

Additionally to what was specified in the NC4 of the RM under the UNFCCC (2018), it should be mentioned that waste management as waste collection and disposal infrastructure is still underdeveloped in the Republic of Moldova. At the same time, the legal framework has been substantially improved in the recent years due to the Law no. 209 of 29.07.2016 on Waste, and the subsequent regulatory framework. Currently, the Environmental Agency is being established, which will serve as the institutional framework for law enforcement and regulation of waste management activities.

Hazardous waste management remains a problem which is expected to be addressed following the establishment of the Hazardous Waste Management Center, to be created according to the Law no. 209 on Waste of 29.07.2016. Establishment of the Center requires about four mil. Euro, a considerable amount of financial resources which Moldova cannot afford now. This Center will provide hazardous waste treatment capabilities, including medical, construction and demolition waste, manure, municipal waste, technical oils, tires, etc. There are also difficulties in the existing legislative and regulatory framework implementation. Small penalties do not sufficiently motivate compliance with legal requirements.

With regard to wastewater, it should be mentioned that the achievement of the water supply and sanitation targets set out in the strategic documents, is being procrastinated. Thus, rural settlements, still lack improved water sources. Lack of centrally supplied water and sewage leads to environmental pollution by contamination of surface and underground waters.

At the same time, as the number of people having access to centralize water supply grows, consumption of water, especially domestic consumption, grows as well, and respectively, the amount of waste water discharged directly into the environment because of lack of sewerage, also grows. Though, in some cases, people build their own wastewater accumulation facilities, lack of norms, as well as insufficient information on the imminent harm do not ensure protection of the environment.

The institutions that have to lead, implement and operate the water supply and sanitation infrastructure in a sustainable manner, are inadequately equipped to cope with the challenges of adapting national legislation to that of the EU and good European practices in the field of water supply and sanitation.

Efforts are needed to align the water and sewerage infrastructure planning, design, construction, expertise, and control and operation mechanism to the EU standards. Existing design rules include the same provisions for urban and rural areas, what results in over-dimensioning of rural systems. The existing norms do not provide

[217] Law no. 1041 of 15.06.2000 on Afforestation of Degraded Land, Government Decision no. 1186 of 28.10.2016 approving the Regulation on afforestation of degraded lands owned by administrative-territorial units and privately owned degraded lands.

for some modern wastewater treatment/purification technologies such as wetland type wastewater treatment plants, EcoSan toilets, etc., posing an obstacle to their implementation.

5.2. Capacity Building Needs for Climate Change Mitigation

Climate change mitigation capacity should be understood as an ability of individuals, groups, organizations and institutions to identify, plan and implement climate change mitigation and adaptation actions, considered an integral part of sustainable development efforts[218].

Climate change mitigation capacity building needs are relevant and cover four dimensions:

- Carry out climate studies, research and assessments;
- Formulate climate strategies and policies;
- Implement climate strategies and policies;
- Negotiate climate issues at international level, mainly for attracting funds[219].

5.2.1. Capacity to Carry out Climate Studies, Research and Assessments

The information in this chapter is reflected in the NC4 of the RM under the UNFCCC (2018) (see Chapter 10.2.1).

5.2.2. Capacity to Formulate Strategies and Climate Policies

The information on this topic is reflected in the NC4 of the RM under the UNFCCC (2018) (see Chapter 10.2.2).

5.2.3. Capacity to Implement Climate Strategies and Policies

The information on this topic is reflected in the NC4 of the RM under the UNFCCC (2018) (see Chapter 10.2.3). However, because the content of some of the paragraphs has evolved, the new developments are provided below.

Highlighting low-emission development priorities in the national political agenda can be achieved through a high-level national structure capable of covering cross-cutting issues responding to the climate change challenges to support green economic development. Such a structure is the National Commission for Climate Change, an inter-ministerial body, consisting of representatives of central and local public authorities, academia, non-governmental organizations and private sector, which will promote the measures and actions needed to address the objectives and provisions of the Climate Change Adaptation Strategy and the UNFCCC. The Commission will be created by the end of 2018 on the basis of a Government Decision.

Eight NAMAs were developed in the context of the NC4 of the RM under the UNFCCC (2018), including an action in the detailed format entitled "Use of Energy Willow for Heat Generation in the RM". All five NAMAs specified in the NC4 of the RM under the UNFCCC (2018) and other seven developed in a more concise format were registered in the UNFCCC NAMA Register[220]. The most important indicators of these NAMAs are shown in Table 5-1. As seen, implementation of the 12 NAMAs reaches 68% of the country's conditional NDC objective. Conditional objective can only be accomplished with donors' financial support, technical assistance and technology transfer.

Table 5-1: Features of the RM's NAMAs registered in the UNFCCC NAMA Register

No.	NAMA	Emissions reduction, kt CO_2/year by 2030	The required investment, mil. US$	Specific investment, US $ / t CO_2 cumulative
1	Promotion of wind power plants in the Republic of Moldova	609	640	53
2	Promotion of small scale CHPs in the Republic of Moldova	41	23	23
3	Promotion of heat pumps in the Republic of Moldova	148	180	108
4	Use of solar energy for domestic hot water production in the Republic of Moldova	116	606.3	758
5	Use of energy willow for thermal energy production in the Republic of Moldova	250	89	15
6	Waste to Energy in the Republic of Moldova	109	15	4
7	Hybrid and electric buses and minibuses in Chisinau municipality	17	344.3	2,006
8	Promoting energy efficient lighting in the Republic of Moldova	327	236.3	52
9	Clinker replacement in cement production	301	100	92
10	Implementation of cattle feeding technologies using dried grape marc in cattle ratios	69	4	4
11	Implementation of soil conservation tillage system in the Republic of Moldova	323	184	38
12	Afforestation of degraded lands, riparian areas and protection belts in the Republic of Moldova	284	144	10
	TOTAL	2,568	2,567	
Conditional NDC coverage		**68%**		

The most appropriate organization layout for NAMA implementation is through Project Implementation Units (PIU). The Republic of Moldova has a rich experience in applying such mechanisms to promote internationally funded projects.

The Strategy implementation will be monitored by the Ministry of Agriculture, Regional Development and Environment. To ensure the monitoring process, a monitoring group will be created by the Minister of Agriculture, Regional Development and Environment, which will periodically assess the achieved indicators and objectives. Based on the collected and systematized information, it will draft the annual report on Strategy implementation and submit it to the Government.

5.2.4. Capacity to Negotiate Climate Issues at the International Level

Typically, climate change is a complex horizontal set of issues, which are similar to other sustainable development issues. These issues require new capabilities such as the ability to establish long-term sustained commitments, create a strong political and integration coherence, and enter into partnerships between governments and civil society. Climate change as a horizontal issue, require the availability of two kinds of capabilities: climate specific capabilities

[218] Donor assistance to capacity development in environment, OECD, Paris, 1995.
[219] Sagar, A. Capacity development for the environment: A view from the south, view from the north, in: Annual Review of Energy and Environment 25, 2000, pages 377-439.
[220] <http://www4.UNFCCCc.int/sites/nama/SitePages/NamaImplementation.aspx>

and climate relevant capacities. The climate specific capability implies the capacity to develop exclusively climate actions.

At the same time, given that climate change is a cross-sectoral issue, the most significant institutional capacity, which might be necessary for the development of climate actions cannot be regarded as climate-specific, but rather climate relevant. This means that this capability shall be developed for purposes other than those directly related to climate change, and for concrete sectors, such as energy, transport, agriculture and forestry. And the display of such capabilities could have a very significant impact on the success of climate action or policies in this area.

Starting from this division of capacities, Table 5-2 shows the specifics of the above mentioned capacities, as well as their availability in the Republic of Moldova now (in brackets, the score 10 is maximum availability, 1 - total lack).

The level of availability of capacities listed in Table 5-2 predetermines the capacity to negotiate climate change issues internationally. Considering that negotiation in itself is an art and a science, maximum performance in negotiations cannot be achieved without knowledge transfer, as well as relevant best practices. In this regard, the Republic of Moldova needs relevant training, which is provided by donors based on predetermined programmes, and systematically.

Table 5-2: Climate-specific and relevant capacity needs

Categories	Climate-specific capacities	Climate relevant capacities
Staff	Sufficient availability of: staff at Government level (7), experts (7), business representatives and NGOs for national assessments (5), formulation of national strategies (7), design and implementation of policies and measures, as well as monitoring, reporting and review (5), Reasonable level of climate-specific skills and training (7), Presence of interest in climate change (6)	Availability of experts at governmental level and beyond for the development of relevant climate policies in the sectors: Energy (9), Transport (6), Agriculture (7), Forestry (9), Industry (5), Research and Development (8), Economy (7), Finance (4), Education (5), Presence of general training opportunities (7), Availability of financial and other incentives (4)
Organizations	Specific mandate for climate change (8), "Unity" within the organization (7), Working climate for senior management (7)	Compatibility of organizational objectives with climate change (7), structured management and processing skills (7), availability of financial and human resources (5), broad capability to carry out missions (5)
Network of organizations	Financial procedures and provisions (6), level of cooperation on climate issues (6), presence of a coordinating organization (8), allocation of responsibilities (5), stability/adaptability of the institutional framework (6)	Public sector practices and procedures underlying policy streamlining (4)
Public governance	Ability to influence mass policies to take into account climate change aspects (7)	Political stability (3), the right to expose and responsibility (5); the capacity to implement sound climate relevant policies and ensure a solid business environment (5), an independent public service (5), the ability to collect sufficient resources (5); a rule of law state and corruption control (2)
Social norms, values, practices	Knowledge of climate change and positive attitude towards climate change mitigation measures (7)	Compliance with laws (6); positive attitude towards environmental protection (7), cooperative attitude among citizens (6)

5.3. Financial Needs in the Context of Ensuring Low-Carbon Development

In order to ensure the objectives of greenhouse gas emissions reduction in the context of low emission development, two funding categories are required. The first is the need to reach an adequate capacity level in GHG mitigation. The second are the investments needed to implement measures and technologies contributing to the proposed GHG reductions.

The relevant financial needs are shown in Tab. 5-3, where the investments needed for NAMA implementation correspond to investments needed to achieve the country's conditional objective.

Table 5-3: Financings needs in the context of ensuring Moldova's low-emission development

No.	Actions	State (in process, planned, accomplished)	Required support	Already received support	Additionally needed support
Technical and capacity development needs, US$ thousand					
	TOTAL including:		1,404.5	725.5	679
1	Supporting the country's capacity to develop capability and strengthen the national inventory system	In process	290	258	32
2	Strengthen the national GHG inventory development capability for the LULUCF sector, including the development of the land use matrix and completing the transition to the 2006 IPCC Guidelines for LULUCF	Planned	30	0	30
3	Strengthen the capacity of the national network of research institutions to conduct studies, research and assessments to identify additional mitigation opportunities, that include financial and organizational justification in terms of social, technical and economic impacts	Planned	169	0	169
4	Enhance the national capacity to prepare viable NAMA projects proposals in the Transport, Industry and Agriculture sectors, to attract investment	In process	350	302	48
5	Strengthen the Forestry sector policies, legal framework and forest management of the Republic of Moldova	Planned	50	0	50
6	Strengthen the stakeholders capacity in the Waste sector to implement EU directives and regulations	Planned	40	0	40
7	Enhancing the negotiating capacity of international mitigation and adaptation projects to attract funding	Planned	22	0	22
8	Develop capacity to formulate and implement climate strategies and policies	Planned	24	0	24
9	Facilitate the dialogue towards knowledge transfer and lessons learned, as well as training relevant stakeholders and experts from the administrative structures of the Republic of Moldova for successful implementation of the national MRV system, with special emphasis on MRV of LEDS and NAMA	In process	205	165	40
10	Stakeholders training and promoting workshops on afforestation, land reclamation, forestry and sustainable pasture management	Planned	32	0	32
11	Stakeholders training, including through workshops on renewable energy and energy efficiency, as well as developing the respective technical and financial demonstration tools (in the context of NAMA on renewable energy and energy efficiency)	Planned	192	0	192

No.	Actions	State (in process, planned, accomplished)	Required support	Already received support	Additionally needed support
Financial needs, US$ million					
	TOTAL including:		4,961		
1	Promotion of small-scale CHPs in the Republic of Moldova	Planned	23		
2	Promotion of heat pumps in the Republic of Moldova	Planned	180		
3	Promotion of wind sources in the Republic of Moldova	Planned	640		
4	Use of solar energy for domestic hot water production in the Republic of Moldova	Planned	606		
5	Promoting efficient lighting in the Republic of Moldova	Planned	236		
6	Hybrid and electric buses and minibuses in Chisinau municipality	Planned	344		
7	Clinker replacement in cement production	Planned	100		
8	Reducing GHG emissions in enteric fermentation by including dried grape marc in rabbit ratios	Planned	228		
9	Implementation of soil conservation tillage system in the Republic of Moldova	Planned	5		
10	Afforestation of degraded lands, riparian areas and protection belts in the Republic of Moldova	Planned	144		
11	Use of energy willow for heat production in the Republic of Moldova	Planned	89		
12	Promoting of waste to energy in the Republic of Moldova	Planned	15		
13	Other NAMA conditioned by LEDS	Planned	2,271		
Technology transfer needs, US$ thousand					
	TOTAL including:		375		
1	Institutional Assistance in Promoting Advanced Technologies	Planned	250		
2	Internship programs for learning advanced technologies in operation	Planned	125		

The table shows that addressing the RM's needs in technical and development capacity require US$ 679 thousand, technology transfer – US$ 375 thousand, and implementation of NAMAs aimed at reaching the conditional National Determined Contribution – US$ 4.9 billion, according to LEDS.

The investments needed for the implementation of measures and technologies entailing GHG emissions reduction and which will ensure the sustainability of the national economy development with own forces (and, separately, also with the donors' contribution), are reflected in the NC4 of the RM under the UNFCCC (2018).

5.4. Technical Needs in the Context of Ensuring Low-Carbon Development

Technical assistance in the Republic of Moldova is regulated by the GD no. 561 of 19.08.2015 on regulating the institutional framework and the mechanism for coordinating external assistance granted to the Republic of Moldova by international organizations and donor countries[221]. The document sets out the principles and procedures defining:

a) The institutional framework for coordination of external assistance provided to the Republic of Moldova by the donor community;

b) Programming, implementation, monitoring and evaluation of external assistance projects and programs.

The Government Decision provides for coordination ensures and better synergy in programming, implementation, monitoring and evaluation of external assistance by establishing a broad consultative process and dialogue between the Government, private sector and civil society.

The technical assistance coordination mechanism comprises several phases, each being the responsibility of the respective entity within the corresponding institutional framework. The latter is shown in Fig. 5-1.

During the programming phase, the National Coordinator, supported by the National Coordination Unit, ensures the organization of the programming phase and the hearings at the Inter-ministerial Committee for Strategic Planning about the programming phase.

The programming phase consists of the following stages:

a) Defining assistance priorities;

b) Identifying project ideas and formulation of project proposals, fiches and terms of reference;

c) Negotiation and signing the external assistance agreement.

External assistance priorities at sector level are reviewed and approved within the Sectoral Council, where the Sectoral Coordinator presents them to the National Coordination Authority.

Proposals on external assistance priorities at the national level are formulated by the National Coordination Unit based on proposals submitted by sectoral coordinators, in compliance with the following documents:

a) National Development Strategy;

b) Bilateral agreements between the Republic of Moldova and the European Union;

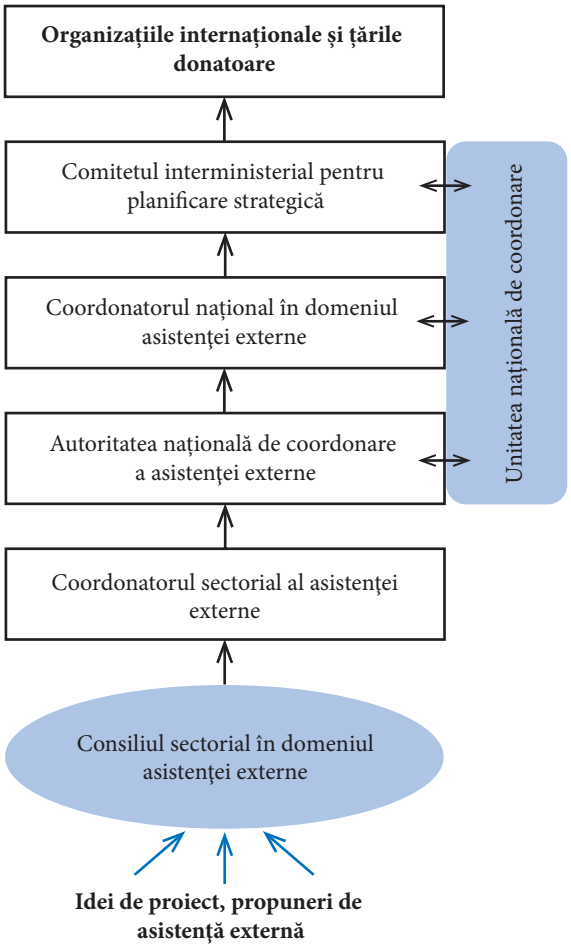
c) Government activity program;

d) Policy documents, including the LEDS.

The National Coordination Authority submits the identified external assistance priorities for approval to the Inter-ministerial Strategic Planning Committee. The approved priorities serve as a basis for the development/negotiation of external assistance agreements, country donor assistance strategies, and project proposals.

The National Coordination Unit formulates the assessment opinion on the project proposal in accordance with pre-established criteria. The project proposal, together with the assessment opinion, is examined within the Inter-ministerial Strategic Planning Committee. Once approved by the Committee, the primary beneficiary institution that submitted the project proposal, with the assistance of the National Coordination Unit, ensures the qualitative development of the terms of reference in accordance with the application requirements for the available donor funding and ensure the external assistance agreements drafting/negotiating process coordination.

[221] Official Gazette of the RM no. 224-233 of 21.08.2015, Government Decision no. 561 of 19.08.2015 on regulation of the institutional framework and mechanism for coordination of external assistance granted to the Republic of Moldova by international organizations and donor countries.



Acordă asistență.

Asigură direcționarea și corelarea asistenței externe pentru realizarea priorităților naționale.

Prim-ministrul. Promovează în rândurile donatorilor prioritățile de asistență externă și proiectele identificate și aprobate în cadrul Comitetului interministerial; semnează acordurile; asigură MRV.

Responsabilă de programarea, monitorizarea, evaluarea operațională și evaluarea metodologică, precum și asigurarea transparenței în valorificarea asistenței externe acordate Republicii Moldova de comunitatea donatorilor.

Asigură coordonarea la nivel de sector a asistenței externe acordate Republicii Moldova de comunitatea donatorilor.

Este organul consultativ, creat în baza principiului de parteneriat, abilitat cu funcții de programare și monitorizare sectorială. Identifică, formulează și propune autorității naționale de coordonare prioritățile de asistență pentru sector, inclusiv propunerile de proiecte. Este alcătuit din: șefi sau reprezentanți ai subdiviziunilor sectorului; reprezentanți ai: donatorilor activi în sector; unității naționale de coordonare; sectorului privat; comunității științifice; organizațiilor obștești; altor instituții relevante.

Ideile și propunerile de asistență pot fi înaintate din partea agențiilor, subdiviziunilor ministeriale, sectorului privat, organizațiile obștești etc.

Figure 5-1: Institutional arrangements regarding external assistance for the Republic of Moldova.

Applications for external donor assistance, together with the terms of reference, are signed and submitted on behalf of the National Coordinator. Within 30 calendar days since launching the external assistance project/program, the primary beneficiary institution shall ensure the registration of the projects/programs on the External Assistance Management Platform (AMP).

It should be mentioned that in April 2018 the Government of the Republic of Moldova approved a decision amending the institutional framework and external assistance coordination and management mechanism, in the context of assigning the external assistance coordination authorities to the Ministry of Finance[222].

As a result, the Inter-ministerial Strategic Planning Committee and Sectoral Councils are excluded from the external assistance coordination process. The Ministry of Finance, as the national external assistance co-ordination body, within six months shall develop the Operational Guide on External Assistance Coordination and Management. The State Chancellery is designated as the authority responsible for the coordination and management of external technical assistance, and the Ministry of Finance – External Financial Assistance.

As far as the need for technical assistance is concerned, it is determined by each individual sector. It is complex by nature, and as a rule, with no precise indication of GHG reduction, difficult to be identified on the External Assistance Management Platform[223] comprising all external assistance, including the technical one, negotiated and received by the RM.

[222] <https://sputnik.md/politics/20180415/18572318/guvernul-a-decis-coordona-asistenta-externa.html>

[223] <http://amp.gov.md/portal/activities?search=&da=&ba=&psec=&loc=>

CHAPTER 6. DOMESTIC MONITORING, REPORTING AND VERIFICATION ARRANGEMENTS

6.1. Domestic MRV System Currently in Place

At present, the key elements of the domestic measurement, reporting and verification system are found both in the UNFCCC mechanisms established for reporting on effective and projected emissions produced in the country, and in many energy efficiency and renewable energy promotion activities, as well as in the CDM projects of the Kyoto Protocol.

In the above context, it is necessary to mention that national GHG emissions, as well as their evolution trends, are periodically reported in the National Communications of the Republic of Moldova to the UNFCCC[224] (since 2000) and in the National Inventory Reports[225] (since 2010). These documents are developed on the basis of studies, research, reports by top-level national consultants, including with relevant international expertise, selected to make retrospective calculations and analysis, as well as develop short and medium term evolution scenarios for the GHG emissions from each sector, based on macroeconomic development scenarios of the RM.

In addition, in order to improve transparency, stability, comparability, completeness and accuracy of the national inventory of anthropogenic GHG emissions from carbon dioxide sources and sinks not covered by the Montreal Protocol, the Republic of Moldova has developed in 2015 the "Report on the National Inventory System in the Republic of Moldova", using as a starting point six templates developed by the United States Environmental Protection Agency (US EPA)[226] (institutional arrangements, assessment methodologies and process documentation, description of Quality Assurance (QA) and Quality Control procedures (QC), description of the archiving system, key category analysis, and the national inventory improvement plan). The respective Report is currently undergoing an update and is planned to be published in the first quarter of 2019 year.

As part of the ongoing effort to produce a qualitative, transparent and credible inventory, in 2005 the Republic of Moldova developed, and periodically updates its "Quality Assurance and Quality Control Plan". The key features of the "QA/QC Plan" include detailed specific procedures and typical quality control and verification forms according to Tier 1 (general procedures) and Tier 2 methodologies (specific procedures for individual categories) to standardize the process of implementing Quality Assurance (QA) and Quality Control (QC) activities for the national inventory; also the external technical reviews (audits) carried out by the staff not directly involved in the national inventory drafting and development (both by national and international consultants[227] included in the UNFCCC[228] roster of experts); checking the quality of activity data, including by comparing sets of data obtained from different sources; planning and coordinating the inventory process at inter-institutional level; as well as continuous documentation of the national inventory development process.

For activities focused on GHG emissions reduction, including measurement, reporting and verification, the most relevant are:

- CDM projects, so far 10 projects of this kind have been registered in Moldova[229];
- MoSEFF Program[230] is one of the largest energy efficiency financing programs in the Republic of Moldova, supported by the EBRD; eligible projects received up to 20% grant funding and the results are also measured by GHG emissions reduction;
- MoREEFF[231], a program supported by the EBRD, the EU and the Swedish Government in the buildings sector; by financing conditions is similar to the MoSEFF program;
- The Project "Energy and Biomass in Moldova"[232], funded by the EU and UNDP, focused on installation of heat boilers in schools, kindergartens and hospitals; UNDP nominates a third party verifier;
- National Action Plan on Renewable Energy for 2013-2020[233] specifies concrete values for substitution of traditional fuels with renewable energy and ways to follow up the targets achieved in the period up to 2020;
- National Energy Efficiency Action Plan for 2016-2018[234] specifies concrete values for reducing energy consumption compared to the baseline scenario for each sector, as well as the ways to monitor the objectives implementation.

The Legal and Administrative Framework of the Measurement, Reporting and Verification System

The Ministry of Agriculture, Regional Development and Environment (MARDE) is the state authority responsible for developing and promoting policies and strategies addressing environmental protection, rational use of natural resources and biodiversity conservation.

MARDE is responsible for implementing the international environmental treaties to which the Republic of Moldova is a Party.

[224] <http://clima.md/lib.php?l=ro&idc=81&>
[225] <http://clima.md/lib.php?l=ro&idc=82&>
[226] <www.epa.gov/climatechange/emissions/ghginventorycapacitybuilding>
[227] <http://clima.md/doc.php?l=ro&idc=82&id=3853>; <http://clima.md/doc.php?l=en&idc=82&id=3852>
[228] <http://UNFCCCc.int/parties_and_observers/roster_of_experts/items/534.php>
[229] <http://cdm.UNFCCCc.int/Projects/projsearch.html>, <http://clima.md/lib.php?l=en&idc=242&>
[230] <www.moseff.org>
[231] <www.moreeff.org>
[232] <www.biomasa.md>
[233] GD no. 1073 of 27.12.2013.
[234] <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=369635>

The Climate Change Office by the MADRE is responsible for the activities related to drafting the National Inventory Reports, Biennial Update Reports and National Communications of the Republic of Moldova to the UNFCCC.

The National Inventory Team, based in the Climate Change Office, is responsible for assessing emissions by sources and sinks, key emission sources analysis, inventory quality verification and control activities, uncertainties analysis, documentation and archiving of information associated with the process of preparing the national GHG emissions inventory.

Monitoring of the degree of pollution, including of the atmospheric air, is carried out by the Environmental Protection Inspectorate of the Republic of Moldova, which monitors enterprises and installations with potential for environmental pollution, registers and intervenes in cases when the maximum permissible concentration of pollutants, including harmful emissions is exceeded, but not GHG emissions, which are not yet regulated by national legislation.

The National Commission for the implementation of the provisions of the UNFCCC as well as of the mechanisms and provisions of the Kyoto Protocol (here after the National Commission) was established by the Government Decision no. 1574 of December 26, 2003, and has the mandate to communicate with the UNFCCC and to evaluate CDM projects. The National Commission does not yet have the mandate to prioritize, evaluate, approve/reject and monitor NAMA projects and related MRVs. Also, currently there is no accreditation system for environmental impact monitoring and verification experts and authorities responsible for monitoring and verification.

6.2. The Domestic Monitoring, Reporting and Verification System for LEDS and NAMA Implementation Progress in the Republic of Moldova

The GHG reduction targets set out in the NDC can be achieved by the Republic of Moldova by implementing NAMAs identified and set forth in the LEDS, but also other NAMAs initiated by stakeholders. The latter document includes the Action Plan for the implementation of these measures. One of the core actions specified in the LEDS is to create a robust MRV system for NAMA implementation. In this respect, the draft Government Decision on the establishment of the Climate Change Coordination Mechanism, which aims to establish an effective institutional coordination, monitoring, verification and reporting instrument on climate change mitigation and adaptation, has been already drafted. The normative act is expected to be approved in 2018 and will contribute to the adoption of optimal social, economic and financial decisions on climate change in the Republic of Moldova, including at sectoral level, by approving policies, instruments and measures specific to the GHG emissions mitigation and adaptation to climate change.

The key element in the climate change coordination mechanism is the National Commission for Climate Change, an inter-ministerial body, consisting of representatives of central and local public authorities, academia, non-governmental organizations and private sector, which will promote the measures and actions needed to address the objectives and provisions of the Climate Change Mitigation and Adaptation Strategy and the UNFCCC. The National Commission will ensure the coordination of the institutional framework for monitoring, reporting and verification (MRV) of the GHG emissions reductions and facilitate streamlining the climate change issues into national and sectoral planning documents. At the same time, the Commission will coordinate actions previously initiated but not completed, in the context of the Kyoto Protocol. The Commission also aims to coordinate the NAMA projects development, assessment and approval process.

The Commission will be chaired by the Minister of Agriculture, Regional Development and Environment, and its secretariat will be provided by the Climate Change Office. In its NAMA coordination mechanism implementation activities, the Commission will be supported by the technical committees responsible for NAMA projects evaluation at all phases of the project cycle.

The NAMA coordination mechanism is described in a separate Regulation, an integral part of the above-mentioned Government Decision. The document establishes the responsibilities of the participants in the NAMA development, evaluation and approval cycle, as well as the MRV process.

According to the Regulation, two types of NAMA projects are considered:

- Unilateral and;
- Seeking external support.

Unilateral projects are funded from the state budget and are provided for in national/sectoral planning documents, while supported projects are funded by donors and can also be registered in the NAMA Register of the UNFCCC Secretariat.

The development, evaluation, approval and the MRV cycle of seeking support NAMA projects consist of three implementation stages:

- Initial NAMA Project Proposal;
- Complete NAMA Project Proposal;
- Monitoring, Reporting and Verification Procedure (MRV).

For unilateral NAMA projects MRV is simplified.

The initial project proposal shall be drawn up in accordance with the Operational Manual on the NAMA coordination mechanism and the template for NAMA projects development, approved by the Commission.

Based on the NAMA initial proposal acceptance letter, the Beneficiary shall draw up the complete project proposal, which shall take into account the stakeholders' and civil society's opinion on the project by public consultations, including by public meetings and debates.

Evaluation and approval of the NAMA project proposal by the Technical Committees and the National Commission shall follow the evaluation procedure and criteria set out in the Operational Manual on the NAMA Coordination Mechanism approved by the National Commission.

The Monitoring, Reporting and Verification Mechanism set out in the Draft Government Decision aims at tracking the overall performance of NAMA and includes the following activities:

1) Measuring the GHG emissions reduction;
2) Reporting information;
3) Verification of reported information.

The MRV procedure shall be applied at the implementation stage and after the project is completed.

The monitoring and reporting components are carried out by the NAMA Project Beneficiary, and the verification component - by the Verifier.

The project monitoring is carried out during the NAMA project implementation phase. During the monitoring phase, the Beneficiary shall measure and calculate the GHG emissions reductions resulted from the NAMA project implementation. All along the monitoring phase, the Beneficiary shall use standardized measurement and calculation methodologies and tools set forth and approved in the NAMA project document.

The reporting is carried out during the project implementation phase (periodic/annual reports) and after the project is completed (final report). The periods during which the Beneficiary reports to the National Commission are specified in the Operations Manual of the NAMA Coordination Mechanism. While reporting, the Beneficiary shall comply with the requirements of the monitoring, reporting and verification system approved within the project documentation.

The Beneficiary shall submit the reports through the Climate Change Monitoring, Reporting and Verification Information System in accordance with the procedure set out in the Operations Manual of the NAMA Coordination Mechanism. The reports shall contain data on the results of GHG emissions reduction monitoring, support provided by donors, and sustainable development indicators. These are presented based on monitoring indicators established in the Information System and Operations Manual.

The drafted report is required to undergo the verification procedure, to ensure the truthfulness and reliability of the information reported by the Beneficiary.

The verification procedure is carried out by the Verifier, which verifies the compliance with the methodologies used to calculate the reductions, donor support, and sustainable development impact assessment. The Verifier shall draw up the verification report and submit it to the project Beneficiary who shall complete and submit the report to the National Commission in accordance with the procedures outlined in the Operations Manual of the NAMA Coordination Mechanism. The Verifier shall be hired and paid by the project Beneficiary.

Authorities and institutions implementing unilateral NAMA projects shall use a simplified MRV system. Once a year they shall report to the National Commission Secretariat on actions undertaken and results obtained under the projects. The reporting format and reporting deadlines are set out in the Operations Manual of the NAMA Coordination Mechanism.

The Secretariat of the National Commission shall process the data submitted by the Beneficiary and shall calculate the total amount of GHG emissions reduced as a result of unilateral and supported NAMA projects implementation.

The Secretariat of the National Commission shall use primary information about the amount of GHG emissions reduced as a result of NAMA projects implementation in the National GHG Emissions Inventories, the Biennial Update Reports and National Communications under the UNFCCC. This information shall also be distributed to donors who have contributed to implementation of concrete NAMAs.

To reduce the costs and time of the staff involved in monitoring, reporting and verification, NAMA projects will be monitored using standard templates, part of the Operations Manual of the NAMA Coordination Mechanism. In this respect, the regulatory framework shall provide for the mandatory requirement to fill in the relevant form with basic information about the proposed or on-going NAMAs.

Initially, the information shall be submitted for processing to the Ministry of Agriculture, Regional Development and Environment, which will process and verify it through the Climate Change Office, but once the Environment Agency is established, the technical function of monitoring, reporting and verification of the unilateral NAMA will be taken over by this entity.

The templates shall be used to monitor emission reductions for mitigation activities in all categories. The templates for unilateral and supported actions will also contain information on the support received for implementation of the respective NAMA (financial flows, technology transfer, capacity building, and related impact, etc.). The approach and mechanism used to verify the information, as well as the procedure of selecting the experts engaged in data verification, the sources of funding for experts shall be described in the Operations Manual of the NAMA Coordination Mechanism.

Monitoring, reporting and verification for Clean Development Mechanism projects shall meet the UNFCCC requirements.

The Strategy implementation shall be monitored by the Ministry of Agriculture, Regional Development and Environment. To ensure the monitoring process, based on the Decree of the Ministry of Agriculture, Regional Development and Environment, a monitoring group shall be created to periodically evaluate the indicators and objectives achievement. Based on the collected and systematized information, the monitoring group shall draft the annual Strategy Implementation Report and submit it to the Government.

Annual monitoring reports developed during the monitoring process shall include information on the implementation of indicators for each individual action, and every five years evaluation and progress reports will be produced to assess the impact of the activities carried out during the period under review, and the level of implementation of the set objectives. Based on the evaluation and progress reports, the Action Plan for Strategy implementation will be revised. The monitoring and evaluation reports shall be submitted to the Government for review.

Towards the end of the Strategy implementation, a final evaluation report should be produced, containing the information on the extent to which the set objectives and the expected impact were achieved. The evaluation report shall be submitted to the Government, and it shall serve as basis for deciding on the next stage of strategic planning for low emission development.

CHAPTER 7. OTHER RELEVANT INFORMATION IN THE CONTEXT OF CLIMATE CHANGE MITIGATION

7.1. Integrating Climate Change Mitigation into Social, Economic and Environmental Policies

According to the Development Strategy of the Republic of Moldova[235], "*The strategic vision of the Government in the medium and long term is the reconciliation between the need for accelerated economic development and environmental protection in line with European standards. This will be accomplished by: (i) achieving a rate of economic growth that allows increased funding for environmental protection measures; and (ii) balanced business environment regulation, both in terms of economic, as well as environmental impact*". The commitment to implement European standards on climate change mitigation was set forth in the Association Agreement between the Republic of Moldova and the European Union[236] in Chapter 17, Art. 95, which provides for development and implementation of:

a) a global climate strategy and action plan for the long-term climate change mitigation and adaptation;
b) a low-carbon development strategy;
c) long-term measures to reduce greenhouse gas emissions;
d) measures to prepare for carbon dioxide emissions trading certificates;
e) measures to promote technology transfer based on technology needs assessment;
f) measures to streamline climate considerations, as well as measures related to ozone layer depleting substances into sectoral policies.

According to the same document (Annex XII), RM is committed to progressively approximate its legislation to the following EU legislation and the following climate change international instruments:

1) By 2023 - Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a system for GHG emissions allowance trading within the Community, applicable to the following provisions:
   - establishing a system for identifying relevant installations and identifying greenhouse gases (Annexes I and II);
   - establishing a monitoring, reporting, verification and enforcement system and public consultation procedures (Articles 9, 14-17, 19 and 21).
2) By 2018 - Regulation (EC) no. 842/2006 of the European Parliament and of the Council of 17 May 2006 on certain fluorinated greenhouse gases, applicable to the following provisions:
   - adoption of national legislation and the designation of the competent authority (ies);
   - setting up reporting systems to collect emissions data in the relevant sectors (Article 6);
   - setting up systems to ensure implementation (Article 13).

Meanwhile, in September 2015, the Republic of Moldova developed the Intended Nationally Determined Contribution" (INDC) for the new Paris Climate Agreement, and submitted it to the 21st Conference of the Parties to the UNFCCC, held in December 2015 in Paris.

Aiming at commitments made under the Moldova-EU Association Agreement, and the INDC, the following documents have already been approved:

1. The Low-Emission Development Strategy of the Republic of Moldova until 2030 and the Action Plan for its implementation[237]. The Strategy provides for 51 GHG emissions reduction measures within the NDC.
2. The Law on ratifying the Paris Agreement, adopted on 4 May 2017,[238] by which the country commits to achieve NDC objectives.
3. The Law on Promoting Use of Energy from Renewable Energy Sources[239]. It provides for the main targets to achieve at least 17% of renewable energy in the gross final energy consumption by 2020 and at least 10% of renewable energy in the final energy consumption in transport by 2020. Achieving these goals will also increase the country's energy security, which is considerably dependent on energy imports.
4. Moldova's Sustainable Development Fund, which aims to continue certain activities ensuring sustainability of projects funded by the Millennium Challenge Corporation and programs and projects funded by other donors[240].
5. Energy Roadmap for the period 2015-2030[241]. The objective of the Roadmap is to create the normative, institutional and organizational framework in the electricity and natural gas sector, as well as to ensure the security of electricity and natural gas supply resulting from achieving the specific targets stipulated in the Energy Strategy of the Republic of Moldova

[235] Official Gazette of the RM no. 245-247 / 791 of 30.11.2012, Parliament of the Republic of Moldova. Law no. 166 of 11.07.2012 on approval of the National Development Strategy "Moldova 2020".
[236] Official Gazette of the RM no. 185-199 of 18.07.2014, Parliament of the Republic of Moldova. Law no. 112 of 02.07.2014 for the ratification of the Association Agreement between the Republic of Moldova and the European Union and the European Atomic Energy Community and their Member States.
[237] The Low-Emission Development Strategy of the Republic of Moldova until 2030 and the Action Plan for its implementation. Government Decision of December 14, 2016. Official Gazette no. 85-91 of 24.03.2017.
[238] The Law on ratification of the Paris Agreement no. 78 of 04.05.2017. Official Gazette no.162-170 of 26.05.2017.
[239] Official Gazette no. 69-77 / 117 of 25.03.2016, Parliament of the Republic of Moldova. Law no. 10 of 26.02.2016 on promoting use of energy from renewable sources.
[240] Official Gazette no. 2-12 of 15.01.2016, Government Decision no. 903 of 31.12.2015 on the public institution "Sustainable Development Fund Moldova".
[241] Official Gazette no. 177-184 of 10.07.2015, Government Decision no. 409 of 16.06.2015 on Energy Road Map for 2015-2030.

until 2030. The Energy Roadmap determines the evaluation, reporting and progress monitoring mechanisms for the actions implementation process.

6. New modules in the vocational education system: "Energy Plants, Renewable Energy Sources" and "Solid Biofuel-based Heat Plants"[242].
7. The Program for Promoting Green Economy in the Republic of Moldova for 2018-2020 and the Action Plan for its Implementation, GD no.160/2018.
8. The program integrates the green economy promotion priorities in line with the final declaration of the United Nations Conference on Sustainable Development "The Future We Want" (Rio de Janeiro, June 20-22, 2012).
9. Regulation on measures to reduce emissions from vehicles air conditioning systems, GD no. 1242/2016. The document provides for the installation of air conditioning systems on vehicles placed on the market and recharging air conditioning systems of any vehicle with fluorinated greenhouse gases with a global warming potential higher than 150. Directive 2006/40/EC of the European Parliament and of the Council of 17 May 2006 relating to emissions from air-conditioning systems in motor vehicles and amending Council Directive 70/156/EEC.
10. Law on Environmental Pollution Payments no. 1540/1998, amended in December 2017, establishes payments for environmental pollution from the use of fluorides.

It is noteworthy that Moldova's climate change mitigation objectives are also achieved through implementation of the priority economic, social and environmental policies approved before the Association Agreement between the Republic of Moldova and the EU was signed and the NDC declared by the country, with further updating of these documents. Among the most relevant are:

1. The Law on Energy Efficiency no. 142/2010. The Law is aimed at creating the prerequisites for improving energy efficiency, including by setting up and supporting the work of the structures involved in development and implementation of programs, plans, energy services and other measures to increase energy efficiency.
2. National Energy Efficiency Program for 2011-2020, GD no. 833/2011. The Program sets out the priority policies and actions to be implemented over 2011-2020 to meet the challenges of growing energy prices, dependence on energy imports and impact of the energy sector on climate change. The Program will be supported by National Energy Efficiency Action Plans, adopted every three years. The Program objectives are the same as of the Renewable Energy Law.
3. The Energy Strategy of the Republic of Moldova until 2030, GD no. 102/2013. The document provides for concrete benchmarks for the energy sector development in the Republic of Moldova, including in the field of energy efficiency and renewable energy sources, and the objectives correspond to the Moldova 2020 National Development Strategy.
4. National Action Plan for Renewable Energy for 2013-2020, GD no. 1073/2013. The Plan defines the sectoral target as 20% of energy demand covered by renewable energy sources by 2020 and, at the same time, sets out the needed legislative, regulatory and administrative actions to support achieving of these objectives.
5. The Law on Heat and Cogeneration Promotion no. 92/2014. The Law regulates: the principles and objectives of state policy in the field of district heating systems; management by the state of the heat sector; cogeneration, cogeneration technologies and their promotion; setting and approval of regulated tariffs for heat; licensing of activities in the thermal power sector; rights and obligations of thermal energy units, etc.
6. The Law on the Energy Performance of Buildings no. 128/2014. The Law promotes the improvement of the energy performance of buildings and establishes requirements towards the general framework for the methodology of calculating energy performance of buildings and units thereof; applying minimum energy performance requirements to buildings; certification of the energy performance of buildings; periodic inspection of the heating and of air conditioning systems in buildings; respective monitoring systems, etc.
7. The Law no. 44/2014 on Energy Labelling. The Law establishes the regulatory framework for national labelling and standard and additional information on energy-related products.
8. Establishment of the Energy Efficiency Fund (EEF), GD no. 401/2012. The Decision concerns the Regulation on the organization and functioning of the Energy Efficiency Fund. The objective of the Fund is to attract and manage financial resources to finance and implement projects in the field of energy efficiency and use of renewable energy sources in accordance with the strategies and programs developed by the Government of the Republic of Moldova. Over 2012-2016, the EEF signed contracts for implementation of energy efficiency projects where the Fund's contribution amounted to 433.2 million MDL, representing the Government's contribution, thus ensuring 76% of the total value of the projects, equal to 569.6 million MDL[243].
9. The Soil Conservation and Fertility Enhancement Program for 2011-2020, GD no. 626/2011 and the Action Plan for the implementation of the Soil Conservation and Fertility Enhancement Program for 2014-2016, GD no. 138/2014. The Program provides for measures to maintain and increase soil fertility by compensating soil humus losses through complex fertilization with organic fertilizers (manure and composts). The objectives of the documents are the long-term preservation of the soil quality and production capacity to ensure the food security of the country. Productivity of agricultural crops, livestock sector development, export of agro-food products, the well-being of the population and the ecological situation in the country largely depend on the soils quality.
10. The National Strategy for Agricultural and Rural Development for 2014-2020, GD no. 409/2014. The Strategy provides for use of modern land and water management practices; afforestation of low- or non-productive agricultural land to increase biodiversity, reducing soil erosion and conservation of water resources, etc. In the Forestry sector the Strategy provides for afforestation of low quality farmland to increase biodiversity, and reduce soil erosion, contributing also to the conservation of water resources.
11. The National Plan for Extension of Woodland for 2014-2018, GD no. 101/2014. The Plan provides for the expansion of forest vegetation across 13.041 thousand hectares, as well as provision of the planting material needed for afforestation works.

[242] Ministry of Education of the Republic of Moldova, Order no. 858 of 04.10.2016 approving the curricula for secondary technical vocational education.

[243] Activity Report of the Energy Efficiency Fund for January-December 2016. January 20, 2017. 64 pages.

12. The Waste Management Strategy of the Republic of Moldova for 2013-2027, GD no. 248/2013. The Strategy provides for the development of integrated municipal waste management systems through harmonization of normative acts; territorial division of the country into eight waste management regions; increasing the amount of recovered and recycled waste by 20-30% by 2025; reducing the amount of deposited biodegradable waste; development of regional waste disposal infrastructure, construction of seven SWD sites and two mechanic-biological treatment plants in Chisinau and Balti municipalities; re-cultivating at least 50% of non-compliant landfills by 2027.

Climate change mitigation issues continue to be reflected in a range of country policies currently under development, or ready as drafts for public debate. These include:

1. The Law on Energy Efficiency. Draft approved at the Government meeting of 22 February 2018. It partially transposes Directive 2012/27/EU on Energy Efficiency. The Law regulates the activities designed to maximize the efficiency of both production and use of energy, enhance the country's energy security, including by integrating RES into the economic circuit, to lessen the negative impact of the sector energy on the environment by reducing GHG emissions.
2. The Energy Strategy for 2018-2030. The Strategy sets out three strategic objectives the Republic of Moldova undertakes to achieve by 2030: security of energy supply, development of competitive energy markets and integration into the regional and European market, as well as promoting energy efficiency and sustainable development of the energy sectors.
3. The methodology for calculating the price caps and the fixed tariffs for electricity produced from renewable energy sources, aiming at establishing a single method for determining the price caps for all producers of electricity from renewable energy sources, to be proposed to the Government to be used for tendering and setting of fixed tariffs for electricity produced from renewable energy sources by eligible producers who own or intend to own power plants with a cumulative power not exceeding the capacity limit set by the Government.
4. Government Decision on the establishment of a mechanism for climate change related activities coordination. The draft was developed to create an effective institutional instrument for coordination, monitoring, verification and reporting in the field of climate change adaptation. The normative act will contribute to the adoption of optimal climate change related social, economic and financial decisions in the Republic of Moldova.

7.2. Technology Transfer Related Activities to Mitigate Climate Change

Generally speaking, it is recognized that technology transfer plays a decisive role in achieving the direct GHG emissions reduction target as most of the used technologies are emission sources, so replacing obsolete technologies by more efficient ones imminently entail direct GHG emissions reduction.

Among the many definitions of the technology transfer concept, it is worth to mention the one proposed by the Global Environment Facility (GEF), according to which the technology transfer is:

"... a broad set of processes encompassing know-how, experience and equipment for mitigation and adaptation to climate change between different stakeholders such as governments, private sector entities, financial institutions, non-governmental organizations and research/education institutions...;

...The term "transfer" includes the diffusion of technologies and technological cooperation between and within countries. It covers technology transfer processes between developed countries, developing countries and countries with economies in transition. It includes the process of studying to understand, use and reproduce technology, including the ability to choose and adapt to local conditions, and integrate them with native technologies"[244].

The IPCC identifies three major dimensions needed to ensure efficient technology transfer:

- Capacity building;
- Enabling business environment;
- Technology transfer mechanisms.

7.2.1. Capacity Building

The content of this chapter is the same as the one in the NC4 of the RM under the UNFCCC (2018). However, the number of industrial parks has changed. Thus, since 2011 and until now, 10 industrial parks were created, comprising 60 businesses – IP "Tracom" and IP "FAIP" (Chisinau municipality), IP Raut (Balti Municipality) , IP "Cimislia" (Cimislia), IP "Edinet" (Edinet), IP "Comrat" (Comrat town), IP "CAAN" and IP Triveneta Cavi Development (Straseni town), IP Bioenergagro (Drochia) and IP "Cahul" (Cahul town). The 10 industrial parks provide jobs for almost 2,800 people, and over the six years almost 1.4 billion MDL were invested in infrastructure development and almost 5 billion MDL received as revenues[245].

7.2.2. Enabling Business Environment

Overall, the current business environment in the Republic of Moldova, including the technologies transfer for GHG emissions mitigation, is described in the National Development Strategy "Moldova 2020", being identified as the country's priority for the coming years. According to the Strategy, business environment is characterized by unjustified financial costs, which essentially exceed the level featured by developed countries, and do not motivate fair competition focused on productivity and innovation.

The World Bank's international ranking Cost of Doing Business (2018) shows that in 2017 the RM ranked 44th out of 190 countries, with Serbia (43) and Romania (45)[246].

Within the global competitiveness ranking, in 2017-2018 the RM ranked 89th out of 137 countries[247], surpassed by most countries in the region and the CIS countries. According to the same report, entrepreneurs have highlighted the following factors as the main business issues, in order of priority: (i) corruption; (ii) political instability; (iii) government instability; (iv) access to finance; (v) inefficient government bureaucracy, etc.

The climate for starting a business improved in 2017 compared to 2016 by 1.8 points[248].

Another international reference indicator is the Economic Freedom Index, developed by the "*The Heritage Foundation*"[249]. This indicator

[244] <http://www.ipcc.ch/ipccreports/sres/tectran/index.php?idp=517>
[245] <http://www.prime.md/ro/parcurile-industriale-din-republica-moldova-au-atras-mai-multe-investitii-in-comparatie-cu-anul-trec_64530.html>
[246] <http://www.doingbusiness.org/~/media/WBG/DoingBusiness/Documents/Annual-Reports/English/DB2018-Full-Report.pdf>
[247] <http://www3.weforum.org/docs/GCR2017-2018/05FullReport/TheGlobalCompetitivenessReport2017%E2%80%932018.pdf>
[248] <http://www.doingbusiness.org/data/exploreeconomies/moldova?topic=starting-a-business>
[249] <http://www.heritage.org/international-economies/report/2017-index-economic-freedom-trade-and-prosperity-risk>

measures the degree of intervention by the state in economic activity based on ten sub-indicators: business freedom, trade freedom, fiscal freedom, spending, monetary freedom, investment freedom, financial freedom, ownership rights, freedom from corruption and freedom of labor. For this indicator the RM only ranked 87th among 186 countries.

The business environment issues are present at all stages of the business life cycle: launching, developing and liquidation. The state's administrative system is far from being perfect in terms of granting permits and carrying out inspections.

Removing regulatory constraints and unwarranted costs would create prerequisites for more dynamic and sustainable economic growth, encouraging national and international investment.

The Moldova 2020 Strategy and the "Small and Medium Enterprises Development Strategy for 2012-2020" aim to remove the existing barriers, so that the risks and costs associated with each phase of the business lifecycle, including technology transfer, become lower than in the countries in the region by 2020.

The results of the above Strategies implementation can be found in the EU Report on the Implementation of the Association Agreement between 2014 and early 2017[250]. According to this report, business environment was still affected by corruption and inconsistency, widely spread during this period, which had a negative effect on the investment climate. Consolidation of economic interests in the hands of a small number of people continues. This poses risks of interference with public policies. Access to finance, especially for SMEs, remains difficult. To improve business environment, the Economic Council attached to the Prime Minister, re-launched during the period under review, and which brings together state institutions, the business community and civil society organizations, has undertaken a number of measures to promote effective business activity. For the SMEs long- and medium-term development, an enabling legal framework has been created. The following documents have been approved:

- The SMEs Development Strategy for 2012-2020[251] (2012, updated in 2016);
- The Strategy for the Reform of the Entrepreneurial Activity Regulatory Framework for 2013-2020 (2013, updated in 2016) and the Action Plan for its implementation in 2016-2017[252];
- The Law on Small and Medium-sized Enterprises (2016)[253];
- The Law on Small and Medium-sized Enterprises Support (updated in 2016)[254];
- The Law on Peasant Farms (updated in 2017)[255];
- The Law on Investments in Entrepreneurship (updated in 2017)[256];
- The Law on Entrepreneurship and Enterprise (updated in 2018)[257].

The success of the industrial and enterprise policy of the Republic of Moldova largely depends on the extent to which the country is able to assimilate modern products and technologies and to diversify its production and exports. Moldova needs to make further efforts to strengthen its market economy and competition structures.

7.2.3. Technology Transfer Mechanisms

According to the IPCC "Methodological and Technological Aspects in Technology Transfer"[258], the technology transfer mechanisms include:

- The National Innovation System;
- The Official Development Assistance;
- The Global Environment Facility;
- The Multilateral Development Banks;
- The Kyoto Protocol Mechanisms.

7.2.3.1. National Innovation System

The National Innovation System of the Republic of Moldova is regulated by a number of normative acts: the Code on Science and Innovation of the Republic of Moldova no. 259/2004; the Education Code of the Republic of Moldova no. 152/2014; the Innovation Strategy of the Republic of Moldova for 2013-2020 "Innovations for Competitiveness", GD no. 952/2013; R&D Strategy of the Republic of Moldova until 2020, GD no. 920/2014, etc.

On 20 February 2018, the new amendments to the Code of Science and Innovation of the Republic of Moldova came into force to reform the national system of science and innovation. According to it, all scientific institutions of the Academy of Sciences of Moldova (ASM) are transferred into subordination of the Ministry of Education, Culture and Research (MECR). The purpose of the transfer is to ensure more efficiency in managing and funding research and innovation. Consequently, it provides for the possibility of substantial increase in funding research projects, while the ASM will only be in charge of research, and absolved of the administrative management and assets administration. The most important provisions of the project are aimed at: (a) transmitting the development of relevant policies from the ASM to the central specialized body of the state which ensures the development of the national policy in the field of research and innovation; (b) creation of the National Agency for Research and Development (NARD) as an entity responsible for policy implementation; (c) establishment of the National Agency for Quality Assurance in Education and Research; (d) transfer of the status of founder of all public law organizations in the field of research and innovation to the central specialized body of the state.

NARD will be responsible for the competitive evaluation of project proposals submitted by researchers, regardless of the institutional membership. Access to funds managed by the NARD will be facilitated by eliminating the mechanism of accreditation of research and innovation organizations by replacing it with the scientific titles evaluation and confirmation tool. The aim is to adjust the institutional framework for research and innovation management, with competencies concentrated at the Government level, where the policy documents reflecting the sector priorities will be approved. The respective policies will be developed by the scientific community at the supreme forum represented by the ASM, which will act as a strategic consultant of the Government in research and innovation[259].

[250] <http://infoeuropa.md/files/aa-3.pdf>
[251] <http://lex.justice.md/viewdoc.php?action=view&view=doc&id=344806&lang=1>
[252] <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=350792>
[253] <http://www.mec.gov.md/sites/default/files/document/attachments/l_e_g_e_privind_intreprinderile_mici_si_mijlocii.docx>
[254] <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=316995>
[255] <http://lex.justice.md/md/311579/>
[256] <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=312880>
[257] <http://lex.justice.md/viewdoc.php?id=311735&lang=1>
[258] <http://www.ipcc.ch/ipccreports/sres/tectran/index.php?idp=517>
[259] Monitoring report on the implementation of the Roadmap on the Priority Reform Agenda (5 July - 22 November 2017). Developed by the Expert-Grup Analytical Center, the ADEPT Participatory Democracy Association and the Moldovan Legal Resources Center <https://crjm.org/wp-content/uploads/2017/12/Report-Intermediar-RO_final. pdf>

According to the ASM reform concept, development of research policies will be the responsibility of the Ministry of Education, Culture and Research, while the Ministry of Economy and Infrastructure will take up innovation and technology transfer policies.

At the same time, in order to ensure a pertinent expertise of the science and innovation development policies, an impartial cross-sectoral approach, and to monitoring the NARD activity, the Research, Development, Innovation and Technology Transfer Council by the Prime Minister will be established. This board will be made up of outstanding personalities from various fields and will be an advisory platform, which will develop guidelines for research and innovation development, provide advice and expertise[260].

International experience has shown that in order to reduce barriers to technology transfer, intermediate bodies related to information, management, technology and funding are also needed. Technological intermediaries are government-funded agencies, energy companies, services, non-governmental organizations, university liaison departments, regional technology centers, research and technology organizations, electrical utilities and transnational networks[261]. Presence of many of them in the RM is described above in Chapter 7.2.1.

Now, the R&D system is made up of several actors, including the ASM, research institutions, the Agency for Innovation and Technology Transfer (AITT), the State Agency for Intellectual Property (AGEPI), three technological science parks ("Academica", "INAGRO" and "Micronanoteh"), eight innovation incubators, universities and SME Development Organization (ODIMM).

7.2.3.2. Official Development Assistance

The National Development Strategy "Moldova 2020" plans a long-term economic development supported by the country's own forces through sustainable development. However, until the development paradigm changes, the Republic of Moldova will continue to rely on development partners support.

Official Development Assistance (ODA) is divided into grants and loans to developing countries for macroeconomic consolidation (by the IMF), concessional loans to the Government (in particular by AID), grants for direct budget support (by the EU, WB, DID), technical assistance from a number of multinational organizations and bilateral donors[262].

In order to formalize development assistance, the Republic of Moldova joined the Paris Declaration (2005), the Accra Agenda for Action (2008), the Busan Commitments (2011) and the Mexico Communiqué (2014).

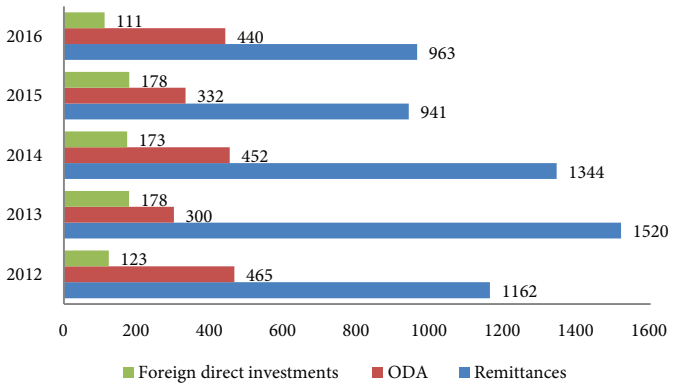
Detailed information on official development assistance provided to the Republic of Moldova can be accessed on-line from the External Assistance Management Platform (AMP)[263], which since 31 March 2018 provides data on 1952 ongoing and completed projects. Below are the most relevant information on the subject.

Total ODA commitments for the Republic of Moldova amount to 4,341.88 million Euro, with 2,523.71 million Euro already disbursed, as at 31.03.2018.

In order to identify the position and the role of external assistance in the national economy, total external assistance was compared to remittances sent through Moldovan banks, and foreign direct investments, considered as financial flows for real economic growth.

As seen from Fig. 7-1, during the period under review remittances were about 2-3 times higher than external assistance. It should also be noted that during 2012-2016 foreign direct investments were 2-4 times lower than the total external assistance disbursements during the year.

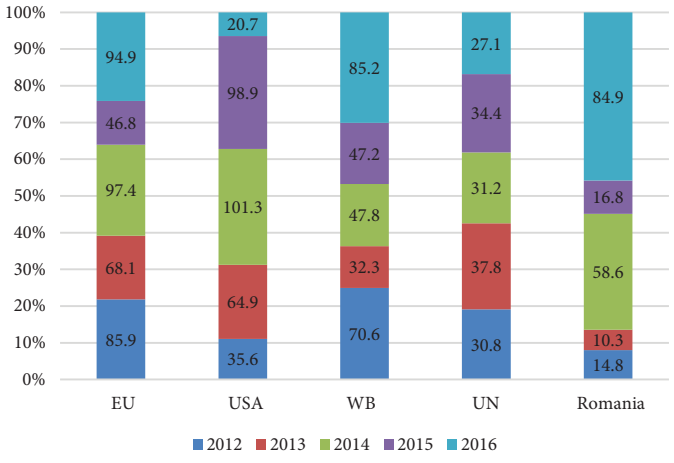
During 2012-2016, external assistance tended to grow, and decrease, actually remaining at the level of 2012 and 2014. Over the years under review the total external assistance disbursed accounted for 6% of GDP on average. At the same time, disbursements made in 2016, compared to the previous year, showed a growing trend, with external assistance increasing by 32.8%[264].



Source: State Chancellery and NBM.

Figure 7-1: Major financial flows to the Republic of Moldova within 2012-2016, million Euro.

Among the development partners with which the Republic of Moldova cooperates towards achieving the development agenda, the EU and USA remain the largest and most important donors by the amount of disbursements made (Fig. 7-2).

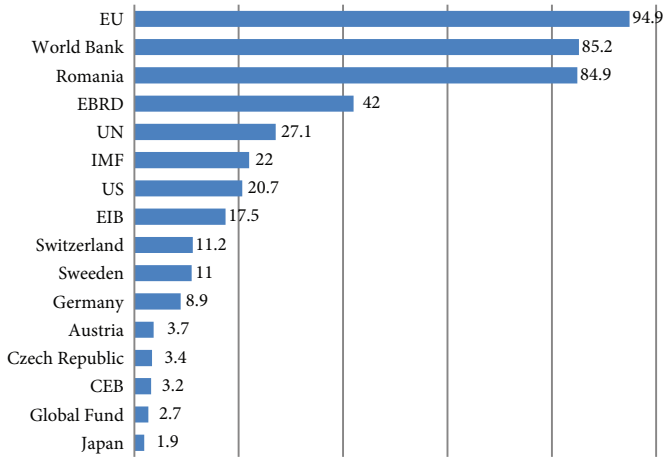


Source: *State Chancellery.*

Figure 7-2: Dynamics of ODA disbursements by development partners, mil. Euro

During the entire period of 2012-2016, the external assistance provided by the EU was 393.1 mil. Euro, US – 321.4 mil. Euro, World Bank – 283.1 mil. Euro, UN – 161.3 mil. Euro, Romania – 185.4 mil. Euro. These five donors account for 76% of the amount of external assistance disbursed in 2016 for the Republic of Moldova, and the remaining 24% are covered by 11 donors (Fig. 7-3.)

[260] <http://www.moldpres.md/news/2017/03/07/17001818>
[261] < http://www.ipcc.ch/ipccreports/sres/tectran/index.php?idp=517 >
[262] The analysis of the evolution of external assistance provided to Moldova during 2001-2007, ADEPT <http://www.e-de-mocracy.md/fles/prioritati-guvernare-2009.pdf>
[263] <http://amp.gov.md/portal/>
[264] Annual report on external assistance to the Republic of Moldova in 2016. State Chancellery of the Republic of Moldova. Chisinau, June 2017.

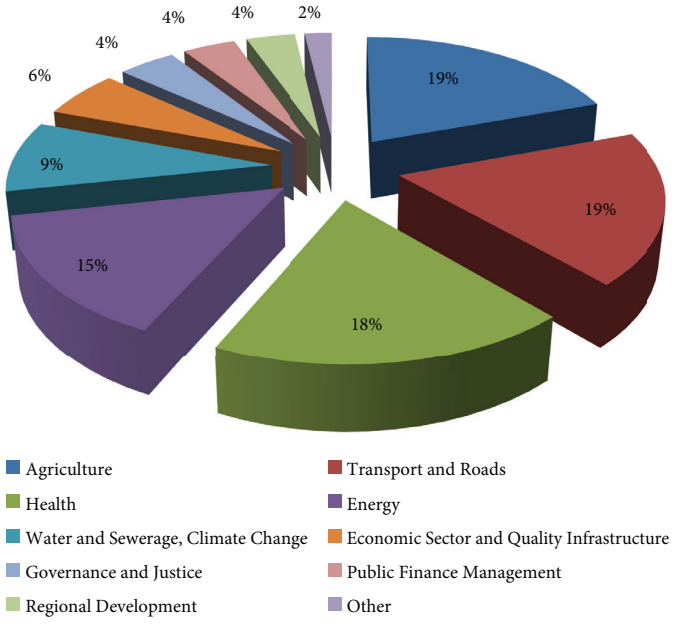


Source: State Chancellery.

Figure 7-3: Ranking of development partners by disbursements made to the RM in 2016, mil. Euro.

In 2016, the main sectors in the RM that benefited from external assistance projects were: Agriculture; Transport and Roads; Health; Energy; Water and Sewerage and Climate Change.

As see from Fig. 7-4, the most important ODA contribution in 2016 was made in Agriculture (19.6%), Transport and Roads (18.6%), Health (18.6%) and Energy (14.9%), accumulating 71.8%.



Source: State Chancellery.

Figure 7-4: Share of disbursements among sectors in the RM in 2016.

Following the Government Decision no. 561 of 19 August 2015[265], the Government gave preference to non-reimbursable technical and financial assistance. At the same time, the loans comprised at least one 25% grant element.

Tab. 7-1 shows the ratio of grants to repayable loans over the period under review. The average share of loans during 2012-2016 was 53%, and of grants 47%, respectively. In 2016, the loans prevailed in external assistance, with a share of about 78%, which largely represented the repayable financial support granted to RM for implementing large investment projects in Road Infrastructure, Transport, Agriculture, Energy, Water and Sewerage. For sure the provided assistance has an indirect impact on GHG reductions. For example, construction of good and very good roads leads to up to 20% reduction in fuel consumption and thus, to CO_2 reductions.

Table 7-1: Share of Grants and Loans in ODA within 2012-2016 period in the RM

	2012	2013	2014	2015	2016
Loan	47%	44%	51%	43%	78%
Grant	53%	56%	49%	57%	22%

Source: *State Chancellery.*

7.2.3.3. Global Environment Facility

The Global Environment Facility (GEF), the operating entity of UNFCCC's financial mechanism, is a key multilateral institution for environmental technology transfers. GEF also aims at promoting GHG emissions reduction by eliminating long-term barriers, reducing implementation and technology costs. An important objective of these programs is to catalyze sustainable markets and create a favorable environment for technology transfer.

GEF's agencies in the Republic of Moldova are: International Fund for Agricultural Development (IFAD); World Bank; United Nations Development Program (UNDP); United Nations Environment Program (UNEP) and United Nations Industrial Development Organization (UNIDO).

GEF projects are geared towards testing and demonstrating a variety of funding and institutional models to promote technology fusion, with many GEF projects being designed to mobilize private sector funding. Capacity building is a core element of most GEF projects, with a direct impact on host countries' capacities to understand, absorb and disseminate technologies.

Since 1992, over 25 years of activity, GEF has granted developing countries and countries with economies in transition around US$ 15.3 billion in grants and US$ 81.9 billion in co-financing of nearly 4,149 projects in 167 countries[266]. Through the Small Grants Program, GEF channeled more than 21,468 small grants directly to civil society and community organizations, a total of 133 countries, totaling US$ 577 million[267].

Since the Republic of Moldova joined GEF, the country received non-repayable financial support worth US$ 176.11 million and US$ 515.08 million in co-financing for 46 projects[268], including 10 climate change related projects.

Preparation of the Second Biennial Update Report (BUR2) under the UNFCCC is also part of such project, funded with US$ 352 thousand as grant and US$ 37 thousand as co-financing[269].

Moldova also participated in 21 regional and global projects funded by GEF totaling to US$ 140.3 million, with US$ 377.8 million allocated as co-financing, including the development of the Intended Nationally Determined Contribution to the Paris Agreement under the UNFCCC[270].

At the last operational phase of application for GEF funding (GEF-6) for July 2014 - June 2018, the Republic of Moldova became eligible for development and implementation of projects worth US$ 1.5 million for biodiversity protection, US$ 2.0 million for climate change (US$ 3.219 million have already been used) and about US$ 5.5 million for soil degradation (US$ 3.3 million have already been used). Application for GEF-7 is in progress[271].

[265] <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=360497>

[266] <https://www.thegef.org/sites/default/files/council-meeting-documents/EN_GEF.C.53.03_APMR%2B-Scorecard.pdf>

[267] <https://www.thegef.org/topics/gefsgp>

[268] <https://www.thegef.org/country/moldova>

[269] <https://www.thegef.org/projects?f[] = field_country 109>

[270] <https://www.thegef.org/country/moldova>

[271] <https://www.thegef.org/country/moldova>

The Republic of Moldova has also joined the Small Grants Program (SGP) promoted by the Global Environment Facility. Launched in 1992, in Moldova SGP was set up in the end of 2012. During 2012-2015, Operational Phase 5 (OP5) was implemented, which included 12 projects promoted by NGOs. For 2015-2018, new funding from GEF (OP6) was launched for small projects amounting to US$ 2.07 million. The funding is aimed at: conservation of community environment; promoting smart innovative agro-ecology for climate; promoting the co-benefits of access to low-carbon energy; promoting chemical management coalitions at local and global level; developing dialogue platforms for government policy and entertainment planning; promoting social inclusion (financiers +); the Global Program Reach for Citizens' Knowledge (Grant-makers +).

By 31.03.2018, the following results were obtained:

- 17 projects are successfully completed and 13 are under way;
- US$ 1.1 million have been co-funded, including US$ 0.44 million in kind;
- 198.6 tons of CO_2 have been reduced by implementing energy-efficient and renewable energy technologies;
- Training was provided to 14 NGOs;
- 118 thousand people benefited from the implemented projects;
- 784 women participated/were involved in SGP projects[272].

It is also important to underline that over the last few years several already completed projects have created the basis for implementation of new projects supported by the GEF's SGP. These include: the improvement of the terrain layer and the efficiency of the protected areas management in the Republic of Moldova, climate in the eastern regions, the environmental fiscal reform in the Republic of Moldova, the rural economic program and sustainable climate (FIDA VI), energy and biomass, implemented by UNDP in the Republic of Moldova.

7.2.3.4. Green Climate Fund

Currently, the RM is implementing a number of projects supported by the GCF. Detailed information on this topic is provided in Table 7-2. Of the four projects supported by the GCF, two are intended to assist the countries in the region, including the RM.

Table 7-2: GCF funded projects in the Republic of Moldova

No.	Project Name	Allocated funds, US$ million		Financing status / comments
		Grant	Loan	
1.	Support for the RM in the establishment and strengthening of the National Designated Authority, development of the strategic framework and of the national program with the Green Climate Fund	0.30		Approved
2.	Facilitate financing of sustainable energy	34.00	344.00	Approved/ regional project
3.	Unblocking the market for the energy efficiency renovation of buildings in the RM	31.11	117.09	Pending approval
4.	Facilitating green cities	59.26	572.22	Pending approval/ regional project, 9 countries
	TOTAL	**124.67**	**1,033.31**	

Source: *GCF.*

7.2.3.5. Multilateral Development Banks

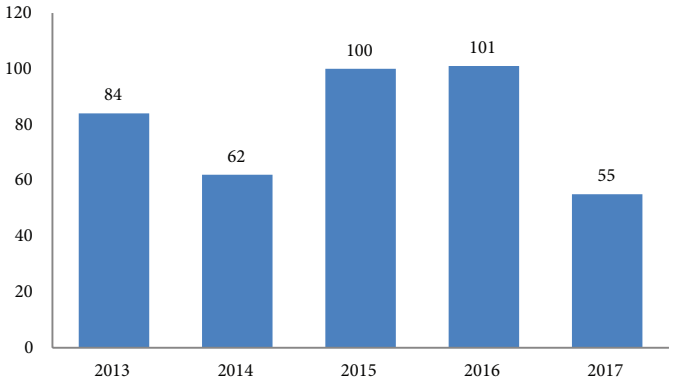
Multilateral Development Banks (MDB) consider technology transfer as part of their development encouraging mission, including for a cleaner environment. They have become aware of the role they can play in mobilizing capital to meet sustainable development and the environment needs, as well as the opportunity to use financial innovation to encourage environmental projects and initiatives. Of the Multilateral Development Banks, the World Bank (WB) and the European Bank for Reconstruction and Development (EBRD) have been particularly prominent in the promotion of sustainable development and environmental projects in the Republic of Moldova.

World Bank Group (IBRD, IDA, CFI, MIGA, ICSID)

The RM joined the IBRD on 12 August 1992, the day on which it became a member of the World Bank. The International Development Association (IDA) lends low-interest or interest-free loans – called "credits" – and grants to poorer countries. The RM became a member of IDA on 14 June 1994. The International Financial Corporation (IFC) provides loans, capital and technical assistance to encourage private sector investment in developing countries. The RM became an IFC member on 10 March 1995. The Multilateral Investment Guarantee Agency (MIGA) provides guarantees against losses caused by non-commercial risks borne by investors in developing countries. The RM became a member of the MIGA on 9 June 1993. The International Center for Settlement of Investment Disputes (ICSID) provides international facilities for reconciliation and arbitration of investment disputes. The RM became a member of ICSID on 4 June 2011.

From 1992 to 2016, the World Bank granted about US$ 1.4 billion[273] for 97 projects in the RM, with more than US$ 1.02 billion disbursed. The current World Bank Group Country Partnership Strategy for the Republic of Moldova includes total commitments of US$ 318 million in assistance for fiscal years 2014-2017. The Strategy will assist the Republic of Moldova on three main pillars, including "Promoting Green, Clean and Resilient Moldova" by: (i) enhancing climate change adaptation and resilience; (ii) improving the management of natural resources; and (iii) enhancing energy efficiency and security[274].

Distribution of the loan over the years is shown in Fig. 7-5.



Source: *World Bank. Amounts include IBRD and IDA commitments.*

Figure 7-5: Annual World Bank Loaning Commitments, US$ million.

Currently (31 March 2018), the World Bank portfolio includes eight active projects with a total commitment of US$333.3 million. The supported areas include regulatory reform and business development, education, social assistance, energy, healthcare, agriculture, local roads, the environment and others[275].

Concerning the GHG mitigation impact projects of the WB in the Republic of Moldova over the last ten years, they are shown in Tab. 7-3.

[272] <http://www.md.undp.org/content/moldova/en/home/projects/the-gef-small-grants-programme.html>

[273] <http://web.worldbank.org/WBSITE/EXTERNAL/PROJECTS/0,,pagePK:64392398~piPK:64392037~theSitePK:40941~countrycode:MD~menuPK:64820000,00.html>

[274] <http://www.worldbank.org/ro/country/moldova/projects>

[275] <http://chamber.md/cci-a-rm-si-oficiului-bancii-mondiale-in-republica-moldova-vor-coopera-pentru-sustinerea-producatorilor-autohtoni/>

Table 7-3: WB Projects on GHG Emissions Mitigation in the RM[276]

No.	Project Name	Committed loan, millions USD	Approval Date
1	Climate Adaptation Project	27.2	06/09/17
2	Agricultural Competitiveness Project (WB), second additional funding	10.0	07/07/16
3	Rehabilitation of Local Roads	80.0	30/10/15
4	Agricultural Competitiveness Project (WB), additional funding	12.0	19/05/15
5	District Heating Efficiency Improvement Project	40.5	21/11/14
6	Emergency Agriculture Support Project	10.0	14/05/13
7	Agriculture Competitiveness Project (WB)	18.0	01/05/12
8	Agriculture Competitiveness Project (GEF)	4.4	01/05/12
9	Production of Biogas from Manure, pilot project	1.0	24/06/11
10	Moldova: AIDS Trust Fund to finance energy reforms and increase energy efficiency	2.9	17/02/11
11	Community Forestry Project in Moldova	2.0	26/05/09
12	Energy Project II, additional funding	10.0	29/01/09
13	Environmental Infrastructure Project	4.6	29/05/07
14	The Road Sector Program Support Project	16.0	29/03/07
15	Soil Conservation Project	2.5	16/06/06
16	Energy Conservation and Emission Reduction (Development of the Community Carbon Fund)	0.5	24/02/06
17	Use of Biomass for Public Heating in the Rural Sector (Facilitating the development of the Community Carbon Fund)	1.5	24/02/06
TOTAL		**243.0**	

The biggest environmental problems of the Republic of Moldova are: soil degradation, surface water pollution, lack of sustainable waste management (both solid and liquid), as well as increased groundwater pollution caused by poor manure management in rural communities. The RM has made significant progress in the field of environmental protection. At the same time, projects have been successfully implemented to stop and reverse soil degradation while providing global benefits such as the planned CO_2 emission reduction in the years to come.

The biggest project supported by the World Bank is the Energy II Project (IDA credit of US$ 45 million, 2003-2012), ended in April 2012, was aimed at improving the security and reliability of electricity transmission system and electricity supply, and thus, facilitating free commercial operations of the energy system and efficiency of heat supply in certain public buildings (schools, hospitals, etc.).

Another project focused on the energy sector, launched in 2011 for the district heating system in Chisinau municipality, is underway. For the efficient implementation of the project, in November 2014 the World Bank allocated US$ 40.5 million, further increasing this amount to US$ 61.1 million by 2020. The project will provide energy savings of about 2.8 billion kWh with obvious GHG emissions reduction[277].

European Bank for Reconstruction and Development

The European Bank for Reconstruction and Development (EBRD) is owned by 67 shareholders, 65 countries and two international organizations.

The current projects (31.03.2018) launched by the EBRD for the Republic of Moldova are:

- Infrastructure (Environment and Municipal Transport) – 61%;
- Energy Sector – 25%;
- Financial Sector – 8%;
- Industry, Trade and Agriculture Sectors – 7%.

[276] <http://www.worldbank.org/en/country/moldova/projects/all>
[277] <http://projects.worldbank.org/P132443/district-heating-efficiency-improvement-project?lang=en&tab=overview>

The assistance granted to the Republic of Moldova between 1991 and January 2017 includes a total of 121 projects with a total value of 1,238 million euro, out of which 614 million euro are already disbursed, the current investment portfolio amounting to 569 million euro for 46 ongoing projects[278].

The EBRD projects over the past ten years in the Republic of Moldova, with direct impact on GHG emissions reduction in the Republic of Moldova, are shown in Table 7-4.

Table 7-4: EBRD projects/loans with impact on direct GHG emissions reduction in the RM[279]

No.	Loan / Project Title	Committed Loan, million USD	Approval Date
1	Green cities: solid waste in Chisinau	10.5	10/08/17
2	The Glass Factory in Chisinau	5.6	12/06/16
3	Chisinau buildings within the green city	10.0	14/09/16
4	Balti district heating system	7.0	17/04/14
5	Rehabilitation of Moldovan roads IV	150.0	26/03/13
6	Rehabilitation of the Moldova Railways Park	25.0	10/16/13
7	The Sustainable Energy Financing Facility in Moldova (MoSEFF and MoSEFF II)	42.0	05/09/12
8	Sustainable Energy Financing Facility in the Moldovan Rural Sector (MoREEFF)	35.0	05/09/12
9	Rehabilitation of Moldelectrica transmission networks	21.5	05/09/12
10	Rehabilitation of the Chisinau road sector	11.4	22/11/11
11	Rehabilitation of Moldovan roads III	75.0	10/26/10
12	Moldova's Roads Rehabilitation Project	30.0	27/06/07
TOTAL		**423.0**	

Among the above-mentioned projects/loans, the most important impact on direct GHG emissions reduction is expected to be from the MoSEFF credit lines[280], MoREEFF[281] and the Balti District Heating System Project. As a rule, energy consumption reduction in projects funded through these credit lines exceeds 30%, with respective direct GHG emissions mitigation impact.

In order to make investments in energy efficiency projects more attractive, MoSEFF has provided a grant component for eligible projects. Depending on energy savings and direct GHG emissions reduction, the grant component ranges between 5 and 20% of the credit amount.

Among the well-known companies in the Republic of Moldova that implemented MoSEFF projects are: Orhei-Vit, Macon, Ungheni Carpets and others. Also, a number of small companies have implemented projects with loans from 10,000 euro to 2 million euro. To facilitate and accelerate investments in energy efficiency, the MoSEFF team provided technical assistance and recommendations for optimizing energy consumption. MoSEFF technical assistance was funded by EU and was free of charge for eligible projects.

The MoREEFF program provides loans for the implementation of energy-efficient housing technologies. This financing facility provides for credit lines to Moldovan banks for energy efficiency projects in the residential sector in the Republic of Moldova. Borrowers may be the owners and tenants of housing, Associations of home owners, housing fund management companies, energy service companies and other eligible companies providing maintenance, operation, construction and renovation works contracted with the owners/tenants, and aim to implement eligible projects. Eligible projects include: energy-efficient windows; walls,

[278] <http://www.ebrd.com/where-we-are/moldova/data.html>
[279] <http://www.ebrd.com/work-with-us/project-finance/project-summary-documents.html?1=1&filterCountry=Moldova>
[280] <http://www.moseff.org/>
[281] <http://www.ebrd.com/work-with-us/projects/psd/moreeff---moldovan-residential-ee-financing-facility.html>

floors and roofs insulation; installation of efficient biomass-based boilers, solar water heating systems, efficient gas boilers; heat pump systems, photovoltaic systems, including architectural integrated ones, heat exchangers and engineering systems.

Implementation of this program is expected to produce three sources of impact:

- Demonstration and market expansion effect;
- Competences transfer;
- Technology transfer.

Loans and credits are provided for promoting advanced technologies which are included in the respective technologies lists[282]. They include: windows, thermal insulation, heat pumps, biomass boilers and stoves, solar water heating systems, gas boilers, photovoltaic systems, etc.

7.2.3.6. Clean Development Mechanism of the Kyoto Protocol

Aiming at promoting eligible CDM projects, the RM has set up the Designated National Authority for the Kyoto Protocol Clean Development Mechanism (DNA). Its activity is regulated by the Government Decision no. 1574 of 26.12.2003.[283]

It should be noted that the Kyoto Protocol expired in 2012, however, by the decision of the 18th Conference of UNFCCC Signatories of December 2012 in Doha, Qatar, the Kyoto Protocol has been extended for eight more years. Thus, the mechanisms of the Kyoto Protocol will continue to influence technology transfer and serve as important tools to achieve the goal of reducing GHG emissions globally.

Until now, several CDM projects have been initiated in the Republic of Moldova, as shown in Tab. 7-5. Implementation of these projects is expected to produce GHG emissions annual reductions equivalent to about 1.5 million tons of CO_2.

[282] <http://moreeff.info/tehnologii/>

[283] <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=299618>

Table 7-5: CDM projects implemented in the Republic of Moldova[284]

Date of approval by DNA	Project Name	Expected annual emissions reduction, tons CO_2	CERs issued until 01.02.2017, tons CO_2 eq.	Status of the project
07/02/2012	Reduction of fugitive gas leakage from the distribution network "Tiraspoltransgaz-Pridnestrovie" SRL, Republic of Moldova	164,043	0	Registered
20/12/2011	Reducing the fugitive gas leakage from Moldovagaz distribution network, Republic of Moldova	748,903	0	Registered
17/03/2009	The afforestation/reforestation project of the Republic of Moldova	94,354	328,809	Ongoing
31/07/2006	Production of biogas from pressed sugar beet pulp at the sugar production plant in Drochia, Südzucker Moldova	21,142	0	Registered
31/07/2006	Construction of Combined Heat and Power Plant at SE "Tirotex", Tiraspol, Republic of Moldova	62,000	0	In the process of registration
19/07/2006	Recovery of biogas from the solid waste disposal site from Țantareni, Anenii Noi rayon, Republic of Moldova	61,757	0	In the process of registration
30/09/2005	Biomass-based Heating in Rural Communities of the Republic of Moldova no. 2	17,888	36,658	Ongoing
01/10/2005	Biomass-based Heating in Rural Communities of the Republic of Moldova no. 1	17,888	43,062	Credit line closed
02/10/2005	Energy Conservation in the Republic of Moldova	11,567	44,339	Credit line closed
09/09/2004	Soil Conservation in the Republic of Moldova	179,242	851,911	Ongoing
TOTAL		**1,378,784**	**1,304,779**	

[284] <https://cdm.UNFCCCc.int/Projects/projsearch.html>

The total amount of emission reduction certificates (CERs) issued by the CDM Executive Council until 01.02.2017 for the CDM projects registered in the RM account for 1,304,779 tons CO_2 equivalent[285].

To facilitate CDM projects contributing to reduced consumption of electricity produced from fossil fuels, in 2011, the World Bank financially supported the development of the National Grid Emission Factor (NGEF) calculation tool, and NGEF concrete values for the credit periods starting 2010 were determined[286]. In 2017, NGEFs were updated.

Due to the additional criteria applied in CDM projects (for example, projects are eligible if they are not economically feasible without carbon trade, the technology is new for the country, etc.) it was possible to transfer technologies that commonly would not have been implemented in the RM in those years. All projects mentioned above are part of this category.

[285] <https://cdm.UNFCCCc.int/Projects/projsearch.html> (click "Database for PAs and PoAs")

[286] <http://clima.md/lib.php?l=ro&idc=243&>

ANNEXES

Annex 1: Summary Reports on GHG Emissions in the Republic of Moldova within 1990-2016

Annex 1-1: Inventory Year - 1990

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Net CO_2 emissions / removals	CH_4	N_2O	HFCs	PFCs	Unspecified mix of HFCs and PFCs	SF_6	NF_3	NO_x	CO	NMVOC	SO_2
	(kt)			($kt\ CO_2$ equivalent)					(kt)			
Total national emissions and removals	**35170.1483**	**203.0080**	**10.5565**	**NO**	**NO**	**NO**	**NO**	**NO**	**94.9462**	**283.3446**	**141.4089**	**157.0987**
1. Energy	**35280.7915**	**39.1313**	**1.1793**						**91.0406**	**271.4048**	**31.6819**	**155.7638**
A. Fuel combustion Reference approach	35068.3279											
Sectoral approach	35280.1538	13.5063	0.6293						91.0406	271.4048	31.1002	155.7638
1. Energy industries	21244.3119	0.4903	0.1733						39.3776	7.1710	0.6271	102.3604
2. Manufacturing industries and construction	2204.8457	0.0985	0.0171						11.0992	3.7377	0.9764	2.8767
3. Transport	4344.7615	1.3226	0.3410						18.3508	71.4239	8.8402	5.1891
4. Other sectors	7372.2624	11.5841	0.0935						21.4533	188.2435	20.5339	44.9266
5. Other	113.9722	0.0109	0.0044						0.7597	0.8286	0.1226	0.4110
B. Fugitive emissions from fuels	0.6377	25.6250	0.5500						0.0000	0.0000	0.5817	0.0000
1. Solid fuels	NO	NO	NO						NO	NO	NO	NO
2. Oil and natural gas and other emissions from energy production	0.6377	25.6250	0.5500						0.0000	0.0000	0.5817	0.0000
C. CO_2 Transport and storage	NO											
2. Industrial processes and product use	**1572.2808**	**NO**	**0.0001**	**NO**	**NO**	**NO**	**NO**	**NO**	**3.6380**	**5.4100**	**106.6288**	**1.3289**
A. Mineral industry	1306.2407								3.4824	3.3540	0.0339	1.2645
B. Chemical industry	NO	NO	NO						NO	NO	0.0650	NO
C. Metal industry	28.5023	NO	NO	NO	NO	NO	NO	NO	0.0925	1.2102	0.0370	0.0427
D. Non-energy products from fuels and solvent use	234.3591	NO	NO						0.0434	0.2441	92.7937	0.0216
E. Electronic industry				NO	NO	NO	NO	NO				
F. Product uses as substitutes for ODS				NO	NO	NO	NO	NO				
G. Other product manufacture and use	3.1787	NO	0.0001	NO	NO	NO	NO	NO	0.0197	0.6017	1.4449	NO
H. Other									NO	NO	12.2544	NO
3. Agriculture	**0.5820**	**107.4316**	**8.5040**						**NO**	**NO**	**NE, NO**	
A. Enteric fermentation		87.6278										
B. Manure management		19.8038	3.7470								NO	
C. Rice cultivation		NO										
D. Agricultural soils			4.7570									
E. Prescribed burning of savannas		NO	NO						NO	NO	NO	
F. Field burning of agricultural residues		IE	IE						IE	IE	NO, NE	
G. Liming	NO											
H. Urea application	0.5820											
I. Other carbon-containing fertilizers	NO, NE											
J. Other	NO	NO	NO						**NO**	**NO**	**NO**	
4. Land use, land-use change and forestry	**-1700.6120**	**0.1061**	**0.5717**						**0.0959**	**3.5227**	**NE**	
A. Forest land	-2563.4328	0.0083	0.0005						0.0053	0.1887	NE	
B. Cropland	2508.9630	0.0978	0.0350						0.0906	3.3340	NE	
C. Grassland	-1205.6938	NE	NE						NE	NE	NE	
D. Wetlands	-555.3798	NE	NE						NE	NE	NE	
E. Settlements	84.7480	NE	0.5362						NE	NE	NE	
F. Other land	152.3638	NE	NE						NE	NE	NE	
G. Harvested wood products	-122.1804											
H. Other	NO	NO	NO						NO	NO	NO	
5. Waste	**17.1060**	**56.3390**	**0.3013**						**0.1717**	**3.0071**	**3.0982**	**0.0060**
A. Solid waste disposal	NA, NO	41.8691							NA, NO	NA, NO	2.9908	
B. Biological treatment of solid waste		NO, NE	NO, NE						NO, NE	NO, NE	NO, NE	
C. Incineration and open burning of waste	17.1060	0.3513	0.0062						0.1717	3.0071	0.0664	0.0060
D. Wastewater treatment and discharge		14.1186	0.2951						NA, IE	NA, IE	0.0410	
E. Other	NO	NO	NO						NO	NO	NO	
6. Other	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Memo items:												
International bunkers	**216.5837**	**0.0105**	**0.0070**						**0.8905**	**0.5270**	**0.2334**	**0.0687**
Aviation	216.5837	0.0105	0.0070						0.8905	0.5270	0.2334	0.0687
Navigation	NO	NO	NO						NO	NO	NO	NO
Multilateral operations	**NO**	**NO**	**NO**						**NO**	**NO**	**NO**	**NO**
CO_2 emissions from biomass	232.8093											
CO_2 captured	NO											

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Net CO_2 emissions / removals	CH_4	N_2O	HFCs	PFCs	Unspecified mix of HFCs and PFCs	SF_6	NF_3	NO_x	CO	NMVOC	SO_2
	(kt)			($kt\ CO_2$ equivalent)					(kt)			
Long-term storage of C in waste disposal sites	NO											
Indirect N_2O			**1.9635**									
Indirect CO_2	**207.3247**											

Annex 1-2: Inventory Year - 1991

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Net CO_2 emissions / removals	CH_4	N_2O	HFCs	PFCs	Unspecified mix of HFCs and PFCs	SF_6	NF_3	NO_x	CO	NMVOC	SO_2
	(kt)			($kt\ CO_2$ equivalent)					(kt)			
Total national emissions and removals	**30196.2180**	**200.0984**	**10.0258**	**NO**	**NO**	**NO**	**NO**	**NO**	**83.7669**	**266.2526**	**120.3062**	**142.3319**
1. Energy	**31560.0966**	**44.2135**	**1.0207**						**80.1554**	**255.1241**	**29.4152**	**141.0744**
A. Fuel combustion Reference approach	31331.7444											
Sectoral approach	31559.4826	13.7209	0.5386						80.1554	255.1241	28.8714	141.0744
1. Energy industries	18873.0209	0.4220	0.1562						34.9804	6.3731	0.5490	90.5222
2. Manufacturing industries and construction	1485.7792	0.0631	0.0113						8.0111	1.9356	0.6185	1.3614
3. Transport	3299.6478	0.9966	0.2721						15.9307	64.7274	8.0260	3.8891
4. Other sectors	7794.6662	12.2320	0.0956						20.5753	181.4709	19.5923	44.9417
5. Other	106.3685	0.0072	0.0034						0.6579	0.6170	0.0855	0.3599
B. Fugitive emissions from fuels	0.6140	30.4926	0.4822						0.0000	0.0000	0.5438	0.0000
1. Solid fuels	NO	NO	NO						NO	NO	NO	NO
2. Oil and natural gas and other emissions from energy production	0.6140	30.4926	0.4822						0.0000	0.0000	0.5438	0.0000
C. CO_2 Transport and storage	NO											
2. Industrial processes and product use	**1394.6352**	**NO**	**0.0001**	**NO**	**NO**	**NO**	**NO**	**NO**	**3.3511**	**4.8635**	**87.9714**	**1.2515**
A. Mineral industry	1173.7238								3.2148	3.0021	0.0315	1.1965
B. Chemical industry	NO	NO	NO						NO	NO	0.0544	NO
C. Metal industry	24.7297	NO	NO	NO	NO	NO	NO	NO	0.0803	1.0502	0.0323	0.0371
D. Non-energy products from fuels and solvent use	193.3185	NO	NO						0.0361	0.2030	76.2635	0.0180
E. Electronic industry				NO	NO	NO	NO	NO				
F. Product uses as substitutes for ODS				NO	NO	NO	NO	NO				
G. Other product manufacture and use	2.8632	NO	0.0001	NO	NO	NO	NO	NO	0.0199	0.6083	1.3014	NO
H. Other									NO	NO	10.2883	NO
3. Agriculture	**0.5226**	**97.8292**	**8.1094**						**NO**	**NO**	**NE, NO**	
A. Enteric fermentation		81.2260										
B. Manure management		16.6032	3.4991									
C. Rice cultivation		NO										
D. Agricultural soils			4.6102									
E. Prescribed burning of savannas		NO	NO						NO	NO	NO	
F. Field burning of agricultural residues		IE	IE						IE	IE	NO, NE	
G. Liming	NO											
H. Urea application	0.5226											
I. Other carbon-containing fertilizers	NO, NE											
J. Other	NO	NO	NO						NO	NO	NO	
4. Land use, land-use change and forestry	**-2776.1620**	**0.0960**	**0.6171**						**0.0885**	**3.2552**	**NE**	
A. Forest land	-2343.3131	0.0014	0.0001						0.0009	0.0316	NE	
B. Cropland	1380.4637	0.0946	0.0335						0.0876	3.2236	NE	
C. Grassland	-1414.3167	NE	NE						NE	NE	NE	
D. Wetlands	-526.4627	NE	NE						NE	NE	NE	
E. Settlements	88.7139	NE	0.5835						NE	NE	NE	
F. Other land	152.3638	NE	NE						NE	NE	NE	
G. Harvested wood products	-113.6108											
H. Other	NO	NO	NO						NO	NO	NO	
5. Waste	**17.1256**	**57.9597**	**0.2786**						**0.1719**	**3.0098**	**2.9196**	**0.0060**
A. Solid waste disposal	NA, NO	43.9447							NA, NO	NA, NO	2.8159	
B. Biological treatment of solid waste		NO, NE	NO, NE						NO, NE	NO, NE	NO, NE	
C. Incineration and open burning of waste	17.1256	0.3516	0.0062						0.1719	3.0098	0.0664	0.0060
D. Wastewater treatment and discharge		13.6633	0.2724						NA, IE	NA, IE	0.0373	
E. Other	NO	NO	NO						NO	NO	NO	
6. Other	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Memo items:												
International bunkers	**232.8535**	**0.0113**	**0.0075**						**0.9574**	**0.5666**	**0.2510**	**0.0738**
Aviation	232.8535	0.0113	0.0075						0.9574	0.5666	0.2510	0.0738
Navigation	NO	NO	NO						NO	NO	NO	NO
Multilateral operations	**NO**	**NO**	**NO**						**NO**	**NO**	**NO**	**NO**
CO_2 emissions from biomass	201.2009											
CO_2 captured	NO											
Long-term storage of C in waste disposal sites	NO											
Indirect N_2O			**1.8193**									
Indirect CO_2	**170.6429**											

Annex 1-3: Inventory Year - 1992

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Net CO_2 emissions / removals	CH_4	N_2O	HFCs	PFCs	Unspecified mix of HFCs and PFCs	SF_6	NF_3	NO_x	CO	NMVOC	SO_2
	(kt)			($kt\ CO_2$ equivalent)					(kt)			
Total national emissions and removals	**23688.7639**	**188.9530**	**8.4444**	**NO**	**NO**	**NO**	**NO**	**NO**	**61.6793**	**147.6510**	**91.5110**	**102.2872**
1. Energy	**25040.7269**	**35.8458**	**0.6834**						**59.6389**	**138.2917**	**16.3771**	**101.6319**
A. Fuel combustion Reference approach	24946.0303											
Sectoral approach	25040.2094	8.2415	0.3994						59.6389	138.2917	15.8840	101.6319
1. Energy industries	15608.8471	0.3570	0.1218						28.6709	5.5397	0.4738	71.2475
2. Manufacturing industries and construction	1064.8093	0.0456	0.0080						5.5713	1.4481	0.4536	1.0216
3. Transport	2320.9288	0.6971	0.2057						10.5582	31.7322	4.0838	2.7653
4. Other sectors	5967.8768	7.1372	0.0616						14.3609	99.2287	10.8213	26.3830
5. Other	77.7474	0.0046	0.0023						0.4776	0.3429	0.0514	0.2146
B. Fugitive emissions from fuels	0.5175	27.6043	0.2840						0.0000	0.0000	0.4931	0.0000
1. Solid fuels	NO	NO	NO						NO	NO	NO	NO
2. Oil and natural gas and other emissions from energy production	0.5175	27.6043	0.2840						0.0000	0.0000	0.4931	0.0000
C. CO_2 Transport and storage	NO											
2. Industrial processes and product use	**808.8996**	**NO**	**0.0001**	**NO**	**NO**	**NO**	**NO**	**NO**	**1.7876**	**3.3721**	**72.3206**	**0.6493**
A. Mineral industry	628.3873								1.6607	1.6135	0.0165	0.5982
B. Chemical industry	NO	NO	NO						NO	NO	0.0238	NO
C. Metal industry	23.9922	NO	NO	NO	NO	NO	NO	NO	0.0780	1.0194	0.0314	0.0360
D. Non-energy products from fuels and solvent use	154.2628	NO	NO						0.0304	0.1706	62.9651	0.0151
E. Electronic industry				NO	NO	NO	NO	NO				
F. Product uses as substitutes for ODS				NO	NO	NO	NO	NO				
G. Other product manufacture and use	2.2573	NO	0.0001	NO	NO	NO	NO	NO	0.0186	0.5686	1.0260	NO
H. Other									NO	NO	8.2577	NO
3. Agriculture	**0.3905**	**94.7068**	**6.8184**						**NO**	**NO**	**NE, NO**	
A. Enteric fermentation		79.7785										
B. Manure management		14.9283	3.1392								NO	
C. Rice cultivation		NO										
D. Agricultural soils			3.6792									
E. Prescribed burning of savannas		NO	NO						NO	NO	NO	
F. Field burning of agricultural residues		IE	IE						IE	IE	NO, NE	
G. Liming	NO											
H. Urea application	0.3905											
I. Other carbon-containing fertilizers	NO, NE											
J. Other	NO	NO	NO						NO	NO	NO	
4. Land use, land-use change and forestry	**-2178.3822**	**0.0879**	**0.6868**						**0.0809**	**2.9777**	**NE**	
A. Forest land	-2184.2404	0.0015	0.0001						0.0010	0.0346	NE	
B. Cropland	1318.7877	0.0864	0.0321						0.0800	2.9431	NE	
C. Grassland	-1428.4835	NE	NE						NE	NE	NE	
D. Wetlands	-595.5455	NE	NE						NE	NE	NE	
E. Settlements	386.6196	NE	0.6545						NE	NE	NE	
F. Other land	418.7786	NE	NE						NE	NE	NE	
G. Harvested wood products	-94.2986											
H. Other	NO	NO	NO						NO	NO	NO	
5. Waste	**17.1291**	**58.3125**	**0.2558**						**0.1719**	**3.0096**	**2.8134**	**0.0060**
A. Solid waste disposal	NA, NE	45.6782							NA, NO	NA, NO	2.7135	
B. Biological treatment of solid waste		NO, NE	NO, NE						NO, NE	NO, NE	NO, NE	
C. Incineration and open burning of waste	17.1291	0.3517	0.0062						0.1719	3.0096	0.0664	0.0060
D. Wastewater treatment and discharge		12.2826	0.2496						NA, IE	NA, IE	0.0335	
E. Other	NO	NO	NO						NO	NO	NO	
6. Other	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Memo items:												
International bunkers	**96.2944**	**0.0047**	**0.0031**						**0.3959**	**0.2343**	**0.1038**	**0.0305**
Aviation	96.2944	0.0047	0.0031						0.3959	0.2343	0.1038	0.0305
Navigation	NO	NO	NO						NO	NO	NO	NO
Multilateral operations	**NO**	**NO**	**NO**						**NO**	**NO**	**NO**	**NO**
CO_2 emissions from biomass	169.5924											
CO_2 captured	NO											
Long-term storage of C in waste disposal sites	NO											
Indirect N_2O			**1.5183**									
Indirect CO_2	**140.7804**											

Annex 1-4: Inventory Year - 1993

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Net CO_2 emissions / removals	CH_4	N_2O	HFCs	PFCs	Unspecified mix of HFCs and PFCs	SF_6	NF_3	NO_x	CO	NMVOC	SO_2
	(kt)			(kt CO_2 equivalent)					(kt)			
Total national emissions and removals	**15865.1656**	**174.5446**	**8.4261**	**NO**	**NO**	**NO**	**NO**	**NO**	**49.5001**	**71.9930**	**70.7995**	**75.3756**
1. Energy	**17349.6063**	**27.4350**	**0.4615**						**47.5279**	**61.7648**	**8.3876**	**74.7382**
A. Fuel combustion Reference approach	17288.4173											
Sectoral approach	17349.1681	2.6323	0.3112						47.5279	61.7648	7.9439	74.7382
1. Energy industries	12601.5386	0.2816	0.1057						23.5816	4.2083	0.3669	62.2741
2. Manufacturing industries and construction	682.7002	0.0297	0.0051						3.3714	1.0112	0.3028	0.7220
3. Transport	1699.5673	0.4721	0.1729						10.8208	24.8418	3.3466	2.1971
4. Other sectors	2271.9102	1.8431	0.0250						9.2951	31.0782	3.8422	9.1547
5. Other	93.4518	0.0058	0.0024						0.4591	0.6253	0.0853	0.3903
B. Fugitive emissions from fuels	0.4382	24.8026	0.1503						0.0000	0.0000	0.4437	0.0000
1. Solid fuels	NO	NO	NO						NO	NO	NO	NO
2. Oil and natural gas and other emissions from energy production	0.4382	24.8026	0.1503						0.0000	0.0000	0.4437	0.0000
C. CO_2 Transport and storage	NO											
2. Industrial processes and product use	**724.8725**	**NO**	**0.0001**	**NO**	**NO**	**NO**	**NO**	**NO**	**1.6915**	**3.2093**	**60.6455**	**0.6314**
A. Mineral industry	574.7172								1.5690	1.4535	0.0143	0.5827
B. Chemical industry	NO	NO	NO						NO	NO	0.0199	NO
C. Metal industry	24.4250	NO	NO	NO	NO	NO	NO	NO	0.0794	1.0383	0.0315	0.0366
D. Non-energy products from fuels and solvent use	123.8759	NO	NO						0.0241	0.1356	50.1008	0.0120
E. Electronic industry				NO	NO	NO	NO	NO				
F. Product uses as substitutes for ODS				NO	NO	NO	NO	NO				
G. Other product manufacture and use	1.8544	NO	0.0001	NO	NO	NO	NO	NO	0.0190	0.5819	0.8429	NO
H. Other									NO	NO	9.6360	NO
3. Agriculture	**0.1276**	**86.0110**	**6.9774**						**NO**	**NO**	**NE, NO**	
A. Enteric fermentation		75.0132										
B. Manure management		10.9978	2.7360								NO	
C. Rice cultivation		NO										
D. Agricultural soils			4.2414									
E. Prescribed burning of savannas		NO	NO						NO	NO	NO	
F. Field burning of agricultural residues		IE	IE						IE	IE	NO, NE	
G. Liming	NO											
H. Urea application	0.1276											
I. Other carbon-containing fertilizers	NO, NE											
J. Other	NO	NO	NO						NO	NO	NO	
4. Land use, land-use change and forestry	**-2226.5422**	**0.1179**	**0.7469**						**0.1091**	**4.0151**	**NE**	
A. Forest land	-2193.5115	0.0001	0.0000						0.0001	0.0024	NE	
B. Cropland	1581.1497	0.1178	0.0328						0.1090	4.0127	NE	
C. Grassland	-1303.5202	NE	NE						NE	NE	NE	
D. Wetlands	-525.8447	NE	NE						NE	NE	NE	
E. Settlements	114.6181	NE	0.7141						NE	NE	NE	
F. Other land	164.0168	NE	NE						NE	NE	NE	
G. Harvested wood products	-63.4504											
H. Other	NO	NO	NO						NO	NO	NO	
5. Waste	**17.1013**	**60.9808**	**0.2403**						**0.1716**	**3.0038**	**1.7665**	**0.0060**
A. Solid waste disposal	NA, NO	48.1887							NA, NO	NA, NO	1.6703	
B. Biological treatment of solid waste		NO, NE	NO, NE						NO, NE	NO, NE	NO, NE	
C. Incineration and open burning of waste	17.1013	0.3511	0.0062						0.1716	3.0038	0.0663	0.0060
D. Wastewater treatment and discharge		12.4409	0.2341						NA, IE	NA, IE	0.0299	
E. Other	NO	NO	NO						NO	NO	NO	
6. Other	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Memo items:												
International bunkers	**62.1153**	**0.0030**	**0.0020**						**0.2554**	**0.1512**	**0.0669**	**0.0197**
Aviation	62.1153	0.0030	0.0020						0.2554	0.1512	0.0669	0.0197
Navigation	NO	NO	NO						NO	NO	NO	NO
Multilateral operations	**NO**	**NO**	**NO**						**NO**	**NO**	**NO**	**NO**
CO_2 emissions from biomass	143.2360											
CO_2 captured	NO											
Long-term storage of C in waste disposal sites	NO											
Indirect N_2O			**1.4401**									
Indirect CO_2	**112.0762**											

Annex 1-5: Inventory Year - 1994

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Net CO_2 emissions / removals	CH_4	N_2O	HFCs	PFCs	Unspecified mix of HFCs and PFCs	SF_6	NF_3	NO_x	CO	NMVOC	SO_2
	(kt)			(kt CO_2 equivalent)					(kt)			
Total national emissions and removals	**12811.9109**	**171.0638**	**6.8750**	**NO**	**NO**	**NO**	**NO**	**NO**	**37.6185**	**76.1058**	**52.0801**	**59.9048**
1. Energy	**14385.1477**	**26.9908**	**0.2932**						**36.0499**	**68.0468**	**8.8374**	**59.3963**
A. Fuel combustion Reference approach	14347.7336											
Sectoral approach	14384.7392	3.1194	0.2216						36.0499	68.0468	8.4105	59.3963
1. Energy industries	9928.6683	0.1882	0.0871						18.7582	3.5339	0.2831	47.1205
2. Manufacturing industries and construction	791.2803	0.0203	0.0027						1.6523	0.7840	0.3410	0.4040
3. Transport	1485.6786	0.4245	0.1044						6.7086	22.3898	2.8852	1.7192
4. Other sectors	2090.7472	2.4795	0.0257						8.5983	40.7319	4.8148	9.8738
5. Other	88.3648	0.0069	0.0016						0.3325	0.6071	0.0863	0.2787
B. Fugitive emissions from fuels	0.4085	23.8714	0.0716						0.0000	0.0000	0.4269	0.0000
1. Solid fuels	NO	NO	NO						NO	NO	NO	NO
2. Oil and natural gas and other emissions from energy production	0.4085	23.8714	0.0716						0.0000	0.0000	0.4269	0.0000
C. CO_2 Transport and storage	NO											
2. Industrial processes and product use	**548.7445**	**NO**	**0.0001**	**NO**	**NO**	**NO**	**NO**	**NO**	**1.3361**	**2.8203**	**41.6403**	**0.5025**
A. Mineral industry	437.5899								1.2218	1.1320	0.0115	0.4572
B. Chemical industry	NO	NO	NO						NO	NO	0.0074	NO
C. Metal industry	25.3289	NO	NO	NO	NO	NO	NO	NO	0.0824	1.0774	0.0322	0.0380
D. Non-energy products from fuels and solvent use	84.4738	NO	NO						0.0146	0.0820	32.7972	0.0073
E. Electronic industry				NO	NO	NO	NO	NO				
F. Product uses as substitutes for ODS				NO	NO	NO	NO	NO				
G. Other product manufacture and use	1.3519	NO	0.0001	NO	NO	NO	NO	NO	0.0173	0.5290	0.6145	NO
H. Other									NO	NO	8.1775	NO
3. Agriculture	**0.0537**	**83.6261**	**5.5546**						**NO**	**NO**	**NE, NO**	
A. Enteric fermentation		73.0168										
B. Manure management		10.6093	2.6585								NO	
C. Rice cultivation		NO										
D. Agricultural soils			2.8961									
E. Prescribed burning of savannas		NO	NO						NO	NO	NO	
F. Field burning of agricultural residues		IE	IE						IE	IE	NO, NE	
G. Liming	NO											
H. Urea application	0.0537											
I. Other carbon-containing fertilizers	NO, NE											
J. Other	NO	NO	NO						NO	NO	NO	
4. Land use, land-use change and forestry	**-2139.1679**	**0.0662**	**0.7938**						**0.0606**	**2.2302**	**NE**	
A. Forest land	-2108.0022	0.0023	0.0001						0.0015	0.0526	NE	
B. Cropland	1378.5094	0.0639	0.0265						0.0592	2.1776	NE	
C. Grassland	-1577.3332	NE	NE						NE	NE	NE	
D. Wetlands	-497.6418	NE	NE						NE	NE	NE	
E. Settlements	130.4883	NE	0.7671						NE	NE	NE	
F. Other land	549.4579	NE	NE						NE	NE	NE	
G. Harvested wood products	-14.6464											
H. Other	NO	NO	NO						NO	NO	NO	
5. Waste	**17.1330**	**60.3807**	**0.2334**						**0.1719**	**3.0085**	**1.6024**	**0.0060**
A. Solid waste disposal	NA, NO	48.3920							NA, NO	NA, NO	1.5088	
B. Biological treatment of solid waste		NO, NE	NO, NE						NO, NE	NO, NE	NO, NE	
C. Incineration and open burning of waste	17.1330	0.3517	0.0062						0.1719	3.0085	0.0664	0.0060
D. Wastewater treatment and discharge		11.6369	0.2272						NA, IE	NA, IE	0.0272	
E. Other	NO	NO	NO						NO	NO	NO	
6. Other	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Memo items:												
International bunkers	**37.8367**	**0.0018**	**0.0012**						**0.1556**	**0.0921**	**0.0408**	**0.0120**
Aviation	37.8367	0.0018	0.0012						0.1556	0.0921	0.0408	0.0120
Navigation	NO	NO	NO						NO	NO	NO	NO
Multilateral operations	**NO**	**NO**	**NO**						**NO**	**NO**	**NO**	**NO**
CO_2 emissions from biomass	157.4600											
CO_2 captured	NO											
Long-term storage of C in waste disposal sites	NO											
Indirect N_2O			**1.1554**									
Indirect CO_2	**73.5058**											

Annex 1-6: Inventory Year - 1995

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Net CO_2 emissions / removals	CH_4	N_2O	HFCs	PFCs	Unspecified mix of HFCs and PFCs	SF_6	NF_3	NO_x	CO	NMVOC	SO_2
	(kt)			($kt\ CO_2$ equivalent)					(kt)			
Total national emissions and removals	9714.0200	161.8576	7.2892	3.9514	NO	NO	NO	NO	31.8584	66.8777	48.9688	34.4348
1. Energy	11372.9604	28.3994	0.2497						30.4649	58.2794	7.2884	33.9768
A. Fuel combustion Reference approach	11331.5265											
Sectoral approach	11372.5410	1.9439	0.1782						30.4649	58.2794	6.8123	33.9768
1. Energy industries	7142.1394	0.1364	0.0501						12.9349	3.1262	0.2355	25.5947
2. Manufacturing industries and construction	439.7389	0.0139	0.0020						1.0932	0.6245	0.2000	0.4180
3. Transport	1498.3876	0.4335	0.1009						6.7826	23.3926	2.9874	1.7003
4. Other sectors	2166.6313	1.3497	0.0230						9.1404	30.5063	3.2880	5.9766
5. Other	125.6438	0.0104	0.0022						0.5138	0.6299	0.1015	0.2872
B. Fugitive emissions from fuels	0.4194	26.4555	0.0716						0.0000	0.0000	0.4761	0.0000
1. Solid fuels	NO	NO	NO						NO	NO	NO	NO
2. Oil and natural gas and other emissions from energy production	0.4194	26.4555	0.0716						0.0000	0.0000	0.4761	0.0000
C. CO_2 Transport and storage	NO											
2. Industrial processes and product use	446.5790	NO	0.0000	3.9514	NO	NO	NO	NO	1.1389	2.5418	40.2086	0.4519
A. Mineral industry	342.6866								1.0250	0.8818	0.0089	0.4060
B. Chemical industry	NO	NO	NO						NO	NO	0.0051	NO
C. Metal industry	26.2369	NO	NO	NO	NO	NO	NO	NO	0.0854	1.1166	0.0327	0.0394
D. Non-energy products from fuels and solvent use	76.5608	NO	NO						0.0132	0.0740	29.2180	0.0065
E. Electronic industry				NO	NO	NO	NO	NO				
F. Product uses as substitutes for ODS				3.9514	NO	NO	NO	NO				
G. Other product manufacture and use	1.0947	NO	0.0000	NO	NO	NO	NO	NO	0.0153	0.4695	0.4976	NO
H. Other									NO	NO	10.4463	NO
3. Agriculture	**0.0607**	**73.0803**	**5.9592**						**NO**	**NO**	**NE, NO**	
A. Enteric fermentation		64.8293										
B. Manure management		8.2510	2.4596								NO	
C. Rice cultivation		NO										
D. Agricultural soils			3.4996									
E. Prescribed burning of savannas		NO	NO						NO	NO	NO	
F. Field burning of agricultural residues		IE	IE						IE	IE	NO, NE	
G. Liming	NO											
H. Urea application	0.0607											
I. Other carbon-containing fertilizers	NO, NE											
J. Other	NO	NO	NO						NO	NO	NO	
4. Land use, land-use change and forestry	**-2122.7016**	**0.0896**	**0.8440**						**0.0829**	**3.0510**	**NE**	
A. Forest land	-2045.0670	0.0001	0.0000						0.0001	0.0030	NE	
B. Cropland	1478.8872	0.0895	0.0270						0.0828	3.0480	NE	
C. Grassland	-1601.1004	NE	NE						NE	NE	NE	
D. Wetlands	-469.4389	NE	NE						NE	NE	NE	
E. Settlements	106.9167	NE	0.8170						NE	NE	NE	
F. Other land	401.1281	NE	NE						NE	NE	NE	
G. Harvested wood products	5.9727											
H. Other	NO	NO	NO						NO	NO	NO	
5. Waste	17.1216	60.2883	0.2362						0.1717	3.0055	1.4718	0.0060
A. Solid waste disposal	NA, NO	48.3670							NA, NO	NA, NO	1.3847	
B. Biological treatment of solid waste		NO, NE	NO, NE						NO, NE	NO, NE	NO, NE	
C. Incineration and open burning of waste	17.1216	0.3514	0.0062						0.1717	3.0055	0.0664	0.0060
D. Wastewater treatment and discharge		11.5698	0.2301						NA, IE	NA, IE	0.0207	
E. Other	NO	NO	NO						NO	NO	NO	
6. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:												
International bunkers	41.9184	0.0059	0.0013						0.1572	0.1403	0.0813	0.0133
Aviation	41.9184	0.0059	0.0013						0.1572	0.1403	0.0813	0.0133
Navigation	NO	NO	NO						NO	NO	NO	NO
Multilateral operations	NO	NO	NO						NO	NO	NO	NO
CO_2 emissions from biomass	230.0480											
CO_2 captured	NO											
Long-term storage of C in waste disposal sites	NO											
Indirect N_2O			**1.2081**									
Indirect CO_2	**65.3743**											

Annex 1-7: Inventory Year - 1996

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Net CO_2 emissions / removals	CH_4	N_2O	HFCs	PFCs	Unspecified mix of HFCs and PFCs	SF_6	NF_3	NO_x	CO	NMVOC	SO_2
	(kt)			(kt CO_2 equivalent)					(kt)			
Total national emissions and removals	**9134.8072**	**159.4293**	**7.0954**	**4.2815**	**NO**	**NO**	**NO**	**NO**	**29.6580**	**79.2850**	**47.0827**	**34.2863**
1. Energy	**11259.1406**	**31.7252**	**0.2579**						**28.4374**	**71.5642**	**8.7276**	**33.8981**
A. Fuel combustion Reference approach	11194.2167											
Sectoral approach	11258.6680	2.9697	0.1750						28.4374	71.5642	8.2116	33.8981
1. Energy industries	7074.2917	0.1347	0.0468						12.6955	3.2367	0.2406	23.4410
2. Manufacturing industries and construction	369.3794	0.0136	0.0020						0.9809	0.6916	0.1772	0.5219
3. Transport	1451.6525	0.4184	0.0959						6.4252	22.2564	2.8534	1.5938
4. Other sectors	2281.5067	2.3921	0.0280						7.8935	44.9136	4.8417	8.1114
5. Other	81.8376	0.0109	0.0023						0.4423	0.4659	0.0987	0.2300
B. Fugitive emissions from fuels	0.4726	28.7555	0.0829						0.0000	0.0000	0.5160	0.0000
1. Solid fuels	NO	NO	NO						NO	NO	NO	NO
2. Oil and natural gas and other emissions from energy production	0.4726	28.7555	0.0829						0.0000	0.0000	0.5160	0.0000
C. CO_2 Transport and storage	NO											
2. Industrial processes and product use	**405.4054**	**NO**	**0.0000**	**4.2815**	**NO**	**NO**	**NO**	**NO**	**0.9923**	**2.6269**	**36.9171**	**0.3822**
A. Mineral industry	306.5696								0.8724	0.7810	0.0069	0.3361
B. Chemical industry	NO	NO	NO						NO	NO	0.0046	NO
C. Metal industry	26.7261	NO	NO	NO	NO	NO	NO	NO	0.0870	1.1375	0.0332	0.0401
D. Non-energy products from fuels and solvent use	71.0711	NO	NO						0.0119	0.0671	27.0276	0.0059
E. Electronic industry				NO	NO	NO	NO	NO				
F. Product uses as substitutes for ODS				4.2815	NO	NO	NO	NO				
G. Other product manufacture and use	1.0386	NO	0.0000	NO	NO	NO	NO	NO	0.0210	0.6414	0.4721	NO
H. Other									NO	NO	9.3728	NO
3. Agriculture	**0.0911**	**67.1421**	**5.7247**						**NO**	**NO**	**NE, NO**	
A. Enteric fermentation		59.6463										
B. Manure management		7.4958	2.5974								NO	
C. Rice cultivation		NO										
D. Agricultural soils			3.1273									
E. Prescribed burning of savannas		NO	NO						NO	NO	NO	
F. Field burning of agricultural residues		IE	IE						IE	IE	NO, NE	
G. Liming	NO											
H. Urea application	0.0911											
I. Other carbon-containing fertilizers	NO, NE											
J. Other	NO	NO	NO						NO	NO	NO	
4. Land use, land-use change and forestry	**-2546.9382**	**0.0616**	**0.8801**						**0.0569**	**2.0916**	**NE**	
A. Forest land	-2190.4337	0.0008	0.0000						0.0005	0.0176	NE	
B. Cropland	1312.1146	0.0609	0.0194						0.0564	2.0740	NE	
C. Grassland	-1548.0826	NE	NE						NE	NE	NE	
D. Wetlands	-441.2360	NE	NE						NE	NE	NE	
E. Settlements	101.5910	NE	0.8606						NE	NE	NE	
F. Other land	217.3293	NE	NE						NE	NE	NE	
G. Harvested wood products	1.7792											
H. Other	NO	NO	NO						NO	NO	NO	
5. Waste	**17.1083**	**60.5003**	**0.2328**						**0.1716**	**3.0022**	**1.4379**	**0.0060**
A. Solid waste disposal	NA, NO	48.6713							NA, NO	NA, NO	1.3509	
B. Biological treatment of solid waste		NO, NE	NO, NE						NO, NE	NO, NE	NO, NE	
C. Incineration and open burning of waste	17.1083	0.3511	0.0062						0.1716	3.0022	0.0663	0.0060
D. Wastewater treatment and discharge		11.4778	0.2266						NA, IE	NA, IE	0.0208	
E. Other	NO	NO	NO						NO	NO	NO	
6. Other	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Memo items:												
International bunkers	**65.8650**	**0.0048**	**0.0021**						**0.2563**	**0.1684**	**0.0900**	**0.0209**
Aviation	65.8650	0.0048	0.0021						0.2563	0.1684	0.0900	0.0209
Navigation	NO	NO	NO						NO	NO	NO	NO
Multilateral operations	**NO**	**NO**	**NO**						**NO**	**NO**	**NO**	**NO**
CO_2 emissions from biomass	294.0280											
CO_2 captured	NO											
Long-term storage of C in waste disposal sites	NO											
Indirect N_2O			**1.1656**									
Indirect CO_2	**60.4993**											

Annex 1-8: Inventory Year - 1997

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Net CO_2 emissions / removals	CH_4	N_2O	HFCs	PFCs	Unspecified mix of HFCs and PFCs	SF_6	NF_3	NO_x	CO	NMVOC	SO_2
	(kt)			(kt CO_2 equivalent)					(kt)			
Total national emissions and removals	**8528.1893**	**143.9327**	**7.2593**	**5.1070**	**NO**	**NO**	**NO**	**NO**	**26.6717**	**74.6802**	**32.2721**	**19.0834**
1. Energy	**10212.0544**	**26.0293**	**0.2472**						**25.1996**	**65.0399**	**7.9743**	**18.6133**
A. Fuel combustion Reference approach	10137.5783											
Sectoral approach	10211.5893	2.3865	0.1492						25.1996	65.0399	7.5567	18.6133
1. Energy industries	5583.3634	0.1102	0.0244						9.4662	3.1137	0.2218	10.5369
2. Manufacturing industries and construction	588.3594	0.0200	0.0027						1.2171	0.7931	0.2990	0.4427
3. Transport	1469.7744	0.4631	0.0952						6.3542	25.1328	3.1478	1.6297
4. Other sectors	2493.4333	1.7851	0.0250						7.8746	35.5006	3.8095	5.7662
5. Other	76.6587	0.0081	0.0020						0.2875	0.4997	0.0785	0.2379
B. Fugitive emissions from fuels	0.4651	23.6428	0.0979						0.0000	0.0000	0.4176	0.0000
1. Solid fuels	NO	NO	NO						NO	NO	NO	NO
2. Oil and natural gas and other emissions from energy production	0.4651	23.6428	0.0979						0.0000	0.0000	0.4176	0.0000
C. CO_2 Transport and storage	NO											
2. Industrial processes and product use	**446.3084**	**NO**	**0.0000**	**5.1070**	**NO**	**NO**	**NO**	**NO**	**1.2016**	**2.9865**	**22.9531**	**0.4641**
A. Mineral industry	370.9362								1.0716	0.9575	0.0096	0.4134
B. Chemical industry	NO	NO	NO						NO	NO	0.0037	NO
C. Metal industry	32.3806	NO	NO	NO	NO	NO	NO	NO	0.1054	1.3781	0.0401	0.0486
D. Non-energy products from fuels and solvent use	42.0527	NO	NO						0.0040	0.0227	14.1331	0.0020
E. Electronic industry				NO	NO	NO	NO	NO				
F. Product uses as substitutes for ODS				5.1070	NO	NO	NO	NO				
G. Other product manufacture and use	0.9389	NO	0.0000	NO	NO	NO	NO	NO	0.0205	0.6281	0.4268	NO
H. Other									NO	NO	8.3398	NO
3. Agriculture	**1.0992**	**57.4896**	**5.8619**						**NO**	**NO**	**NE, NO**	
A. Enteric fermentation		51.4030										
B. Manure management		6.0866	2.0035								NO	
C. Rice cultivation		NO										
D. Agricultural soils			3.8583									
E. Prescribed burning of savannas		NO	NO						NO	NO	NO	
F. Field burning of agricultural residues		IE	IE						IE	IE	NO, NE	
G. Liming	NO											
H. Urea application	1.0992											
I. Other carbon-containing fertilizers	NO, NE											
J. Other	NO	NO	NO						NO	NO	NO	
4. Land use, land-use change and forestry	**-2148.3338**	**0.1075**	**0.9134**						**0.0995**	**3.6610**	**NE**	
A. Forest land	-2232.2854	0.0002	0.0000						0.0001	0.0053	NE	
B. Cropland	1628.0567	0.1073	0.0116						0.0993	3.6556	NE	
C. Grassland	-1400.8607	NE	NE						NE	NE	NE	
D. Wetlands	-413.0332	NE	NE						NE	NE	NE	
E. Settlements	100.7954	NE	0.9017						NE	NE	NE	
F. Other land	188.2363	NE	NE						NE	NE	NE	
G. Harvested wood products	-19.2429											
H. Other	NO	NO	NO						NO	NO	NO	
5. Waste	**17.0610**	**60.3063**	**0.2369**						**0.1711**	**2.9928**	**1.3447**	**0.0060**
A. Solid waste disposal	NA, NO	48.1521							NA, NO	NA, NO	1.2600	
B. Biological treatment of solid waste		NO, NE	NO, NE						NO, NE	NO, NE	NO, NE	
C. Incineration and open burning of waste	17.0610	0.3501	0.0061						0.1711	2.9928	0.0661	0.0060
D. Wastewater treatment and discharge		11.8041	0.2307						NA, IE	NA, IE	0.0186	
E. Other	NO	NO	NO						NO	NO	NO	
6. Other	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Memo items:												
International bunkers	**75.6418**	**0.0054**	**0.0024**						**0.3033**	**0.1927**	**0.1018**	**0.0240**
Aviation	75.6418	0.0054	0.0024						0.3033	0.1927	0.1018	0.0240
Navigation	NO	NO	NO						NO	NO	NO	NO
Multilateral operations	**NO**	**NO**	**NO**						**NO**	**NO**	**NO**	**NO**
CO_2 emissions from biomass	291.1280											
CO_2 captured	NO											
Long-term storage of C in waste disposal sites	NO											
Indirect N_2O			**1.1723**									
Indirect CO_2	**32.0316**											

Annex 1-9: Inventory Year - 1998

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Net CO_2 emissions / removals	CH_4	N_2O	HFCs	PFCs	Unspecified mix of HFCs and PFCs	SF_6	NF_3	NO_x	CO	NMVOC	SO_2
	(kt)			($kt\ CO_2$ equivalent)					(kt)			
Total national emissions and removals	**7000.6810**	**138.2519**	**6.7040**	**6.0624**	**NO**	**NO**	**NO**	**NO**	**22.4434**	**58.0613**	**28.2124**	**14.3869**
1. Energy	**8789.7567**	**23.8383**	**0.2174**						**21.1263**	**49.2086**	**6.3618**	**13.9529**
A. Fuel combustion Reference approach	8718.4021											
Sectoral approach	8789.3294	1.7133	0.1232						21.1263	49.2086	5.9702	13.9529
1. Energy industries	4806.4261	0.0957	0.0189						8.0624	2.7581	0.1958	7.9287
2. Manufacturing industries and construction	566.7379	0.0197	0.0026						1.2172	0.7349	0.3099	0.3474
3. Transport	1273.6172	0.3957	0.0790						5.2998	21.3500	2.6683	1.4210
4. Other sectors	2069.7199	1.1935	0.0205						6.1550	23.7795	2.6921	4.0184
5. Other	72.8283	0.0088	0.0021						0.3919	0.5862	0.1041	0.2375
B. Fugitive emissions from fuels	0.4274	22.1250	0.0942						0.0000	0.0000	0.3916	0.0000
1. Solid fuels	NO	NO	NO						NO	NO	NO	NO
2. Oil and natural gas and other emissions from energy production	0.4274	22.1250	0.0942						0.0000	0.0000	0.3916	0.0000
C. CO_2 Transport and storage	NO											
2. Industrial processes and product use	**371.0737**	**NO**	**0.0000**	**6.0624**	**NO**	**NO**	**NO**	**NO**	**1.0549**	**2.5139**	**20.5122**	**0.4279**
A. Mineral industry	304.0902								0.9420	0.7779	0.0078	0.3832
B. Chemical industry	NO	NO	NO						NO	NO	0.0042	NO
C. Metal industry	28.6822	NO	NO	NO	NO	NO	NO	NO	0.0934	1.2208	0.0371	0.0431
D. Non-energy products from fuels and solvent use	37.5993	NO	NO						0.0033	0.0185	13.2679	0.0016
E. Electronic industry				NO	NO	NO	NO	NO				
F. Product uses as substitutes for ODS				6.0624	NO	NO	NO	NO				
G. Other product manufacture and use	0.7020	NO	0.0000	NO	NO	NO	NO	NO	0.0162	0.4967	0.3191	NO
H. Other									NO	NO	6.8761	NO
3. Agriculture	**0.2721**	**55.0092**	**5.2920**						**NO**	**NO**	**NE, NO**	
A. Enteric fermentation		49.9008										
B. Manure management		5.1085	1.9398								NO	
C. Rice cultivation		NO										
D. Agricultural soils			3.3522									
E. Prescribed burning of savannas		NO	NO						NO	NO	NO	
F. Field burning of agricultural residues		IE	IE						IE	IE	NO, NE	
G. Liming	NO											
H. Urea application	0.2721											
I. Other carbon-containing fertilizers	NO, NE											
J. Other	NO	NO	NO						NO	NO	NO	
4. Land use, land-use change and forestry	**-2177.5062**	**0.0989**	**0.9542**						**0.0909**	**3.3430**	**NE**	
A. Forest land	-2288.4857	0.0023	0.0001						0.0015	0.0530	NE	
B. Cropland	1657.1571	0.0966	0.0110						0.0894	3.2900	NE	
C. Grassland	-1436.2698	NE	NE						NE	NE	NE	
D. Wetlands	-384.8303	NE	NE						NE	NE	NE	
E. Settlements	99.0440	NE	0.9431						NE	NE	NE	
F. Other land	185.0077	NE	NE						NE	NE	NE	
G. Harvested wood products	-9.1293											
H. Other	NO	NO	NO						NO	NO	NO	
5. Waste	**17.0846**	**59.3055**	**0.2404**						**0.1713**	**2.9958**	**1.3384**	**0.0061**
A. Solid waste disposal	NA, NO	47.5742							NA, NO	NA, NO	1.2568	
B. Biological treatment of solid waste		NO, NE	NO, NE						NO, NE	NO, NE	NO, NE	
C. Incineration and open burning of waste	17.0846	0.3506	0.0062						0.1713	2.9958	0.0662	0.0061
D. Wastewater treatment and discharge		11.3807	0.2342						NA, IE	NA, IE	0.0155	
E. Other	NO	NO	NO						NO	NO	NO	
6. Other	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Memo items:												
International bunkers	**72.4923**	**0.0041**	**0.0023**						**0.2935**	**0.1739**	**0.0883**	**0.0230**
Aviation	72.4923	0.0041	0.0023						0.2935	0.1739	0.0883	0.0230
Navigation	NO	NO	NO						NO	NO	NO	NO
Multilateral operations	**NO**	**NO**	**NO**						**NO**	**NO**	**NO**	**NO**
CO_2 emissions from biomass	269.0120											
CO_2 captured	NO											
Long-term storage of C in waste disposal sites	NO											
Indirect N_2O			**1.0458**									
Indirect CO_2	**29.8821**											

Annex 1-10: Inventory Year - 1999

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Net CO_2 emissions / removals	CH_4	N_2O	HFCs	PFCs	Unspecified mix of HFCs and PFCs	SF_6	NF_3	NO_x	CO	NMVOC	SO_2
	(kt)			($kt\ CO_2$ equivalent)					(kt)			
Total national emissions and removals	**5786.1209**	**133.8675**	**6.2228**	**6.8017**	**NO**	**NO**	**NO**	**NO**	**17.3237**	**45.6938**	**22.3883**	**11.4081**
1. Energy	**7328.4925**	**23.9672**	**0.2036**						**16.1243**	**36.8298**	**4.9938**	**11.0284**
A. Fuel combustion Reference approach	7257.1721											
Sectoral approach	7328.0994	1.5627	0.0868						16.1243	36.8298	4.5931	11.0284
1. Energy industries	4133.6361	0.0797	0.0160						6.9218	2.4138	0.1693	6.2916
2. Manufacturing industries and construction	488.2612	0.0137	0.0017						0.8414	0.5356	0.2311	0.2632
3. Transport	855.4540	0.2410	0.0492						3.5193	12.5713	1.5845	1.0059
4. Other sectors	1801.5918	1.2218	0.0183						4.6961	20.9461	2.5442	3.2790
5. Other	49.1563	0.0065	0.0016						0.1458	0.3630	0.0640	0.1887
B. Fugitive emissions from fuels	0.3931	22.4045	0.1168						0.0000	0.0000	0.4007	0.0000
1. Solid fuels	NO	NO	NO						NO	NO	NO	NO
2. Oil and natural gas and other emissions from energy production	0.3931	22.4045	0.1168						0.0000	0.0000	0.4007	0.0000
C. CO_2 Transport and storage	NO											
2. Industrial processes and product use	**334.1373**	**NO**	**0.0000**	**6.8017**	**NO**	**NO**	**NO**	**NO**	**0.9405**	**2.6378**	**16.1821**	**0.3736**
A. Mineral industry	270.1228								0.8158	0.6939	0.0075	0.3247
B. Chemical industry	NO	NO	NO						NO	NO	0.0035	NO
C. Metal industry	31.7942	NO	NO	NO	NO	NO	NO	NO	0.1035	1.3533	0.0408	0.0478
D. Non-energy products from fuels and solvent use	31.6142	NO	NO						0.0024	0.0133	11.6405	0.0012
E. Electronic industry				NO	NO	NO	NO	NO				
F. Product uses as substitutes for ODS				6.8017	NO	NO	NO	NO				
G. Other product manufacture and use	0.6062	NO	0.0000	NO	NO	NO	NO	NO	0.0189	0.5773	0.2755	NO
H. Other									NO	NO	4.2144	NO
3. Agriculture	**0.0034**	**50.6594**	**4.7978**						**NO**	**NO**	**NE, NO**	
A. Enteric fermentation		46.1673										
B. Manure management		4.4921	1.7608								NO	
C. Rice cultivation		NO										
D. Agricultural soils			3.0370									
E. Prescribed burning of savannas		NO	NO						NO	NO	NO	
F. Field burning of agricultural residues		IE	IE						IE	IE	NO, NE	
G. Liming	NO											
H. Urea application	0.0034											
I. Other carbon-containing fertilizers	NO, NE											
J. Other	NO	NO	NO						NO	NO	NO	
4. Land use, land-use change and forestry	**-1893.5700**	**0.0956**	**0.9861**						**0.0880**	**3.2363**	**NE**	
A. Forest land	-2336.8468	0.0017	0.0001						0.0011	0.0396	NE	
B. Cropland	1677.6681	0.0938	0.0109						0.0869	3.1967	NE	
C. Grassland	-1433.2865	NE	NE						NE	NE	NE	
D. Wetlands	-356.6274	NE	NE						NE	NE	NE	
E. Settlements	111.8259	NE	0.9751						NE	NE	NE	
F. Other land	425.1554	NE	NE						NE	NE	NE	
G. Harvested wood products	18.5414											
H. Other	NO	NO	NO						NO	NO	NO	
5. Waste	**17.0578**	**59.1454**	**0.2353**						**0.1710**	**2.9899**	**1.2123**	**0.0060**
A. Solid waste disposal	NA, NO	47.8091							NA, NO	NA, NO	1.1343	
B. Biological treatment of solid waste		NO, NE	NO, NE						NO, NE	NO, NE	NO, NE	
C. Incineration and open burning of waste	17.0578	0.3500	0.0061						0.1710	2.9899	0.0661	0.0060
D. Wastewater treatment and discharge		10.9864	0.2292						NA, IE	NA, IE	0.0119	
E. Other	NO	NO	NO						NO	NO	NO	
6. Other	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Memo items:												
International bunkers	**72.4890**	**0.0040**	**0.0023**						**0.2907**	**0.1724**	**0.0877**	**0.0230**
Aviation	72.4890	0.0040	0.0023						0.2907	0.1724	0.0877	0.0230
Navigation	NO	NO	NO						NO	NO	NO	NO
Multilateral operations	**NO**	**NO**	**NO**						**NO**	**NO**	**NO**	**NO**
CO_2 emissions from biomass	266.1120											
CO_2 captured	NO											
Long-term storage of C in waste disposal sites	NO											
Indirect N_2O			**0.9405**									
Indirect CO_2	**26.2056**											

Annex 1-11: Inventory Year - 2000

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Net CO_2 emissions / removals	CH_4	N_2O	HFCs	PFCs	Unspecified mix of HFCs and PFCs	SF_6	NF_3	NO_x	CO	NMVOC	SO_2
	(kt)			($kt\ CO_2$ equivalent)					(kt)			
Total national emissions and removals	**4729.3456**	**130.5540**	**5.8503**	**8.3038**	**NO**	**NO**	**NO**	**NO**	**16.0283**	**41.8286**	**21.9813**	**9.8641**
1. Energy	**6584.0211**	**25.5715**	**0.2200**						**14.7597**	**34.8619**	**4.8848**	**9.3678**
A. Fuel combustion Reference approach	6518.8855											
Sectoral approach	6583.6452	1.5461	0.0881						14.7597	34.8619	4.4508	9.3678
1. Energy industries	3607.4274	0.0676	0.0138						6.0316	2.1531	0.1489	4.9599
2. Manufacturing industries and construction	531.0321	0.0125	0.0015						0.8916	0.4987	0.2297	0.2370
3. Transport	920.5951	0.2445	0.0546						3.8839	12.3795	1.5620	1.1803
4. Other sectors	1488.2025	1.2169	0.0172						3.8215	19.5985	2.4681	2.8261
5. Other	36.3881	0.0046	0.0010						0.1311	0.2320	0.0421	0.1644
B. Fugitive emissions from fuels	0.3759	24.0254	0.1318						0.0000	0.0000	0.4341	0.0000
1. Solid fuels	NO	NO	NO						NO	NO	NO	NO
2. Oil and natural gas and other emissions from energy production	0.3759	24.0254	0.1318						0.0000	0.0000	0.4341	0.0000
C. CO_2 Transport and storage	NO											
2. Industrial processes and product use	**305.7865**	**NO**	**0.0000**	**8.3038**	**NO**	**NO**	**NO**	**NO**	**1.0642**	**2.7415**	**15.8877**	**0.4903**
A. Mineral industry	237.9796								0.9242	0.5746	0.0067	0.4349
B. Chemical industry	NO	NO	NO						NO	NO	0.0065	NO
C. Metal industry	36.2689	NO	NO	NO	NO	NO	NO	NO	0.1181	1.5438	0.0462	0.0545
D. Non-energy products from fuels and solvent use	30.6392	NO	NO						0.0019	0.0108	11.6590	0.0010
E. Electronic industry				NO	NO	NO	NO	NO				
F. Product uses as substitutes for ODS				8.3038	NO	NO	NO	NO				
G. Other product manufacture and use	0.8987	NO	0.0000	NO	NO	NO	NO	NO	0.0200	0.6124	0.4085	NO
H. Other									NO	NO	3.7608	NO
3. Agriculture	**0.4397**	**46.8269**	**4.3951**						**NO**	**NO**	**NE, NO**	
A. Enteric fermentation		43.4256										
B. Manure management		3.4013	1.5712								NO	
C. Rice cultivation		NO										
D. Agricultural soils			2.8239									
E. Prescribed burning of savannas		NO	NO						NO	NO	NO	
F. Field burning of agricultural residues		IE	IE						IE	IE	NO, NE	
G. Liming	NO											
H. Urea application	0.4397											
I. Other carbon-containing fertilizers	NO, NE											
J. Other	NO	NO	NO						NO	NO	NO	
4. Land use, land-use change and forestry	**-2177.9243**	**0.0365**	**0.9944**						**0.0338**	**1.2427**	**NE**	
A. Forest land	-2307.4384	0.0001	0.0000						0.0000	0.0014	NE	
B. Cropland	1465.3794	0.0364	0.0091						0.0337	1.2413	NE	
C. Grassland	-1291.9495	NE	NE						NE	NE	NE	
D. Wetlands	-328.4245	NE	NE						NE	NE	NE	
E. Settlements	100.1768	NE	0.9853						NE	NE	NE	
F. Other land	178.5246	NE	NE						NE	NE	NE	
G. Harvested wood products	5.8073											
H. Other	NO	NO	NO						NO	NO	NO	
5. Waste	**17.0226**	**58.1191**	**0.2408**						**0.1706**	**2.9825**	**1.2088**	**0.0060**
A. Solid waste disposal	NA, NO	46.7813							NA, NO	NA, NO	1.1318	
B. Biological treatment of solid waste		NO, NE	NO, NE						NO, NE	NO, NE	NO, NE	
C. Incineration and open burning of waste	17.0226	0.3492	0.0061						0.1706	2.9825	0.0659	0.0060
D. Wastewater treatment and discharge		10.9886	0.2346						NA, IE	NA, IE	0.0111	
E. Other	NO	NO	NO						NO	NO	NO	
6. Other	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Memo items:												
International bunkers	**66.2279**	**0.0043**	**0.0021**						**0.2728**	**0.1738**	**0.0800**	**0.0210**
Aviation	66.2279	0.0043	0.0021						0.2728	0.1738	0.0800	0.0210
Navigation	NO	NO	NO						NO	NO	NO	NO
Multilateral operations	**NO**	**NO**	**NO**						**NO**	**NO**	**NO**	**NO**
CO_2 emissions from biomass	272.3720											
CO_2 captured	NO											
Long-term storage of C in waste disposal sites	NO											
Indirect N_2O			**0.8563**									
Indirect CO_2	**26.5388**											

Annex 1-12: Inventory Year - 2001

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Net CO_2 emissions / removals	CH_4	N_2O	HFCs	PFCs	Unspecified mix of HFCs and PFCs	SF_6	NF_3	NO_x	CO	NMVOC	SO_2
	(kt)			(kt CO_2 equivalent)					(kt)			
Total national emissions and removals	**5692.4617**	**129.9605**	**6.4910**	**10.4771**	**NO**	**NO**	**NO**	**NO**	**17.3856**	**41.2933**	**23.3836**	**9.3435**
1. Energy	**7180.7453**	**25.2431**	**0.2715**						**16.1444**	**33.7768**	**4.7942**	**8.8744**
A. Fuel combustion Reference approach	7119.8320											
Sectoral approach	7180.3360	1.4223	0.0944						16.1444	33.7768	4.3665	8.8744
1. Energy industries	4101.5064	0.0787	0.0147						6.8092	2.5265	0.1735	4.6865
2. Manufacturing industries and construction	611.5689	0.0152	0.0020						1.2488	0.5855	0.2629	0.2920
3. Transport	995.4935	0.2597	0.0601						4.1902	13.3146	1.6695	1.3035
4. Other sectors	1428.3712	1.0636	0.0164						3.7395	16.9934	2.2000	2.4655
5. Other	43.3961	0.0050	0.0012						0.1565	0.3569	0.0605	0.1268
B. Fugitive emissions from fuels	0.4092	23.8208	0.1771						0.0000	0.0000	0.4278	0.0000
1. Solid fuels	NO	NO	NO						NO	NO	NO	NO
2. Oil and natural gas and other emissions from energy production	0.4092	23.8208	0.1771						0.0000	0.0000	0.4278	0.0000
C. CO_2 Transport and storage	NO											
2. Industrial processes and product use	**308.5598**	**NO**	**0.0000**	**10.4771**	**NO**	**NO**	**NO**	**NO**	**1.0250**	**2.8520**	**17.4938**	**0.4631**
A. Mineral industry	235.2359								0.8765	0.5715	0.0066	0.4038
B. Chemical industry	NO	NO	NO						NO	NO	0.0080	NO
C. Metal industry	38.6274	NO	NO	NO	NO	NO	NO	NO	0.1257	1.6441	0.0500	0.0580
D. Non-energy products from fuels and solvent use	33.9235	NO	NO						0.0024	0.0135	12.8867	0.0012
E. Electronic industry				NO	NO	NO	NO	NO				
F. Product uses as substitutes for ODS				10.4771	NO	NO	NO	NO				
G. Other product manufacture and use	0.7730	NO	0.0000	NO	NO	NO	NO	NO	0.0203	0.6229	0.3514	NO
H. Other									NO	NO	4.1911	NO
3. Agriculture	**0.1496**	**47.6636**	**4.9809**						**NO**	**NO**	**NE, NO**	
A. Enteric fermentation		44.2270										
B. Manure management		3.4366	1.5998								NO	
C. Rice cultivation		NO										
D. Agricultural soils			3.3811									
E. Prescribed burning of savannas		NO	NO						NO	NO	NO	
F. Field burning of agricultural residues		IE	IE						IE	IE	NO, NE	
G. Liming	NO											
H. Urea application	0.1496											
I. Other carbon-containing fertilizers	NO, NE											
J. Other	NO	NO	NO						NO	NO	NO	
4. Land use, land-use change and forestry	**-1813.9954**	**0.0508**	**0.9951**						**0.0459**	**1.6868**	**NE**	
A. Forest land	-2273.7027	0.0039	0.0002						0.0025	0.0896	NE	
B. Cropland	1811.2281	0.0469	0.0079						0.0434	1.5972	NE	
C. Grassland	-1290.6541	NE	NE						NE	NE	NE	
D. Wetlands	-300.2217	NE	NE						NE	NE	NE	
E. Settlements	67.0898	NE	0.9870						NE	NE	NE	
F. Other land	178.5246	NE	NE						NE	NE	NE	
G. Harvested wood products	-6.2594											
H. Other	NO	NO	NO						NO	NO	NO	
5. Waste	**17.0025**	**57.0030**	**0.2434**						**0.1703**	**2.9776**	**1.0956**	**0.0060**
A. Solid waste disposal	NA, NO	45.4990							NA, NO	NA, NO	1.0191	
B. Biological treatment of solid waste		NO, NE	NO, NE						NO, NE	NO, NE	NO, NE	
C. Incineration and open burning of waste	17.0025	0.3487	0.0061						0.1703	2.9776	0.0658	0.0060
D. Wastewater treatment and discharge		11.1552	0.2373						NA, IE	NA, IE	0.0106	
E. Other	NO	NO	NO						NO	NO	NO	
6. Other	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Memo items:												
International bunkers	**61.8894**	**0.0039**	**0.0020**						**0.2403**	**0.1649**	**0.0728**	**0.0196**
Aviation	61.8894	0.0039	0.0020						0.2403	0.1649	0.0728	0.0196
Navigation	NO	NO	NO						NO	NO	NO	NO
Multilateral operations	**NO**	**NO**	**NO**						**NO**	**NO**	**NO**	**NO**
CO_2 emissions from biomass	282.2280											
CO_2 captured	NO											
Long-term storage of C in waste disposal sites	NO											
Indirect N_2O			**0.9676**									
Indirect CO_2	**29.1198**											

Annex 1-13: Inventory Year - 2002

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Net CO_2 emissions / removals	CH_4	N_2O	HFCs	PFCs	Unspecified mix of HFCs and PFCs	SF_6	NF_3	NO_x	CO	NMVOC	SO_2
	(kt)			($kt\ CO_2$ equivalent)					(kt)			
Total national emissions and removals	**5289.7042**	**132.0605**	**6.6715**	**14.5015**	**NO**	**NO**	**NO**	**NO**	**18.1326**	**46.0931**	**26.0647**	**10.3207**
1. Energy	**6815.4249**	**27.6695**	**0.3037**						**16.7861**	**40.7569**	**5.8776**	**9.7897**
A. Fuel combustion Reference approach	6754.3765											
Sectoral approach	6815.0348	1.7870	0.1229						16.7861	40.7569	5.4078	9.7897
1. Energy industries	3347.8492	0.0673	0.0132						5.6018	2.0379	0.1404	4.3168
2. Manufacturing industries and construction	424.4928	0.0102	0.0012						0.7088	0.4221	0.1855	0.2119
3. Transport	1261.2777	0.3310	0.0875						5.8622	17.2703	2.2093	1.6207
4. Other sectors	1741.9621	1.3702	0.0193						4.4721	20.7406	2.8043	3.4683
5. Other	39.4529	0.0083	0.0016						0.1411	0.2860	0.0683	0.1720
B. Fugitive emissions from fuels	0.3901	25.8825	0.1808						0.0000	0.0000	0.4697	0.0000
1. Solid fuels	NO	NO	NO						NO	NO	NO	NO
2. Oil and natural gas and other emissions from energy production	0.3901	25.8825	0.1808						0.0000	0.0000	0.4697	0.0000
C. CO_2 Transport and storage	NO											
2. Industrial processes and product use	**357.7976**	**NO**	**0.0000**	**14.5015**	**NO**	**NO**	**NO**	**NO**	**1.1676**	**2.0313**	**19.0331**	**0.5249**
A. Mineral industry	300.3739								1.0852	0.7298	0.0083	0.4931
B. Chemical industry	NO	NO	NO						NO	NO	0.0104	NO
C. Metal industry	20.5030	NO	NO	NO	NO	NO	NO	NO	0.0667	0.8725	0.0263	0.0308
D. Non-energy products from fuels and solvent use	36.1900	NO	NO						0.0021	0.0118	13.8294	0.0010
E. Electronic industry				NO	NO	NO	NO	NO				
F. Product uses as substitutes for ODS				14.5015	NO	NO	NO	NO				
G. Other product manufacture and use	0.7307	NO	0.0000	NO	NO	NO	NO	NO	0.0136	0.4172	0.3321	NO
H. Other									NO	NO	4.8266	NO
3. Agriculture	**0.0470**	**48.7415**	**5.1218**						**NO**	**NO**	**NE, NO**	
A. Enteric fermentation		45.1436										
B. Manure management		3.5979	1.6116								NO	
C. Rice cultivation		NO										
D. Agricultural soils			3.5102									
E. Prescribed burning of savannas		NO	NO						NO	NO	NO	
F. Field burning of agricultural residues		IE	IE						IE	IE	NO, NE	
G. Liming	NO											
H. Urea application	0.0470											
I. Other carbon-containing fertilizers	NO, NE											
J. Other	NO	NO	NO						NO	NO	NO	
4. Land use, land-use change and forestry	**-1900.5120**	**0.0106**	**0.9965**						**0.0092**	**0.3385**	**NE**	
A. Forest land	-2267.6159	0.0021	0.0001						0.0013	0.0481	NE	
B. Cropland	1407.6151	0.0085	0.0066						0.0079	0.2904	NE	
C. Grassland	-1235.1380	NE	NE						NE	NE	NE	
D. Wetlands	-272.0188	NE	NE						NE	NE	NE	
E. Settlements	67.0898	NE	0.9898						NE	NE	NE	
F. Other land	456.2431	NE	NE						NE	NE	NE	
G. Harvested wood products	-56.6873											
H. Other	NO	NO	NO						NO	NO	NO	
5. Waste	**16.9466**	**55.6389**	**0.2495**						**0.1697**	**2.9664**	**1.1541**	**0.0060**
A. Solid waste disposal	NA, NO	44.3224							NA, NO	NA, NO	1.0781	
B. Biological treatment of solid waste		NO, NE	NO, NE						NO, NE	NO, NE	NO, NE	
C. Incineration and open burning of waste	16.9466	0.3475	0.0061						0.1697	2.9664	0.0656	0.0060
D. Wastewater treatment and discharge		10.9689	0.2434						NA, IE	NA, IE	0.0104	
E. Other	NO	NO	NO						NO	NO	NO	
6. Other	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Memo items:												
International bunkers	**62.0647**	**0.0036**	**0.0020**						**0.2505**	**0.1652**	**0.0671**	**0.0197**
Aviation	62.0647	0.0036	0.0020						0.2505	0.1652	0.0671	0.0197
Navigation	NO	NO	NO						NO	NO	NO	NO
Multilateral operations	**NO**	**NO**	**NO**						**NO**	**NO**	**NO**	**NO**
CO_2 emissions from biomass	322.0800											
CO_2 captured	NO											
Long-term storage of C in waste disposal sites	NO											
Indirect N_2O			**1.0023**									
Indirect CO_2	**31.1517**											

Annex 1-14: Inventory Year - 2003

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Net CO_2 emissions / removals	CH_4	N_2O	HFCs	PFCs	Unspecified mix of HFCs and PFCs	SF_6	NF_3	NO_x	CO	NMVOC	SO_2
	(kt)			($kt\ CO_2$ equivalent)					(kt)			
Total national emissions and removals	**6044.9776**	**128.2609**	**5.8544**	**20.8415**	**NO**	**NO**	**0.0000**	**NO**	**19.0556**	**55.7655**	**28.5055**	**11.8437**
1. Energy	**7469.8555**	**29.3361**	**0.3138**						**17.6796**	**50.0082**	**7.0341**	**11.3068**
A. Fuel combustion Reference approach	7400.3518											
Sectoral approach	7468.7964	2.2776	0.1255						17.6796	50.0082	6.4958	11.3068
1. Energy industries	3431.0444	0.0681	0.0130						5.7150	2.1205	0.1452	3.9758
2. Manufacturing industries and construction	452.5663	0.0105	0.0013						0.7738	0.4050	0.1942	0.1826
3. Transport	1477.1995	0.3896	0.0857						6.3214	20.8227	2.5969	1.9187
4. Other sectors	2079.5633	1.8052	0.0246						4.7268	26.3790	3.5070	5.1110
5. Other	28.4228	0.0043	0.0009						0.1427	0.2811	0.0524	0.1187
B. Fugitive emissions from fuels	1.0592	27.0585	0.1884						0.0000	0.0000	0.5383	0.0000
1. Solid fuels	NO	NO	NO						NO	NO	NO	NO
2. Oil and natural gas and other emissions from energy production	1.0592	27.0585	0.1884						0.0000	0.0000	0.5383	0.0000
C. CO_2 Transport and storage	NO											
2. Industrial processes and product use	**385.6075**	**NO**	**0.0000**	**20.8415**	**NO**	**NO**	**0.0000**	**NO**	**1.2054**	**2.7466**	**20.1643**	**0.5309**
A. Mineral industry	308.3700								1.0721	0.7534	0.0091	0.4765
B. Chemical industry	NO	NO	NO						NO	NO	0.0123	NO
C. Metal industry	35.4283	NO	NO	NO	NO	NO	NO	NO	0.1153	1.5074	0.0456	0.0532
D. Non-energy products from fuels and solvent use	40.9211	NO	NO						0.0026	0.0145	14.8735	0.0013
E. Electronic industry				NO	NO	NO	NO	NO				
F. Product uses as substitutes for ODS				20.8415	NO	NO	NO	NO				
G. Other product manufacture and use	0.8881	NO	0.0000	NO	NO	NO	0.0000	NO	0.0154	0.4712	0.4037	NO
H. Other									NO	NO	4.8202	NO
3. Agriculture	**0.2381**	**44.5900**	**4.3116**						**NO**	**NO**	**NE, NO**	
A. Enteric fermentation		41.2430										
B. Manure management		3.3469	1.5302								NO	
C. Rice cultivation		NO										
D. Agricultural soils			2.7814									
E. Prescribed burning of savannas		NO	NO						NO	NO	NO	
F. Field burning of agricultural residues		IE	IE						IE	IE	NO, NE	
G. Liming	NO											
H. Urea application	0.2381											
I. Other carbon-containing fertilizers	NO, NE											
J. Other	NO	NO	NO						NO	NO	NO	
4. Land use, land-use change and forestry	**-1827.6049**	**0.0024**	**0.9877**						**0.0016**	**0.0573**	**NE**	
A. Forest land	-2270.1176	0.0023	0.0001						0.0015	0.0526	NE	
B. Cropland	1489.1023	0.0001	0.0056						0.0001	0.0046	NE	
C. Grassland	-1007.1842	NE	NE						NE	NE	NE	
D. Wetlands	-243.8159	NE	NE						NE	NE	NE	
E. Settlements	67.8615	NE	0.9820						NE	NE	NE	
F. Other land	201.6619	NE	NE						NE	NE	NE	
G. Harvested wood products	-65.1129											
H. Other	NO	NO	NO						NO	NO	NO	
5. Waste	**16.8812**	**54.3324**	**0.2412**						**0.1690**	**2.9534**	**1.3071**	**0.0060**
A. Solid waste disposal	NA, NO	42.8093							NA, NO	NA, NO	1.2315	
B. Biological treatment of solid waste		NO, NE	NO, NE						NO, NE	NO, NE	NO, NE	
C. Incineration and open burning of waste	16.8812	0.3461	0.0061						0.1690	2.9534	0.0653	0.0060
D. Wastewater treatment and discharge		11.1769	0.2351						NA, IE	NA, IE	0.0103	
E. Other	NO	NO	NO						NO	NO	NO	
6. Other	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Memo items:												
International bunkers	**70.1110**	**0.0035**	**0.0023**						**0.2887**	**0.1786**	**0.0705**	**0.0222**
Aviation	70.1110	0.0035	0.0023						0.2887	0.1786	0.0705	0.0222
Navigation	NO	NO	NO						NO	NO	NO	NO
Multilateral operations	**NO**	**NO**	**NO**						**NO**	**NO**	**NO**	**NO**
CO_2 emissions from biomass	373.5760											
CO_2 captured	NO											
Long-term storage of C in waste disposal sites	NO											
Indirect N_2O			**0.8474**									
Indirect CO_2	**33.6057**											

Annex 1-15: Inventory Year - 2004

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Net CO_2 emissions / removals	CH_4	N_2O	HFCs	PFCs	Unspecified mix of HFCs and PFCs	SF_6	NF_3	NO_x	CO	NMVOC	SO_2
	(kt)			($kt\ CO_2$ equivalent)					(kt)			
Total national emissions and removals	**6622.6008**	**126.8977**	**6.7546**	**29.1966**	**NO**	**NO**	**0.0000**	**NO**	**20.3780**	**52.8480**	**40.4511**	**11.1920**
1. Energy	**8141.8766**	**31.3534**	**0.3326**						**18.8504**	**46.5982**	**7.0666**	**10.5973**
A. Fuel combustion Reference approach	8319.9634											
Sectoral approach	8140.7721	1.9835	0.1367						18.8504	46.5982	6.1973	10.5973
1. Energy industries	3725.8039	0.0701	0.0130						5.8304	2.1781	0.1492	3.9179
2. Manufacturing industries and construction	465.1130	0.0124	0.0016						0.8587	0.4651	0.2118	0.2180
3. Transport	1668.6104	0.4162	0.1001						7.2533	22.1923	2.8012	2.1963
4. Other sectors	2253.6075	1.4817	0.0210						4.6918	21.4752	2.9879	4.2007
5. Other	27.6373	0.0031	0.0010						4.6918	21.4752	2.9879	4.2007
B. Fugitive emissions from fuels	1.1045	29.3699	0.1959						0.0000	0.0000	0.8693	0.0000
1. Solid fuels	NO	NO	NO						NO	NO	NO	NO
2. Oil and natural gas and other emissions from energy production	1.1045	29.3699	0.1959						0.0000	0.0000	0.8693	0.0000
C. CO_2 Transport and storage	NO											
2. Industrial processes and product use	**456.2031**	**NO**	**0.0001**	**29.1966**	**NO**	**NO**	**0.0000**	**NO**	**1.3536**	**3.1045**	**31.9898**	**0.5887**
A. Mineral industry	350.6290								1.1984	0.8689	0.0104	0.5238
B. Chemical industry	NO	NO	NO						NO	NO	0.0118	NO
C. Metal industry	40.5084	NO	NO	NO	NO	NO	NO	NO	0.1318	1.7236	0.0522	0.0608
D. Non-energy products from fuels and solvent use	64.1000	NO	NO						0.0082	0.0459	25.3328	0.0041
E. Electronic industry				NO	NO	NO	NO	NO				
F. Product uses as substitutes for ODS				29.1966	NO	NO	NO	NO				
G. Other product manufacture and use	0.9656	NO	0.0001	NO	NO	NO	0.0000	NO	0.0152	0.4661	0.4389	NO
H. Other									NO	NO	6.1437	NO
3. Agriculture	**0.3669**	**41.7419**	**5.1970**						**NO**	**NO**	**NE, NO**	
A. Enteric fermentation		38.4891										
B. Manure management		3.2528	1.4804								NO	
C. Rice cultivation		NO										
D. Agricultural soils			3.7166									
E. Prescribed burning of savannas		NO	NO						NO	NO	NO	
F. Field burning of agricultural residues		IE	IE						IE	IE	NO, NE	
G. Liming	NO											
H. Urea application	0.3669											
I. Other carbon-containing fertilizers	NO, NE											
J. Other	NO	NO	NO						NO	NO	NO	
4. Land use, land-use change and forestry	**-1992.6605**	**0.0080**	**0.9736**						**0.0057**	**0.2051**	**NE**	
A. Forest land	-2334.7768	0.0061	0.0003						0.0039	0.1383	NE	
B. Cropland	1454.1892	0.0020	0.0046						0.0018	0.0668	NE	
C. Grassland	-1120.4767	NE	NE						NE	NE	NE	
D. Wetlands	-215.6130	NE	NE						NE	NE	NE	
E. Settlements	53.6737	NE	0.9686						NE	NE	NE	
F. Other land	223.8177	NE	NE						NE	NE	NE	
G. Harvested wood products	-53.4745											
H. Other	NO	NO	NO						NO	NO	NO	
5. Waste	**16.8147**	**53.7943**	**0.2513**						**0.1683**	**2.9402**	**1.3947**	**0.0060**
A. Solid waste disposal	NA, NO	42.2061							NA, NO	NA, NO	1.3194	
B. Biological treatment of solid waste		NO, NE	NO, NE						NO, NE	NO, NE	NO, NE	
C. Incineration and open burning of waste	16.8147	0.3447	0.0061						0.1683	2.9402	0.0650	0.0060
D. Wastewater treatment and discharge		11.2435	0.2453						NA, IE	NA, IE	0.0103	
E. Other	NO	NO	NO						NO	NO	NO	
6. Other	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Memo items:												
International bunkers	**67.3304**	**0.0035**	**0.0022**						**0.2767**	**0.1815**	**0.0622**	**0.0213**
Aviation	67.3304	0.0035	0.0022						0.2767	0.1815	0.0622	0.0213
Navigation	NO	NO	NO						NO	NO	NO	NO
Multilateral operations	**NO**	**NO**	**NO**						**NO**	**NO**	**NO**	**NO**
CO_2 emissions from biomass	307.6800											
CO_2 captured	NO											
Long-term storage of C in waste disposal sites	NO											
Indirect N_2O			**1.0122**									
Indirect CO_2	**56.6674**											

Annex 1-16: Inventory Year - 2005

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Net CO_2 emissions / removals	CH_4	N_2O	HFCs	PFCs	Unspecified mix of HFCs and PFCs	SF_6	NF_3	NO_x	CO	NMVOC	SO_2
	(kt)			($kt\ CO_2$ equivalent)					(kt)			
Total national emissions and removals	**7187.4952**	**127.2037**	**6.8069**	**40.7988**	**NO**	**NO**	**0.0000**	**NO**	**21.1705**	**54.6818**	**43.0595**	**10.9930**
1. Energy	**8318.1422**	**33.1010**	**0.3460**						**19.3776**	**48.2340**	**7.2002**	**10.2932**
A. Fuel combustion Reference approach	8423.1477											
Sectoral approach	8317.0204	2.0836	0.1464						19.3776	48.2340	6.4212	10.2932
1. Energy industries	3755.2075	0.0719	0.0129						5.9812	2.2656	0.1548	3.6993
2. Manufacturing industries and construction	598.3665	0.0140	0.0017						1.0377	0.5095	0.2596	0.2064
3. Transport	1723.5435	0.4294	0.1102						7.8009	22.8161	2.9145	2.2802
4. Other sectors	2213.9626	1.5658	0.0206						4.3277	22.5157	3.0624	4.0412
5. Other	25.9403	0.0024	0.0010						0.2301	0.1272	0.0300	0.0661
B. Fugitive emissions from fuels	1.1219	31.0174	0.1997						0.0000	0.0000	0.7790	0.0000
1. Solid fuels	NO	NO	NO						NO	NO	NO	NO
2. Oil and natural gas and other emissions from energy production	1.1219	31.0174	0.1997						0.0000	0.0000	0.7790	0.0000
C. CO_2 Transport and storage	NO											
2. Industrial processes and product use	**551.0519**	**NO**	**0.0001**	**40.7988**	**NO**	**NO**	**0.0000**	**NO**	**1.6255**	**3.3507**	**34.3106**	**0.6942**
A. Mineral industry	440.2134								1.4680	1.1141	0.0133	0.6274
B. Chemical industry	NO	NO	NO						NO	NO	0.0149	NO
C. Metal industry	41.9358	NO	NO	NO	NO	NO	NO	NO	0.1364	1.7839	0.0545	0.0630
D. Non-energy products from fuels and solvent use	67.8400	NO	NO						0.0077	0.0431	27.0205	0.0038
E. Electronic industry				NO	NO	NO	NO	NO				
F. Product uses as substitutes for ODS				40.7988	NO	NO	NO	NO				
G. Other product manufacture and use	1.0626	NO	0.0001	NO	NO	NO	0.0000	NO	0.0134	0.4096	0.4830	NO
H. Other									NO	NO	6.7243	NO
3. Agriculture	**0.1739**	**40.5020**	**5.2539**						**NO**	**NO**	**NE, NO**	
A. Enteric fermentation		37.0587										
B. Manure management		3.4433	1.5820								NO	
C. Rice cultivation		NO										
D. Agricultural soils			3.6718									
E. Prescribed burning of savannas		NO	NO						NO	NO	NO	
F. Field burning of agricultural residues		IE	IE						IE	IE	NO, NE	
G. Liming	NO											
H. Urea application	0.1739											
I. Other carbon-containing fertilizers	NO, NE											
J. Other	NO	NO	NO						NO	NO	NO	
4. Land use, land-use change and forestry	**-1697.7069**	**0.0099**	**0.9615**						**0.0090**	**0.3317**	**NE**	
A. Forest land	-2409.5185	0.0006	0.0000						0.0004	0.0132	NE	
B. Cropland	1528.2806	0.0093	0.0056						0.0087	0.3185	NE	
C. Grassland	-1058.1239	NE	NE						NE	NE	NE	
D. Wetlands	-187.4101	NE	NE						NE	NE	NE	
E. Settlements	53.6737	NE	0.9559						NE	NE	NE	
F. Other land	416.5012	NE	NE						NE	NE	NE	
G. Harvested wood products	-41.1098											
H. Other	NO	NO	NO						NO	NO	NO	
5. Waste	**15.8340**	**53.5909**	**0.2455**						**0.1584**	**2.7653**	**1.5487**	**0.0057**
A. Solid waste disposal	NA, NO	42.5723							NA, NO	NA, NO	1.4772	
B. Biological treatment of solid waste		NO, NE	NO, NE						NO, NE	NO, NE	NO, NE	
C. Incineration and open burning of waste	15.8340	0.3245	0.0057						0.1584	2.7653	0.0612	0.0057
D. Wastewater treatment and discharge		10.6940	0.2398						NA, IE	NA, IE	0.0103	
E. Other	NO	NO	NO						NO	NO	NO	
6. Other	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Memo items:												
International bunkers	**67.6488**	**0.0035**	**0.0022**						**0.2800**	**0.1836**	**0.0628**	**0.0214**
Aviation	67.6488	0.0035	0.0022						0.2800	0.1836	0.0628	0.0214
Navigation	NO	NO	NO						NO	NO	NO	NO
Multilateral operations	**NO**	**NO**	**NO**						**NO**	**NO**	**NO**	**NO**
CO_2 emissions from biomass	307.3920											
CO_2 captured	NO											
Long-term storage of C in waste disposal sites	NO											
Indirect N_2O			**1.0280**									
Indirect CO_2	**60.5990**											

Annex 1-17: Inventory Year - 2006

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Net CO_2 emissions / removals	CH_4	N_2O	HFCs	PFCs	Unspecified mix of HFCs and PFCs	SF_6	NF_3	NO_x	CO	NMVOC	SO_2
	(kt)			(kt CO_2 equivalent)					(kt)			
Total national emissions and removals	**6367.3802**	**122.2676**	**6.5030**	**53.5982**	**0.0231**	**NO**	**0.0000**	**NO**	**20.2815**	**55.3207**	**48.1839**	**10.9383**
1. Energy	**7516.9276**	**29.6103**	**0.3403**						**18.3425**	**49.3605**	**7.3353**	**10.2098**
A. Fuel combustion Reference approach	7574.4333											
Sectoral approach	7515.7016	2.2799	0.1520						18.3425	49.3605	6.6559	10.2098
1. Energy industries	2963.9244	0.0571	0.0110						4.7598	1.7605	0.1206	3.3790
2. Manufacturing industries and construction	661.3778	0.0145	0.0017						1.1449	0.5118	0.2781	0.1884
3. Transport	1651.6254	0.3962	0.1150						7.8164	20.9913	2.7138	2.2777
4. Other sectors	2199.7343	1.8093	0.0229						4.2889	25.6932	3.4799	4.2136
5. Other	39.0397	0.0029	0.0013						0.3325	0.4037	0.0635	0.1512
B. Fugitive emissions from fuels	1.2260	27.3303	0.1884						0.0000	0.0000	0.6793	0.0000
1. Solid fuels	NO	NO	NO						NO	NO	NO	NO
2. Oil and natural gas and other emissions from energy production	1.2260	27.3303	0.1884						0.0000	0.0000	0.6793	0.0000
C. CO_2 Transport and storage	NO											
2. Industrial processes and product use	**648.0792**	**NO**	**0.0001**	**53.5982**	**0.0231**	**NO**	**0.0000**	**NO**	**1.7731**	**2.9245**	**39.1714**	**0.7229**
A. Mineral industry	538.2308								1.6619	1.3730	0.0164	0.6761
B. Chemical industry	NO	NO	NO						NO	NO	0.0130	NO
C. Metal industry	27.0182	NO	NO	NO	NO	NO	NO	NO	0.0879	1.1492	0.0355	0.0406
D. Non-energy products from fuels and solvent use	81.8718	NO	NO						0.0124	0.0697	33.1366	0.0062
E. Electronic industry				NO	NO	NO	NO	NO				
F. Product uses as substitutes for ODS				53.5982	NO	NO	NO	NO				
G. Other product manufacture and use	0.9584	NO	0.0001	NO	0.0231	NO	0.0000	NO	0.0109	0.3326	0.4356	NO
H. Other									NO	NO	5.5342	NO
3. Agriculture	**0.1460**	**39.3812**	**4.9723**						**NO**	**NO**	**NE, NO**	
A. Enteric fermentation		35.8683										
B. Manure management		3.5129	1.6257								NO	
C. Rice cultivation		NO										
D. Agricultural soils			3.3466									
E. Prescribed burning of savannas		NO	NO						NO	NO	NO	
F. Field burning of agricultural residues		IE	IE						IE	IE	NO, NE	
G. Liming	NO											
H. Urea application	0.1460											
I. Other carbon-containing fertilizers	NO, NE											
J. Other	NO	NO	NO						NO	NO	NO	
4. Land use, land-use change and forestry	**-1813.6146**	**0.0100**	**0.9483**						**0.0075**	**0.2706**	**NE**	
A. Forest land	-2366.5168	0.0063	0.0003						0.0040	0.1427	NE	
B. Cropland	1565.8949	0.0038	0.0048						0.0035	0.1279	NE	
C. Grassland	-1056.3692	NE	NE						NE	NE	NE	
D. Wetlands	-159.2073	NE	NE						NE	NE	NE	
E. Settlements	53.6737	NE	0.9432						NE	NE	NE	
F. Other land	189.4964	NE	NE						NE	NE	NE	
G. Harvested wood products	-40.5864											
H. Other	NO	NO	NO						NO	NO	NO	
5. Waste	**15.8420**	**53.2662**	**0.2420**						**0.1584**	**2.7651**	**1.6772**	**0.0057**
A. Solid waste disposal	NA, NO	42.4737							NA, NO	NA, NO	1.6057	
B. Biological treatment of solid waste		NO, NE	NO, NE						NO, NE	NO, NE	NO, NE	
C. Incineration and open burning of waste	15.8420	0.3246	0.0057						0.1584	2.7651	0.0612	0.0057
D. Wastewater treatment and discharge		10.4679	0.2363						NA, IE	NA, IE	0.0103	
E. Other	NO	NO	NO						NO	NO	NO	
6. Other	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Memo items:												
International bunkers	**75.9610**	**0.0040**	**0.0025**						**0.3208**	**0.2037**	**0.0722**	**0.0241**
Aviation	75.9610	0.0040	0.0025						0.3208	0.2037	0.0722	0.0241
Navigation	NO	NO	NO						NO	NO	NO	NO
Multilateral operations	**NO**	**NO**	**NO**						**NO**	**NO**	**NO**	**NO**
CO_2 emissions from biomass	361.4360											
CO_2 captured	NO											
Long-term storage of C in waste disposal sites	NO											
Indirect N_2O			**0.9757**									
Indirect CO_2	**73.9415**											

Annex 1-18: Inventory Year - 2007

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Net CO_2 emissions / removals	CH_4	N_2O	HFCs	PFCs	Unspecified mix of HFCs and PFCs	SF_6	NF_3	NO_x	CO	NMVOC	SO_2
	(kt)			($kt\ CO_2$ equivalent)					(kt)			
Total national emissions and removals	**6678.2859**	**115.7654**	**4.5042**	**67.7992**	**0.0231**	**NO**	**0.0000**	**NO**	**21.2027**	**51.0359**	**48.3704**	**9.7668**
1. Energy	**7775.4299**	**30.8658**	**0.3533**						**18.6880**	**42.7530**	**6.7207**	**8.8827**
A. Fuel combustion Reference approach	7976.2424											
Sectoral approach	7774.1723	1.8120	0.1536						18.6880	42.7530	5.8497	8.8827
1. Energy industries	3483.6780	0.0653	0.0116						5.3850	2.0508	0.1399	3.2259
2. Manufacturing industries and construction	823.8199	0.0166	0.0019						1.3060	0.5264	0.3426	0.1156
3. Transport	1757.4108	0.4151	0.1206						8.2201	21.5888	2.7975	2.4651
4. Other sectors	1664.7540	1.3111	0.0178						3.3914	18.2795	2.5144	2.9324
5. Other	44.5097	0.0039	0.0017						0.3855	0.3075	0.0552	0.1437
B. Fugitive emissions from fuels	1.2577	29.0539	0.1997						0.0000	0.0000	0.8710	0.0000
1. Solid fuels	NO	NO	NO						NO	NO	NO	NO
2. Oil and natural gas and other emissions from energy production	1.2577	29.0539	0.1997						0.0000	0.0000	0.8710	0.0000
C. CO_2 Transport and storage	NO											
2. Industrial processes and product use	**893.3513**	**NO**	**NO**	**67.7992**	**0.0231**	**NO**	**0.0000**	**NO**	**2.3147**	**4.0508**	**39.5494**	**0.8784**
A. Mineral industry	768.8438								2.1654	2.0062	0.0244	0.8139
B. Chemical industry	NO	NO	NO						NO	NO	0.0139	NO
C. Metal industry	38.6127	NO	NO	NO	NO	NO	NO	NO	0.1256	1.6426	0.0508	0.0580
D. Non-energy products from fuels and solvent use	84.9474	NO	NO						0.0130	0.0732	35.0576	0.0065
E. Electronic industry				NO	NO	NO	NO	NO				
F. Product uses as substitutes for ODS				67.7992	NO	NO	NO	NO				
G. Other product manufacture and use	0.9474	NO	NO	NO	0.0231	NO	0.0000	NO	0.0107	0.3289	0.4306	NO
H. Other									NO	NO	3.9720	NO
3. Agriculture	**0.2631**	**31.4975**	**2.9835**						**NO**	**NO**	**NE, NO**	
A. Enteric fermentation		28.9954										
B. Manure management		2.5021	1.2423								NO	
C. Rice cultivation		NO										
D. Agricultural soils			1.7412									
E. Prescribed burning of savannas		NO	NO						NO	NO	NO	
F. Field burning of agricultural residues		IE	IE						IE	IE	NO, NE	
G. Liming	NO											
H. Urea application	0.2631											
I. Other carbon-containing fertilizers	NO, NE											
J. Other	NO	NO	NO						NO	NO	NO	
4. Land use, land-use change and forestry	**-2006.6996**	**0.0607**	**0.9330**						**0.0405**	**1.4512**	**NE**	
A. Forest land	-2460.3855	0.0546	0.0030						0.0349	1.2433	NE	
B. Cropland	1528.1376	0.0061	0.0049						0.0056	0.2079	NE	
C. Grassland	-1031.2350	NE	NE						NE	NE	NE	
D. Wetlands	-131.0044	NE	NE						NE	NE	NE	
E. Settlements	49.2742	NE	0.9250						NE	NE	NE	
F. Other land	83.1072	NE	NE						NE	NE	NE	
G. Harvested wood products	-44.5936											
H. Other	NO	NO	NO						NO	NO	NO	
5. Waste	**15.9412**	**53.3414**	**0.2345**						**0.1594**	**2.7809**	**2.1003**	**0.0057**
A. Solid waste disposal	NA, NO	42.5929							NA, NO	NA, NO	2.0285	
B. Biological treatment of solid waste		NO, NE	NO, NE						NO, NE	NO, NE	NO, NE	
C. Incineration and open burning of waste	15.9412	0.3266	0.0057						0.1594	2.7809	0.0616	0.0057
D. Wastewater treatment and discharge		10.4219	0.2288						NA, IE	NA, IE	0.0102	
E. Other	NO	NO	NO						NO	NO	NO	
6. Other	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Memo items:												
International bunkers	**79.8999**	**0.0028**	**0.0026**						**0.3447**	**0.1871**	**0.0698**	**0.0253**
Aviation	79.8999	0.0028	0.0026						0.3447	0.1871	0.0698	0.0253
Navigation	NO	NO	NO						NO	NO	NO	NO
Multilateral operations	**NO**	**NO**	**NO**						**NO**	**NO**	**NO**	**NO**
CO_2 emissions from biomass	304.6560											
CO_2 captured	NO											
Long-term storage of C in waste disposal sites	NO											
Indirect N_2O			**0.6037**									
Indirect CO_2	**78.1363**											

Annex 1-19: Inventory Year - 2008

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Net CO_2 emissions / removals	CH_4	N_2O	HFCs	PFCs	Unspecified mix of HFCs and PFCs	SF_6	NF_3	NO_x	CO	NMVOC	SO_2
	(kt)			(kt CO_2 equivalent)					(kt)			
Total national emissions and removals	**7549.6388**	**115.0039**	**6.5151**	**82.0655**	**0.0288**	**NO**	**0.0000**	**NO**	**22.0500**	**53.3172**	**42.1097**	**11.5680**
1. Energy	**8253.4802**	**30.7804**	**0.3664**						**19.3481**	**45.4277**	**7.3059**	**10.6366**
A. Fuel combustion Reference approach	8655.4441											
Sectoral approach	8252.2054	1.8818	0.1592						19.3481	45.4277	6.1576	10.6366
1. Energy industries	3772.1690	0.0722	0.0124						5.5687	2.1292	0.1458	3.3292
2. Manufacturing industries and construction	907.5951	0.0347	0.0047						1.5370	2.2890	0.4765	1.8642
3. Transport	1848.2954	0.4358	0.1218						8.5432	22.4722	2.9125	2.6195
4. Other sectors	1675.4850	1.3355	0.0186						3.3674	18.1831	2.5680	2.6248
5. Other	48.6609	0.0037	0.0016						0.3318	0.3542	0.0549	0.1988
B. Fugitive emissions from fuels	1.2748	28.8986	0.2072						0.0000	0.0000	1.1483	0.0000
1. Solid fuels	NO	NO	NO						NO	NO	NO	NO
2. Oil and natural gas and other emissions from energy production	1.2748	28.8986	0.2072						0.0000	0.0000	1.1483	0.0000
C. CO_2 Transport and storage	NO											
2. Industrial processes and product use	**972.6989**	**NO**	**NO**	**82.0655**	**0.0288**	**NO**	**0.0000**	**NO**	**2.5157**	**4.1128**	**32.4087**	**0.9256**
A. Mineral industry	869.1962								2.3845	2.2999	0.0277	0.8688
B. Chemical industry	NO	NO	NO						NO	NO	0.0122	NO
C. Metal industry	35.4118	NO	NO	NO	NO	NO	NO	NO	0.1152	1.5064	0.0465	0.0532
D. Non-energy products from fuels and solvent use	67.1050	NO	NO						0.0075	0.0427	26.7467	0.0037
E. Electronic industry				NO	NO	NO	NO	NO				
F. Product uses as substitutes for ODS				82.0655	NO	NO	NO	NO				
G. Other product manufacture and use	0.9859	NO	NO	NO	0.0288	NO	0.0000	NO	0.0086	0.2638	0.4481	NO
H. Other									NO	NO	5.1274	NO
3. Agriculture	**0.8505**	**30.0951**	**5.0005**						**NO**	**NO**	**NE, NO**	
A. Enteric fermentation		27.6273										
B. Manure management		2.4678	1.2244								NO	
C. Rice cultivation		NO										
D. Agricultural soils			3.7762									
E. Prescribed burning of savannas		NO	NO						NO	NO	NO	
F. Field burning of agricultural residues		IE	IE						IE	IE	NO, NE	
G. Liming	NO											
H. Urea application	0.8505											
I. Other carbon-containing fertilizers	NO, NE											
J. Other	NO	NO	NO						NO	NO	NO	
4. Land use, land-use change and forestry	**-1693.2806**	**0.0308**	**0.9128**						**0.0274**	**1.0067**	**NE**	
A. Forest land	-2462.7874	0.0038	0.0002						0.0024	0.0864	NE	
B. Cropland	1499.7873	0.0270	0.0052						0.0250	0.9203	NE	
C. Grassland	-932.1498	NE	NE						NE	NE	NE	
D. Wetlands	-102.8015	NE	NE						NE	NE	NE	
E. Settlements	49.2742	NE	0.9074						NE	NE	NE	
F. Other land	291.0044	NE	NE						NE	NE	NE	
G. Harvested wood products	-35.6078											
H. Other	NO	NO	NO						NO	NO	NO	
5. Waste	**15.8898**	**54.0976**	**0.2354**						**0.1588**	**2.7699**	**2.3951**	**0.0057**
A. Solid waste disposal	NA, NO	43.3679							NA, NO	NA, NO	2.3236	
B. Biological treatment of solid waste		NO, NE	NO, NE						NO, NE	NO, NE	NO, NE	
C. Incineration and open burning of waste	15.8898	0.3254	0.0057						0.1588	2.7699	0.0613	0.0057
D. Wastewater treatment and discharge		10.4043	0.2297						NA, IE	NA, IE	0.0102	
E. Other	NO	NO	NO						NO	NO	NO	
6. Other	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Memo items:												
International bunkers	**89.2738**	**0.0017**	**0.0029**						**0.3939**	**0.1807**	**0.0752**	**0.0283**
Aviation	89.2738	0.0017	0.0029						0.3939	0.1807	0.0752	0.0283
Navigation	NO	NO	NO						NO	NO	NO	NO
Multilateral operations	**NO**	**NO**	**NO**						**NO**	**NO**	**NO**	**NO**
CO_2 emissions from biomass	352.4520											
CO_2 captured	NO											
Long-term storage of C in waste disposal sites	NO											
Indirect N_2O			**0.9800**									
Indirect CO_2	**59.8913**											

Annex 1-20: Inventory Year - 2009

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Net CO_2 emissions / removals	CH_4	N_2O	HFCs	PFCs	Unspecified mix of HFCs and PFCs	SF_6	NF_3	NO_x	CO	NMVOC	SO_2
	(kt)			($kt\ CO_2$ equivalent)					(kt)			
Total national emissions and removals	**8334.3612**	**112.2682**	**7.2343**	**91.3620**	**0.0288**	**NO**	**0.0000**	**NO**	**21.1944**	**50.7336**	**36.3792**	**13.7619**
1. Energy	**9152.8755**	**25.9197**	**0.3719**						**19.7779**	**45.5750**	**7.1466**	**13.2555**
A. Fuel combustion Reference approach	9650.4082											
Sectoral approach	9151.6023	2.0024	0.1459						19.7779	45.5750	6.0141	13.2555
1. Energy industries	5027.2977	0.0960	0.0194						7.6814	2.7418	0.1899	6.5062
2. Manufacturing industries and construction	514.8733	0.0223	0.0031						0.8955	1.6077	0.2844	1.3799
3. Transport	1771.7398	0.4415	0.1035						7.5996	22.2381	2.8305	2.4477
4. Other sectors	1824.3586	1.4415	0.0195						3.4941	18.8063	2.6817	2.8745
5. Other	13.3329	0.0012	0.0003						0.1073	0.1811	0.0277	0.0472
B. Fugitive emissions from fuels	1.2732	23.9173	0.2260						0.0000	0.0000	1.1325	0.0000
1. Solid fuels	NO	NO	NO						NO	NO	NO	NO
2. Oil and natural gas and other emissions from energy production	1.2732	23.9173	0.2260						0.0000	0.0000	1.1325	0.0000
C. CO_2 Transport and storage	NO											
2. Industrial processes and product use	**463.8910**	**NO**	**NO**	**91.3620**	**0.0288**	**NO**	**0.0000**	**NO**	**1.2491**	**2.0725**	**27.0536**	**0.5008**
A. Mineral industry	387.9410								1.1775	0.9929	0.0122	0.4724
B. Chemical industry	NO	NO	NO						NO	NO	0.0100	NO
C. Metal industry	17.0619	NO	NO	NO	NO	NO	NO	NO	0.0555	0.7255	0.0227	0.0256
D. Non-energy products from fuels and solvent use	58.1883	NO	NO						0.0056	0.0316	23.2322	0.0028
E. Electronic industry				NO	NO	NO	NO	NO				
F. Product uses as substitutes for ODS				91.3620	NO	NO	NO	NO				
G. Other product manufacture and use	0.6998	NO	NO	NO	0.0288	NO	0.0000	NO	0.0105	0.3225	0.3181	NO
H. Other									NO	NO	3.4583	NO
3. Agriculture	**0.5864**	**31.5113**	**5.7499**						**NO**	**NO**	**NE, NO**	
A. Enteric fermentation		28.7000										
B. Manure management		2.8113	2.8112								NO	
C. Rice cultivation		NO										
D. Agricultural soils			2.9387									
E. Prescribed burning of savannas		NO	NO						NO	NO	NO	
F. Field burning of agricultural residues		IE	IE						IE	IE	NO, NE	
G. Liming	NO											
H. Urea application	0.5864											
I. Other carbon-containing fertilizers	NO, NE											
J. Other	NO	NO	NO						NO	NO	NO	
4. Land use, land-use change and forestry	**-1298.8485**	**0.0126**	**0.8904**						**0.0090**	**0.3239**	**NE**	
A. Forest land	-2526.0659	0.0093	0.0005						0.0059	0.2109	NE	
B. Cropland	1652.4751	0.0033	0.0046						0.0031	0.1130	NE	
C. Grassland	-447.6932	NE	NE						NE	NE	NE	
D. Wetlands	-74.5986	NE	NE						NE	NE	NE	
E. Settlements	45.5694	NE	0.8853						NE	NE	NE	
F. Other land	79.9357	NE	NE						NE	NE	NE	
G. Harvested wood products	-28.4708											
H. Other	NO	NO	NO						NO	NO	NO	
5. Waste	**15.8568**	**54.8247**	**0.2221**						**0.1584**	**2.7622**	**2.1790**	**0.0057**
A. Solid waste disposal	NA, NO	44.6020							NA, NO	NA, NO	2.1076	
B. Biological treatment of solid waste		NO, NE	NO, NE						NO, NE	NO, NE	NO, NE	
C. Incineration and open burning of waste	15.8568	0.3247	0.0057						0.1584	2.7622	0.0612	0.0057
D. Wastewater treatment and discharge		9.8980	0.2164						NA, IE	NA, IE	0.0102	
E. Other	NO	NO	NO						NO	NO	NO	
6. Other	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Memo items:												
International bunkers	**82.6571**	**0.0018**	**0.0027**						**0.3672**	**0.1729**	**0.0709**	**0.0262**
Aviation	82.6571	0.0018	0.0027						0.3672	0.1729	0.0709	0.0262
Navigation	NO	NO	NO						NO	NO	NO	NO
Multilateral operations	**NO**	**NO**	**NO**						**NO**	**NO**	**NO**	**NO**
CO_2 emissions from biomass	362.1000											
CO_2 captured	NO											
Long-term storage of C in waste disposal sites	NO											
Indirect N_2O			**0.8522**									
Indirect CO_2	**51.8736**											

Annex 1-21: Inventory Year – 2010

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Net CO_2 emissions / removals	CH_4	N_2O	HFCs	PFCs	Unspecified mix of HFCs and PFCs	SF_6	NF_3	NO_x	CO	NMVOC	SO_2
	(kt)			($kt\ CO_2$ equivalent)					(kt)			
Total national emissions and removals	**8729.1714**	**112.8412**	**6.4089**	**102.8657**	**0.0403**	**NO**	**0.0000**	**NO**	**22.8098**	**52.1684**	**40.8325**	**12.8153**
1. Energy	**9443.1854**	**25.3348**	**0.3974**						**21.3124**	**47.3547**	**7.0824**	**12.2631**
A. Fuel combustion Reference approach	9750.7612											
Sectoral approach	9441.9107	2.1419	0.1563						21.3124	47.3547	6.2054	12.2631
1. Energy industries	4975.7812	0.0998	0.0186						7.7976	2.8882	0.1987	5.5945
2. Manufacturing industries and construction	443.0025	0.0128	0.0017						0.8138	0.6084	0.2062	0.3865
3. Transport	2008.0937	0.4528	0.1165						8.8144	21.8270	2.8213	2.9534
4. Other sectors	1985.0640	1.5742	0.0190						3.7572	21.7528	2.9332	3.2007
5. Other	29.9692	0.0023	0.0006						0.1294	0.2782	0.0459	0.1281
B. Fugitive emissions from fuels	1.2747	23.1928	0.2411						0.0000	0.0000	0.8770	0.0000
1. Solid fuels	NO	NO	NO						NO	NO	NO	NO
2. Oil and natural gas and other emissions from energy production	1.2747	23.1928	0.2411						0.0000	0.0000	0.8770	0.0000
C. CO_2 Transport and storage	NO											
2. Industrial processes and product use	**488.7178**	**NO**	**NO**	**102.8657**	**0.0403**	**NO**	**0.0000**	**NO**	**1.3351**	**1.9059**	**31.7424**	**0.5465**
A. Mineral industry	411.0616								1.2832	1.0406	0.0126	0.5285
B. Chemical industry	NO	NO	NO						NO	NO	0.0143	NO
C. Metal industry	9.6985	NO	NO	NO	NO	NO	NO	NO	0.0315	0.4121	0.0128	0.0145
D. Non-energy products from fuels and solvent use	67.0530	NO	NO						0.0069	0.0392	26.8426	0.0034
E. Electronic industry				NO	NO	NO	NO	NO				
F. Product uses as substitutes for ODS				102.8657	NO	NO	NO	NO				
G. Other product manufacture and use	0.9046	NO	NO	NO	0.0403	NO	0.0000	NO	0.0135	0.4140	0.4112	NO
H. Other									NO	NO	4.4489	NO
3. Agriculture	**1.7443**	**31.5783**	**4.9121**						**NO**	**NO**	**NE, NO**	
A. Enteric fermentation		28.5028										
B. Manure management		3.0755	1.4304								NO	
C. Rice cultivation		NO										
D. Agricultural soils			3.4817									
E. Prescribed burning of savannas		NO	NO						NO	NO	NO	
F. Field burning of agricultural residues		IE	IE						IE	IE	NO, NE	
G. Liming	NO											
H. Urea application	1.7443											
I. Other carbon-containing fertilizers	NO, NE											
J. Other	NO	NO	NO						NO	NO	NO	
4. Land use, land-use change and forestry	**-1220.3031**	**0.0056**	**0.8665**						**0.0042**	**0.1529**	**NE**	
A. Forest land	-2484.1627	0.0032	0.0002						0.0021	0.0737	NE	
B. Cropland	1537.9925	0.0023	0.0028						0.0022	0.0792	NE	
C. Grassland	-691.9874	NE	NE						NE	NE	NE	
D. Wetlands	-46.3958	NE	NE						NE	NE	NE	
E. Settlements	45.5694	NE	0.8636						NE	NE	NE	
F. Other land	441.4824	NE	NE						NE	NE	NE	
G. Harvested wood products	-22.8014											
H. Other	NO	NO	NO						NO	NO	NO	
5. Waste	**15.8271**	**55.9225**	**0.2329**						**0.1581**	**2.7549**	**2.0077**	**0.0057**
A. Solid waste disposal	NA, NO	45.5140							NA, NO	NA, NO	1.9364	
B. Biological treatment of solid waste		NO, NE	NO, NE						NO, NE	NO, NE	NO, NE	
C. Incineration and open burning of waste	15.8271	0.3240	0.0057						0.1581	2.7549	0.0610	0.0057
D. Wastewater treatment and discharge		10.0845	0.2272						NA, IE	NA, IE	0.0102	
E. Other	NO	NO	NO						NO	NO	NO	
6. Other	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Memo items:												
International bunkers	**82.6894**	**0.0027**	**0.0027**						**0.3600**	**0.1894**	**0.0734**	**0.0262**
Aviation	82.6894	0.0027	0.0027						0.3600	0.1894	0.0734	0.0262
Navigation	NO	NO	NO						NO	NO	NO	NO
Multilateral operations	**NO**	**NO**	**NO**						**NO**	**NO**	**NO**	**NO**
CO_2 emissions from biomass	341.0480											
CO_2 captured	NO											
Long-term storage of C in waste disposal sites	NO											
Indirect N_2O			**0.9721**									
Indirect CO_2	**60.0215**											

Annex 1-22: Inventory Year – 2011

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Net CO_2 emissions / removals	CH_4	N_2O	HFCs	PFCs	Unspecified mix of HFCs and PFCs	SF_6	NF_3	NO_x	CO	NMVOC	SO_2
	(kt)			(kt CO_2 equivalent)					(kt)			
Total national emissions and removals	**9092.7746**	**115.1425**	**6.3983**	**116.5249**	**0.0403**	**NO**	**0.0000**	**NO**	**23.3601**	**55.8177**	**44.0445**	**13.0829**
1. Energy	**9654.6698**	**28.7372**	**0.4209**						**21.5558**	**50.5851**	**7.7791**	**12.3977**
A. Fuel combustion Reference approach	9987.3155											
Sectoral approach	9653.3531	2.2724	0.1626						21.5558	50.5851	6.7617	12.3977
1. Energy industries	4607.9596	0.0891	0.0159						7.0725	2.6695	0.1831	4.5393
2. Manufacturing industries and construction	596.4123	0.0272	0.0038						1.0531	1.8817	0.3409	1.5948
3. Transport	2117.5188	0.4522	0.1212						9.1394	22.5108	2.8983	3.1362
4. Other sectors	2310.0323	1.7027	0.0214						4.1347	23.1600	3.2929	3.0189
5. Other	21.4301	0.0013	0.0005						0.1561	0.3630	0.0465	0.1085
B. Fugitive emissions from fuels	1.3167	26.4648	0.2583						0.0000	0.0000	1.0174	0.0000
1. Solid fuels	NO	NO	NO						NO	NO	NO	NO
2. Oil and natural gas and other emissions from energy production	1.3167	26.4648	0.2583						0.0000	0.0000	1.0174	0.0000
C. CO_2 Transport and storage	NO											
2. Industrial processes and product use	**578.6725**	**NO**	**NO**	**116.5249**	**0.0403**	**NO**	**0.0000**	**NO**	**1.6415**	**2.3161**	**34.2293**	**0.6794**
A. Mineral industry	492.3783								1.5766	1.2592	0.0155	0.6562
B. Chemical industry	NO	NO	NO						NO	NO	0.0157	NO
C. Metal industry	12.8556	NO	NO	NO	NO	NO	NO	NO	0.0418	0.5465	0.0169	0.0193
D. Non-energy products from fuels and solvent use	72.3407	NO	NO						0.0078	0.0443	29.0886	0.0039
E. Electronic industry				NO	NO	NO	NO	NO				
F. Product uses as substitutes for ODS				116.5249	NO	NO	NO	NO				
G. Other product manufacture and use	1.0979	NO	NO	NO	0.0403	NO	0.0000	NO	0.0152	0.4661	0.4389	NO
H. Other									NO	NO	4.6537	NO
3. Agriculture	**3.6752**	**29.7453**	**4.9014**						**NO**	**NO**	**NE, NO**	
A. Enteric fermentation		26.8403										
B. Manure management		2.9050	1.3045								NO	
C. Rice cultivation		NO										
D. Agricultural soils			3.5970									
E. Prescribed burning of savannas		NO	NO						NO	NO	NO	
F. Field burning of agricultural residues		IE	IE						IE	IE	NO, NE	
G. Liming	NO											
H. Urea application	3.6752											
I. Other carbon-containing fertilizers	NO, NE											
J. Other	NO	NO	NO						NO	NO	NO	
4. Land use, land-use change and forestry	**-1160.1391**	**0.0064**	**0.8455**						**0.0047**	**0.1680**	**NE**	
A. Forest land	-2390.5712	0.0043	0.0002						0.0028	0.0987	NE	
B. Cropland	1492.5261	0.0020	0.0026						0.0019	0.0693	NE	
C. Grassland	-638.1726	NE	NE						NE	NE	NE	
D. Wetlands	-75.3129	NE	NE						NE	NE	NE	
E. Settlements	62.0438	NE	0.8426						NE	NE	NE	
F. Other land	393.7285	NE	NE						NE	NE	NE	
G. Harvested wood products	-4.3808											
H. Other	NO	NO	NO						NO	NO	NO	
5. Waste	**15.8962**	**56.6537**	**0.2304**						**0.1582**	**2.7486**	**2.0361**	**0.0058**
A. Solid waste disposal	NA, NO	46.2032							NA, NO	NA, NO	1.9649	
B. Biological treatment of solid waste		NO, NE	NO, NE						NO, NE	NO, NE	NO, NE	
C. Incineration and open burning of waste	15.8962	0.3248	0.0057						0.1582	2.7486	0.0611	0.0058
D. Wastewater treatment and discharge		10.1257	0.2247						NA, IE	NA, IE	0.0102	
E. Other	NO	NO	NO						NO	NO	NO	
6. Other	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Memo items:												
International bunkers	95.4144	0.0032	0.0031						0.3984	0.2213	0.0959	0.0303
Aviation	95.4144	0.0032	0.0031						0.3984	0.2213	0.0959	0.0303
Navigation	NO	NO	NO						NO	NO	NO	NO
Multilateral operations	**NO**	**NO**	**NO**						**NO**	**NO**	**NO**	**NO**
CO_2 emissions from biomass	384.6400											
CO_2 captured	NO											
Long-term storage of C in waste disposal sites	NO											
Indirect N_2O			**0.9716**									
Indirect CO_2	**65.1556**											

Annex 1-23: Inventory Year – 2012

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Net CO_2 emissions / removals	CH_4	N_2O	HFCs	PFCs	Unspecified mix of HFCs and PFCs	SF_6	NF_3	NO_x	CO	NMVOC	SO_2
	(kt)			(kt CO_2 equivalent)					(kt)			
Total national emissions and removals	**8631.3138**	**112.8679**	**4.9766**	**124.2123**	**0.0403**	**NO**	**0.0000**	**NO**	**21.9737**	**54.4470**	**45.6689**	**11.4909**
1. Energy	**9195.8094**	**28.4588**	**0.4326**						**20.2207**	**48.4470**	**7.4794**	**10.8629**
A. Fuel combustion Reference approach	9487.6044											
Sectoral approach	9194.4989	2.4223	0.1490						20.2207	48.4470	6.5497	10.8629
1. Energy industries	4596.6508	0.0848	0.0152						7.0895	2.6782	0.1832	4.4420
2. Manufacturing industries and construction	456.6973	0.0120	0.0015						0.7894	0.4438	0.2107	0.1935
3. Transport	1859.5648	0.3906	0.1092						8.2552	18.9451	2.4721	2.8138
4. Other sectors	2273.0863	1.9343	0.0229						4.0301	26.2302	3.6664	3.3897
5. Other	8.4998	0.0006	0.0002						0.0565	0.1496	0.0172	0.0238
B. Fugitive emissions from fuels	1.3104	26.0365	0.2836						0.0000	0.0000	0.9297	0.0000
1. Solid fuels	NO	NO	NO						NO	NO	NO	NO
2. Oil and natural gas and other emissions from energy production	1.3104	26.0365	0.2836						0.0000	0.0000	0.9297	0.0000
C. CO_2 Transport and storage	NO											
2. Industrial processes and product use	**588.1935**	**NO**	**NO**	**124.2123**	**0.0403**	**NO**	**0.0000**	**NO**	**1.5651**	**2.1892**	**36.1774**	**0.6221**
A. Mineral industry	498.5638								1.5049	1.2916	0.0158	0.5987
B. Chemical industry	NO	NO	NO						NO	NO	0.0150	NO
C. Metal industry	12.6973	NO	NO	NO	NO	NO	NO	NO	0.0413	0.5398	0.0171	0.0191
D. Non-energy products from fuels and solvent use	75.8897	NO	NO						0.0088	0.0500	31.1720	0.0044
E. Electronic industry				NO	NO	NO	NO	NO				
F. Product uses as substitutes for ODS				124.2123	NO	NO	NO	NO				
G. Other product manufacture and use	1.0427	NO	NO	NO	0.0403	NO	0.0000	NO	0.0101	0.3078	0.4739	NO
H. Other									NO	NO	4.4834	NO
3. Agriculture	**5.5908**	**28.0764**	**3.5322**						**NO**	**NO**	**NE, NO**	
A. Enteric fermentation		25.3134										
B. Manure management		2.7630	1.1973								NO	
C. Rice cultivation		NO										
D. Agricultural soils			2.3349									
E. Prescribed burning of savannas		NO	NO						NO	NO	NO	
F. Field burning of agricultural residues		IE	IE						IE	IE	NO, NE	
G. Liming	NO											
H. Urea application	5.5908											
I. Other carbon-containing fertilizers	NO, NE											
J. Other	NO	NO	NO						NO	NO	NO	
4. Land use, land-use change and forestry	**-1174.1542**	**0.0467**	**0.7833**						**0.0299**	**1.0665**	**NE**	
A. Forest land	-2294.8221	0.0464	0.0026						0.0296	1.0565	NE	
B. Cropland	1496.0113	0.0003	0.0026						0.0003	0.0100	NE	
C. Grassland	-562.7510	NE	NE						NE	NE	NE	
D. Wetlands	-15.4700	NE	NE						NE	NE	NE	
E. Settlements	11.8882	NE	0.7781						NE	NE	NE	
F. Other land	114.1449	NE	NE						NE	NE	NE	
G. Harvested wood products	76.8444											
H. Other	NO	NO	NO						NO	NO	NO	
5. Waste	**15.8744**	**56.2859**	**0.2285**						**0.1580**	**2.7443**	**2.0122**	**0.0058**
A. Solid waste disposal	NA, NO	45.7446							NA, NO	NA, NO	1.9411	
B. Biological treatment of solid waste		NO, NE	NO, NE						NO, NE	NO, NE	NO, NE	
C. Incineration and open burning of waste	15.8744	0.3243	0.0057						0.1580	2.7443	0.0610	0.0058
D. Wastewater treatment and discharge		10.2170	0.2228						NA, IE	NA, IE	0.0101	
E. Other	NO	NO	NO						NO	NO	NO	
6. Other	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Memo items:												
International bunkers	**107.6790**	**0.0031**	**0.0034**						**0.4332**	**0.2338**	**0.1073**	**0.0342**
Aviation	107.6790	0.0031	0.0034						0.4332	0.2338	0.1073	0.0342
Navigation	NO	NO	NO						NO	NO	NO	NO
Multilateral operations	**NO**	**NO**	**NO**						**NO**	**NO**	**NO**	**NO**
CO_2 emissions from biomass	403.3840											
CO_2 captured	NO											
Long-term storage of C in waste disposal sites	NO											
Indirect N_2O			**0.7285**									
Indirect CO_2	**69.6839**											

Annex 1-24: Inventory Year – 2013

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Net CO_2 emissions / removals	CH_4	N_2O	HFCs	PFCs	Unspecified mix of HFCs and PFCs	SF_6	NF_3	NO_x	CO	NMVOC	SO_2
	(kt)			(kt CO_2 equivalent)					(kt)			
Total national emissions and removals	**7844.2261**	**109.8890**	**6.5526**	**130.5506**	**0.0403**	**NO**	**0.0000**	**NO**	**20.9878**	**56.1626**	**45.2815**	**14.5122**
1. Energy	**8214.0054**	**27.2872**	**0.4347**						**19.0713**	**50.5789**	**7.5356**	**13.8040**
A. Fuel combustion Reference approach	8441.4833											
Sectoral approach	8212.3614	2.4890	0.1518						19.0713	50.5789	6.6563	13.8040
1. Energy industries	3680.5879	0.0702	0.0149						5.7643	2.0314	0.1406	5.1228
2. Manufacturing industries and construction	597.3290	0.0309	0.0044						1.0424	2.3184	0.3625	2.0459
3. Transport	1979.4512	0.3941	0.1089						8.4436	18.4275	2.4051	3.0379
4. Other sectors	1951.0935	1.9936	0.0235						3.7779	27.7566	3.7430	3.5798
5. Other	3.8998	0.0003	0.0001						0.0432	0.0450	0.0052	0.0176
B. Fugitive emissions from fuels	1.6441	24.7983	0.2829						0.0000	0.0000	0.8793	0.0000
1. Solid fuels	NO	NO	NO						NO	NO	NO	NO
2. Oil and natural gas and other emissions from energy production	1.6441	24.7983	0.2829						0.0000	0.0000	0.8793	0.0000
C. CO_2 Transport and storage	NO											
2. Industrial processes and product use	**631.0394**	**NO**	**NO**	**130.5506**	**0.0403**	**NO**	**0.0000**	**NO**	**1.7356**	**2.0193**	**35.5686**	**0.7023**
A. Mineral industry	551.2987								1.6944	1.4147	0.0172	0.6865
B. Chemical industry	NO	NO	NO						NO	NO	0.0159	NO
C. Metal industry	7.6569	NO	NO	NO	NO	NO	NO	NO	0.0249	0.3250	0.0100	0.0115
D. Non-energy products from fuels and solvent use	70.9399	NO	NO						0.0088	0.0501	28.8972	0.0044
E. Electronic industry				NO	NO	NO	NO	NO				
F. Product uses as substitutes for ODS				130.5506	NO	NO	NO	NO				
G. Other product manufacture and use	1.1438	NO	NO	NO	0.0403	NO	0.0000	NO	0.0075	0.2296	0.5199	NO
H. Other									NO	NO	6.1085	NO
3. Agriculture	**4.1840**	**28.4486**	**5.1582**						**NO**	**NO**	**NE, NO**	
A. Enteric fermentation		25.7324										
B. Manure management		2.7162	1.1203								NO	
C. Rice cultivation		NO										
D. Agricultural soils			4.0379									
E. Prescribed burning of savannas		NO	NO						NO	NO	NO	
F. Field burning of agricultural residues		IE	IE						IE	IE	NO, NE	
G. Liming	NO											
H. Urea application	4.1840											
I. Other carbon-containing fertilizers	NO, NE											
J. Other	NO	NO	NO						NO	NO	NO	
4. Land use, land-use change and forestry	**-1020.8558**	**0.0349**	**0.7290**						**0.0230**	**0.8237**	**NE**	
A. Forest land	-2141.8702	0.0322	0.0018						0.0206	0.7339	NE	
B. Cropland	1408.2056	0.0026	0.0026						0.0024	0.0898	NE	
C. Grassland	-360.1740	NE	NE						NE	NE	NE	
D. Wetlands	-106.0998	NE	NE						NE	NE	NE	
E. Settlements	13.7512	NE	0.7246						NE	NE	NE	
F. Other land	103.4500	NE	NE						NE	NE	NE	
G. Harvested wood products	61.8814											
H. Other	NO	NO	NO						NO	NO	NO	
5. Waste	**15.8530**	**54.1182**	**0.2307**						**0.1578**	**2.7406**	**2.1773**	**0.0058**
A. Solid waste disposal	NA, NO	43.3907							NA, NO	NA, NO	2.1063	
B. Biological treatment of solid waste		NO, NE	NO, NE						NO, NE	NO, NE	NO, NE	
C. Incineration and open burning of waste	15.8530	0.3239	0.0057						0.1578	2.7406	0.0609	0.0058
D. Wastewater treatment and discharge		10.4036	0.2250						NA, IE	NA, IE	0.0101	
E. Other	NO	NO	NO						NO	NO	NO	
6. Other	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Memo items:												
International bunkers	**130.4626**	**0.0046**	**0.0042**						**0.5235**	**0.3098**	**0.1345**	**0.0414**
Aviation	130.4626	0.0046	0.0042						0.5235	0.3098	0.1345	0.0414
Navigation	NO	NO	NO						NO	NO	NO	NO
Multilateral operations	**NO**	**NO**	**NO**						**NO**	**NO**	**NO**	**NO**
CO_2 emissions from biomass	429.2796											
CO_2 captured	NO											
Long-term storage of C in waste disposal sites	NO											
Indirect N_2O			**1.0337**									
Indirect CO_2	**64.7797**											

Annex 1-25: Inventory Year – 2014

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Net CO_2 emissions / removals	CH_4	N_2O	HFCs	PFCs	Unspecified mix of HFCs and PFCs	SF_6	NF_3	NO_x	CO	NMVOC	SO_2
	(kt)			($kt\ CO_2$ equivalent)					(kt)			
Total national emissions and removals	**8828.9210**	**112.5777**	**7.1810**	**142.0853**	**0.0403**	**NO**	**0.0000**	**NO**	**22.0784**	**80.8849**	**57.7562**	**12.0378**
1. Energy	**8807.4746**	**28.4042**	**0.4675**						**20.1823**	**75.8060**	**11.5158**	**11.3285**
A. Fuel combustion Reference approach	8960.9436											
Sectoral approach	8805.8026	4.5913	0.1740						20.1823	75.8060	10.7386	11.3285
1. Energy industries	4351.4775	0.0856	0.0160						6.8994	2.5652	0.1761	4.8179
2. Manufacturing industries and construction	467.8569	0.0148	0.0019						0.8282	0.7873	0.2267	0.5538
3. Transport	2049.6794	0.3919	0.1026						7.9515	18.0907	2.3365	3.1778
4. Other sectors	1933.4972	4.0986	0.0533						4.4914	54.3206	7.9960	2.7674
5. Other	3.2915	0.0004	0.0001						0.0119	0.0423	0.0033	0.0118
B. Fugitive emissions from fuels	1.6721	23.8129	0.2935						0.0000	0.0000	0.7772	0.0000
1. Solid fuels	NO	NO	NO						NO	NO	NO	NO
2. Oil and natural gas and other emissions from energy production	1.6721	23.8129	0.2935						0.0000	0.0000	0.7772	0.0000
C. CO_2 Transport and storage	NO											
2. Industrial processes and product use	**651.6580**	**NO**	**NO**	**142.0853**	**0.0403**	**NO**	**0.0000**	**NO**	**1.7352**	**2.2144**	**43.9371**	**0.7035**
A. Mineral industry	547.8150								1.6724	1.4004	0.0167	0.6764
B. Chemical industry	NO	NO	NO						NO	NO	0.0166	NO
C. Metal industry	13.8464	NO	NO	NO	NO	NO	NO	NO	0.0450	0.5882	0.0186	0.0208
D. Non-energy products from fuels and solvent use	88.9627	NO	NO						0.0128	0.0723	37.0850	0.0064
E. Electronic industry				NO	NO	NO	NO	NO				
F. Product uses as substitutes for ODS				142.0853	NO	NO	NO	NO				
G. Other product manufacture and use	1.0338	NO	NO	NO	0.0403	NO	0.0000	NO	0.0050	0.1535	0.4699	NO
H. Other									NO	NO	6.3301	NO
3. Agriculture	**10.2058**	**30.1395**	**5.8007**						**NO**	**NO**	**NE, NO**	
A. Enteric fermentation		27.2385										
B. Manure management		2.9011	1.2336								NO	
C. Rice cultivation		NO										
D. Agricultural soils			4.5671									
E. Prescribed burning of savannas		NO	NO						NO	NO	NO	
F. Field burning of agricultural residues		IE	IE						IE	IE	NO, NE	
G. Liming	NO											
H. Urea application	10.2058											
I. Other carbon-containing fertilizers	NO, NE											
J. Other	NO	NO	NO						NO	NO	NO	
4. Land use, land-use change and forestry	**-656.2221**	**0.0047**	**0.6794**						**0.0036**	**0.1293**	**NE**	
A. Forest land	-2134.7390	0.0027	0.0001						0.0017	0.0603	NE	
B. Cropland	1445.7270	0.0020	0.0026						0.0019	0.0690	NE	
C. Grassland	-341.1085	NE	NE						NE	NE	NE	
D. Wetlands	-139.7535	NE	NE						NE	NE	NE	
E. Settlements	18.9848	NE	0.6766						NE	NE	NE	
F. Other land	436.6463	NE	NE						NE	NE	NE	
G. Harvested wood products	58.0208											
H. Other	NO	NO	NO						NO	NO	NO	
5. Waste	**15.8047**	**54.0294**	**0.2333**						**0.1574**	**2.7351**	**2.3033**	**0.0058**
A. Solid waste disposal	NA, NO	43.3232							NA, NO	NA, NO	2.2326	
B. Biological treatment of solid waste		NO, NE	NO, NE						NO, NE	NO, NE	NO, NE	
C. Incineration and open burning of waste	15.8047	0.3230	0.0057						0.1574	2.7351	0.0607	0.0058
D. Wastewater treatment and discharge		10.3832	0.2276						NA, IE	NA, IE	0.0100	
E. Other	NO	NO	NO						NO	NO	NO	
6. Other	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Memo items:												
International bunkers	**154.5245**	**0.0034**	**0.0050**						**0.6239**	**0.3279**	**0.1425**	**0.0490**
Aviation	154.5245	0.0034	0.0050						0.6239	0.3279	0.1425	0.0490
Navigation	NO	NO	NO						NO	NO	NO	NO
Multilateral operations	**NO**	**NO**	**NO**						**NO**	**NO**	**NO**	**NO**
CO_2 emissions from biomass	1314.4896											
CO_2 captured	NO											
Long-term storage of C in waste disposal sites	NO											
Indirect N_2O			**1.1797**									
Indirect CO_2	**82.6825**											

Annex 1-26: Inventory Year – 2015

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Net CO_2 emissions / removals	CH_4	N_2O	HFCs	PFCs	Unspecified mix of HFCs and PFCs	SF_6	NF_3	NO_x	CO	NMVOC	SO_2
	(kt)			(kt CO_2 equivalent)					(kt)			
Total national emissions and removals	**8780.6110**	**110.3835**	**5.9031**	**167.8122**	**0.0403**	**NO**	**0.0000**	**NO**	**23.4811**	**87.0305**	**55.4304**	**13.0690**
1. Energy	**9231.5931**	**27.5534**	**0.4811**						**21.6188**	**81.5147**	**12.1824**	**12.3574**
A. Fuel combustion Reference approach	9415.5922											
Sectoral approach	9229.9350	4.8894	0.1917						21.6188	81.5147	11.4666	12.3574
1. Energy industries	4737.5409	0.0928	0.0167						7.3734	2.7936	0.1911	4.6488
2. Manufacturing industries and construction	532.9098	0.0261	0.0036						0.9164	1.8245	0.3207	1.5551
3. Transport	2158.9106	0.4126	0.1144						8.7542	18.6703	2.4258	3.3598
4. Other sectors	1797.6960	4.3577	0.0568						4.5637	58.1907	8.5260	2.7814
5. Other	2.8778	0.0003	0.0001						0.0112	0.0355	0.0030	0.0124
B. Fugitive emissions from fuels	1.6581	22.6640	0.2894						0.0000	0.0000	0.7158	0.0000
1. Solid fuels	NO	NO	NO						NO	NO	NO	NO
2. Oil and natural gas and other emissions from energy production	1.6581	22.6640	0.2894						0.0000	0.0000	0.7158	0.0000
C. CO_2 Transport and storage	NO											
2. Industrial processes and product use	**615.2290**	**NO**	**NO**	**167.8122**	**0.0403**	**NO**	**0.0000**	**NO**	**1.6893**	**2.1941**	**40.9424**	**0.7059**
A. Mineral industry	510.8250								1.6204	1.2924	0.0160	0.6756
B. Chemical industry	NO	NO	NO						NO	NO	0.0118	NO
C. Metal industry	17.2792	NO	NO	NO	NO	NO	NO	NO	0.0561	0.7340	0.0221	0.0259
D. Non-energy products from fuels and solvent use	86.3698	NO	NO						0.0089	0.0503	35.8010	0.0044
E. Electronic industry				NO	NO	NO	NO	NO				
F. Product uses as substitutes for ODS				167.8122	NO	NO	NO	NO				
G. Other product manufacture and use	0.7549	NO	NO	NO	0.0403	NO	0.0000	NO	0.0038	0.1174	0.3432	NO
H. Other									NO	NO	4.7483	NO
3. Agriculture	**11.2402**	**28.9696**	**4.5493**						**NO**	**NO**	**NE, NO**	
A. Enteric fermentation		26.1360										
B. Manure management		2.8336	1.1950								NO	
C. Rice cultivation		NO										
D. Agricultural soils			3.3543									
E. Prescribed burning of savannas		NO	NO						NO	NO	NO	
F. Field burning of agricultural residues		IE	IE						IE	IE	NO, NE	
G. Liming	NO											
H. Urea application	11.2402											
I. Other carbon-containing fertilizers	NO, NE											
J. Other	NO	NO	NO						NO	NO	NO	
4. Land use, land-use change and forestry	**-1093.0947**	**0.0261**	**0.6385**						**0.0171**	**0.6123**	**NE**	
A. Forest land	-2159.4439	0.0246	0.0014						0.0157	0.5597	NE	
B. Cropland	1392.3816	0.0015	0.0026						0.0014	0.0526	NE	
C. Grassland	-418.4569	NE	NE						NE	NE	NE	
D. Wetlands	-82.7917	NE	NE						NE	NE	NE	
E. Settlements	39.1617	NE	0.6345						NE	NE	NE	
F. Other land	86.8192	NE	NE						NE	NE	NE	
G. Harvested wood products	49.2353											
H. Other	NO	NO	NO						NO	NO	NO	
5. Waste	**15.6434**	**53.8343**	**0.2342**						**0.1559**	**2.7094**	**2.3056**	**0.0057**
A. Solid waste disposal	NA, NO	43.4869							NA, NO	NA, NO	2.2355	
B. Biological treatment of solid waste		NO, NE	NO, NE						NO, NE	NO, NE	NO, NE	
C. Incineration and open burning of waste	15.6434	0.3198	0.0056						0.1559	2.7094	0.0602	0.0057
D. Wastewater treatment and discharge		10.0277	0.2286						NA, IE	NA, IE	0.0100	
E. Other	NO	NO	NO						NO	NO	NO	
6. Other	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Memo items:												
International bunkers	**218.4141**	**0.0058**	**0.0070**						**0.9076**	**0.4463**	**0.2200**	**0.0693**
Aviation	218.4141	0.0058	0.0070						0.9076	0.4463	0.2200	0.0693
Navigation	NO	NO	NO						NO	NO	NO	NO
Multilateral operations	**NO**	**NO**	**NO**						**NO**	**NO**	**NO**	**NO**
CO_2 emissions from biomass	1439.5226											
CO_2 captured	NO											
Long-term storage of C in waste disposal sites	NO											
Indirect N_2O			**0.9192**									
Indirect CO_2	**79.5560**											

Annex 1-27: Inventory Year – 2016

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Net CO_2 emissions / removals	CH_4	N_2O	HFCs	PFCs	Unspecified mix of HFCs and PFCs	SF_6	NF_3	NO_x	CO	NMVOC	SO_2
	(kt)			(kt CO_2 equivalent)					(kt)			
Total national emissions and removals	**8545.8253**	**113.4198**	**7.0461**	**175.5848**	**0.0403**	**NO**	**0.0000**	**NO**	**24.0494**	**89.6457**	**52.8600**	**12.0308**
1. Energy	**9032.6132**	**29.7056**	**0.5100**						**22.2698**	**84.9869**	**12.8957**	**11.3492**
A. Fuel combustion Reference approach	8970.2547											
Sectoral approach	9030.9428	5.2620	0.2128						22.2698	84.9869	12.1865	11.3492
1. Energy industries	4518.9699	0.0908	0.0162						7.1984	2.7454	0.1872	4.3305
2. Manufacturing industries and construction	500.7010	0.0199	0.0027						0.8499	1.2769	0.2685	1.0313
3. Transport	2331.5969	0.4819	0.1318						9.7662	19.1661	2.5173	3.6073
4. Other sectors	1677.5744	4.6692	0.0620						4.4456	61.7768	9.2109	2.3703
5. Other	2.1005	0.0002	0.0001						0.0097	0.0217	0.0026	0.0098
B. Fugitive emissions from fuels	1.6704	24.4436	0.2972						0.0000	0.0000	0.7092	0.0000
1. Solid fuels	NO	NO	NO						NO	NO	NO	NO
2. Oil and natural gas and other emissions from energy production	1.6704	24.4436	0.2972						0.0000	0.0000	0.7092	0.0000
C. CO_2 Transport and storage	NO											
2. Industrial processes and product use	**585.1146**	**NO**	**NO**	**175.5848**	**0.0403**	**NO**	**0.0000**	**NO**	**1.6158**	**1.6323**	**37.8661**	**0.6760**
A. Mineral industry	500.5774								1.5895	1.2591	0.0157	0.6655
B. Chemical industry	NO	NO	NO						NO	NO	0.0131	NO
C. Metal industry	5.2203	NO	NO	NO	NO	NO	NO	NO	0.0169	0.2204	0.0075	0.0078
D. Non-energy products from fuels and solvent use	78.6128	NO	NO						0.0055	0.0313	32.3532	0.0028
E. Electronic industry				NO	NO	NO	NO	NO				
F. Product uses as substitutes for ODS				175.5848	NO	NO	NO	NO				
G. Other product manufacture and use	0.7041	NO	NO	NO	0.0403	NO	0.0000	NO	0.0040	0.1216	0.3200	NO
H. Other									NO	NO	5.1565	NO
3. Agriculture	**12.2747**	**28.7044**	**5.6999**						**NO**	**NO**	**NE, NO**	
A. Enteric fermentation		25.9708										
B. Manure management		2.7337	1.2507								NO	
C. Rice cultivation		NO										
D. Agricultural soils			4.4492									
E. Prescribed burning of savannas		NO	NO						NO	NO	NO	
F. Field burning of agricultural residues		IE	IE						IE	IE	NO, NE	
G. Liming	NO											
H. Urea application	12.2747											
I. Other carbon-containing fertilizers	NO, NE											
J. Other	NO	NO	NO						NO	NO	NO	
4. Land use, land-use change and forestry	**-1099.6373**	**0.0143**	**0.6016**						**0.0097**	**0.3468**	**NE**	
A. Forest land	-2113.5468	0.0123	0.0007						0.0079	0.2809	NE	
B. Cropland	1393.2356	0.0019	0.0026						0.0018	0.0658	NE	
C. Grassland	-402.3693	NE	NE						NE	NE	NE	
D. Wetlands	-82.7917	NE	NE						NE	NE	NE	
E. Settlements	19.3071	NE	0.5983						NE	NE	NE	
F. Other land	85.6461	NE	NE						NE	NE	NE	
G. Harvested wood products	0.8816											
H. Other	NO	NO	NO						NO	NO	NO	
5. Waste	**15.4600**	**54.9955**	**0.2347**						**0.1541**	**2.6797**	**2.0983**	**0.0056**
A. Solid waste disposal	NA, NO	44.6069							NA, NO	NA, NO	2.0288	
B. Biological treatment of solid waste		NO, NE	NO, NE						NO, NE	NO, NE	NO, NE	
C. Incineration and open burning of waste	15.4600	0.3161	0.0056						0.1541	2.6797	0.0595	0.0056
D. Wastewater treatment and discharge		10.0725	0.2291						NA, IE	NA, IE	0.0100	
E. Other	NO	NO	NO						NO	NO	NO	
6. Other	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Memo items:												
International bunkers	**313.0386**	**0.0063**	**0.0100**						1.3124	0.6066	0.2929	0.0993
Aviation	313.0386	0.0063	0.0100						1.3124	0.6066	0.2929	0.0993
Navigation	NO	NO	NO						NO	NO	NO	NO
Multilateral operations	**NO**	**NO**	**NO**						**NO**	**NO**	**NO**	**NO**
CO_2 emissions from biomass	1561.9690											
CO_2 captured	NO											
Long-term storage of C in waste disposal sites	NE											
Indirect N_2O			**1.1410**									
Indirect CO_2	**71.4341**											

Annex 2: NAMA considered, planned and ongoing in the Republic of Moldova

The actions are presented on the basis of the information available in the NC4 of the Republic of Moldova under the UNFCCC (2018), the Low Emissions Development Strategy of the Republic of Moldova until 2030 (2016), as well as other relevant information from national programs and action plans published in the recent years.

Mitigation action 2-1: Construction of electricity and thermal power generation capacities from renewable sources

Description	Nature of action	Production of electricity and heat
	Sector	Energy
	GHG	CO_2, CH_4
	Quantitative targets	- minimum 150 MW and 400 million kWh by 2020; - maximum 800 MW and 2.137 billion kWh by 2030.
	Progress indicators	- RES capacity in operation, MW; - electricity produced by RES, MWh; - GHG emissions reduction, CO_2 tons eq.
Methods		- feed-in tariffs; - annual tendering for construction of pre-established capacities for each kind of RES: wind, solar, hydro, biogas; - GHG emissions reduction will be calculated based on the amount of electricity replaced in the national grid, as well as the national grid emission factors[1].
Assumptions		- the wind power technical potential - 9000 MW[2]; - the maximum potential of biogas sources - 50 MW; - hydro technical potential 3 MW.
Goals		- increase energy security; - GHG emissions reduction.
Undertaken steps		- the Renewable Energy Law was approved in 2007 and in 2016 it was replaced by the Law on promoting the use of energy from renewable sources, updated in March 2018[3]; - the Methodology for feed-in tariffs calculation was approved in 2009, and the Methodology for establishing the fixed tariffs and prices for the electricity produced by the RES eligible producers[4] was approved in the end of 2017; - the draft Regulation on organization of tenders for the status of eligible producer was developed in 2017; - in 2017, the Government prepared the draft Decision approving the RES capacity limits, maximum allowances and capacity categories[5]; - by 31.12.2017, ANRE approved the feed-in tariff for 44 RES electricity producers with a total installed capacity of about 17.2 MW[4]; - the Energy Strategy of the Republic of Moldova until 2030[51] was published in 2013, and a new Energy Strategy 2030 was proposed for public debate in 2018; - in 2013, the Government approved the National Action Plan for Renewable Energy for 2013-2020.
Planned steps		- the first tender for the status of eligible RES electricity producer is planned for November 2018.
Implementation progress	Outputs	As of 31.12.2017, the total power of the RES in operation was about 17 MW, including wind - 9.19 MW, generating sets on biogas - 5.71 MW, photovoltaic - 2.1 MW, hydro - 0.25 MW (except for the existing HPPs)[6].
	Estimated emissions reductions	- minimum 161,200 tons of CO_2 by 2020; - maximum 1,126,048 tons of CO_2 by 2030.

[1] Moldova Grid Emission Factor Assessment. 2017. <http://www.clima.md/lib.php?l=en&idc=243&>
[2] V. Rachier, I. Sobor, A. Chiciuc, Assessment of the Wind Energy Resource of Moldova. Meridian Ingineresc, No. 2, 2014, pp. 23-29. ISSN 1683-853X.
[3] Official Gazette no. 69-77 / 117 of 25.03.2016, the Parliament of the RM. Law no. 10 of 26.02.2016 on promotion of use of energy from renewable sources.
[4] <http://lex.justice.md/md/372482%20/>
[5] <http://particip.gov>
[6] <www.anre.md>

Mitigation action 2-2: Construction of electrical interconnections with the ENTSO-E power system

Description	Nature of action	Diversification of electricity sources, energy security
	Sector	Energy
	GHG	CO_2
	Quantitative targets	- increasing the capacity to import electricity from ENTSO-E to 870 MW by 2030[7]; - import of electricity up to 4.5 billion kWh per year.
	Progress indicators	- interconnection capacities with Romania, MW; - the amount of electricity imported from ENTSO-E, MWh; - GHG emissions reductions, CO_2 tons equivalent.
Methodology		- Construction of the first 400 kV interconnection with Romania by the end of 2022[8], with the back-to-back station to be installed at the Vulcanesti power plant of the transmission system operator SE "Moldelectrica". - construction of second interconnection400 kV with Romania towards 2025-2027[9]; - promoting the a competitive electricity sale platform by the year 2023, following the approval of the electricity market rules and creating conditions for electricity import from Romania, as a result of the asynchronous operation of the Moldovan and Romanian power systems; - CO_2 emissions reduction will be calculated based on the assessment of the energy structure by sources and the energy structure by sources in the baseline scenario, determined as the average for the last five years. For external sources, the emission factor will be zero.
Assumptions		- the average increase of electricity demand - 2.1%/year; - Romania will have sufficient power generation capacities, including RES types, to export to the RM by 2030; - Ukraine and CTEM will be able to participate in the competition for selling electricity to the RM.
Goals		- enhance energy security; - ensure effective competition on the electricity market, currently not yet in place; - reduce GHG emissions.
Undertaken steps		- the draft of the new Energy Strategy of the Republic of Moldova until 2030 establishes the target to build the interconnection with Romania's power system for asynchronous operation through back-to-back stations; - in December 2017, the Agreement between the RM, the EBRD, the EIB, the WB and the EU on loans and grants for financing the construction of the back-to-back Vulcanesti power station and the electric transmission lines, was signed.
Planned steps		- establish the interconnections ownership and management by 2018; - launch the tender for construction of interconnections by 2019; - the Government[10] designates the Electricity Market Operator following the approval of the Electricity Market Rules.
Implementation progress	Outputs	- at the request of the Government of the Republic of Moldova, the WB carried out a feasibility study which economically justified the solution of importing electricity from ENTSO-E to meet the electricity demand; - the feasibility study for the "Interconnection of the Moldovan and Romanian power systems through the Vulcanesti back-to-back station"[11] project has been developed.
	Estimated emissions reductions	- at least 10% reduction relative to CO_2 emissions under the BAU, measured at regional level.

[7] LEDS of the RM until 2030 and the Action Plan for its implementation. Government Decision no.1470 of 30.12.2016. Official Gazette 85-91 / 222 of 24.03.2017.
[8] Electricity Transport Development Plan for 2018-2027 <http://www.moldelectrica.md/files/docs/TYNDP.pdf>
[9] Energy Strategy of the Republic of Moldova until 2030. Government Decision no. 102 of 05.02.2013. 08.02.2013 in the Official Gazette no. 27-30/146 of 08.02.2013.
[10] According to the Electricity Law no. 107 of 27.05.2016, Official Gazette no. 193-203/413 of 08.07.2016.
[11] <http://www.moldelectrica.md/ro/finances/mold_rom_project>

Mitigation action 2-3: GHG emissions reduction in construction sector

Description	Nature of action	Enhance energy efficiency, RES promotion
	Sector	Energy
	GHG	CO_2, CH_4, N_2O
	Quantitative targets	- unconditional GHG emissions reduction from buildings sector by 77% by 2030, and conditional GHG emissions reduction by up to 80% compared to 1990[12]; - energy savings in residential sector up to 23.71 ktoe[13] by 2020 - energy savings in construction sector up to 47.09 ktoe[13] by 2020 according to the *bottom-up* approach; - energy savings, including by RES promotion, of cca. 250 ktoe[14] by 2030
	Progress indicators	- legislative acts in the field of construction drafted and approved annually; - building codes developed and approved annually; - implementing Energy Efficiency Roadmap for energy efficiency in buildings; - proportion of rehabilitated buildings in the total housing stock, %; - annual energy savings, GJ/year (MWh/year); - total installed biomass boiler capacity, MW; - energy produced by biomass boilers, MWh/year; - area of the installed solar collectors; - substituted solar energy, MWh/year; - heat power of the installed heat pumps, MW; - GHG emissions reduction, CO_2 tons equivalent.
Methodologies		1. The following core actions related to drafting of legislation and its implementation[13]: - drawing up the financial schemes (EU experience and proposals on using financial incentive practices in the Republic of Moldova); - the national plan for improving the energy performance of existing public and residential buildings; - the national plan to increase the number of buildings with almost zero energy consumption; - setting minimum requirements for all categories of buildings and for all construction services. 2. Core actions under the Action Plan for Harmonization of Technical Regulations and National Construction Standards with European Legislation and Standards for 2014-2020[15]: - transposing the European legislation documents in construction and related fields into national legislation; - roadmaps for adoption and implementation of European standards in specific areas; - adopting the European construction standards as Moldovan standards. 3. The buildings renovation strategy will provide for the following actions[16]: - separate inventory of the buildings stock; - monitoring and development of the Roadmap for public buildings renovation; - setting financial incentives for renovation of public/residential buildings. 4. Establish and implement financial incentives for[16]: a) measures to improve the energy performance of existing buildings, units and elements; b) promoting construction of new buildings with almost zero energy consumption and promoting conversion of existing buildings into buildings with almost zero energy consumption by: - tax cuts, tax deductions for energy modernization, reduced VAT rate for thermal insulation works, renovation; - bank loans, low interest loans, zero interest loans, costs paid on fuel bills; - financing the population at risk, energy efficiency measures in energy-poor households, for low-income households; - financial support programs for renewable energy owners/energy efficiency measures; - schemes for integrating energy from renewable sources; - green savings programs, incentives for energy-efficient heating systems; - support programs, incentives, energy grants for construction and renovation of energy-efficient buildings. 5. Creation of additional financial instruments similar to MoREEFF to cover the energy efficiency potential in residential buildings. 6. The Energy Efficiency Fund will launch a program dedicated to the renovation of multi-story residential blocks. 7. Promoting NAMA. 8. Promoting energy efficiency of the Termoelectrica SA energy distribution systems by installing the individual heat points, changing the vertical to horizontal system with separate, apartment-based metering, providing the heating system with adjustable/automation elements with the possibility of setting and maintaining the temperature in the room[17]. 9. Calculation of the GHG emissions reduction will be made based on replaced fuel or energy compared to the baseline scenario (BAU), on a case-by-case basis, as well as default emission factors set in the 2006 IPCC Guidelines, or national emission factors. BAU will take into account the respective methodologies provided for in the CDM).
Assumptions		For the residential sector: 1) The MoREEFF II credit line will continue and all funds will be used; 2) Other MoREEFF similar financial grant-based instruments generating energy savings are likely to be provided either by the EBRD, or other donors; 3) The Energy Efficiency Fund will establish a program dedicated to the private sector, especially multi-story residential buildings.
Goals		- develop and implement national programs and action plans to improve the energy performance of buildings[18]; - create and implement financial incentives for: accomplishing improvement of energy performance of the existing buildings, their units and elements; promoting construction of new buildings with almost zero energy consumption and promoting conversion of existing buildings into buildings with almost zero energy consumption [18] - use of renewable energy sources; - enhance energy security; - reduce energy consumption costs; - reduce GHG emissions.
Undertaken steps		- the Law no. 128 on the Energy Performance of Buildings[19] came into force on 1 January 2015, except for the provisions on energy performance of buildings referring to ventilation, cooling and lighting. These provisions came into force in 2017; - Action Plan for Harmonization of Technical Regulations and National Construction Standards with European Legislation and Standards for 2014-2020[20]; - MADRE and EEA signed the Roadmap for the implementation of Directive 2010/31/EU on the energy performance of buildings in the Republic of Moldova; - the EBRD, the EU and the Kingdom of Sweden credit line for the residential sector - MoREEF, was launched for 2012-2017 implementation period, totaling 35 million euro; - to stimulate investment in residential sector Sweden and the EU allocated over 11 million euro to the grant fund and technical cooperation; - the International Project "Improving Energy Efficiency Regulatory Framework in Construction Sector", funded by the EBRD shareholders' fund, totaling 4.48 million MDL[21]; - the EU provided funding worth 9.41 million euro for the Energy and Biomass Project for 2 years 2015-2017.
Planned steps		- develop and adopt the Building Renovation Strategy; - National Plan of the Republic of Moldova to increase the number of buildings with almost zero energy consumption to be considered by national and international experts[22]; - launch new EEF tenders to finance eligible projects; - implement the Roadmap for the implementation of the requirements of the Law no.128 on Energy Performance of Buildings.
Implementation progress	Outputs	- a number of new regulations have been adopted and a series of draft regulatory documents are pending approval[23]; - 36 energy efficiency projects approved in 2016, and 15 - in 2017[24]; - 17 inspections at solid biofuel producers were carried out in 2016, and 19 - in 2017; - 29 energy products tested in 2016, and 47 - in 2017; - 771 consultancy visits to inform and educate consumers in 2016, and 204 - in 2017; - consultancy for 6838 people from business environment in 2016, and 54 - in 2017; - a campaign to promote energy labelling of household electrical appliances according to the energy efficiency class was carried out in 2017; - pilot project for modernization of the district heating system with the transition to the horizontal distribution and providing 5 residential buildings with heat points[25]; - in 2017, "Termoelectrica" SA established partnerships with the residential buildings managers and made the first attempts to implement individual metering for each apartment, ensure heat temperature regulation and provide for nonstop hot water supply[26]; - the technical and financial assistance program provided by the Government of Romania to pre-school institutions in the Republic of Moldova: the total amount contracted by the end of 2017 was 26 million euro. These funds were provided to 933 kindergartens in Moldova[27];

Implementation progress	Outputs	- the achievements of the Energy and Biomass II Project in Moldova in 2015-2018[28] are the following: - 40 biomass based heat plants and 20 solar hot water systems installed in public institutions; - 523 households and micro-enterprises are heated with green energy; - 30 companies assemble or produce local biomass boilers and provide to beneficiaries; - the first laboratory for testing physical and chemical parameters of biofuel has been accredited; - the first training center for biomass heat plant operators was opened, etc.
	Estimated emission reductions	- 166.3 kt CO_2 eq by 2020 based on projected energy reductions[29]; - 846.8 kt CO_2 eq by 2030 projected for the Buildings sector[30]; - about 373.8 kt CO_2 eq emission reductions in 2020 and 589.2 kt CO_2 eq by 2030[31] without considering the energy efficiency measures and RES implementation in buildings connected to the centralized heat supply system.

[12] LEDS of the RM until 2030 and the Action Plan for its implementation. Government Decision no.1470 of 30.12.2016. Official Gazette no.85-91 / 222 of 24.03.2017.
[13] Based on the National Energy Efficiency Action Plan for 2016-2018. Government Decision no.1471 of 30.12.2016. Official Gazette no.92-102 of 31.03.2017.
[14] Based on expert estimates, taking into account the implementation of measures in the Low-Emission Development Strategy until 2030 of the Republic of Moldova.
[15] Government Decision no. 933 of 12.11.2014. Official Gazette 340-343 of 14.11.2014.
[16] Based on the National Energy Efficiency Action Plan for 2016-2018. Government Decision no.1471 of 30.12.2016. Official Gazette no. 92-102 of 31.03.2017.
[17] Termoelectrica SA <https://www.termoelectrica.md/ro_RO/development/pri-distribution-to-orizontal/>
[18] Law on Energy Performance of Buildings no.148 of 30.07.2015. Official Gazette no. 211-212 / 429 of 11.08.2015.
[19] Law on Energy Performance of Buildings, no.128 of 11.07.2014. Official Gazette no. 297-309 of 10.10.2014.
[20] Government Decision no. 933 of 12.11.2014. Official Gazette no. 340-343 of 14.11.2014.
[21] National Action Plan for Energy Efficiency for 2013-2015. Government Decision no.113 of 07.02.2013. Official Gazette no.31-35 / 158 of 15.02.2013.
[22] Octavian Calmac: Implementation measures of the ZLSAC/DCFTA have facilitated the creation of favorable conditions for businesses in the country. <https://monitorul.fisc.md/mic/octavian-calmac-masurile-de-implementare-ale-zlsac-dcfta-au-facilitat-crearea-conditiilor-favorabile-pentru-agentii-economici-din-tara.html >
[23] The list of new drafts and documents for 2017-2018 is outlined above.
[24] Report on the Implementation of the Sectoral Energy Expenditure Strategy for 2016, Report on the Implementation of the Sectoral Energy Expenditure Strategy for 2017, <http://mei.gov.md/en/content/strategies-of-expenden-cies-domain -energetic>
[25] <https://www.termoelectrica.md/ro_RO/5-blocuri-locative-din-capitala-trec-la-un-nou-sistem-de-termoficare-centralizata-este-mai-eficient-decat-incalzirea-autonoma/>, <https://www.termoelectrica.md/ro_RO/dezvoltare/realizari/>
[26] <https://www.termoelectrica.md/ro_RO/incalzire-autonoma-centralizata-inca-un-bloc-din-capitala-isi-modernizeaza-sistemul-de-distributie-a-energiei-termice/>
[27] 900 +1 kindergartens in RM renovated with the support of the Government of Romania <http://fism.gov.md/en/content/900-1-gradinite-din-moldova-renovate-with-surveillance-guidelines-romania>
[28] Energy and Biomass (Phase 2) <http://www.md.undp.org/content/moldova/en/home/projects/moldova-energy-and-biomass-project2.html>
[29] National Action Plan for Energy Efficiency for 2016-2018. Government Decision no.1471 of 30.12.2016. Official Gazette no.92-102 of 31.03.2017.
[30] Government Decision no.1470 of December 30, 2016 approving LEDS of the RM until 2030 and the Action Plan for its implementation. Official Gazette no. 85-91 / 222 of 24.03.2017.
[31] Based on experts' estimates, taking into account the Low-Emission Development Strategy of the Republic of Moldova until 2030.

Mitigation action 2-4: GHG emissions reduction from production, transport and distribution of heat

Description	Nature of action	Enhance energy efficiency, use of RES
	Sector	Energy
	GHG	CO_2, CH_4, N_2O
	Quantitative targets	- unconditional reduction of GHG emissions from the Energy sector by 74% and conditional GHG emissions reduction by up to 82% by 2030 compared to 1990[30]; - energy savings, including the use of biomass, in 2020 of about 54 ktoe.[32]
	Progress indicators	- normative acts developed and approved; - action plans for heat production by cogeneration developed and approved; - the power of new CHPs and energy produced; - heat losses in heat networks; - GHG emissions reduction, of CO_2 tons eq.
Methodologies		1. Development of the regulatory framework, including: a) creating a database and an atlas to show the heat generation potential, including from renewable energy sources, and the capacities to be installed; estimating the investments needed for the thermal power sector; b) updating the Government Decision no. 189 approving the Concept of the National Heat Supply System Renovation"[33]; c) developing and approving new plans for heat cogeneration and updating the already developed plans (36 such plans were developed in 2003, included in the Government Decision no. 1059[34], subsequently abrogated[35]) d) approving the Action Plans aimed at achieving energy efficiency targets for every three years thereafter. 2. Modernization of the distribution network and of the centralized heat supply system in Chisinau municipality, including: - replacing the substations within the district heating system with automated individual heat supply substations at the building level; - re-connection of the selected public institutions to the centralized heat supply system. 3. Upgrading the distribution network and the centralized heat supply system in Balti municipality, including: - replacing the equipment of the heat supplier, including coal based boilers, with biomass based boilers; - installation of individual heat points in buildings in Balti; - reducing losses in the distribution network. 4. Rehabilitation of thermal networks, including the existing heat points; 6. Installing condensing economizers on existing boilers; 7. Transforming existing thermal power plants into modern mini-CHPs; 8. Estimation of GHG emission reduction will be based on the CDM methodologies for each individual case; 9. GHG emission reduction will be calculated on the basis of the fuel or energy replaced compared to the baseline scenario (BAU), on a case-by-case basis, as well as the default emission factors set in the 2006 IPCC Guidelines, or country specific emission factors. The BAU shall take into account the methodologies provided by the CDM mechanism.
Assumptions		It is expected that the EBRD Project[36] will generate total savings of 19.35 ktoe between 2018 and 2020, of which[37]: – 3 ktoe primary savings due to reduced distribution losses (heat); – 7.9 ktoe primary savings resulting from the transformation phase (natural gas); – 8.45 ktoe from final consumption (natural gas and electricity); – external assistance for energy efficiency to maintain or step up its pace.
Goals		- increase energy efficiency; - create the regulatory framework for the thermal energy sector; - transpose the EU directive on efficient cogeneration; - reduce operational costs; - increase energy security; - reduce GHG emissions.
Undertaken steps		- centralized heating system in Chisinau municipality has been restructured, a new company has been set up to stop the accumulation of debt from payments [38]; - the Law no. 92 on Heat and Promotion of Cogeneration[39] has been adopted; - regulatory framework on cogeneration has been developed; - in 2017 the internal heat distribution system was upgraded by installing 283[40] individual heat points, including in 124 residential buildings[41].
Planned steps		- amend the Regulation on supply and use of thermal energy[42]; - amend the Government Decision no. 267 on optimizing the gas boilers installation procedure in apartments, individual homes and social facilities[43]; - by 2020, upgrade and reconstruct 207 km of district heating and distribution networks with expired lifetime[44]; - replace thermal insulation for 39.0 km of thermal networks by 2020[44]; - install 4,928 individual heat points in the housing stock in Chisinau by 2020[44]; - install 169 individual heat points in Balti municipality[45]; - automate the heat supply system.

Implementation progress	Outputs	During 2016-2017, in Chisinau: - the pumping station with the capacity of 2,800m^3/h was built; - 300 m of interconnection pipelines between CHP-1 and CHP-2 were built; - 9 pumps were replaced at the main pumping stations; - 312 IHPs were implemented (142 IHPs in public institutions, 170 IHPs in residential buildings); - centralized heat supply system was reconstructed in 50 public institutions, of which 43 are with real consumption; - 7181.55 m of thermal networks were rehabilitated[46].
	Estimated emission reductions	- 45.45 kt CO_2 eq by 2020[47]; - 127 kt CO_2 eq by 2020, 190 kt CO_2 eq by 2020 to 2030[48].

[32] Based on experts' estimates, taking into account the implementation of measures in the Moldova's Low-Emission Development Strategy until 2030.
[33] GD no.189 of March 20, 2003 approving the Concept of Renovation of the Republican Heat Supply System. Official Gazette no.027/203 of 28.02.2003.
[34] GD no. 1059 of 29.08.2003 approving the National Program for the Renovation and Decentralization of the Heat Supply Systems of the RM. Official Gazette no. 191-195 / 1105 of 05.09.2003.
[35] GD no. 1103 of 29.09.2008 on abrogation of Government Decisions. Official Gazette no.180-181 / 1107 of 03.10.2008.
[36] Project ID P132443: Improving the efficiency of the centralized heat supply system Termocom <http://termocom.md/termo/Asp_Soc.pdf>
[37] Based on the National Energy Efficiency Action Plan for 2016-2018, pp. 108-109. Government Decision no.1471 of 30.12.2016. Official Gazette no.92-102 of 31.03.2017.
[38] Government Decision no. 707 of 20 September 2011 „On some measures to improve the operation of centralized heat supply systems". Official Gazette no.156-159 of 23.09.2011.
[39] Law on Heat and Cogeneration no. 92 of 29.05.2014. Official Gazette no.178-184 / 415 of 11.07.2014.
[40] <https://www.termoelectrica.md/ro_RO/dezvoltare/realizari/>
[41] <https://www.termoelectrica.md/ro_RO/termoelectrica-investeste-in-modernizarea-sistemului-de-termoficare-in-124-de-blocuri-locative-si-34-de-cladiri-administrative/>
[42] Government Decision no. 434 of 09.04.1998 approving the Regulation on supply and use of thermal energy. Official Gazette no. 060 of 02.07.1998.
[43] Government Decision no. 267 of 12.03.2003 on optimizing of the procedure of installation of gas boilers in apartments, individual homes and social facilities. Official Gazette no. 46-47/272 of 14.03.2003.
[44] National Energy Efficiency Action Plan for 2013-2015. Government Decision no.113 of 07.02.2013. Official Gazette no.31-35/158 of 15.02.2013.
[45] <http://www.cet-nord.md/ru/>
[46] Report on the Implementation of the Sectoral Energy Expenditure Strategy for 2016, Report on the Implementation of the Sector Energy Expenditure Strategy for 2017, <http://mei.gov.md/en/content/strategies-of-expenden-cies-domain -energetic>
[47] Based on the National Energy Efficiency Action Plan for 2016-2018. Government Decision no.1471 of 30.12.2016. Official Gazette no. 92-102 of 31.03.2017.
[48] Based on expert estimates, taking into account the implementation of measures in the Low-Emission Development Strategy of the Republic of Moldova until 2030.

Mitigation action 2-5: Development of heat plants in manufacturing and construction industry

Description	Nature of action	Production of energy from RES
	Sector	Manufacturing and construction
	GHG	CO_2, CH_4, N_2O
	Quantitative targets	- minimum 934 TJ by 2020; - maximum 3,221 TJ by 2030.
	Progress indicators	- capacity of solar collectors or biogas installations in operation, MW; - amount of energy produced from agricultural and wood waste, TJ; - the quantity of liquid biofuel (bioethanol and biodiesel used), TJ; - GHG emissions reductions, CO_2 tons eq.
Methodologies		- provide advantageous credit lines to motivate the manufacturing and construction industry to build solar collector plants, biogas production plants to produce heat/steam; - set up financial/fiscal support mechanisms for companies developing and implementing technological processes based on the use of renewable energy; - GHG emissions reduction estimates will be calculated based on replaced fuel or energy compared to the baseline scenario (BAU), on a case-by-case basis, as well as the default emission factors set in the 2006 IPCC Guidelines, or country specific emission factors. The BAU shall take into account the methodologies provided by the CDM mechanism.
Assumptions		- at least 20% of the energy consumed by the sector will be renewable energy; - at least 69GWh will be produced from green energy as a result of the "green" energy production support[49]; - energy consumption in the sector will decrease by at least 20TJ as a result of a 1% annual increase in energy efficiency during 2020-2030[50]; - 10% of the burned fuels will be bio diesel and bioethanol; - energy intensity will reduce by 10%.
Goals		- enhance energy security; - reduce GHG emissions.
Undertaken steps		- the Law on Renewable Energy was approved in 2007 and in 2016 it was replaced by the Law on Promotion of the Use of Renewable Energy, updated in March 2018[51]; - the Law on Energy Efficiency was approved in 2010 [52]; - the National Energy Efficiency Program 2011-2020 was approved in 2011[53]; - the Energy Strategy 2030 was published in 2013[54]; - the Government approved the National Action Plan for Renewable Energy for the years 2013-2020 in 2013; - the National Development Strategy was approved in 2014: 8 solutions for growth and poverty reduction. Law no. 166/2012, amended by no. 121/2014[55]; - the Low Emissions Development Strategy of the Republic of Moldova until 2030[7] was approved in March 2017; - the National Action Plan for Energy Efficiency for 2016-2018 was approved in 2017[34]; - the "Green" Economy Promotion Program in the Republic of Moldova for 2018-2020 and the Action Plan for its implementation were approved in 2017[56].
Planned steps		- approve the new Law on Energy Efficiency in 2018; - new amendments to the Law on the Promotion of the Use of Renewable Energy will come into force in 2018.
Implementation progress	Outputs	- Several enterprises such as SA Basarabia Nord, SRL Verisin, Baiur-Agro, SprinAgroLaiola SRL, Ungheni Vin SA, Podgoria Vin SRL, JLCAGRO-MAIAC, Villa Verde, Nufarul SRL, Orhei Vit etc. have implemented energy efficiency projects during 2012-2017 (ex. steam production from biomass based boilers, biogas production and use in thermal energy production processes, installing solar collectors and heat pumps, etc.) with the support of European MoSEFF[57] and GGF TAF[58] (Green Growth Fund Technical Assistance Facility), allowing to implement advanced production technologies; - some companies have integrated solar collector systems in their production operation.
	Estimated emission reductions	- minimum 60.22 kt CO_2 by 2020; - maximum 220.5 kt CO_2 to 2030.

[49] The Program for Promoting the Green Economy in the Republic of Moldova for 2018-2020 and the Action Plan for its Implementation approved by GD no.160 of 21.02.2018.
[50] The draft Law on Energy Efficiency of 2018 pending approval. <https://gov.md/sites/default/files/document/attachments/intr18_118.pdf>
[51] Official Gazette no. 69-77/117 of 25.03.2016, the Parliament of the Republic of Moldova Law no. 10 of 26.02.2016 on Promotion of Use of Energy from Renewable Sources.
[52] Law no.142 of 02.07.2010 on Energy Efficiency. <http://lex.justice.md/md/335818/>
[53] Government Decision no.833 of 10.11.2011 on the National Energy Efficiency Program 2011-2020. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=340940>
[54] Official Gazette no.27-30 / 146 of 08.02.2013, Government Decision no.102 of 05.02.2013 on the Energy Strategy of the Republic of Moldova until 2030. <http://lex.justice.md/md/346670/>
[55] Official Gazette no.245-247/791 of 30.11.2012, Parliament of the RM. Law no.166 of 11.07.2012 on approval of the National Development Strategy "Moldova 2020", <http://lex.justice.md/index.php?action=view&-view=doc&id=345635>
[56] Official Gazette no. 68-76 / 208 of 02.03.2018, Government Decision no.160 of 21.02.2018 approving the program for promoting green economy in the Republic of Moldova for 2018-2020 and the Action Plan for its implementation. <http://lex.justice.md/viewdoc.php?action= doc & view = view & id = 374523 & lang = 1>
[57] Moldovan Sustainable Energy Financing Facility. <http://finantare.gov.md/ro/content/moseff>
[58] <http://www.ggf.lu/project-portfolio/investments/moldova/>

Mitigation action 2-6: Use of biofuels in the transport sector

Description	Nature of action	Renewable sources in transport
	Sector	Transport
	Gases (GES)	CO_2
	Quantitative targets	- 10% share of biofuels in total fuel used in the country by 2020[59].
	Progress indicators	- amount of biofuels used; - GHG emissions reductions, CO_2 tons eq.
Methodologies		- motivating biofuels marketing and consumption; - monitoring purchases of biofuels by car owners; - monitoring import of biofuels; - monitoring export of rapeseed; - setting up dedicated MRV systems on actual consumption of biofuels; - publicity and training; - GHG emissions reductions will be calculated based on the fuel replaced compared to BAU and the default emission factors set in the 2006 IPCC Guidelines.
Assumptions		- biofuel consumption of 38.5 ktoe, including 11.7 ktoe bioethanol and 26.8 ktoe biodiesel[60] by 2020; - until 2020 biofuels are not expected to be produced in the country for own consumption.
Goals		- enhance energy security; - GHG emissions reduction.
Undertaken steps		- the Moldovan-German company "Bio-Compani-Raps" has been active in Lipcani since 2006; - the Energy Strategy 2030, published in 2013, provides for achieving 10% of biofuels blend in the amount of fuel sold by 2020; - in 2018, the Government has approved the National Action Plan for Renewable Energy for 2013-2020[61], according to which the planned contribution of biofuels to achieving the 10% renewable energy target in transport energy consumption by 2020 will be fully secured on the basis of imports, while internal contribution will become relevant only if it can compete with import prices; - the Law on Promotion of the Use of Renewable Energy was approved in 2016. According to the Law, the share of energy from renewable sources in the final energy consumption should reach at least 10%[62]; - in 2018, the Government approved the "Green" Economy Promotion Program for 2018-2020 and the Action Plan for its Implementation[63], providing for integration in the transport policies of environmental provisions that encourage use of alternative fuels and new technologies in all types of transport.
Planned steps		- development and approval of the secondary regulatory framework.
Implementation progress	Outputs	- biofuels were not used in the country, while 887.05 tons of rapeseed was processed in 2009, generating more than 261.5 tons of biofuel (exported)[64].
	Estimated emissions reductions	50 thousand tons of CO_2 by 2030

[59] Energy Strategy of the Republic of Moldova until 2030, GD no. 102/2013. <http://lex.justice.md/md/346670/>
[60] GD no. 1073 of 27.12.2013 approving the National Action Plan for Renewable Energy for 2013-2020. <http://lex.justice.md/viewdoc.php?action=view&view=doc&id=351034&lang=1>
[61] <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=351034>
[62] <http://lex.justice.md/md/363886/>
[63] <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=374523>
[64] <http://mediu.gov.md/images/documente/starea_mediului/rapoarte/nationale/p7_Anuarul_IES_2009.pdf>

Mitigation action 2-7: Electric buses and hybrid minibuses in Chisinau municipality

Description	Nature of action	Public, electric and hybrid transport in the Chisinau municipality
	Sector	Transport
	Gases (GHG)	CO_2, N_2O, CH_4
	Quantitative targets	- starting 2019, within 10 years, 100% of the Diesel buses in the Chisinau municipality replaced by electric engines, 100% of Diesel minibuses in Chisinau municipality replaced by hybrid engines[65].
	Progress indicators	- the number of public transport units replaced; - lower fuel consumption; - GHG emissions reductions, CO_2 tons equivalent.
Methodologies		- monitoring the procurement of public transport units with electric engines; - the use of default emission factors; - GHG emissions reduction estimates will be calculated based on the amount of fuel replaced compared to the BAU, and the default emission factors from the 2006 IPCC Guidelines.
Assumptions		- all Diesel buses in Chisinau municipality replaced with electric engines[58] by 2030; - all Diesel minibuses in Chisinau municipality replaced with hybrid engines by 2030[66].
Goals		- enhance energy security; - GHG emissions reduction; - reduction of pollution at local level, including noise pollution; - reduce the frequency of human illnesses caused by atmospheric air pollution.
Undertaken steps		- following the amendments made to the Fiscal Code, starting with 2017, the excise tax rate for hybrid motor cars was reduced by 50%; - the Program for the Promotion of the Green Economy in the Republic of Moldova for the years 2018-2020 was published in 2018.
Planned steps		- develop and approve the secondary regulatory framework, amend the existing regulatory framework.
Implementation progress	Outputs	The first electric bus was tested in the streets of Chisinau[67] in May 2018. According to the local public authorities such transport units could be assembled locally, provided the appropriate financial resources are identified. Following the amendments made to the Fiscal Code[68] starting with 2017, the excise tax rate for hybrid motor cars was reduced by 50% for cars imported in the country. As a result, import of hybrid cars increased, and from approx. 23 thousand cars imported in 2017, 13% were hybrid cars[69].
	Estimated emissions reductions	21 thousand tons CO_2 by 2030

[65] Hybrid and electric buses and minibuses in the city of Chisinau. NAMA Seeking Support for Implementation. Chisinau, 2017.
[66] Electric and hybrid buses and minibuses in the city of Chisinau. Rationale to support the application for registration in the UNFCCC NAMA Register. Chisinau, 2017.
[67] < http://protv.md/stiri/actualitate/primul-autobuz-electric-a-ajuns-la-chisinau-de-maine-va-circula---2250151.html>
[68] <http://lex.justice.md/md/368097/>
[69] <http://autoblog.md/invazie-de-masini-hibride-2017-moldova-topul-celor-mai-populare-modele-dominat-de-toyota/>

Mitigation action 2-8: Co-incineration of alternative fuels (biomass and municipal solid waste) in the clinker furnace at Lafarge Cement (Moldova)

Description	Nature of action	Co-incineration of alternative fuels (biomass and municipal solid waste)
	Sector	Industrial Processes and Products Use
	Gases (GHG)	CO_2
	Quantitative targets	The Lafarge Holcim Group member companies have set the following CO_2 reduction targets compared to 1990[70, 71]: 2020 - 33% reduction in CO_2 emissions per ton of cement; 2025 - 37% reduction in CO_2 emissions per ton of cement; 2030 - 40% reduction in CO_2 emissions per ton of cement.
	Progress indicators	- the total amount of cement and clinker produced annually, thousands of tons/year; - the specific amount of clinker used to produce cement, t/t; - total fuel consumption used for cement production, TJ/year; - CO_2 process emissions from cement production, thousands of tons/year; - CO_2 emissions from combustion of fuel in the cement production process, thousands tons/year; - trend in the default emission factor, tons CO_2 from combustion of fuel/ton of cement; - trend in the default emission factor tons CO_2 process/ton of cement; - trend in the default emission factor, total tons CO_2 (combustion + process)/ton of cement.
Methodologies		- CO_2 combustion emissions and CO_2 combustion emissions projections from cement production were calculated according to Tier 1 methodology, available in the 2006 IPCC Guidelines, Vol. 2, Chapters 1 and 2; - CO_2 process emissions from cement production, and CO_2 process emissions projections were calculated according to Tier 2 methodology available in the 2006 IPCC Guidelines, Vol. 3, Chapter 2; - MRV of mitigation measures for CO_2 emissions from clinker production.
Assumptions		With respect to Lafarge Cement (Moldova), the following production output is assumed: 2020 - 700 thousand tons of cement, 2025 - 900 thousand tons of cement, 2030 - 1100 thousand tons of cement (the cement production level in 1990 – 1100.256 thousand tons); specific clinker consumption per ton of cement: 2020 - 0.750 t/t, 2025 - 0.725 t/t, 2030 - 0.700 t/t (to compare with 1990 - 0.788 t/t). With reference to historical fuel consumption period, during 1990-1995 the enterprise used exclusively petcoke, while during 1995 - 2016 it used natural gas in combination with other types of fuels, but consumption of natural gas decreased considerably in the last decade due to the high price - for example from 85.4 million m^3 in 2007 to 1.9 million m^3 in 2016. The evolution of prices for natural gas over the recent years allow to assume that natural gas consumption will tend to increase in the short and medium term; since 2008 the company started to use coal (anthracite) because of its lower price compared to natural gas. Coal consumption ranged between 26 and 81 thousand tons over 2008-2016. It is assumed that by 2020 the company will continue to use coal, but in the future it will give up this type of fuel in favor of natural gas which is less harmless environmentally due to its lower carbon content.
Goals		- the CO_2 emissions reduction target per ton of cement, as announced by the Lafarge Holcim Group by 2030 is by 40% less than in 1990; - substitution of clinker in cement production.
Undertaken steps		The following documents were approved: - National Energy Efficiency Program 2011-2020, GD no. 833/2011[72]; - Energy Strategy of the Republic of Moldova until 2030, GD no. 102/2013[73]; - Waste Management Strategy of the Republic of Moldova for 2013-2027, GD no. 248/2013[74]; - Environmental Strategy for 2014-2023 and the Action Plan for its implementation, GD no. 301/2014[75]; - Moldova's Low-Emission Development Strategy until 2030 and the Action Plan for its implementation, GD no. 1470/2016[76]; - compared to 1990, the efforts of the Lafarge Holcim Group to reduce CO_2 emissions resulted in 21.7% reduction in CO_2 emissions per ton of cement in 2010, specific CO_2 reductions per ton of cement accounted for 24% by the end of 2015; - to meet its environmental sustainability commitment, the Lafarge Holcim Group has developed new types of cement, such as CEMFORT[77], with a lower clinker content than in traditional products[78,79], as well as hydraulic binders (ROADMIX, FILLER) for road infrastructure projects. The new products have been created to better respond to customer needs. The formula of all new products from the Lafarge Holcim Group allows for a significant CO_2 emissions reduction; - on 16.11.2017 Lafarge Cement (Moldova) inaugurated a Center for Innovation in Chisinau[80], which is part of Lafarge Holcim's international network of construction research laboratories, designed to harness the Group's global experience and know-how to develop construction solutions tailored to the unique features of local markets.
Planned steps		- develop new types of cement with smaller clinker content than in traditional products; - use of alternative energy sources to those traditionally used in the enterprise lately, preference will be given to more fuel-efficient and environmentally friendly fuels (with lower carbon content); - amend Art. 17 "Waste incineration and co-incineration" of the Law no. 209 of 29.07.2016, by including the provisions on using incineration and/or co-incineration waste, making it possible to continue the practice of co-incineration of alternative fuels (biomass and municipal solid waste) in the clinker furnace, aiming at energy recovery from waste at cement production at Lafarge Cement (Moldova).
Implementation progress	Outputs	Between 1990 and 2016, cement production at Lafarge Cement (Moldova) decreased by 59.4%, from 1,100.256 thousand tons to 446.270 thousand tons; clinker production decreased by 59.8%, from 866.708 thousand tons to 348.112 thousand tons; energy consumption decreased by 63.2%, from 3,881.21 TJ to 1,426.7 TJ; the specific clinker consumption per ton of cement reduced by 1%, from 0.788 t/t to 0.780 t/t; the default emission factor expressed in tons of CO_2 from fuel combustion per TJ decreased from 1.9%, from 97.5 t CO_2 TJ to 95.7 t CO_2/TJ. At the same time during 1995-2007 when the enterprise used only natural gas, the default emission factor was 56.1 t CO_2/TJ; the default emission factor, total CO_2 emissions (process + combustion) per ton of cement reduced by about 5.8%, from 0.7690 tons of CO_2/ton of cement in 1990 to 0.7244 tons of CO_2/ton of cement in 2016.
	Emissions reductions	Total CO_2 emissions reduction (fuel combustion and process) from cement production at Lafarge Cement plant (Moldova) under the WAM scenario is projected to be about 15-30 thousand tons of CO_2 by 2020, and about 35-50 thousand tons of CO_2 by 2030 under the WM scenario.

[70] <http://www.lafarge.md/wps/portal/md/7_3-TheNews_Detail?WCM_GLOBAL_CONTEXT=/wps/wcm/connectlib_md/Site_md/AllPR2/PressRelease_1327993713495/PR_Header>
[71] Lafarge Holcim <https://www.lafargeholcim.com/climate>
[72] Government Decision no. 833 of 10.11.2011 on the National Energy Efficiency Program 2011-2020. Published on 18.11.2011 in the Official Gazette no. 197-202, art. 914 <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=340940>
[73] Government Decision no. 102 of 05.02.2013 on the Energy Strategy of the Republic of Moldova until 2030. Published on 08.02.2013 in the Official Gazette no. 27-30, art. 146. <http://lex.justice.md/md/346670/>
[74] Government Decision no. 248 of 10.04.2013 approving the Waste Management Strategy in the Republic of Moldova for 2013-2027. Published on 12.04.2013 in the Official Gazette no. 82, art.306. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=347341>
[75] Government Decision no. 301 from 24.04.2014 approving the Environmental Strategy for 2014-2023 and Action Plan for its implementation. Published on 06.05.2014 in the Official Gazette no. 104-109, art. 328. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=352740>
[76] Government Decision no. 1470 of 30.12.2016 approving the Low-Emission Development Strategy of the Republic of Moldova until 2030 and the Action Plan for its implementation. Published: 24.03.2017 in the Official Gazette no. 85-91, art.222. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=369528>
[77] Lafarge Cement plant (Moldova) (2017), CEMFORT is a composite Portland cement with hardening fast (R) and high workability. The main constituents are Portland Clincher between 65-79% and 21-35% high lime admixture. <http://docplayer.ru/51293331-Ciment-pentru-betoane.html>
[78] Lafarge Cement Plant (Moldova) (2017), Cement CEM II AS 32.5R is a composite cement type Portland for conventional concrete with high initial strength and high workability. The main constituents are clinker between 80-94% and mixed addition in the proportion of 6-20%. <http://www.lafarge.md/wps/portal/md/2_3_A-Detail?WCM_GLOBAL_CONTEXT=/wps/wcm/connectlib_md/Site_md/AllProductDataSheet/ProductDatasheet+Exemple_1413538963872/ProductDatasheet+RO>
[79] Lafarge Cement plant (Moldova) (2017), Cement CEM I 42.5 R cement is Portland a concrete type extra hard. It is a cement without added, with high initial strength for concrete, with fast cure. The main constituents are the Portland clinker (95-100%) and minor components (0-5%). < http://www.lafarge.md/wps/portal/md/2_3_A-Detail? WCM_GLOBAL_CONTEXT =/wps/wcm/connectlib_md/Site_md/AllProductDataSheet/ProductDatasheet + Exemple_1308902180501/Product Datasheet + RO >
[80] Lafarge Cement Plant (Moldova) (2017), Press Release from 16.11.2017. Lafarge Moldova inaugurates an Innovation Center in Chisinau. <http://www.lafarge.md/wps/portal/md/7_2-LatestNews_Detail?WCM_GLOBAL_CONTEXT=/wps/wcm/connectlib_md/Site_md/AllPR/PressRelease_1511126081427/PR_RO>

Mitigation action 2-9: Implementing the energy management system and increasing the share of glass chips in batch at the SE "Chisinau Glass Factory"

Description	Nature of action	Energy efficiency, recycling of glass fragments
	Sector	Industrial Processes and Products Use
	Gases (GHG)	CO_2
	Quantitative targets	- reducing CO_2 combustion emissions by 70% by 2030 per ton of glass, compared to 1990; - reducing CO_2 process emissions by 37% by 2030 per ton of glass, compared to the weighted average recorded over the period 2009-2017, by increasing the share of glass chips in batch.
	Progress indicators	- total amount of glass produced annually, thousand tons/year; - total fuel used to produce glass, TJ/year; - CO_2 process emissions from glass manufacturing, thousands of tons/year; - CO_2 emissions from combustion of fuel in the glass production process, thousands tons/year; - trend in the default emission factor, tons CO_2 from combustion of fuel/ton of glass; - trend in the default emission factor, tons CO_2 process/ton of glass; - trend in the default emission factor, total CO_2 tons (combustion + process)/ton of glass.
Methodologies		- CO_2 combustion emissions and CO_2 combustion emissions projections from glass production were calculated according to Tier 1 methodology, available in the 2006 IPCC Guidelines, Vol. 2, Chapters 1 and 2; - CO_2 process emissions from glass production, and CO_2 process emission projections were calculated according to Tier 2 methodology available in the 2006 IPCC Guidelines, Vol. 3, Chapter 2; - MRV of mitigation measures for CO_2 emissions from glass production.
Assumptions		- With respect to SE "The Chisinau Glass Factory", the following production output is assumed: 2020 - about 60 thousand tons of glass, 2025 - about 80 thousand tons of glass, 2030 - about 100 thousand tons of glass (glass production level close to 1990 - 98 thousand tons of glass and 1991 - 99 thousand tons of glass); the share of glass chips in batch is expected to increase: in 2020 - to 35% or 21 thousand tons, in 2025 - to 45% or 36 thousand tons, in 2030 - to 55% or 55 thousand tons (to compare with, in 2017 the share of glass chips in batch was 28%, or about 7.9 thousand tons). Consumption of natural gas will amount to about 344.8 TJ in 2020; to about 431 TJ in 2025; and to about 517.2 TJ in 2030. Default values of the CO_2 combustion emission factor will account for 322.4 kg CO_2 per ton of glass in 2020; 302.2 kg CO_2 per ton of glass in 2025; 290.2 kg CO_2 per ton of glass in 2030 (to compare with: 1003.3 kg CO_2 per ton of glass in 1990; 969.1 kg CO_2 per ton of glass in 2000; 854 kg CO_2 per ton of glass in 2005; 494.1 kg CO_2 per ton of glass in 2010; 329.4 kg CO_2 per ton of glass in 2017). The default values of the CO_2 process emission factor will account for 130 kg CO_2 per ton of glass in 2020; 110 kg CO_2 per ton of glass in 2025; 90 kg CO_2 per ton of glass in 2030 (to compare with: 150 kg CO_2 per ton of glass in 2013; 155.8 kg CO_2 per ton of glass in 2014, 149.8 kg CO_2 per ton of glass in 2015, 143.9 kg CO_2 per ton of glass in 2017).
Goals		- With reference to combating climate change and mitigating CO_2 emissions, the SE "Chisinau Glass Factory" focuses on the variable cost of glass production, with emphasis on energy efficiency measures, and defines the following priorities at the company level: efficient energy resources management and industrial and operational capacity increase; - The enterprise development strategy for 2016-2020 provides for the development, production and promotion of a wide range of products including standard products and high quality exclusive products[81]. The main purpose of the investment program implemented by the company over 2016-2020 is to ensure the company's further development based on increased production efficiency, which means offering high-quality products at competitive prices while meeting the environmental protection standards; - The objectives to be achieved by implementing the investment program are: increased export due to competitiveness of glass products; increased production efficiency as a result of partial repair of the glass melting furnace, capital repair of the glass forming machines, upgrading the power transmission line; - The investment program specifically provides for: partial repairs of the glass melting furnace using high quality refractory materials; capital repairs of the technological equipment; upgrading the sand processing line in the components section; upgrading the power transmission line; capital repairs of the roof; upgrading the products storing facilities (ramp); The partial repairs of the glass melting furnace included design works, purchasing of high quality refractory materials from manufacturers using advanced technologies, delivery and transportation, repairs of the automatic control system, glass melting furnace repair works, heating and starting up the glass melting furnace; - The objective of specific CO_2 combustion emissions reduction per ton of glass for 2030 is minus 70% compared to 1990 levels; respectively, reducing of CO_2 process emissions by about 37% per ton of glass by 2030 compared to the weighted average achieved in 2009-2017, by increasing the share glass chips in batch.
Undertaken Steps		Approved: - National Energy Efficiency Program 2011-2020, GD no. 833/2011[82]; - Energy Strategy of the Republic of Moldova until 2030, GD no. 102/2013[83]; - Waste Management Strategy for the Republic of Moldova for 2013-2027, GD no. 248/2013[84]; - Environmental Strategy for 2014-2023 and the Action Plan for its implementation, GD no. 301/2014 85; - Low-Emission Development Strategy of the Republic of Moldova until 2030 and the Action Plan for its implementation, GD no. 1470/2016[86] (Specific objective 4 provides for the unconditional reduction by 2020 of industrial GHG emissions by 45% and conditional reduction of GHGs by up to 56% compared to 1990, while Action 4.1 of the Action Plan for Strategy implementation provides for implementation of the energy management system and the National Standard ISO 50001: 2012 in 39 industrial enterprises in the country, and Action 4.3 of the Action Plan for Strategy implementation provides for promotion of energy efficiency in the industrial sector); - by the end of 2017, specific CO_2 emissions reductions per ton of glass accounted for 67.2%, compared to 1990; - aiming at fulfilling its environmental sustainability commitment, the SE "Chisinau Glass Factory" is implementing an investment program for 2016-2020 worth about 5.5 mil. Euro, including about 1 mil. Euro from its own financial sources; 3.5 mil. Euro from the funds granted by financial institutions; the remaining 1.0 mil. Euro is expected to be provided by the founder of the enterprise.
Planned steps		- implement the energy management system (EnMS) and the national standard SM ISO 50001: 2012; - promote energy efficiency; - increase in the share of glass chips in batch in order to reduce the cost of product and reduce CO_2; - implement the investment program for 2016-2020.
Implementation progress	Outputs	- Compared to 1990, by the end of 2015, specific CO_2 emissions reductions per ton of glass accounted for 68.7%, and by the end of 2017 specific CO_2 reductions per ton of glass accounted for 67.2%.
	Estimated emissions reductions	Total CO_2 emissions (fuel combustion and process) reduction from glass production at the SE "Chisinau Glass Factory" is expected to reach circa 15-25 thousand tons CO_2 by 2020 under the WAM scenario, and by about 30-45 thousand tons of CO_2 by 2030 under the WM scenario.

[81] Business Plan for the 2016-2020 SE „Chisinau Glass Factory", approved by the Board of Directors Decision, Minutes no. 29 of 24.11.2016. <http://www.glass.md/img/files/Panul%20de%20afaceri%202016%20-2020.pdf>
[82] Government Decision no. 833 of 10.11.2011 on the National Energy Efficiency Program 2011-2020. Published on 18.11.2011 in the Official Gazette no. 197-202, art. 914, <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=340940>
[83] Government Decision no. 102 of 05.02.2013 on the Energy Strategy of the Republic of Moldova until 2030. Published on 08.02.2013 in the Official Gazette no. 27-30, art. 146. <http://lex.justice.md/md/346670/>
[84] Government Decision no. 248 of 10.04.2013 approving the Waste Management Strategy of the Republic of Moldova for 2013-2027. Published on 12.04.2013 in the Official Gazette no. 82, art. 306. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=347341>
[85] Government Decision no. 301 of 24.04.2014 approving the Environmental Strategy for 2014-2023 and the Action Plan for its implementation. Published on 06.05.2014 in the Official Gazette no. 104-109, art. 328. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=352740>
[86] Government Decision no. 1470 of 30.12.2016 approving the Low-Emission Development Strategy of the Republic of Moldova until 2030 and the Action Plan for its implementation. Published on 24.03.2017 in the Official Gazette no. 85-91, art. 222. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=369528>

Mitigation action 2-10: Soil conservation and fertility enhancement

Description	Nature of action	Sustainable practices in agricultural soils cultivation
	Sector	Agriculture, agricultural soils
	Gases (GHG)	N_2O, CO_2
	Quantitative targets	Use of chemical fertilizers: - nitrogen: 50-55 thousand tons by 2020, 75-90 thousand tons by 2030; - natural organic: 22-25 thousand tons by 2020, 34-37 thousand tons by 2030. Use of green fertilizers equivalent to mineral fertilizers: - 700-1400 thousand tons by 2020; - 2100-2800 thousand tons by 2030. Area of conservation agriculture: - 100-200 thousand hectares by 2020; - 300-400 thousand hectares by 2030.
	Progress indicators	- amount of chemical fertilizers; - amount of organic fertilizers of animal origin; - amount of green fertilizers; - area of conservation agriculture lands.
Methodologies		- appropriate implementation of the Soil Conservation and Fertility Enhancement Program for 2011-2020, GD no. 626/2011[87], and the Action Plan for the implementation of the Soil Conservation and Fertility Enhancement Program for 2014-2016, GD no. 138/2014[88], Action Plan for the implementation of the Soil Conservation and Fertility Enhancement Program for the years 2017-2020, GD no. 554/2017[89], the Action Plan on implementation of the National Strategy for Agricultural and Rural Development for 2014-2020, GD no. 742/2015[90]; - motivating conservation agriculture development; - "no-till" and "mini-up" technologies; - publicity and training on sustainable agriculture; - MRV for conservation agriculture; - direct and indirect N_2O emissions and projections of direct and indirect N_2O emissions from agricultural soils were calculated according to Tier 1 calculation methodology available in the 2006 IPCC Guidelines, Vol. 3, Chapter 11; - CO_2 emissions from agricultural soils, and projections of CO_2 emission from agricultural soils were calculated according to Tier 1 calculation methodology available in the 2006 IPCC Guidelines, Vol. 4, Chapter 2, alternatively calculated according to the specific national methodology, equivalent to Tier 3 (Banaru, 2000)[91].
Assumptions		- for green manure (autumn vetch as an intermediate crop) the following basic parameters were taken into account: average green mass humidity - 80%; average content of nitrogen in green mass - 0.8%; average productivity - 20 t/ha; the coefficient of passage to manure with litter - 1.4 (in other words, 1 ton of green mass of vetch is equivalent to 1.4 tons of cattle manure with litter in terms of nitrogen content); - introduction of intermediate crops as green manure will be carried out in parallel with the implementation of the "no-till" and "mini-till" conservation agriculture technologies; - projections were made based on the information available in the Land Reclamation and Soil Fertility Enhancement Program (Part II, Soil Fertility Enhancement), GD no. 841/2004[92]; the Soil Conservation and Fertility Enhancement Program for 2011-2020, GD no. 626/2011, the Action Plan for implementation of the Soil Conservation and Fertility Enhancement Program for 2014-2016, GD no. 138/2014, and the Action Plan for Implementation of the Soil Conservation and Fertility Enhancement Program for 2017-2020, GD no. 554/2017; the National Strategy for Agricultural and Rural Development for 2014-2020, GD no. 409/2014[93], and the Action Plan for implementation of the National Strategy for Agricultural and Rural Development for 2014-2020, GD no. 742/2015; - the total amount of mineralized nitrogen was determined in accordance with the "Method for Calculating GHG Emissions from Agricultural Soils" (Banaru, 2000); - on conservation agriculture areas, 75-90% of the main crop residues will remain in the field to form the mulch.
Goals		- reach a neutral or slightly positive carbon and humus balance in soil by 2030; - increase soil productivity avoiding erosion; - limit growth trends and reduce direct GHG emissions (N_2O and CO_2) from agricultural soils.
Undertaken steps		The following have been approved and are under implementation: - Soil Conservation and Fertility Enhancement Program for 2011-2020, GD no. 626/2011; - National Development Strategy "Moldova 2020", Law no. 166/2012[94]; - Environmental Strategy for 2014-2023 and the Action Plan for its implementation, GD no. 301/2014[95]; - National Strategy for Agricultural and Rural Development for 2014-2020, GD no. 409/2014; - Action Plan for implementation of the National Strategy for Agricultural and Rural Development for 2014-2020, GD no. 742/2015; - Action Plan for implementation of the Soil Conservation and Fertility Enhancement Program for 2014-2016, GD no. 138/2014; - Financing Agreement between the Government of the Republic of Moldova and the European Commission regarding the implementation of the ENPARD Moldova Program - support for agriculture and rural development, promulgated by the Decree of the President of the Republic of Moldova no. 1815 of 12.11.2015[96]; - Low-Emission Development Strategy of the Republic of Moldova until 2030 and Action Plan for its implementation, GD no. 1470/2016[97]; - Action Plan for implementation of the Soil Conservation and Fertility Enhancement Program for 2017-2020, GD no. 554/2017; - Program for Promoting the Green Economy in the Republic of Moldova for 2018-2020 and Action Plan for its implementation, GD no. 160/2018[98].
Planned steps		1) Full implementation of: - Soil Conservation and Fertility Enhancement Program for 2011-2020, GD no. 626/2011; - National Development Strategy "Moldova 2020", Law no. 166/2012; - Environmental Strategy for 2014-2023 and the Action Plan for its implementation, GD no. 301/2014; - National Strategy for Agricultural and Rural Development for 2014-2020, GD no. 409/2014; - Action Plan for implementation of the National Strategy for Agricultural and Rural Development for 2014-2020, GD no. 742/2015; - Financing Agreement between the Government of the Republic of Moldova and the European Commission regarding the implementation of the ENPARD Moldova Program - support for agriculture and rural development, promulgated by the Decree of the President of the Republic of Moldova no. 1815 of 12.11.2015; - Low-Emission Development Strategy of the Republic of Moldova until 2030 and the Action Plan for its implementation, GD no. 1470/2016; - Program for promotion of green economy in the Republic of Moldova for 2018-2020 and the Action Plan for its implementation, GD no. 160/2018. 2) Developing and approving the long-term secondary policy, legislative and regulatory framework (by 2030).
Implementation progress	Outputs	- the State provides financial incentives for procurement of agricultural machinery needed for advanced soil cultivation technologies (the amount of support for agricultural machinery and equipment is conventional calculated as 25% cost compensation (per unit), but not exceeding 300 thousand MDL per beneficiary, while for "no-till" and "mini-till" technologies, the amount of support is calculated as 30% cost compensation per unit, but not exceeding 500 thousand MDL per beneficiary); according to the GD no. 455 of 21.06.2017 on allocation of the funds of the National Fund for Agriculture and Rural Development (NFARD)[99], the Fund accumulated 900 million MDL in 2017, or by 28% more than in 2016, of which 231 million MDL from the EU-funded ENPARD budget support program. Most applications for funding – 2,110, or almost 1/3 of the total number of applications received, were submitted for sub-action 1.3 "Stimulating investments for procurement of agricultural machinery and equipment" and sub-action 2.4 "Stimulating investments for procurement of "no till" and "mini-till" equipment, amounting to more than 237 million MDL[100,101]; - the total number of applicants for purchasing "no-till" and "mini-till" equipment through NFARD in 2016 was 121; the total amount applied for – 20,901 million MDL; the total number of beneficiaries - 107; the total amount authorized by the Agency for Intervention and Payments in Agriculture - 18,165 million MDL; various types of "no-till" and "mini-till" technology were purchased, including: 54 no-till seed drills, 38 scarificators, 31multifunction combined cultivators, 128 agricultural machines; - 1,850 applications for financial support from NFARD worth 178.050 million MDL were received in 2017, and various types of "no-till" and "mini-till" equipment were purchased, including: 110 "no-till" seed drills, 52 scarificators, 3 multifunctional combined cultivators, 981 agricultural tractors, 128 combines, 2,646 other agricultural machinery and equipment; - according to the Ministry of Agriculture and Food Industry Activity Report for 2015[102] the "no-till"/"mini-till" area has expanded from 85 thousand ha in 2013 to 150 thousand ha in 2014 and was maintained at the same level in 2015 when "mini-till" technology areas accounted for 79%, "no-till" technology areas accounted for 20% and "strip-till" - for 1% of the 150 thousand ha; - according to the Information Note to the Draft Government Decision approving the Action Plan for the implementation of the Soil Conservation and Fertility Enhancement Program for 2017-2020[103] in 2016, about 30 economic agents successfully implemented the new ("mini-till" and "no-till") soil fertility enhancement technologies on about 139.7 thousand ha of agricultural soils in all regions of the country, but preponderantly in the northern part of the country, which resulted in savings of about 2 million liters of diesel, or 34 million MDL per year; - at the same time, the "no-till"/"mini-till" technology areas cultivated with the support of the National Agriculture and Rural Development Fund (NFARD) increased to about 60,634 ha in 2017 (about 53,530 ha in 2016 and 40,100 ha in 2015); - according to the data of the "Competitive Agriculture in Moldova" (CAMP) project (November 2012 - June 2019)[104], the sustainable land management practices were used on about 6,452.7 ha in 2016; the demonstration plots in the field schools for farmers were developed on 437.6 ha; 300 farmers used "no-till" technologies and sustainable land management practices; 350 agricultural producers implemented soil conservation technology; in 2016, supported by the MACP Project, 16 beneficiaries received grants totaling US$ 241,819; in 2016, with the support of the Rural Economic Climate Resilience Program implemented by IFAD, a total of US$ 289,157 in the form of grants were approved for 33 beneficiaries;

Implementation progress	Outputs	- according to the National Bureau of Statistics of the Republic of Moldova and the State Statistical Service of the Ministry of Economic Development of the UATSN, the amounts of chemical nitrogen fertilizer applied in soil have evolved during the period of 1990-2016 as follows: 1990 - 92.1 tons of active substance, 1995 - 10.5 thousand tons, 2000 - 10.2 thousand tons, 2005 - 16.1 thousand tons, 2010 - 20.6 thousand tons, 2011 -25.0 thousand tons, 2012 - 34.1 thousand tons, 2013 - 42.1 thousand tons, 2014 - 61.1 thousand tons, 2015 - 38.7 thousand tons, 2016 - 43.4 thousand tons. The trend of growing consumption of mineral nitrogenous fertilizers is expected to continue; - according to the information available in the "National Inventory Report 1990-2015. Greenhouse Gas Sources and Sinks in the Republic of Moldova"(2017), the amounts of natural organic fertilizers applied in soil (mainly cattle, swine and poultry manure with bedding) have evolved during the period 1990-2016 as follows: 1990 -9.91 mil. tons, 1995 - 6.15 mil. tons, 2000 - 3.84 mil. tons, 2005 - 3.79 mil. tons, 2010 - 3.37 mil. tons, 2011 - 3.09 mil. tons, 2012 - 2.85 mil. tons, 2013 - 2.71 mil. tons, 2014 - 2.95 mil. tons, 2015 -2.87 mil. tons, 2016 - 2.98 mil. tons. Based on the evolution of livestock and poultry numbers in the RM, consumption of natural organic fertilizers is expected to range between 3.0 - 3.5 mil. tons until 2020.
	GHG emissions	Limit the growth of N_2O emissions from the 3D "Agricultural Soils" source category by 2030 by 3.8% under the WM scenario, and by about 4.8% under the WAM scenario, relative to the reference year (1990).

[87] Government Decision no. 626 of 20.08.2011 approving the Soil Conservation and Fertility Enhancement Program for 2011-2020. Published on 26.08.2011 in the Official Gazette no. 139-145, art. 696. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=339882>
[88] Government Decision no. 138 of 24.02.2014 approving the Action Plan for implementation of the Soil Conservation and Fertility Enhancement Program for 2014-2016. Published on 28.02.2014 in the Official Gazette no. 49-52, art. 154. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=351879>
[89] Government Decision no. 554 of 14.07.2017 approving the Action Plan for implementation of the Soil Conservation and Fertility Enhancement Program for 2017-2020. Published on 21.07.2017 in the Official Gazette no. 253-264, art.650. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=371387>
[90] Government Decision no. 742 of 21.10.2015 approving the Action Plan for implementation of the National Strategy for Agricultural and Rural Development for 2014-2020. Published on 30.10.2015 in the Official Gazette no. 297-300, art. 835. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=361669>
[91] Banaru, Anatol (2000), Method for Calculating GHG Emissions from Agricultural Soils. Collection of Works „Climate Change. Research, Studies, Solutions". Ministry of Environment and Territorial Planning / UNDP Moldova. „Bons Offices" Ltd. Chisinau, 2000, pp. 115-123.
[92] Government Decision no. 841 of 26.07.2004 approving the Land Reclamation and Soil Fertility Enhancement Program (Part II: Soil Fertility Enhancement). Published on 13.08.2004 in the Official Gazette no. 138-146, art. 1066. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=305055>
[93] Government Decision no. 409 of 04.06.2014 approving the National Strategy for Agricultural and Rural Development for 2014-2020. Published on 10.06.2014 in the Official Gazette no. 152, art. 451. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=353310>
[94] Law no. 166 of 11.07.2012 approving the National Development Strategy „Moldova 2020". Published on 30.11.2012 in the Official Gazette no. 245-247, art. 791. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=345635>. Amended by Law no. 121 of 03.07.2014 amending and supplementing the annex to the Law no. 166 of July 11, 2012 approving the National Development Strategy „Moldova 2020" Published on 03.10.2014 in the Official Gazette no. 293-296, art. 603. <http://lex.justice.md/md/354876/>
[95] Government Decision no. 301 of 24.04.2014 approving the Environmental Strategy for 2014-2023 and the Action Plan for its implementation. Published on 06.05.2014 in the Official Gazette no. 104-109, art. 328. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=352740>
[96] Decree of the President of the Republic of Moldova no. 1815 of 12.11.2015 promulgating the Law on Ratification of the Financing Agreement between the Government of the Republic of Moldova and the European Commission on the implementation of the ENPARD Moldova Program - support for agriculture and rural development. Published: 27.11.2015 in the Official Gazette no. 317-323, art. 575. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=361905>
[97] Government Decision no. 1470 of 30.12.2016 approving the Low-Emission Development Strategy of the Republic of Moldova until 2030 and the Action Plan for its implementation. Published on 24.03.2017 in the Official Gazette no. 85-91, art. 222. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=369528>
[98] Government Decision no. 160 of February 21, 2018 approving the „green" economy promotion program in the Republic of Moldova for 2018-2020 and the Action Plan for its implementation. Published on 02.03.2018 in the Official Gazette no. 68-76, art.208. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=374523>
[99] Government Decision no. 455 of 21.06.2017 regarding allocation of funds of the National Fund for Agriculture and Rural Development. Published on 23.06.2017 in the Official Gazette no. 201-213, art.537. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=370674>. Amended by the Government Decision no. 903 of 07.11.2017 on amending and completing the Government Decision no. 455 of 21 June 2017. Published on 10.11.2017 in the Official Gazette no. 390-395, art. 1012. <http://lex.justice.md/md/372416%20/>
[100] Agency for Intervention and Payments in Agriculture (2017), Annual Activity Report - Subsidies results for 2016. <http://aipa.gov.md/sites/default/files/REZULTATELE%20SUBVEN%C5%A2ION%C4%82RII%20PENTRU%20ANUL%202016_pdf.pdf>
[101] Public Institution „Agency for Intervention and Payments in Agriculture" (2018), Annual Activity Report for 2017. Approved: Minutes no. 1 of 26 January 2018 of the IP AIPA Supervisory Board meeting. <http://aipa.gov.md/sites/default/files/Raportul%20anual%20activitate%20AIPA_2017.pdf>
[102] Ministry of Agriculture and Food Industry (2016), Activity Report of the Ministry of Agriculture and Food Industry for 2015. <http://maia.gov.md/sites/default/files/article/01/21/2016%20-%2014%3A21 /raport_maia_2015_site.pdf>
[103] Ministry of Agriculture and Food Industry (2017), Information Note to the Draft Government Decision approving the Action Plan for the implementation of the Soil Conservation and Fertility Enhancement Program for 2017-2020. <http://www.gov.md/sites/default/files/document/attachments/intr17_96.pdf>
[104] "Competitive Agriculture in Moldova" (MACP Project) (November 2012 – June 2019). <https://www.odimm.md/ro/component/content/article/41-conferinta-2016/163-2016-11-03-07-26-57.html>, <http://www.capmu.md/2017/01/ongoing-projects-mac-p/>

Mitigation action 2-11: Improving livestock and poultry population in the RM

Description	Nature of action	Creating a more productive livestock and poultry
	Sector	Agriculture, animal husbandry
	GHG	CH_4
	Quantitative targets	Production by 2020 and 2030, respectively: - cattle 210-220 and 230-240 thousand heads; - sheep 730-735 and 750-755 thousand heads; - goats 180-190 and 210-220 thousand heads; - swine 500-510 and 550-570 thousand heads; - poultry 14-15 and 20-21 million heads.
	Progress indicators	- livestock and poultry numbers; - productivity.
Methodologies		- mediatizing and promoting highly productive breeds of livestock and poultry; - introducing and breeding highly productive livestock and poultry breeds; - subsidies to promote new livestock and poultry highly productive breeding technologies, according to the provisions of the Law no. 276 of 16.12.2016 on principles of subsidizing agricultural producers[105] through the Agency for Intervention and Payments in Agriculture (AIPA), which is responsible for the efficient management of the National Agricultural and Rural Development Fund (NFARD), and according to the GD no. 455 of 21 June 2017 on allocation of funds of the National Agriculture and Rural Development Fund[106], especially for sub-action 1.4. "Stimulating investments for operation and upgrading livestock farms", or for increasing productivity, competitiveness and ensuring food safety by stimulating technological organization and modernization of livestock farms, and by sub-action 1.5. "Stimulating procurement of breeding animals and maintaining genetic pool", or increasing productivity, competitiveness and ensuring food security by stimulating livestock improvement (this support is provided for partial compensation of investments in procurement of animals from breeding farms included in Nomenclature of breeds, types and crosses of animals, homologated in the Republic of Moldova, including imported ones); - MRV of mitigation of GHG emissions from animal husbandry sector; - CH_4 emissions, and projections of CH_4 emissions from the Enteric Fermentation sector, were estimated using Tier 1 and Tier 2 calculation methodologies available in the 2006 IPCC Guidelines, Volume 4, Chapter 10.
Assumptions		– the downward trend in livestock and poultry populations in the Republic of Moldova is expected to slow down by 2020 and slightly increase over 2020-2030. At the same time, according to the Draft National Dairy Sector Development Program of the Republic of Moldova for 2017-2025, the average production of dairy cows is expected to increase to 5705 kg annually by 2022, respectively to 7000 kg annually by 2025; thus, during 2025-2030, the level of o Moldova's livestock sector productivity will be similar to the one in countries with a transition economy in Eastern Europe included in Annex I of the UNFCCC, i.e. the emission factors will have similar values to default emission factors used for assessing CH_4 emissions from enteric fermentation, specific for Eastern European countries.
Goals		- ensure agro-food security, including efficient productivity for meat, milk and eggs.
Undertaken steps		The following documents have been approved and are under implementation: - dairy cattle breeding program of the Republic of Moldova for the years 2014-2020[107]; - sheep and goats breeding program of the Republic of Moldova for the years 2014-2020[108]; - the National Strategy for Agricultural and Rural Development for 2014-2020, GD no. 409/2014[109] and the Action Plan on the Implementation of the National Strategy for Agricultural and Rural Development for the years 2014-2020, GD no. 742/2015[110]; - the Environmental Strategy for 2014-2023 and the Action Plan for its implementation, GD no. 301/2014[111]; - the FAO Project "Development of the National Strategy and Action Plan for Livestock Genetic Resources and Dairy Cows Genetic Improvement Program"[112]; - the Law no. 276 of 16.12.2016 on the principles of subsidizing agricultural producers; - the Low-Emission Development Strategy of the Republic of Moldova until 2030 and the Action Plan for its implementation, GD no. 1470/2016[113]; - Government Decision no. 455 of 21.06.2017 on the allocation of funds of the National Fund for Agriculture and Rural Development[114].

Planned steps		- approval of the Law on Animal Husbandry (new version)[115]; - approval of the National Milk Sector Development Program in the Republic of Moldova for the years 2017-2025[116].
Implementation progress	Outputs	- the funds of the National Fund for Agriculture and Rural Development amounted to about 900 million MDL in 2017, by 28% more than in 2016; - about 7800 financing applications were submitted for 3612 unique agricultural producers through the Public Agency for Intervention and Payments in Agriculture (AIPA), totaling to more than 800 million MDL; - in 2017 the number of financing applications increased by 80.5%, or by 3479 financing applications more than in 2016; -153 applications for financial support amounting to 45.1 million MDL, were submitted in 2017, including for upgrading and technological development of 29 dairy farms - 12.4 million MDL, 5 meat livestock farms - 4.8 mil. MDL, 7 sheep and goat farms - 3.6 million MDL, 12 swine farms - 5.0 million MDL, 21 poultry farms - 11.7 million MDL, 74 apicultural farms - 6.5 million MDL, 5 rabbit farms - 1.1 million MDL; - 153 livestock farms were re-equipped and upgraded in 2017 (to compare with - 86 farms in 2016, 67 farms in 2015, 111 farms in 2014 and 64 farms in 2013); - in 2016, applications for financial support amounting to 34.8 million MDL submitted by 86 beneficiaries were accepted for financing, including for renovation and technological development of 26 dairy farms - 11.5 million MDL, 5 sheep and goat farms - 0.5 million MDL, 9 swine farms - 3.6 million MDL, 18 poultry farms - 15.97 million MDL and 25 apicultural farms - 1.7 million MDL; - in 2017, 12.3 million MDL were requested for subsidizing 318 cattle, 557 goats and sheep, 1212 pigs and 1811 bees; for comparison, in 2016, 22.88 million MDL were requested for subsidizing 299 cattle, 1345 goats and sheep, 624 swine, 200 breeding rabbits and 1418 queen bees; the amount requested from FNDAMR for subsidies in 2013 amounted to 69.81 million MDL, in 2014 - 1.73 million MDL, and in 2015 - 30.85 million MDL; -according to the National Bureau of Statistics of the Republic of Moldova and the State Statistical Service of the Ministry of Economic Development of the UATSN, livestock and poultry populations have evolved during the period of 1990-2016 as follows: the overall population of cattle has reduced by approximately 81.2%, from 1060.7 thousand heads in 1990, to 199.8 thousand heads in 2016; the herd of dairy cows has reduced by approximately 66.5%, from 395.2 thousand heads in 1990, to 132.3 thousand heads in 2016; other cattle herd has reduced by approximately 89.8%, from 665.5 thousand heads in 1990 up to 67.6 thousand heads in 2016; sheep population has reduced by approximately 42.6%, from 1244.8 thousand heads in 1990 to 714.8 thousand heads in 2016; number of goats increased by 350.2%, from 37.1 thousand heads in 1990, to 167.0 thousand heads in 2016; swine population has reduced by about 74.6%, from 1850.1 thousand heads in 1990, to 469.7 thousand heads in 2016; rabbit population has increased by 29.6%, roughly from 283.0 thousand heads in 1990 to 366.7 thousand heads in 2016; poultry has reduced by about 46.5% from 24.625 mil. heads in 1990 to 13.172 mil. heads in 2016.
	Emissions reductions	- reduction of methane emissions from source category 3A "Enteric fermentation" under the WM scenario compared to the reference year - by about 1.393 Mt CO_2 equivalent by 2030, and under the WAM scenario - by about 1.419 Mt CO_2 equivalent by 2030.

[105] Law no. 276 of 16.12.2016 on principles of subsidizing agricultural producers. Published on 03.03.2017 in the Official Gazette no. 67-71, art.93. Date of entry into force: 01.01.2017. <http://lex.justice.md/index.php?action=-view&view=doc&lang=1&id=369204>

[106] Government Decision no. 455 of 21.06.2017 on allocation of funds of the National Fund for Agriculture and Rural Development. Published on 23.06.2017 in the Official Gazette no. 201-213, art.537. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=370674>. Amended by the Government Decision no. 903 of 07.11.2017 on amending and completing the Government Decision no. 455 of 21 June 2017. Published on 10.11.2017 in the Official Gazette no. 390-395, art. 1012. <http://lex.justice.md/md/372416%20/>

[107] Dairy Cattle Breeding Program in the Republic of Moldova for 2014-2020, approved for implementation by the Animal Husbandry Commission of the Technical and Scientific Council of the Ministry of Agriculture and Food Industry of the Republic of Moldova, Minutes no.2 of 17.10.2013. Focsa, V., Constandoglo, A. Chisinau, Printing House „Print-Caro" 2013, 22 pp., ISBN 978-9975-56-122-8.

[108] Sheep and Goats Breeding Program in the Republic of Moldova for 2014-2020, approved for implementation by the Animal Husbandry Commission of the Technical and Scientific Council of the Ministry of Agriculture and Food Industry of the Republic of Moldova, minutes no. 3 of 18.12.2013. Masner, O., Liutcanov, P., Evtodienco, S., Danuta, A. Chisinau, Printing House „Print-Caro" 2014, 34 pp. ISBN 978-9975-56-197-6.

[109] Government Decision no. 409 of 04.06.2014 approving the National Strategy for Agricultural and Rural Development for 2014-2020. Published on 10.06.2014 in the Official Gazette no. 152, art. 451. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=353310>

[110] Government Decision no. 742 of 21.10.2015 approving the Action Plan on implementation of the National Strategy for Agricultural and Rural Development for 2014-2020. Published on 30.10.2015 in the Official Gazette no. 297-300, art. 835. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=361669>

[111] Government Decision no. 301 of 24.04.2014 approving the Environmental Strategy for 2014-2023 and the Action Plan for its implementation. Published on 06.05.2014 in the Official Gazette no. 104-109, art. 328. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=352740>

[112] The FAO project „Development of National Strategy and Action Plan for Livestock Genetic Resources and Dairy Cows Genetic Improvement Program". < http://www.madrm.gov.md/ro/content/ Moldova-consolideaz%C4%%C3%AE%C8%99i-83-cre%C8%99terii-sector-cows-milk-with-support-< http://maia.gov.md/ro/categorii/>, FAO projects-of-foreign-assistance-agri-food sector->

[113] Government Decision no. 1470 of 30.12.2016 approving the Low-Emission Development Strategy of the Republic of Moldova until 2030 and the Action Plan for its implementation. Published on 24.03.2017 in the Official Gazette no. 85-91, art. 222. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=369528>

[114] Government Decision no. 455 of 21.06.2017 regarding the allocation of funds of the National Fund for Agriculture and Rural Development. Published on 23.06.2017 in the Official Gazette no. 201-213, art.537. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=370674>. Amended by the Government Decision no. 903 of 07.11.2017 on amending and completing the Government Decision no. 455 of 21 June 2017. Published on 10.11.2017 in the Official Gazette no. 390-395, art. 1012. <http://lex.justice.md/md/372416%20/>

[115] Draft Law on Animal Husbandry (new version). <http://particip.gov.md/proiectview.php?l=ro&idd=3693>

[116] Draft National Program for Dairy Sector Development in the Republic of Moldova for 2017-2025. <https://www.scribd.com/document/364789593/Programul-National-Lapte>

Mitigation action 2-12: Enhance manure management

Description	Nature of action	Concentrating breeding of cattle and swine in large farms
	Sector	Agriculture, animal husbandry
	GHG	CH_4, N_2O
	Quantitative targets	Increasing the share of large cattle and poultry farms among agricultural enterprises and peasant farms in the total number of cattle and poultry in the RM by 2030 compared to current state (2016), as follows: - cattle: 80.0% versus 10.0%; - dairy cows: 75.0% versus 4.7%; - other cattle: 85.0% versus 20.9%; - swine: 80.0% versus 43.6%; - sheep and goats: 35.0% versus 2.9%; - poultry: 55.0% versus 34.4%.
	Progress indicators	- number of large farms; - amount of manure on large farms.
Methodologies		- developing policies for concentrating livestock and poultry on large farms; - motivating the development of livestock and poultry breeding on large farms; - employing modern livestock and poultry breeding technologies on large farms; - CH_4 emissions, and projections of CH_4 emissions from the Manure Management sector, were estimated using Tier 1 and Tier 2 calculation methodologies available in the 2006 IPCC Guidelines, Volume 4, Chapter 10.
Assumptions		- gradual transition to advanced and sustainable manure management practices by 2030; - according to the Draft National Program for Development of the Dairy Sector in the Republic of Moldova for 2017-2025, an increase in the average cow yield to 5705 kg annually is expected by 2022, respectively, to 7000 kg annually by 2025. Thus, the level of Moldova's livestock sector productivity will be similar to that of the Eastern Europe transition economies included in Annex I to the UNFCCC, i.e. emission factors will have values close to the default emission factors used for the assessment of CH_4 emissions from the livestock manure management specific for Eastern European countries with economies in transition included in Annex I to the UNFCCC.
Goals		- livestock and poultry production efficiency at the same level as the EU countries; - use of efficient and sustainable manure management technologies to reduce environmental pollution and greenhouse gas emissions.
Undertaken steps		The following documents have been approved and are under implementation: - National Energy Efficiency Program 2011-2020, GD no. 833/2011[117]; - Waste Management Strategy of the Republic of Moldova for 2013-2027, GD no. 248/2013[118]; - Dairy Cattle Breeding Program of the Republic of Moldova for 2014-2020; - Sheep and Goat Breeding Program of the Republic of Moldova for 2014-2020; - National Strategy for Agricultural and Rural Development for 2014-2020, GD no. 409/2014 and the Action Plan for implementation of the National Strategy for Agricultural and Rural Development for 2014-2020, GD no. 742/2015; - Environmental Strategy for 2014-2023 and the Action Plan for its implementation, GD no. 301/2014; - the FAO Project "Development of the National Strategy and the Action Plan for Livestock Genetic Resources and Dairy Cows Genetic Improvement Program"; - Law no. 276 of 16.12.2016 on Principles of Subsidizing Agricultural Producers; - Low-Emission Development Strategy until 2030 of the Republic of Moldova's and the Action Plan for its implementation, GD no. 1470/2016; - Government Decision no. 455 of 21.06.2017 regarding the allocation of the funds of the National Fund for Agriculture and Rural Development.

Planned steps		- approve the Draft Law on Animal Husbandry, new version; - approve the National Dairy Sector Development Program of the Republic of Moldova for 2017-2025.
Implementation progress	Outputs	- the funds of the National Fund for Agriculture and Rural Development amounted to about 900 million MDL in 2017, by 28% more than in 2016; - about 7800 financing applications were submitted for 3,612 unique agricultural producers through the Public Agency for Intervention and Payments in Agriculture (AIPA), totaling to more than 800 million MDL; - in 2017 the number of financing applications increased by 80.5%, or by 3,479 financing applications more than in 2016; - 153 applications for financial support amounting to 45.1 million MDL, were submitted in 2017, including for upgrading and technological development of 29 dairy farms - 12.4 million MDL, 5 cattle meat farms - 4.8 mil. MDL, 7 sheep and goat farms - 3.6 million MDL, 12 swine farms - 5.0 million MDL, 21 poultry farms - 11.7 million MDL, 74 apicultural farms - 6.5 million MDL, 5 rabbit farms - 1.1 million MDL; - 153 livestock farms were re-equipped and upgraded in 2017 (to compare with 86 farms in 2016, 67 farms in 2015, 111 farms in 2014 and 64 farms in 2013); - in 2016, applications for financial support amounting to 34.8 million MDL submitted by 86 beneficiaries were accepted for financing, including for renovation and technological development of 26 dairy farms - 11.5 million MDL, 5 sheep and goat farms - 0.5 million MDL, 9 swine farms - 3.6 million MDL, 18 poultry farms - 15.97 million MDL and 25 apicultural farms - 1.7 million MDL; - in 2017, 12.3 million MDL were requested for subsidizing 318 cattle, 557 goats and sheep, 1,212 pigs and 1,811 queen bees ; for comparison, in 2016, 22.88 million MDL were requested for subsidizing 299 cattle, 1,345 goats and sheep, 624 swine, 200 breeding rabbits and 1,418 queen bees; the amount requested from NFARD for subsidies in 2013 amounted to 69.81 million MDL, in 2014 - 1.73 million MDL, and in 2015 - 30.85 million MDL; - according to the National Bureau of Statistics of the Republic of Moldova and the State Statistical Service of the Ministry of Economic Development of the UATSN, livestock and poultry populations have evolved during the period of 1990-2016 as follows: the overall population of cattle has reduced by approximately 81.2%, from 1,060.7 thousand heads in 1990, to 199.8 thousand heads in 2016; the herd of dairy cows has reduced by approximately 66.5%, from 395.2 thousand heads in 1990, to 132.3 thousand heads in 2016; other cattle herd has reduced by approximately 89.8%, from 665.5 thousand heads in 1990 up to 67.6 thousand heads in 2016; sheep population has reduced by approximately 42.6%, from 1244.8 thousand heads in 1990 to 714.8 thousand heads in 2016; number of goats increased by 350.2%, from 37.1 thousand heads in 1990, to 167.0 thousand heads in 2016; swine population has reduced by about 74.6%, from 1850.1 thousand heads in 1990, to 469.7 thousand heads in 2016; rabbit population has increased by 29.6%, roughly from 283.0 thousand heads in 1990 to 366.7 thousand heads in 2016; poultry has reduced by about 46.5% from 24.625 mil. heads in 1990 to 13.172 mil. heads in 2016; - considering the total number of livestock and poultry in all types of farms in the Republic of Moldova, the share of large livestock and poultry farms among agricultural enterprises and peasant farms has reduced significantly during over 1990-2016: cattle - from 81.8% in 1990 to 10.0% in 2016, dairy cows - from 74.9% in 1990 to 4.7% in 2016, other cattle - from 86.0% in 1990 to 20.9% in 2016, swine - from 81.0% in 1990 to 43.6% in 2016, sheep and goats - from 35.9% in 1990 to 2.9% in 2016, poultry- from 53.5% in 1990 to 34.4% in 2016; - the share of certain manure management systems specific to large farms which contribute to a higher extent to CH_4 emission, such as liquid manure management systems for dairy cows, has reduced from 24% of the total in 1990 to circa 1.5% of the total in 2016. For other cattle, the share of this system has reduced from 34.0% in 1990 to circa 6.0% in 2016, and for swine, the share of this manure management system has reduced from 73% in 1990 to circa 37% in 2016; - the share of the solid waste management system, which is responsible for CH_4 emissions to a lesser extent, has increased from 70% in 1990 to 74% of the total in 2016 for dairy cows, from 62% in 1990 to 72% in 2016 for other cattle, from 27% in 1990 to 63% in 2016 for swine.
	Emissions reductions	- Reduction of methane emissions from the source category 3B "Manure Management", compared to the level recorded in the reference year, is by circa 0.979 Mt CO_2 equivalent by 2030 under the WM scenario, and by circa 1.001 Mt CO_2 equivalent by 2030 under the WAM scenario.

[117] Government Decision no. 833 of 10.11.2011 on the National Energy Efficiency Program 2011-2020. Published on 18.11.2011 in the Official Gazette no. 197-202, art. 914. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=340940>
[118] Government Decision no. 248 of 10.04.2013 approving the Waste Management Strategy of the Republic of Moldova for 2013-2027. Published on 12.04.2013 in the Official Gazette no. 82, art. 306. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=347341>

Mitigation action 2-13: Expansion of wooded areas

Description	Nature of action	Afforestation of new lands
	Sector	LULUCF
	GHG	CO_2
	Quantitative targets	Expansion of wooded areas, thousands of hectares: - minimum 10-32 by 2020; - maximum 32-85 to 2030. Amount of harvested wood mass, increase thousand m^3: - minimum 88-193 by 2020; - maximum 127-292 to 2030.
	Progress indicators	- wooded areas; - amount of harvested wood mass;
Methodologies		- identification of new territories for afforestation; - integrated planning on a national and local scale, provision of planting material and machinery, methodological and technological, design, fieldwork assurance, etc.; - creating highly productive and environmentally stable stands; - implementation of the Action Plan on extension of wooded areas; - MRV of wooded areas extension and amount of harvested wood mass; - provisions of CDM AR-AM0002 "Restoration of Degraded Areas by Afforestation/Reforestation" (UNFCCC, 2009)[119].
Assumptions		- to estimate annual growth and losses of biomass in forests, the country specific emission factors have been calculated/developed; - afforestation will be implemented on 4.5% glades, 10.4% in gorges and virgin lands, 21.6% in stands affected by natural disasters, 5.4% on non-regenerated parquet, 20.5% on parcels under exploitation by 2020 and 37.6% on other lands;
Goals		- attain the afforestation level of about 15% of the country's territory, appropriate for a healthy ecosystem, which is currently 11.2%; - increase CO_2 removals.
Undertaken steps		Approved: - State Program for Forest Regeneration and Afforestation for 2003-2020, National Area Extension Plan for 2014-2018, National Strategy for Agricultural and Rural Development for 2014-2020; Environmental Strategy for 2014-2023 and the Action Plan for its implementation; - in the end of 2016 the Regulation on afforestation of degraded lands owned as public property by administrative-territorial units and of the degraded private lands, was approved[120].
Planned steps		- develop and approve the Plan for funding the implementation of the State Program for regeneration and afforestation of the forest fund lands; - approve subsequent action plans, following after 2018; - promote the NAMA project "Afforestation of degraded lands, impracticable for agriculture" developed within the LECB project[121] and registered in the UNFCCC NAMA Register in 2018[122].
Implementation progress	Outputs	- forest regeneration has increased from 3.3 thousand hectares in 2006 to about 5 thousand hectares in 2013; - according to the Land Cadaster data as of 01.01.2016, forest vegetation and the country's forest fund account for 446.4 thousand ha or 13.2% of the country's area (including forest protection belts and forest vegetation outside the forest fund)[123].
	CO_2 emissions removals	By 2020 and 2030, respectively: - minimum: -19 and -82 thousand tons CO_2 eq.; - maximum: -111 and -414 thousand tons CO_2 eq.

[119] <https://cdm.unfccc.int/filestorage/L/1/Z/L1ZYHU4X5QRPFS2IVGDM8T90N3W6CJ/EB50_repan16_AR-AM0002_ver_03.pdf?t=c098cGI4NTRufDALvnSO65ly8g28qBOCjy2b>
[120] <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=367373>
[121] UNDP. Low-Emission Capacity Building Project - Republic of Moldova.
[122] <http://www4.unfccc.int/sites/nama/SitePages/NamaImplementation.aspx>
[123] <http://www.parlament.md/LinkClick.aspx?fileticket=PzWljwWlx8U%3D&tabid=263&language=ro-RO>

Mitigation action 2-14: "Moldova Soil Conservation" Project

Description	Nature of action	Afforestation of degraded lands
	Sector	LULUCF
	GHG	CO_2
	Quantitative targets	Afforestation of degraded lands on 20,291 hectares.
	Progress indicators	- wooded areas; - the volume of harvested wood mass; - the amount of GHG emissions reductions achieved and certified.
Methodologies		- identifying new lands for afforestation; - integrated planning on a national and local scale, provision of planting material and machinery, methodological and technological, design, fieldwork assurance, etc.; - creating highly productive and environmentally stable stands; - implementation of the Action Plan on extension of wooded areas; - MRV of wooded areas expansion and amount of harvested wood mass; - GHG removal potential was calculated according to the methodology approved by the CDM AR-AM0002 "Restoration of degraded lands through afforestation/reforestation" (UNFCCC, 2009)[124]. The Methodology should also be used for determining actual CO_2 removals.
Assumptions		- to estimate annual growth and losses of biomass in forests, the country specific emission factors have been calculated/developed; - for planting purposes, species are selected according to soil matching criteria, climate and adaptability characteristics; - afforestation of degraded land will improve soil condition; - increasing access to wood resources and non-timber forest products; - the progress of removals will be calculated against 1990.
Goals		- attain an afforestation level appropriate to a healthy ecosystem of about 15% of the country's territory, which is currently 11.2% (except forest protection belts and forest vegetation outside the forest fund)[125]; - reinstate 20.3 thousand ha of eroded and unproductive land in the general productive circuit; - increase the amount of GHG (CO_2) removals.
Undertaken steps		Approved: - the State Program for regeneration and afforestation of the forest fund lands for 2003-2020[126], the National Area Expansion Plan for 2014-2018[127], the National Agricultural and Rural Development Strategy for 2014-2020[128]; the Environmental Strategy for 2014-2023 and the Action Plan for its implementation[129]; the Low-Emission Development Strategy of the Republic of Moldova until 2030 and the Action Plan for its implementation[130]. - in the end of 2016 the Regulation on afforestation of degraded lands owned by administrative-territorial units as public property, and of private lands, was approved [131].
Planned steps		- re-plant areas under the "Moldova Soils Conservation" Project which showed unsatisfactory results or were destroyed by natural disasters (1,133 ha); - ensure adequate management for newly created forests; - monitor according to the project methodology and report emission reductions achieved in the "Moldova Soil Conservation" Project.
Progress of implementation	Outputs	- developed project documents for the "Moldova Soil Conservation" Project: PDD and Monitoring Plan; - planted and groomed about 20.3 thousand ha of forestry crops; - "Moldova Soil Conservation" project registered at the CDM Secretariat (2009); - monitoring the 1,205 kt CO_2 eq emissions reductions achieved over 2012-2016[132] (2016-2017).
	CO_2 emissions removals	By 2022: about 3,600 kt CO_2 eq.

[124] <https://cdm.unfccc.int/filestorage/L/1/Z/L1ZYHU4X5QRPFS2IVGDM8T90N3W6CJ/EB50_repan16_AR-AM0002_ver_03.pdf?t=c098cGI4NTRufDALvnSO65ly8g28qBOCjy2b>
[125] Government Decision no. 301 of 24.04.2014 approving the Environmental Strategy for 2014-2023 and the Action Plan for its implementation. Published on 06.05.2014 in the Official Gazette no. 104-109, art.328. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=352740>
[126] Government Decision no. 737 of 17.06.2003 approving the State Program for regeneration and afforestation of the forest fund lands for 2003-2020. Published on 01.07.2003 in the Official Gazette no. 132-133, art.788. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=304349>
[127] Government Decision no. 101 of 10.02.2014 approving the National Plan for expansion of areas covered with forest vegetation for 2014-2018. Published on 14.02.2014 in the Official Gazette no. 35-41, art.118. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=351561>
[128] Government Decision no. 742 of 21.10.2015 approving the Action Plan on implementation of the National Strategy for Agricultural and Rural Development for 2014-2020. Published on 30.10.2015 in the Official Gazette no. 297-300, art.835. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=361669>
[129] Government Decision no. 301 of 24.04.2014 approving the Environmental Strategy for 2014-2023 and the Action Plan for its implementation. Published on 06.05.2014 in the Official Gazette no. 104-109, art.328. < http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=352740 >
[130] Government Decision no. 1470 of December 30, 2016 approving the Low-Emission Development Strategy of the Republic of Moldova until 2030 and the Action Plan for its implementation. Published on 24.03.2017 in the Official Gazette no. 85-91 art.222. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=369528>
[131] Government Decision no. 1186 of 28.10.2016 approving the Regulation on afforestation of degraded lands owned by administrative-territorial units as public property, and the degraded private lands. Published on 04.11.2016 in the Official Gazette no. 379-386, art. 1283. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=367373>
[132] <https://cdm.unfccc.int/filestorage/D/P/8/DP8TYXVMQGC5RI2ZK130SWNH9BOF74/1948%202%20MR.pdf?t=cG18cGI4N2VifDCgiL854Re0xhRDDpNOPrf7>

Mitigation action 2-15: "Development of the communal forestry sector in the Republic of Moldova" Project

Description	Nature of action	Afforestation of degraded lands
	Sector	LULUCF
	GHG	CO_2
	Quantitative targets	Afforestation of degraded lands on 8469 hectares.
	Progress indicators	- wooded areas; - amount harvested wood mass; - amount of GHG emissions reductions achieved and certified.
Methodologies		- identifying new lands for afforestation; - integrated planning on a national and local scale, provision of planting material and machinery, methodological and technological, design, fieldwork assurance, etc.; - creating highly productive and environmentally stable stands; - awareness building and training on sustainable management of natural resources; - MRV of wooded areas expansion; - the GHGs removals potential was calculated in accordance with the approved CDM methodology AR-AM0002 "Restoration of Degraded Areas by Afforestation/Reforestation" (UNFCCC, 2009); the Methodology should also be used for determining actual CO_2 removals.
Assumptions		- to estimate annual growth and losses of biomass in forests, the country specific emission factors have been calculated/developed; - for planting purposes, species are selected according to soil matching criteria, climate and adaptability characteristics; - afforestation of degraded land will improve soil condition; - increasing access to wood resources and non-timber forest products;
Goals		- attain the level of afforestation appropriate for a healthy ecosystem of about 15% of the country's territory, which is currently 11.1%[133]; - re-instate 8.5 thousand ha of eroded and non-productive land in the general productive circuit; - use of agroforestry practices; - introduce participatory forest and grassland management practices; - increase the amount of GHGs (CO_2) removals.
Undertaken steps		Approved: - State Program for regeneration and afforestation of forest fund lands for 2003-2020[134], the National Area Extension Plan for 2014-2018[135], the National Agricultural and Rural Development Strategy for 2014-2020[136]; the Environmental Strategy for 2014-2023 and the Action Plan for its implementation[133]; the Low-Emission Development Strategy of the Republic of Moldova until 2030 and the Action Plan for its implementation[137]; - in the end of 2016 the Regulation on afforestation of degraded lands owned by administrative-territorial units as public property, and of private lands, was approved[138].

Planned steps		- re-plant areas under the PDSFCM project which showed unsatisfactory results or were destroyed by natural disasters (326 ha)[139]; - ensure adequate management for newly created forests; - monitoring according to the project methodology and reporting the emission reductions achieved within the PDSFCM.
Implementation progress	Outputs	- developing project documents for PDSFCM: PDD and Monitoring Plan; - planting and grooming 8.5 thousand ha of forestry crops; - registering the PDSFCM with the CDM Secretariat (2012); - monitoring and international certification of 328 kt CO_2 eq emissions reductions achieved over 2006-2012 (2012-2013); - monitoring the 367 kt CO_2 eq emissions reduction achieved over 2013-2017 (2017-2018).
	CO_2 emissions removals	By 2035: about 1200 kt CO_2 eq (cumulative).

[133] Government Decision no. 301 of 24.04.2014 approving the Environmental Strategy for 2014-2023 and the Action Plan for its implementation. Published on 06.05.2014 in the Official Gazette no. 104-109, art.328. < http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=352740 >
[134] Government Decision no. 737 of 17.06.2003 approving the State Program for regeneration and afforestation of the forest fund lands for 2003-2020. Published on 01.07.2003 in the Official Gazette no. 132-133 art.788. < http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=304349 >
[135] Government Decision no. 101 of 10.02.2014 approving the National Plan for the extension of areas covered with forest vegetation for 2014-2018. Published on 14.02.2014 in the Official Gazette no. 35-41, art.118. < http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=351561 >
[136] Government Decision no. 742 of 21.10.2015 approving the Action Plan on implementation of the National Strategy for Agricultural and Rural Development for 2014-2020. Published on 30.10.2015 in the Official Gazette no. 297-300, art.835. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=361669>
[137] Government Decision no. 1470 of December 30, 2016 approving the Low-Emission Development Strategy of the Republic of Moldova until 2030 and the Action Plan for its implementation. Published on 24.03.2017 in the Official Gazette no. 85-91, art.222. < http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=369528 >
[138] Government Decision no. 1186 of 28.10.2016 approving the Regulation on afforestation of the degraded lands owned by administrative-territorial units as public property, and of the degraded lands in private property. Published on 04.11.2016 in the Official Gazette no. 379-386, art. 1283. < http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=367373 >
[139] Based on the information provided by forestry entities, participating in the project „Development of communal forestry sector in Moldova".

Mitigation action 2-16: Rehabilitation of forest belts for protection of agricultural fields in the southern part of the Republic of Moldova

Description	Nature of action	Rehabilitation of forest belts for protection of agricultural fields
	Sector	LULUCF
	GHG	CO_2
	Quantitative targets	Rehabilitation of forest belts for protection of agricultural fields on 2242 hectares.
	Progress indicators	- area of rehabilitated protection forest belts; - area of protected agricultural land; - amount of harvested wood mass; - the amount of GHG emissions reductions achieved and certified.
Methodologies		- integrated planning on a national and local scale, provision of planting material and machinery, methodological and technological, design, fieldwork assurance, etc.; - creating protection forest belts with multiple protection functions; - awareness building and training on sustainable management of natural resources, including forest belts for protection of agricultural fields (104 events); - MRV process for rehabilitation and maintenance of forest curtains; - the GHG removal potential was calculated in accordance with the approved CDM methodology AR-AM0002 "Restoration of Degraded Areas by Afforestation/Reforestation" (UNFCCC, 2009). The Methodology should also be used for determining actual CO_2 removals.
Assumptions		- to estimate annual increases and losses of biomass in rehabilitated protection forestry belts a test sample of areas was used (43 PP)[140]; - for planting purposes, species are selected according to soil matching criteria, climate and adaptability characteristics; - rehabilitation of protection forest belts will ensure protection of adjacent agricultural lands; - increased access to wood resources and non-timber forest products.
Goals		- attain appropriate level of agricultural lands protection - 4%, which is currently 1.7%, or 30.7 thousand ha; - mitigate degradation processes of the adjacent agricultural lands; - use agroforestry practices; - increase the amount of GHG (CO_2) removals.
Undertaken steps		Approved: - the State Program for the regeneration and afforestation of forest fund lands for 2003-2020[141], the National Area Extension Plan for 2014-2018[142], the National Agricultural and Rural Development Strategy for 2014-2020[143]; the Environmental Strategy for 2014-2023 and the Action Plan for its implementation[144]; the Low-Emission Development Strategy of the Republic of Moldova until 2030 and the Action Plan for its implementation[145]; - in the end of 2016 the Regulation on afforestation of degraded lands owned by administrative-territorial units as public property, and of private lands, was approved[146].
Planned steps		- re-plant areas which showed unsatisfactory results or were destroyed by natural disasters; - ensure adequate management of rehabilitated protection forest belts; - monitor emission reductions resulting from rehabilitated protection forest belts.
Implementation progress	Outputs	- forest belts for protection of agricultural fields were rehabilitated on 2,242 hectares; - 43.04 kt CO_2 eq emissions reductions were achieved over 2014-2016.
	CO_2 emissions removals	By 2034: about 430.44 kt CO_2 eq.

[140] The number of required test sample areas was calculated based on the equations provided in the approved CDM Methodology AR-AM0002 „Restoring Degraded Areas by Afforestation / Reforestation" (UNFCCC, 2009). <https://cdm.unfccc.int/filestorage/L/1/Z/L1ZYHU4X5QRPFS2IVGDM8T90N3W6CJ/EB50_repan16_AR-AM0002_ver_03.pdf?t=c098cGI4NTRufDALvnSO65ly8g28qBOCjy2b>
[141] Government Decision no. 737 of 17.06.2003 approving the State Program for regeneration and afforestation of the forest fund lands for 2003-2020. Published on 01.07.2003 in the Official Gazette no. 132-133 art.788. < http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=304349 >
[142] Government Decision no. 101 of 10.02.2014 approving the National Plan for expansion of areas covered with forest vegetation for 2014-2018. Published on 14.02.2014 in the Official Gazette no. 35-41, art.118. < http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=351561 >
[143] Government Decision no. 742 of 21.10.2015 approving the Action Plan on implementing the National Strategy for Agricultural and Rural Development for 2014-2020. Published on 30.10.2015 in the Official Gazette no. 297-300, art.835. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=361669>
[144] Government Decision no. 301 of 24.04.2014 approving the Environmental Strategy for 2014-2023 and the Action Plan for its implementation. Published on 06.05.2014 in the Official Gazette no. 104-109, art.328. < http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=352740 >
[145] Government Decision no. 1470 of December 30, 2016 approving the Low-Emission Development Strategy of the Republic of Moldova until 2030 and the Action Plan for its implementation. Published on 24.03.2017 in the Official Gazette no. 85-91, art.222. < http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=369528 >
[146] Government Decision no. 1186 of 28.10.2016 approving the Regulation on afforestation of the degraded lands owned by administrative-territorial units as public property and of the degraded lands in private property. Published on 04.11.2016 in the Official Gazette no. 379-386, art. 1283. < http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=367373 >

Mitigation action 2-17: NAMA on afforestation of degraded land, riparian areas and protection belts in the Republic of Moldova

Description	Nature of action	Land afforestation
	Sector	LULUCF
	GHG	CO_2
	Quantitative targets	- afforestation of degraded land on 45,000 hectares[144]; - afforestation of riparian strips on 15,000 hectares[147]; - creation of protection belts for agricultural fields on 1,500 hectares[148].
	Progress indicators	- wooded areas; - amount of the harvested wood mass.

Methodologies		- identifying new lands for afforestation; - integrated planning on a national and local scale, provision of planting material and machinery, methodological and technological, design, fieldwork assurance, etc.; - creating highly productive and environmentally stable stands; - awareness building and training on sustainable management of natural resources; - MRV of wooded areas expansion; - the GHG removals potential was calculated in accordance with the approved CDM methodology AR-AM0002 "Restoration of Degraded Areas by Afforestation/Reforestation" (UNFCCC, 2009); the Methodology should also be used to determine actual CO_2 removals.
Assumptions		- to estimate annual growth and losses of biomass in forests, the country specific emission factors have been calculated/developed; - for planting purposes, species are selected according to soil matching criteria, climate and adaptability characteristics; - afforestation of degraded land will improve soil condition.
Goals		- attain an afforestation level appropriate to a healthy ecosystem of about 15% of the country's territory, which is currently 11.2%; - increase the amount of GHG (CO_2) removals.
Undertaken steps		Approved: - the State Program for the regeneration and afforestation of forest land for 2003-2020[149], the National Area Extension Plan for 2014-2018[142], the National Agricultural and Rural Development Strategy for 2014-2020[150], the Environmental Strategy for 2014-2023 and the Action Plan for its implementation[151], The Low-Emission Development Strategy of the Republic of Moldova until 2030 and the Action Plan for its implementation[152]; - in the end of 2016 the Regulation on afforestation of degraded lands owned by administrative-territorial units as public property, and of private lands, was approved [153].
Planned steps		Subsequent promotion of the NAMA document on afforestation of degraded land, riparian areas and protection belts in the Republic of Moldova.
Implementation progress	Outputs	- NAMA on afforestation of degraded lands, riparian areas and protection belts in the Republic of Moldova was registered in the UNFCCC NAMA Register as NAMA seeking implementation support; - the NAMA has been included in the Country Green Climate Fund Program.
	CO_2 emissions removals	By 2030: about 2000 kt CO_2 eq. (cumulative)

[147] Government Decision no. 593 from 01.08.2011 approving the National Program for the Establishment of the National Network for 2011-2018. Published on 12.08.2011 in the Official Gazette no. 131-133, art.664. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=339794>
[148] Government Decision no. 1009 of 10.12.2014 approving the Strategy for Adaptation to Climate Change until 2020 of the Republic of Moldova and the Action Plan for its implementation. Published in the Official Gazette no. 372-384, art.1089. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=355945>
[149] Government Decision no. 737 of 17.06.2003 approving the State Program for regeneration and afforestation of forest land for 2003-2020. Published on 01.07.2003 in the Official Gazette no. 132-133, art.788. < http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=304349 >
[150] Government Decision no. 742 of 21.10.2015 approving the Action Plan on the implementation of the National Strategy for Agricultural and Rural Development for 2014-2020. Published on 30.10.2015 in the Official Gazette no. 297-300, art. 835. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=361669>
[151] Government Decision no. 301 of 24.04.2014 approving the Environmental Strategy for 2014-2023 and the Action Plan for its implementation. Published on 06.05.2014 in the Official Gazette no. 104-109, art.328. < http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=352740 >
[152] Government Decision no. 1470 of December 30, 2016 approving the Low-Emission Development Strategy of the Republic of Moldova until 2030 and the Action Plan for its implementation. Published on 24.03.2017 in the Official Gazette no. 85-91, art.222. < http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=369528 >
[153] Government Decision no. 1186 of 28.10.2016 approving the Regulation on afforestation of degraded lands owned by administrative-territorial units as public property and the degraded lands as private property. Published on 04.11.2016 in the Official Gazette no. 379-386, art. 1283. < http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=367373 >

Mitigation action 2-18: Smart climate management of forests and grasslands

Description	Nature of action	Afforestation of degraded lands, rehabilitation of grasslands, rehabilitation of protection forest belts
	Sector	LULUCF
	GHG	CO_2
	Quantitative targets	- afforestation of degraded land on 1,500 hectares; - afforestation of riparian strips on 320 hectares; - creation of protection belts for agricultural fields on 560 hectares; - rehabilitation of protection forest belts on 750 ha; - rehabilitation of degraded grasslands on 1,000 ha.
	Progress indicators	- the wooded area; - area of rehabilitated protection forest belts; - area of improved grasslands; - the amount of CO_2 removed.
Methodologies		- identifying new lands for afforestation; - integrated planning on a national and local scale, provision of planting material and machinery, methodological and technological, design, fieldwork assurance, etc.; - creating highly productive and environmentally stable stands; - creation highly productive and multifunctional grasslands; - MRV; - CDM AR-AM0002 "Restoration of Degraded Areas by Afforestation/Reforestation" (UNFCCC, 2009)[154]. The Methodology should also be used to determine actual CO_2 removals.
Assumptions		- to estimate annual growth and losses of biomass in forests, the country specific emission factors have been calculated/developed; - for planting purposes, species are selected according to soil matching criteria, climate and adaptability characteristics; - for grassland mowing (sowing), the grass species shall be selected according to soil matching criteria, climate and adaptability characteristics; - in order to carry out rehabilitation works for the protection forest belts, the forest species shall be selected to match with the stationary conditions and meet the attributed protection objectives; - afforestation of degraded land will improve soil condition.
Goals		- rehabilitation of protection forest belts and degraded grasslands; - planting new forest protection belts; - attain an afforestation level appropriate to a healthy ecosystem of about 15% of the country's territory, which is currently 11.2% - increasing CO_2 removals
Undertaken steps		Approved: - the State Program for regeneration and afforestation of forest fund lands for 2003-2020[155], the National Area Extension Plan for 2014-2018[156], the Low-Emission Development Strategy of the Republic of Moldova until 2030[157] and the Action Plan for its implementation, the Climate Change Adaptation Strategy until 2020[158]; - in the end of 2016 the Regulation on afforestation of degraded lands owned by administrative-territorial units as public property, and of private lands, was approved[153].
Planned steps		- develop environmental management plans; - select LPAs from the central and southern areas of the country, considered to be more vulnerable to climate change; - assessment of plots for afforestation or for planting/rehabilitation of forest protection curtains.
Implementation progress	Outputs	The actions described are part of the World Bank's pilot climate change adaptation project in the Republic of Moldova[159].
	CO_2 emissions removals	Circa 50 kt CO_2eq annually.

[154] <https://cdm.unfccc.int/filestorage/L/1/Z/L1ZYHU4X5QRPFS2IVGDM8T90N3W6CJ/EB50_repan16_AR-AM0002_ver_03.pdf?t=c098cGI4NTRufDALvnSO65ly8g28qBOCjy2b >
[155] Government Decision no. 737 of 17.06.2003 approving the State Program for regeneration and afforestation of the forest fund lands for 2003-2020. Published on 01.07.2003 in the Official Gazette no. 132-133, art.788. < http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=304349 >
[156] Government Decision no. 101 of 10.02.2014 approving the National Plan for expansion of areas covered with forest vegetation for 2014-2018. Published on 14.02.2014 in the Official Gazette no. 35-41, art.118. < http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=351561 >
[157] Government Decision no. 1470 of December 30, 2016 approving the Low-Emission Development Strategy of the Republic of Moldova until 2030 and the Action Plan for its implementation. Published on 24.03.2017 in the Official Gazette no. 85-91, art.222. < http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=369528 >
[158] Government Decision no. 1009 of 10.12.2014 approving the Climate Change Adaptation Strategy of the Republic of Moldova until 2020 and the Action Plan for its implementation. Published on 19.12.2014 in the Official Gazette no. 372-384, art.1089. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=355945>
[159] <http://documents.worldbank.org/curated/en/617551497232845961/pdf/Moldova-PAD-05222017.pdf>

Mitigation action 2-19: Improving eroded land by conversion to pastures

Description	Nature of action	Conversion of moderately and heavily eroded lands into pastures
	Sector	LULUCF
	GHG	CO_2
	Quantitative targets	- conversion of 40,000 ha of moderately and heavily eroded land into pastures.
	Progress indicators	- area of moderately and heavily eroded lands converted into pastures; - amount of fodder mass for animals produced on the eroded land converted into pastures; - amount of CO_2 removed.
Methodologies		- identifying new areas with eroded soils for improvement/rehabilitation; - integrated planning on a national and local scale, provision of planting material and machinery, methodological and technological, design, fieldwork assurance, etc.; - special technologies were developed and tested in UNDP projects "Clima-East: Sustainable Management of Pastures and Forests in the First National Park of the Republic of Moldova (Orhei National Park) to demonstrate the benefits of mitigation and adaptation measures to climate change for local communities" and "Integrating Biodiversity Conservation Priorities into Territorial Planning Policies and Land Use Practices in Moldova"; - calculations of estimated emission reductions are based on CDM AR-AM0002 "Restoration of Afforestation/Reforestation Land" (UNFCCC, 2009)[160]. The Methodology should also be used to determine the actual CO_2 removals.
Assumptions		- country-specific emission factors have been calculated/developed to estimate annual biomass increases in newly created pastures; - for improvement works (sowing), the grass species will be selected based on soil matching criteria, climate and adaptability characteristics; - conversion of eroded (degraded) land will improve the condition of eroded soils.
Goals		- increase the share pastures to 16% of the country's territory[161], which is now about 11%; - quantitative and qualitative increase of the fodder mass for animals; - re-inclusion of 40.0 thousand ha of eroded and poorly productive land into the productive general circuit; - increase of GHG (CO_2) removal capacity.
Undertaken steps		Approved: - Low-Emission Development Strategy of the Republic of Moldova until 2030 and the Action Plan for its implementation[162]; - Regulation on grazing and mowing, GD no. 667/2010[163]; - Environmental Strategy for 2014-2023 and the Action Plan for its implementation, GD no. 301/2014[164]; - Biological Diversity Strategy of the Republic of Moldova for 2015-2020 and the Action Plan for its implementation, GD no. 274/2015[165];
Planned steps		- primary assessment of eroded land plots intended for improvement by conversion to pastures; - development of improvement projects for eroded and poorly productive lands converted into pastures; - selection of local public authorities (LPAs) from the central and southern areas of the country, regarded as more vulnerable to climate change; - ensuring appropriate management for newly created pastures.
Implementation progress	Outputs	The actions described are part of a new climate change adaptation project[166].
	CO_2 emissions removals	By 2030: about 555 kt CO_2 eq.

[160] <https://cdm.unfccc.int/filestorage/L/1/Z/L1ZYHU4X5QRPFS2IVGDM8T90N3W6CJ/EB50_repan16_AR-AM0002_ver_03.pdf?t=c098cGI4NTRufDALvnSO65ly8g28qBOCjy2b >
[161] Galupa D., Talmaci I., et al. Development of forests and pastures in the Republic of Moldova. - Ch. UASM Ed. Center, 2006.-19 p.
[162] Government Decision no. 1470 of 30.12.2016 approving the Low-Emission Development Strategy of the Republic of Moldova until 2030 and the Action Plan for its implementation. Published on 24.03.2017 in the Official Gazette no. 85-91, art.222. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=369528>
[163] Government Decision no. 667 of 23.07.2010 approving the Regulation on grazing and mowing. Published on 30.07.2010 in the Official Gazette no. 131-134, art.748. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=335434>
[164] Government Decision no. 301 of 24.04.2014 approving the Environmental Strategy of the Republic of Moldova for 2014-2023 and the Action Plan for its implementation. Published on 06.05.2014 in the Official Gazette no. 104-109, art.328. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=352740>
[165] Government Decision no. 274 of 18.05.2015 approving the Biological Diversity Strategy of the Republic of Moldova for 2015-2020 and the Action Plan for its implementation. Published on 29.05.2015 in the Official Gazette no. 131-138, art. 321. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=358781>
[166] < http://documents.worldbank.org/curated/en/617551497232845961/pdf/Moldova-PAD-05222017.pdf >

Mitigation action 2-20: Management of degraded agricultural land by implementing erosion control measures and eroded soils cultivation methods

Description	Nature of action	Sustainable management of eroded agricultural land
	Sector	LULUCF
	GHG	CO_2
	Quantitative targets	- remediate the eroded arable soils on slopes, increase fertility, sequestrate carbon in soils; - minimize fertile soil losses up to the maximum admissible limit of 5 t/ha; - stable crop yields on arable lands on slopes; - stop the liquid and solid leakage intensity on the slopes and prevent compaction; - implement anti-erosion measures on 865 thousand ha of eroded agricultural land; - stop degradation (compaction) on eroded soils by restoration.
	Progress indicators	- the area of eroded agricultural land improved by anti-erosion measures; - the area of eroded agricultural land with restored fertility; - the amount of CO_2 sequestered.
Methodologies		Anti-erosion protection measures for arable land include measures aimed at surface leakage regulation, agricultural techniques retaining water in soil, optimizing soil compaction degree, crop rotation. For lands with 2° gradient: 1) hoeing crops - 60%, cereal crops - 20%; legumes - 15%, fodder crops - 5%; 2) cereal crops - 50%, hoeing crops - 50%; 3) hoeing crops - 50%; other - 50%, annual cereal and leguminous cereals planted in strips with a maximum width of 200 m. For lands with 2-5° gradient the crops are planted on 100-150 m wide strips, including 50% hoeing crops, 25% - cereal crops, 5% - perennial herbs; 20% - leguminous and fodder crops. For lands with 5-8° - 30% hoeing crops, 40% cereal crops, 20% leguminous and fodder crops, 10% perennial herbs. The crops are planted in strips up to 100 m wide and 4 to 5 m wide swaths. Slopes with more than 8° gradient should not be included in the arable land category, these slopes are used for multiannual plantations (fruit trees and vines) and pastures. On sloping land where it is not possible to permanently sow herbaceous species (herbing), crops are alternated with protective plant strips and grass strips along the length of the curves. For land consolidation and protection, earth waves, agricultural terraces, smooth banks or level fencing are built. To calculate CO_2 emission reductions two methodologies will be used: - Tier 1 methodology available in the 2006 IPCC Guidelines (Vol. 4 - Chapter 2); - Tier 3 methodology to determine the carbon balance in agricultural soils to estimate greenhouse gas emissions (Banaru, 2000)[167].
Assumptions		- develop the sloping arable land distribution schemes, taking into account the geomorphological, pedoclimatic and erosion risk factors; - implement "no-till" and "mini-till" soil conservation systems on at least 160 thousand hectares, with incorporation of green manure into the soil according to pre-set periodicity[168].
Goals		- stop erosion and compaction of eroded soils on 865 thousand ha; - achieve carbon and humus balance in soil by 2030; - increase soil productivity avoiding its degradation by erosion and compaction; - GHG emissions reduction.

Undertaken steps		Approved: - Soil Conservation and Fertility Enhancement Program for 2011-2020 and the Action Plan for its Implementation (2017-2020)[169]; - List of sites and necessary financial means for 2018 to implement the Action Plan on implementation of the Soil Conservation and Fertility Enhancement Program for 2017-2020; - Technical Regulations "Soil Protection Measures in Agricultural Practices"[170], GD no. 1157/2008[171]; - National Agricultural and Rural Development Strategy for 2014-2020[172]; - Environmental Strategy for 2014-2023 and the Action Plan for its Implementation[173].
Planned steps		- develop and approve Action Plans and Agricultural Practices Guidelines for eroded soil management.
Implementation progress	Outputs	- anti-erosion sustainable management (including "no-till" and "mini-till" practices) is used on about 35 thousand ha of agricultural lands; - the state grants financial support (up to 70%) for procurement of machinery for advanced sloped soils cultivation technologies.
	CO_2 emission reductions / removals	By 2030, the humus content in eroded soils will increase and entail the following GHG emissions reductions (indirect calculations): - by 50%, 149 thousand tons of CO_2 equivalent - for poorly eroded soils (humus - 2.97%); - by 30%, 114 thousand tons of CO_2 equivalent - for moderately eroded soils (humus - 2.28%); - 15%, 91 thousand tons of CO_2 equivalent - for heavily eroded soils (humus - 1.82%).

[167] Banaru, Anatol (2000), Method to Determine GHG Emissions from Arable Soils. In the collection of works „Climate changes, Research, Studies, Solutions". Ministry of Environment and Territorial Planning / UNDP Moldova. „Bons Offices" Ltd. Chisinau, 2000, pp. 115-123.
[168] Government Decision no. 1470 of 30.12.2016 approving the Low-Emission Development Strategy of the Republic of Moldova until 2030 and the Action Plan for its implementation. Published: 24.03.2017 in the Official Gazette no. 85-91, art.222. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=369528>
[169] Government Decision no. 626 of 20.08.2011 approving the Soil Conservation and Fertility Enhancement Program for 2011-2020. Published on 26.08.2011 in the Official Gazette no. 139-145, art. 696. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=339882>
[170] Technical Regulations „Soil protection measures in agricultural practices". GD no.1157 of 13.10.2008. Official Gazette 2008, no.193-194, art.1195
[171] Government Decision no. 1157 of 13.10.2008 approving the Technical Regulation „Soil protection measures in agricultural practices". Published: 28.10.2008 in the Official Gazette no. 193-194, art. 1195. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=329482>
[172] Government Decision no. 742 of 21.10.2015 approving the Action Plan on implementation of the National Strategy for Agricultural and Rural Development for 2014-2020. Published on 30.10.2015 in the Official Gazette no. 297-300, art.835. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=361669>
[173] Government Decision no. 301 of 24.04.2014 approving the Environmental Strategy for 2014-2023 and the Action Plan for its implementation. Published on 06.05.2014 in the Official Gazette no. 104-109, art.328. <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=352740>

Mitigation action 2-21: GHG emissions reduction by connecting urban and rural population to centralized sewerage services and upgrading the wastewater treatment plants in Chisinau municipality, by using anaerobic sludge treatment method

Description	Nature of action	Anaerobic treatment of wastewater sludge
	Sector	Wastewater treatment
	GHG	CH_4, N_2O
	Quantitative targets	- by 2025 - connecting 85% of urban population and 25% of rural population to sewage systems[174]; - by 2028 - connecting 652,892 new users to drinking water and sewage systems; construction of 344 new water treatment plants; construction of 1.959 km of new sewerage pipelines[175]; - anaerobic fermentation of sludge and capturing biogas for electricity production; - reduce the amount of sludge and stabilize it for use in agriculture.
	Progress indicators	- number of population connected to sewage and wastewater treatment systems; - amount of anaerobically fermented sludge.
Methodologies		- developing feasibility studies, technical documentation and investment project for construction, repairs of wastewater treatment plants and sewerage networks; - implementation of approved programs and strategies; - MRV of biogas generated and used for electricity production at the sewage treatment plant in Chisinau municipality; - to estimate CH_4 emissions from Wastewater Management, and respectively, CH_4 emissions projections, Tier 1 calculation methodologies available in the 2006 IPCC Guidelines Volume 5, were used.
Assumptions		- development of new sewerage and wastewater treatment infrastructure, as well as ensuring connection of population to the existing infrastructure; - construction and operation of sludge anaerobic fermentation basins with energy production at the wastewater treatment plant in Chisinau municipality[176];
Goals		- improved access to sewage and wastewater treatment services in rural and urban areas in the Republic of Moldova; - management of sewage sludge to recover CH_4 emissions and produce electricity for the needs of the sewage treatment plant in Chisinau municipality; - improving health and quality of life, economic development of the country; - low CH_4 and N_2O emissions in the atmosphere.
Undertaken steps		- Approved: National Program for the Implementation of the Water and Health Protocol (ApaSan) in the Republic of Moldova for 2016-2025[1], the Water Supply and Sanitation Strategy (2014-2028)[2] and the Action Plan for 2018-2028 on regionalization of the water supply and sewerage service[177],pending approval; - a number of projects have already been signed and launched, including: "Strengthening the institutional framework in the water supply and sanitation sector of the Republic of Moldova", Phase III of the Project (ApaSan) in the Republic of Moldova; "Harmonization of the national legislation with Directive 91/271/EEC on Urban Waste Water Treatment"[178]; - the German company GIZ has developed regional sectoral water supply and sewerage programs for all development regions; - the project "Rehabilitation of the wastewater treatment plant and the new sludge treatment line" was launched by the SA "Apa-Canal Chisinau" in early 2018.
Planned steps		- decentralization of public water supply and sanitation services and creation of viable regional operators, development of water supply and sanitation plans; - identify funding sources for project implementation.
Implementation progress	Outputs	- within the project "Rehabilitation of the Water Supply System in the Nisporeni District", the treatment plant for water from the Prut river in Grozesti village was put into operation, and a 16.8 km long aqueduct and 101.8 km distribution networks[5] were built; - the Regional Development Agencies (RDA) implemented the following water supply and sanitation projects during 2017[5]: • RDA North - Drinking water and sewerage services supply to population of Risipeni and Bocsa villages, and social-cultural facilities (Falesti district); • RDA South - Construction of the sewerage system in the Valul Traian sector and upgrading the wastewater treatment plant in Causeni; Construction of the sewerage system in Rosu village, Cahul district"; • RDA Center - Main water pipeline for Bardar, Ruseștii Noi (second stage) and sewerage networks for Ialoveni; Improving the quality of life of rural population by constructing drinking water supply and sewage systems, regionalization of communal services in the villages of Lapusnita river valley, Hancesti district; Construction of the district wastewater treatment station and development of inter-communal public sewerage and waste water treatment system, Nisporeni district; - The ApaSan project has implemented two components: the treatment plant in Trușeni village, Chisinau municipality, and two bathroom facilities in the summer camp in Cahul municipality[5]; - GIZ is implementing regional projects to modernize water and sanitation services[5]; - construction of the platform for installation of container with the sludge dewatering centrifuge has been finalized with the project "Rehabilitation of the wastewater treatment plant and the new sludge treatment line" launched by the SA "Apa-Canal Chisinau" in early 2018.
	CH^4 emission reductions	By 2030: cca. 143.91 kt CO_2 equivalent

[174] Government Decision no. 1063 of 16.09.2016 approving the National Program for Implementation of the Protocol on Water and Health in the Republic of Moldova for 2016-2025 Published on 20.09.2016 in the Official Gazette no. 314, art.1141, amended by GD 1090 of 18.12.17, OG440/20.12.17 art.1214, <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=366749>
[175] Government Decision of the Republic of Moldova no. 199 of 20.03.2014 approving the Water Supply and Sanitation Strategy (2014 - 2028), Published on 28.03.2014 in the Official Gazette no. 72-77, art.222, amended by GD1089 of 18.12.17, OG440/20.12.17 art.1213, <http://lex.justice.md/md/352311/>
[176] Water Supply and Wastewater Treatment Program for Chisinau Municipality - Feasibility Study, Project Presentation Report, EBRD, KfW Entwicklungsbank and European Investment Bank, November 2012.
[177] <http://particip.gov.md/projectview.php?l=en&idd=4693>
[178] The 2017 Report on Implementation of the Water Supply and Sanitation Strategy (2014-2028), the letter of the Ministry of Environment no. 01/01-728 of 14.04.2018 to the State Chancellery, <http://www.madrm.gov.md/en/content/strategia-de-alimentare-cu-apa-sanitație-2014-2028>

Mitigation action 2-22: Primary collection and storage of waste in urban and rural areas

Description	Nature of action	Solid waste management
	Sector	Waste
	GHG	CH_4
	Quantitative targets	- setting up 8 regional solid waste primary collection and storage systems; - waste management services provided in urban and rural areas by 2020; - provision of 35,650 containers and 120 transport units with the capacity of $8m^3$ for waste collection.
	Progress indicators	- the number of maintained SWD sites; - amount of recycled waste; - amount of waste stored in each deposit site; - GHG emissions reduction.
Methodologies		- design and implementation of 8 regional systems for primary collection and storage of solid waste; - construction of power plants based on biogas created in SWDs, a total of 7 units; - MRV of biogas generated and used for power generation; - CDM "Emissions from Solid Waste Deposit Sites "tool and the CDM AMS-III.G CDM "Landfill Methane Recovery"[179] methodology will be used to calculate the GHG emissions reduction.
Assumptions		- about 25-30% of all plastic, metal, glass and paper waste will be collected and recycled by 2025; - biodegradable waste will exceed 40% of the total weight of the stored waste; - electricity produced from landfill gas will be feed into the network based on the feed-in tariff.
Goals		- ensure a high quality environment; - minimize health risks; - reduce raw materials for paper, glass, plastic and metals production; - reduce CH_4 emissions in the atmosphere.
Undertaken steps		Approved: - Waste Management Strategy of the Republic of Moldova for 2013-2027; - the German company GIZ has completed the design of the primary collection and storage system for urban and rural waste for some of the 8 regions in the country, for now, the system is being designed for the remaining regions; - "Promotion of Waste to Energy in the Republic of Moldova" was registered in 2018 in UNFCCC NAMA Register as NAMA seeking implementation support[180].
Planned steps		- drafting and approving the Action Plan; - identification of sources of funding for primary collection and storage systems in urban and rural areas, including implementation of the above mentioned NAMA; - media coverage, awareness building and training on importance of selecting recyclable waste.
Implementation progress	Outputs	- negotiated and located sites for solid waste deposits in all regions of the country; - GIZ will implement regional projects of primary collection and storage of waste in urban and rural areas.
	Emissions reductions	Total 3.39 Mt CO_2 equivalent

[179] CDM Tool „Emissions from Solid Waste Disposal sites", <http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-04-v7.pdf>;
CDM methodology AMS III. G „Landfill methane recovery", <http://cdm.unfccc.int/filestorage/E/K/A/EKA6GXDLB5TNYVCIJP0S3O9HQ8UW7F/EB81_repan32_AMS-III%20G_ver09.0.pdf?t=VUN8bzd6OWJlfDDJYR-DoMIlcrOJ9U_3yIWVH>
[180] <http://www4.unfccc.int/sites/nama/_layouts/un/fccc/nama/NamaSeekingSupportForImplementation.aspx?ID=196&viewOnly=1>

BIBLIOGRAPHY

1. **Academia de Ştiinţe a Moldovei (Academy of Sciences of Moldova) (2011),** *Raport privind activitatea Consiliului Suprem pentru Ştiinţă şi Dezvoltare Tehnologică şi rezultatele ştiinţifice principale, obţinute în sfera ştiinţei şi inovării în perioada anilor 2006-2010 (Report on the activity of the Supreme Council for Science and Technological Development and the main scientific results achieved in science and innovation during 2006-2010)* . Chişinău, 2011. 394 p.
2. **Academia de Ştiinţe a Moldovei (Academy of Sciences of Moldova) (2012),** *Raport privind activitatea Consiliului Suprem pentru Ştiinţă şi Dezvoltare Tehnologică şi rezultatele ştiinţifice principale, obţinute în sfera ştiinţei şi inovării în anul 2011. (Report on the activity of the Supreme Council for Science and Technological Development and the main scientific results achieved in science and innovation in 2011)* Chişinău, 2012. 301 p.
3. **Academia de Ştiinţe a Moldovei / Ministerul Agriculturii şi Industriei Prelucrătoare / Institutul Ştiinţifico-Practic de Biotehnologii în Zootehnie şi Medicină Veterinară (Academy of Sciences of Moldova / Ministry of Agriculture and Food Industry / Scientific and Practical Institute of Biotechnologies in Animal Husbandry and Veterinary Medicine) (2012),** *Raport de autoevaluare privind activitatea ştiinţifică şi inovaţională (2007-2011). Profilul „Tehnologii în zootehnie şi medicină veterinară". (Self-assessment report on scientific and innovation activity (2007-2011). Profile „Technologies in animal husbandry and veterinary medicine")* Maximovca, 2012. 135 p.
4. **Academia de Ştiinţe a Moldovei/ Ministerul Agriculturii şi Industriei Prelucrătoare (Academy of Sciences of Moldova / Ministry of Agriculture and Food Industry) (2012),** *Raport de evaluare Instituţia Publică Institutul de Cercetări pentru Culturile de Câmp „Selecţia". Profil de cercetare: „Crearea soiurilor, elaborarea tehnologiilor de cultivare la culturile de câmp": anii: 2007-2011. Aprobat la şedinţa Consiliului Ştiinţific al IP Institutului de Cercetări pentru Culturile de Câmp „Selecţia", proces-verbal nr. 4 din 21 mai 2012.(Evaluation Report of the Public Institution Research Institute for Field Crops „Selectia". Research profile: „Selection of varieties, development of cultivation techniques in field crops": years: 2007-2011. Approved at the Scientific Council meeting of PI Research Institute for Field Crops „Selectia", Minutes no. of 21 May 2012)* Bălţi, 2012. 153 p.
5. **Academia de Ştiinţe a Moldovei (Academy of Sciences of Moldova) (2013),** *Raport privind activitatea Consiliului Suprem pentru Ştiinţă şi Dezvoltare Tehnologică şi rezultatele ştiinţifice principale, obţinute în sfera ştiinţei şi inovării în anul 2012. (Report on the activity of the Supreme Council for Science and Technological Development and the main scientific results achieved in science and innovation in 2012)* Chişinău, 2013. 298 p.
6. **Academia de Ştiinţe a Moldovei/ Ministerul Agriculturii şi Industriei Prelucrătoare (Academy of Sciences of Moldova / Ministry of Agriculture and Food Industry) (2013),** *Raport de evaluare a Instituţiei Publice Institutul de Fitotehnie „Porumbeni", Profil de cercetare: Ameliorare şi fitotehnie, anii: 2008-2012. Aprobat la şedinţa Consiliului Ştiinţific al IP Institutului de Fitotehnie „Porumbeni" proces-verbal nr. 5 din 10 iulie 2013. (Evaluation Report of the Public Institution Phytosanitary Research Institute"Porumbeni", Research Profile: Amelioration and Phytotechnology, years: 2008-2012. Approved at the Scientific Council meeting of PI „Porumbeni" Institute of Phytosanitary Research no. of 10 July 2013)* Paşcani, 2013. 111 p.
7. **ADEPT (2009),** *The analysis of the evolution of foreign assistance offered Moldova in the period 2001-2007.* <http://www.e-de-mocracy.md/fles/prioritati-guvernare-2009.pdf>
8. **Agency for Land Relations and Cadaster of the Republic of Moldova (1970-2017),** *State Land Cadasters for 1970-2016.*
9. **Agenţia de Intervenţie şi Plăţi în Agricultură (Agency for Intervention and Payments in Agriculture) (2017),** *Raport de activitate – rezultatele subvenţionării pentru anul* 2016 *(Activity report – subsidization results for 2016).* <http://aipa.gov.md/sites/default/files/REZULTATELE%20SUBVEN%C5%A2ION%C4%82RII%20PENTRU%20ANUL%202016_pdf.pdf>
10. **Agenţia Naţională pentru Reglementare în Energetică (National Agency for Energy Regulation) (2009),** *Raport de activitate al Agenţiei Naţionale pentru Reglementare în Energetică a Republicii Moldova.* (*Activity Report of the National Agency for Energy Regulation of the Republic of Moldova.*) Chişinău, 2009. – 33 p.
11. **Agenţia Naţională pentru Reglementare în Energetică (National Agency for Energy Regulation) (2010),** *Raport de activitate al Agenţiei Naţionale pentru Reglementare în Energetică a Republicii Moldova.* (*Activity Report of the National Agency for Energy Regulation of the Republic of Moldova.*) Chişinău, 2010. – 55 p.
12. **Agenţia Naţională pentru Reglementare în Energetică (National Agency for Energy Regulation) (2011),** *Raport de activitate al Agenţiei Naţionale pentru Reglementare în Energetică a Republicii Moldova.* (*Activity Report of the National Agency for Energy Regulation of the Republic of Moldova.*) Chişinău, 2011. – 57 p.
13. **Agenţia Naţională pentru Reglementare în Energetică (National Agency for Energy Regulation) (2012),** *Raport al Agenţiei Naţionale pentru Reglementare în Energetică privind activitatea desfăşurată în anul 2012.* (*Activity Report of the National Agency for Energy Regulation of the Republic of Moldova for 2012.*) Chişinău, 2012. – 70 p.
14. **Agenţia Naţională pentru Reglementare în Energetică (National Agency for Energy Regulation) (2013),** *Raport privind activitatea Agenţiei Naţionale pentru Reglementare în Energetică în anul 2013.* (*Activity Report of the National Agency for Energy Regulation of the Republic of Moldova for 2013.*) Chişinău, 2013. – 65 p.
15. **Agenţia Naţională pentru Reglementare în Energetică (National Agency for Energy Regulation) (2014),** *Raport privind activitatea Agenţiei Naţionale pentru Reglementare în Energetică în anul 2014.* (*Activity Report of the National Agency for Energy Regulation of the Republic of Moldova for 2014.*) Chişinău, 2014. – 85 p.
16. **Agenţia Naţională pentru Reglementare în Energetică (National Agency for Energy Regulation) (2015),** *Raport privind activitatea Agenţiei Naţionale pentru Reglementare în Energetică în anul 2015.* (*Activity Report of the National Agency for Energy Regulation of the Republic of Moldova for 2015.*) Chişinău, 2015, 101 p.

17. **Agenția Națională pentru Reglementare în Energetică (National Agency for Energy Regulation) (2017),** *Raport privind activitatea Agenției Naționale pentru Reglementare în Energetică în anul 2016.* (*Activity Report of the National Agency for Energy Regulation of the Republic of Moldova for 2016.*) Chișinău, 2017, 121 p.

18. **AITT (2016),** *Proiecte de transfer tehnologic implementate în anii 2015-2016.* (*Technology transfer projects implemented in 2015-2016)* <https://aitt.md/uploads/files/Catalog_2016.pdf>

19. **AITT (2015),** *Raportul anual, 2015.* (Annual Report, 2015).

20. **AITT (2014),** *Raportul privind activitatea managerială. (Managerial Activity Report) (2011-2014).* Chișinău, 2015.

21. **Andrieș, Serafim (2013),** *Institutul de Pedologie, Agrochimie și Protecție a Solului „Nicolae Dimo" la 60 de ani.* (*Institute of Pedology, Agrochemistry and Soil Protection „Nicolae Dimo" at 60 years.*) Revista Akademos, nr. 3 (30), septembrie 2013 (Akademos Journal. no. 3 (30), September 2013) P. 49-56.

22. **Asociația ProRuralInvest din Moldova/ Centrul de Consultanță Agricolă Kujawsko-Pomorski din Minikowo din Polonia (ProRuralInvest Association of Moldova / Kujawsko-Pomorski Agricultural Consultancy Center in Minikowo, Poland)(2013),** *Politici agricole și rurale: standarde de dezvoltare. Experiențe europene pentru Republica Moldova.* (*Agricultural and Rural Policies: Development Standards. European experience for the Republic of Moldova*). Chișinău. 44 p.

23. **Banaru, A. (2000)**, *Methodology to calculate CO_2 Emissions from Agriculture Soils* (in Romanian). Collection of articles 'Climate change: Researches, studies, solutions', Ministry of the Environment / UNDP Moldova. „Bons Offices", Chisinau, 2000. p. 115-123.

24. **Banaru, A., Turcan, M., Arhip, O., Andries, S., Balteanschi, D. (2002)**, *Methodological Guidelines to Determine Humus Balance in Agriculture Soils* (in Romanian). Ministry of Agriculture and Food Industry of the Republic of Moldova. Institute of Pedology, Agrochemistry and Soil Protection "Nicolae Dimo" and TACIS FDMOL 9901 Support to Developing Education, Research and Extension Services in Agriculture Project, Chisinau, 2002. 23 p.

25. **Cancelaria de Stat a Republicii Moldova (State Chancellery of the Republic of Moldova) (2017),** *Platforma pentru Gestionarea Asistenței Externe (PGAE) a Guvernului RM. The PGAE Platform of the Government of Moldova.* <http://amp.gov.md/TEMPLATE/ampTemplate/dashboard/build/index.html>

26. **Cancelaria de Stat a Republicii Moldova. (State Chancellery of the Republic of Moldova) (2016),** *Raportul anual privind asistența externă acordată Republicii Moldova în anul 2016.* (Annual report on external assistance to the Republic of Moldova in 2016). Chișinău, iunie 2017.

27. **Centrul Analitic „Expert-Grup", Asociația pentru Democrație Participativă „ADEPT" și Centrul de Resurse Juridice din Moldova (Analytical Center „Expert-Grup", Association for Participatory Democracy „ADEPT" and Center for Legal Resources in Moldova) (2017),** *Raport de monitorizare a implementării Foii de parcurs privind agenda de reforme prioritare (5 iulie-22 noiembrie 2017) (Monitoring report on implementation of the Roadmap for Priority Reform Agenda (5 July-22 November 2017).)* <https://crjm.org/wp-content/uploads/2017/12/Raport-intermediar-RO_final.pdf>

28. **Cerbari, V. (2011),** *No-Till – sistem de agricultură care protejează solul.* Revista „Agricultura Moldovei", nr. 8-9, (*No-Till - a farming system that protects the soil.* Magazine „Agriculture of Moldova", no. 8-9) 2011, p. 9-14.

29. **Cerbari, V., Scorpan, V., Țăranu, M. (2010),** *The potential for reducing the CO_2 emissions from arable soils of the Republic of Moldova.* Mediul Ambiant (Environment), Scientific Journal of Information and Ecological Culture, No. 1 (49), February 2010, ISSN: 1810-9551. P. 6-13.

30. **Cerbari, V., Scorpan, V., Țăranu, M., (2012),** *Changing properties of common chernozems in the south of Moldova as influenced by some phytotechnology actions*, In: „Academician I.A. Krupenikov – 100 years": Collection of Scientific Articles/ Academy of Sciences of Moldova, Institute of Pedology, Agrochemistry and Soil Protection „N. Dimo", „Eco-TIRAS" International Environmental Association of Dniester River Keepers; Ch.: S.n., 2012, 184 p. (P. 68-76).

31. **Cerbari, V., Scorpan, V., Țăranu, M., Bacean, I. (2012),** *Remedy of the quality state and productivity capacity of common chernozems in the south of Moldova as influenced by some phytotechnology actions*, Mediul Ambiant (Environment), Scientific Journal of Information and Ecological Culture, No. 1 (61), February 2012, P. 38-43.

32. **Corobov R., Mitselea M. (2013),** *Some characteristics of current climate in the Moldavian part of the Dniester river's basin.* Transboundary Dniester river basin management in frames of a new river basin treaty. Proceedings of the International Conference, Chisinau, September 20-21, 2013. P. 167-173.

33. **Danish Ministry of the Environment, Environment Protection Agency (2010),** *Greenhouse Gases HFCs, PFCs and SF6, Danish Consumption and Emissions, 2008.* Environmental Project No. 1323 2010, <http://www2.mst.dk/udgiv/publications/2010/978-87-92617-66-8/pdf/978-87-92617-67-5.pdf>

34. **Department for Statistical Analysis of the Republic of Moldova (1994)**, *Energy Balance for 1993 for the Republic of Moldova (without ATULBD)* (in Romanian). Chisinau.

35. **Department for Statistical Analysis of the Republic of Moldova (1994)**, *Statistical Yearbook of the Republic of Moldova, 1993.* Chisinau: "Statistica", 1994, 448 p.

36. **Department for Statistical Analysis of the Republic of Moldova (1995)**, *Energy Balance for 1994 for the Republic of Moldova (without ATULBD)* (in Romanian). Chisinau.

37. **Department for Statistical Analysis of the Republic of Moldova (1995)**, *Statistical Yearbook of the Republic of Moldova, 1994.* Chisinau: Printing and Publishing, 1995, 420 p.

38. **Department for Statistical Analysis of the Republic of Moldova (1996)**, *Statistical Yearbook of the Republic of Moldova, 1995.* Chisinau: Printing and Publishing, 1996, 464 p.

39. **Department for Statistical Analysis of the Republic of Moldova, Main Computing Centre (1996)**, *Energy Balance for 1995 for the Republic of Moldova* (in Romanian). Chisinau.

40. **Department for Statistical Analysis of the Republic of Moldova (1997)**, *Statistical Yearbook of the Republic of Moldova, 1996.* Chisinau: Publishing House "Stiinta", 1997, 528 p.

41. **Department for Statistical Analysis of the Republic of Moldova (1997)**, *Energy Balance for 1996 for the Republic of Moldova* (in Romanian). Chisinau.

42. **Department for Statistical Analysis and Sociology of the Republic of Moldova, Main Computing Centre (1998)**, *Energy Balance for 1997 for the Republic of Moldova* (in Romanian). Chisinau.

43. **Department for Statistical Analysis and Sociology of the Republic of Moldova, Main Computing Centre (1999)**, *Energy Balance for 1998 for the Republic of Moldova* (in Romanian). Chisinau.

44. **Department for Statistical Analysis and Sociology of the Republic of Moldova, Main Computing Centre (2000)**, *Energy Balance for 1999 for the Republic of Moldova* (in Romanian). Chisinau.

45. **Department for Statistical Analysis and Sociology of the Republic of Moldova (2001)**, *Statistical Yearbook of the Republic of Moldova, 1999*. Chisinau: Statistica, 526 p

46. **Department for Statistical Analysis and Sociology of the Republic of Moldova (2001)**, *Energy Balance for 2000 for the Republic of Moldova* (in Romanian). Chisinau.

47. **Department for Statistical Analysis and Sociology of the Republic of Moldova (2002)**, *Energy Balance for 2001 for the Republic of Moldova* (in Romanian). Chisinau.

48. **Department for Statistical Analysis and Sociology of the Republic of Moldova (2003)**, *Statistical Yearbook of the Republic of Moldova, 2003*. Chisinau: Statistica, 704 p.

49. **Department for Statistical Analysis and Sociology of the Republic of Moldova (2003)**, *Energy Balance for 2002 for the Republic of Moldova* (in Romanian). Chisinau.

50. **Department for Statistical Analysis and Sociology of the Republic of Moldova (2004)**, *Statistical Yearbook of the Republic of Moldova, 2004*. Chisinau: Statistica, 738 p.

51. **Department for Statistical Analysis and Sociology of the Republic of Moldova (2004)**, *Energy Balance for 2003 for the Republic of Moldova* (in Romanian). Chisinau.

52. **Department for Statistical Analysis and Sociology of the Republic of Moldova (2005)**, *Statistical Yearbook of the Republic of Moldova, 2005*. Chisinau: Statistica, 555 p.

53. **EEA (2016),** *EMEP/EEA Air Pollution Emission Inventory Guidebook 2016, Technical guidance to prepare national emission inventories.* European Environment Agency, Technical report No 21/2016. Copenhagen, Denmark, (available at: <http://www.eea.europa.eu//publications/emep-eea-guidebook-2016>).

54. **Focșa, V., Constandoglo, A. (2013),** *Program de ameliorare a taurinelor pentru lapte în Republica Moldova pentru anii 2014-2020, aprobat pentru implementare de Comisia Zooveterinară a Consiliului Tehnico-Științific al Ministerului Agriculturii și Industriei Alimentare al Republicii Moldova, proces-verbal nr.2 din 17.10.2013.* (*Breeding program for dairy cattle in the Republic of Moldova for 2014-2020, approved for implementation by the Zootechnical Commission of the Technical and Scientific Council of the Ministry of Agriculture and Food Industry of the Republic of Moldova, Minutes no.2 of 17.10.2013.*) ISBN 978-9975-56-122-8. Chișinău, Tipogr. „Print-Caro". 2013, 22 p.

55. **Fondul de Eficiență Energetică (Energy Efficiency Fund) (2017),** *Raport de activitate a Fondului pentru Eficiență Energetică pentru perioada: ianuarie-decembrie 2016.* 20 ianuarie 2017. 64 pagini. (*Activity Report of the Energy Efficiency Fund for the period: January-December 2016.* January 20, 2017. 64 pages.).

56. **Food and Agriculture Organization of the United Nations (2018),** FAOSTAT / FAO Statistics Division, 15 June 2018 <http://www.fao.org/faostat/en/#data/CL>

57. **Gil-Alana L.A. (2008),** *Time trend estimation with breaks in temperature lime series.* Clim Change 89: 325-337.

58. **Guvernul Republicii Moldova (Government of the Republic of Moldova) (2013),** *Programul de activitate al Guvernului Republicii Moldova „Integrare Europeană: Libertate, Democrație, Bunăstare" (Program of Activities of the Government of the Republic of Moldova „European Integration: Freedom, Democracy, Welfare")(2013-2014). <http://www.gov.md/doc.php?l=ro&idc=445&id=6413>*

59. **Hotărârea Curții de Conturi nr. 38 din 15.07.2014 cu privire la Raportul auditului mediului privind utilizarea durabilă a terenurilor agricole.** Publicată: 29.08.2014 în Monitorul Oficial nr. 256-260, art. nr: 37. (Decision of the Court of Accounts no. 38 of 15.07.2014 on the Environmental Audit Report on Sustainable Use of Agricultural Land. Published: 29.08.2014 in the Official Gazette no. 256-260, art. no: 37.) <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=354507>

60. **IAEA – Energy and Power Evaluation Program (ENPEP),** *User's Guide*, Version 3.0.

61. **IAEA – Wien Automatic System Planning (WASP) Package**, *A Computer Code for Power Generating System Expansion Planning*, Version WASP-IV, User's Manual, 2000.

62. **IEA-ETSAP and IRENA (2016),** *Wind Power Technology Brief.* Technology Brief E07 – March 2016. <www.etsap.org – www.irena.org>

63. **Instituția Publică „Agenția de Intervenție și Plăți în Agricultură" (Public Institution „Agricultural Intervention Agency and Payments in Agriculture) (2018),** *Raport analitic privind gestionarea mijloacelor financiare alocate fondului național de dezvoltare a agriculturii și mediului rural în anul 2017*. Aprobat: proces-verbal nr. 1 din 26 ianuarie 2018 al ședinței Consiliului de supraveghere al Instituției Publice "Agenția de Intervenție și Plăți în Agricultură". (*Analytical report on management of funds allocated to the National Agricultural and Rural Development Fund in 2017*. Approved: Minutes no. 1 of 26 January 2018 of the meeting of the Supervisory Board of the Public Institution „Agency for Intervention and Payments in Agriculture") <http://aipa.gov.md/sites/default/files/Raport%20gestionare%20FNDAMR.pdf>

64. **Instituția Publică „Agenția de Intervenție și Plăți în Agricultură" (Public Institution „Agricultural Intervention Agency and Payments in Agriculture) (2018),** *Raport anual de activitate pentru anul 2017. Aprobat: proces-verbal nr. 1 din 26 ianuarie 2018 al ședinței Consiliului de supraveghere al Instituției Publice „*Agenția de Intervenție și Plăți în Agricultură" (*Activity Report for 2017. Approved: Minutes no. 1 of 26 January 2018 of the meeting of the Supervisory Board of the Public Institution „ Agency for Intervention and Payments in Agriculture"*). <http://aipa.gov.md/sites/default/files/Raportul%20anual%20activitate%20AIPA_2017.pdf>

65. **International Energy Agency.** *World Energy Outlook*. 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015 Editions.

66. **International Renewable Energy Agency (2017),** *Cost-competitive renewable power generation: Potential across South East Europe*. January 2017. <http://www.irena.org/publications/2017/Jan/Cost-competitive-renewable-power-generation-Potential-across-South-East-Europe>

67. **International Renewable Energy Agency (2018),** *Renewable Power Generation Costs in 2017*. 2018 Edition. <https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2018/Jan/IRENA_2017_Power_Costs_2018.pdf>

68. **IPCC (2006),** *Guidelines for National Greenhouse Gas Inventories.* Intergovernmental Panel on Climate Change. Prepared by the National Greenhouse Gas Inventories Programme. Published by Institute for Global Environmental Strategies (IGES). Available from: <http://www.ipcc-nggip.iges.or.jp>

69. **IPCC (2007),** Smith, P., D. Martino, Z. Cai, D. Gwary, H. Janzen, P. Kumar, B. McCarl, S. Ogle, F. O'Mara, C. Rice, B. Scholes, O. Sirotenko. *Agriculture. In Climate Change 2007: Mitigation.* Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [B. Metz, O.R. Davidson, P.R. Bosch, R. Dave, L.A. Meyer (eds)], Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

70. **IPCC (2014),** *Climate Change 2014: Mitigation of Climate Change*. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Edenhofer, O., R.

Pichs-Madruga, Y. Sokona, et. al (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

71. **Lafarge Ciment (Moldova) (2015),** *Documentație privind evaluarea impactului asupra mediului a activității de coincinerare a combustibililor alternativi (biomasă și deșeuri menajere solide) în cuptorul de clincher a uzinei de ciment a S.A. „Lafarge Ciment (Moldova)" din str. Viitorului nr. 1, Rezina*. Beneficiar S.A. „Lafarge Ciment (Moldova). Executant SRL „Fortel-Grup" *(Documentation on the Environmental Impact Assessment of co-incineration of alternative fuels (biomass and solid municipal waste) in the clinker furnace of the cement plant Lafarge Ciment (Moldova) Viitorului nr. 1, Rezina*. Beneficiary - SA „Lafarge Ciment (Moldova). Executor SRL „Fortel-Grup"). Chișinău, 2015. <http://www.lafarge.md/Documentatie_EIM_Lafarge_Moldova.pdf>

72. **Lafarge Ciment (Moldova) (2015),** *Programul de realizare a evaluării impactului asupra mediului pentru activitatea planificata „Co-incinerarea combustibililor alternativi (biomasă și deșeuri solide menajere) în cuptorul de clincher, proprietate Lafarge Ciment (Moldova) din str. Viitorului nr. 1, Rezina cu scopul valorificării energetice a deșeurilor" (Documentation on the Environmental Impact Assessment of co-incineration of alternative fuels (biomass and solid municipal waste) in the clinker furnace of the cement plant Lafarge Ciment (Moldova) Viitorului nr. 1, Rezina*. Beneficiary - SA „Lafarge Ciment (Moldova). Executor SRL „Fortel-Grup"). <http://www.lafarge.md/Programul_de_realizare_a_evaluarii_impactului_asupra_mediului.pdf>

73. **Lafarge Ciment (Moldova) (2017),** *Lafarge Ciment inaugurează un Centru de Inovații în Chișinău. Comunicat de presă din 16.11.2017. (Lafarge Ciment inaugurates an Innovation Center in Chisinau. Press release dated 16.11.2017)* <http://www.lafarge.md/wps/portal/md/7_2testNews_Detail?WCM_GLOBAL_CONTEXT=/wps/wcm/connectlib_md/ Site_md/AllPR/PressRelease_1511126081427/PR_RO>

74. **Mașner, O., Liuțcanov, P., Evtodienco, S., Dănuță, A. (2014),** *Program de ameliorare a ovinelor și caprinelor în Republica Moldova pentru anii 2014-2020, aprobat pentru implementare de Comisia Zooveterinară a Consiliului Tehnico-Științific al Ministerului Agriculturii și Industriei Alimentare al Republicii Moldova, proces-verbal nr.3 din 18.12.2013. (Program for improvement of sheep and goats in the Republic of Moldova for 2014-2020, approved for implementation by the Zootechnical Commission of the Technical and Scientific Council of the Ministry of Agriculture and Food Industry of the Republic of Moldova, minutes no.3 of 18.12.2013.)* ISBN 978-9975-56-197-6. Chișinău, Tipogr. „Print-Caro". 2014, 34 p.

75. **Ministerul Agriculturii și Industriei Alimentare (Ministry of Agriculture and Food Industry) (2016),** *Raportul de activitate al Ministerului Agriculturii și Industriei Alimentare pentru anul 2015. (Activity Report of the Ministry of Agriculture and Food Industry for 2015).* <http://maia.gov.md/sites/default/files/article/01/21/2016%20-%2014%3A21/raport_maia_2015_site.pdf>

76. **Ministerul Agriculturii și Industriei Alimentare (Ministry of Agriculture and Food Industry) (2017),** *Nota informativă la Proiectul Hotărârii Guvernului pentru aprobarea Planului de acțiuni privind implementarea Programului de conservare și sporire a fertilității solurilor pentru anii 2017-2020. (Information Note to the Draft Government Decision approving the Action Plan on implementation of the Soil Conservation and Fertility Enhancement Program for 2017-2020).* <http://www.gov.md/sites/default/files/document/attachments/intr17_96.pdf>

77. **Ministerul Agriculturii și Industriei Alimentare (Ministry of Agriculture and Food Industry) (2017),** *Proiectele de asistență externă în sectorul agroalimentar – 2017. (External assistance projects in the agri-food sector - 2017.)* <http://maia.gov.md/ro/categorii/proiecte-de-asistenta-externa-sectorul-agroalimentar>

78. **Ministerul Agriculturii și Industriei Alimentare (Ministry of Agriculture and Food Industry) (2017),** *Raport privind implementarea Strategiei Naționale de Dezvoltare Agricolă și Rurală pentru anii 2014-2020 (pentru anul calendaristic 2016). (Report on the implementation of the National Strategy for Agricultural and Rural Development for the years 2014-2020 (for the calendar year 2016).* Chișinău, martie 2017. <http://maia.gov.md/sites/default/files/article/07/04/2017%20-2008%3A29/report_draft_nards_2016_23.06.2017_rom_curat_1.pdf>

79. **Ministerul Agriculturii și Industriei Prelucrătoare (Ministry of Agriculture and Food Industry) (2016),** *Proiectul Legii zootehniei (în redacție nouă).* Publicat: 24.11.2016. (*Draft Animal Breeding Law (new version).* Published: 24.11.2016 on the platform <http://particip.gov.md/proiectview.php?l=ro&idd=3693>

80. **Ministerul Agriculturii și Industriei Prelucrătoare (Ministry of Agriculture and Food Industry) (2017),** *Proiectul Strategiei de dezvoltare a sectorului de lapte în Republica Moldova pentru anii 2017-2025.* (*Draft Strategy for Dairy Sector Development in the Republic of Moldova for 2017-2025)* <http://maia.gov.md/ro/proiectul-hotaririi-guvernului-pentru-aprobarea-strategiei-de-dezvoltare-sectorului-de-lapte>, <particip.gov.md/public/files/1455049_md_lapte_strategi.doc>

81. **Ministerul Agriculturii și Industriei Prelucrătoare (Ministry of Agriculture and Food Industry) (2017),** *Proiectul Hotărârii Guvernului cu privire la aprobarea Regulamentului privind condițiile și procedurile de organizare și realizare a executării activităților de protecție a solurilor, îmbunătățiri funciare, conservarea și sporirea fertilității solurilor (Draft Government Decision approving the Regulation on conditions and procedures for organizing and implementing the soil protection, land reclamation, soil conservation and fertility enhancement activities)* <http://particip.gov.md/proiectview.php?l=ro&idd=4682>

82. **Ministerul Agriculturii și Industriei Prelucrătoare/ Academia de Științe a Moldovei (2006),** *Proiectul Strategiei de dezvoltare a sectorului agroalimentar în perioada anilor 2006-2015 (Draft Strategy for Agri-Food Sector Development during 2006-2015)* Chișinău. - 51 p.

83. **Ministerul Agriculturii și Industriei Prelucrătoare/ Agenția de Stat pentru Relații Funciare și Cadastru/ Institutul de Cercetări pentru Pedologie și Agrochimie „N. Dimo"/ Institutul de Proiectări pentru Organizarea Teritoriului (Ministry of Agriculture and Food Industry / State Agency for Land Relations and Cadastre / Research Institute for Pedology and Agrochemistry „N. Dimo"/ Spacial Planning Institute) (2004),** *Programul complex de valorificare a terenurilor degradate și sporirea fertilității solului. Partea I. Ameliorarea terenurilor degradate. (Comprehensive program for reclamation of degraded land and soil fertility enhancement. Part I. Reclamation of degraded land.)* Redactor responsabil membru coresp. al AȘM dr.hab.șt.ag., S. Andrieș. Ch.: Pontos, 2004, (Tipografia Reclama). 212 p.

84. **Ministerul Agriculturii și Industriei Prelucrătoare/ Agenția de Stat pentru Relații Funciare și Cadastru/ Institutul de Cercetări pentru Pedologie și Agrochimie „N. Dimo"/ Institutul de Proiectări pentru Organizarea Teritoriului (Ministry of Agriculture and Manufacturing Industry / State Agency for Land Relations and Cadastre / Research Institute for Pedology and Agrochemistry „N. Dimo „/ Spacial Planning Institute) (2004),** *Programul complex de valorificare a terenurilor degradate și sporirea fertilității solului. Partea II. Sporirea fertilității solurilor. (Comprehensive program for reclamation of degraded land and soil fertility enhancement. Part II. Soil fertility enhancement).* Redactor responsabil membr. coresp. al AȘM dr.hab.șt.ag., S. Andrieș. Ch.: Pontos, 2004, (Tipografia Reclama). 128 p.

85. **Ministerul Agriculturii și Industriei Prelucrătoare/ Institutul de Cercetări pentru Pedologie, Agrochimie și Hidrologie „N. Dimo" (Ministry of Agriculture and Food Industry / Research Institute for Pedology and Agrochemistry and Hydrology „N. Dimo") (2001),** *Programul național complex de sporire a fertilității solului în 2001-2020. (The national comprehensive soil fertility enhancement program for 2001-2020.)* Redactor responsabil membr. coresp. al AȘM dr.hab.șt.ag., S. Andrieș. Alcătuitor responsabil dr.hab.șt.ag., prof. V. Cerbari. Ch.: Pontos, 2001, (Tipografia Reclama). -130 p.

86. **Ministerul Educației al Republicii Moldova (Ministry of Education of the Republic of Moldova) (2016)**, *Ordinul 858 din 04.10.2016 cu privire la aprobarea de curricula pentru învățământul profesional tehnic secundar. (Order 858 of 04.10.2016 approving the curricula for secondary technical vocational education).*

87. **Ministerul Finanțelor al Republicii Moldova (Ministry of Finance of the Republic of Moldova) (2018),** Bugetul pentru cetățeni – 2018. (Budget for Citizens - 2018). <http://mf.gov.md/sites/default/files/Buget%20Cetateni%202018.pdf>

88. **Ministerul Mediului al Republicii Moldova (Ministry of the Environment of the Republic of Moldova) (2013),** *Proiectul Hotărârii Guvernului cu privire la aprobarea Strategiei de dezvoltare cu emisii reduse a Republicii Moldova până în anul 2020.* (*Draft Government Decision approving the Low-Emission Development Strategy of the Republic of Moldova until 2020*) <http://particip.gov.md/proiectview.php?l=ro&idd=929>

89. **Ministry of Agriculture, Regional Development and Environment of the Republic of Moldova/ United Nations Environmental Programme (2018),** *Fourth National Communication of the Republic of Moldova under the United Nations Framework Convention on Climate Change*. Coord.: Ion Apostol, Suzanne Lekoyiet; Synthesis Team: Vasile Scorpan, Marius Taranu, Ion Comendant, Lilia Taranu, Ala Druta, Lidia Trescilo, Alecu Renita, Ioana Bobina. - Ch.: SRL „Bons Offices", 2018 – 470 p.

90. **Ministry of Agriculture, Regional Development and Environment of the Republic of Moldova/ United Nations Environmental Programme (2017),** *National Inventory Report: 1990-2015. Greenhouse Gas Sources and Sinks in the Republic of Moldova* / Coord.: Ion Apostol, Suzanne Lekoyiet. Project Team: Vasile Scorpan, Aliona Solomon. Authors: Marius Taranu, Elena Bicova, Tatiana Kirillova, Larisa Moraru, Serghei Burtev, Vladimir Brega, Anatolie Tarita, Sergiu Cosman, Lilia Taranu, Tamara Leah, Ion Talmaci, Aliona Miron, Victor Sfecla, Valerian Cerbari, Tatiana Tugui, Natalia Efros. - Ch.: „Bons Offices" SRL, 2017 - 628 p.

91. **Ministry of Ecology and Territorial Development/ UNDP Moldova (2000),** *First National Communication of the Republic of Moldova,* Submission to the UNFCCC COP-6 on 13th of November 2000.

92. **Ministry of Environment of the Republic of Moldova/ United Nations Environmental Programme (2016),** *Intended National Determined Contribution Report of the Republic of Moldova under the United Nations Framework Convention on Climate Change.* Coord.: Valeriu Munteanu, Suzanne Lekoyiet; Authors: Vasile Scorpan, Marius Taranu, Ion Comendant, Lilia Taranu, Ala Druta. – Chișinău: „Bons Offices", 2016, 155 p.

93. **Ministry of Environment of Republic of Moldova/ United Nations Development Programme (2016),** *Report on National Greenhouse Gas Inventory System in the Republic of Moldova/* Author-coordinator: Marius Taranu; Authors-contributors: Elena Bicova, Vladimir Brega, Anatol Tarita [et al.]; Coordinators: Valeriu Munteanu, Silvia Pana-Carp: Ministry of Environment (MoEN), United Nations Development Programme (UNDP). – Chisinau: Publishing House „Bons Offices", 2016. – 176 p.

94. **Ministry of Environment of the Republic of Moldova/ United Nations Environmental Programme (2016),** *First Biennial Update Report of the Republic of Moldova under the United Nations Framework Convention on Climate Change.* Coord.: Valeriu Munteanu, Suzanne Lekoyiet; Synthesis team: Vasile Scorpan, Marius Taranu, Ion Comendant, Lilia Taranu. – Chișinău: S.n. (Tipogr. „Bons Offices"), 2016, 220 p.

95. **Ministry of Environment of Republic of Moldova/ United Nations Environmental Programme (2015),** *National Inventory Report: 1990-2013. Greenhouse Gas Sources and Sinks in the Republic of Moldova.* Coordinators: Valeriu Munteanu, Suzanne Lekoyiet; Project Team: Vasile Scorpan, Aliona Solomon. Authors: Taranu, M., Bicova, E., Postolatii, V. [et al.] – Chișinău: S.n., 2015 (Tipografia „Bons Offices"). - 419 p.

96. **Ministry of Environment of Republic of Moldova (2015),** *Republic of Moldova's Intended National Determined Contribution and Clarifying Information.* – Chisinau, 25 September 2015. – 30 p. <http://clima.md/doc.php?l=en&idc=267&id=3736>

97. **Ministry of Environment of Republic of Moldova/ United Nations Environmental Programme (2013),** *Third National Communication of the Republic of Moldova to the United Nations Framework Convention on Climate Change.* Coordinators: Gheorghe Salaru, George Manful. Authors: Taranu M., Comendant I., Taranu L., Druta A., Trescilo L., Voda D. – Ch.: „Imprint Plus" SRL, 2013. – 397 p.

98. **Ministry of Environment of Republic of Moldova/ United Nations Environmental Programme (2013),** *National Inventory Report: 1990-2010. Greenhouse Gas Sources and Sinks in the Republic of Moldova*. Coord.: Gheorghe Salaru, George Manful. Project team: Vasile Scorpan, Aliona Solomon. Authors: Marius Taranu, Elena Bicova, Vitalii Postolatii, Vladimir Brega, Anatol Tarita, Sergiu Cosman, Larisa Cremeneac, Valerian Cerbari, Ion Bacean, Ion Talmaci, Tatiana Tugui, Tamara Guvir. – Ch.: „Imprint Plusp" SRL, 2013. – 380 p.

99. **Ministry of Environment of Republic of Moldova/ United Nations Environmental Programme (2009),** *Second National Communication of the Republic of Moldova under the UNFCCC.* Coord.: Violeta Ivanov, George Manful. Synthesis team: Vasile Scorpan, Marius Taranu, Petru Todos, Ilie Boian. – Ch.: „Bons Offices" SRL, 2009. – 316 p.

100. **Ministry of Environment of Republic of Moldova/ United Nations Environmental Programme (2009),** *National Inventory Report: 1990-2005. Greenhouse Gas Sources and Sinks in the Republic of Moldova*. Coord.: Violeta Ivanov, George Manful. Project team: Vasile Scorpan, Aliona Solomon. Authors: Marius Taranu, Vasile Scorpan, Elena Bicova, Vladimir Brega, Anatol Tarita, Ion Bacean, Violeta Paginu, Ion Talmaci, Anatol Banaru, Tatiana Tugui, Sergiu Calos. – Ch.: „Continental Grup" SRL, 2009. – 352 p.

101. **Monitorul Oficial al RM nr. 68-76 din 02.03.2018 (Official Gazette of the RM no. 68-76 of 02.03.2018)**, *Hotărârea Guvernului RM nr. 160 din 21.02.2018 cu privire la aprobarea Programului de promovare a economiei „verzi" în Republica Moldova pentru anii 2018-2020 și a Planului de acțiuni pentru implementarea acestuia.* (*Government Decision no. 160 of 21.02.2018 approving the „green" economy promotion program in the Republic of Moldova for 2018-2020 and the Action Plan for its implementation*).

102. **Monitorul Oficial al RM nr. 464-470 din 29.12.2017**. (**Official Gazette of the RM no. 464-470 of 29.12.2017**) *Parlamentul Republicii Moldova. Legea nr. 289 din 15.12.2017 cu privire la bugetului*

de stat pentru anul 2018. (Parliament of the Republic of Moldova; Law no. 289 of 15.12.2017 on the state budget for 2018).

103. Monitorul Oficial al RM nr. 364-370 din 20.10.2017 (Official Gazette of the RM no. 364-370 of 20.10.2017), *Parlamentul RM. Legea nr. 174 din 21.09.2017 cu privire la energetică. (Parliament of the Republic of Moldova. Law no. 174 of 21.09.2017 on Energy).*

104. Monitorul Oficial al RM nr. 390-395 din 10.11.2017 (Official Gazette of the RM no. 390-395 of 10.11.2017), *Agenția Națională pentru Reglementare în Energetică. Hotărârea nr. 375 din 28.09.2017 cu privire la aprobarea Metodologiei de determinare a tarifelor fixe și a prețurilor la energia electrică produsă de producătorii eligibili din surse regenerabile de energie. (National Agency for Energy Regulation. Resolution no. 375 of 28.09.2017 approving the Methodology for determining fixed tariffs and prices for electricity produced by eligible producers from renewable energy sources).*

105. Monitorul Oficial al RM nr. 390-395 din 10.11.2017 (Official Gazette of the RM no. 390-395 of 10.11.2017), *Hotărârea Guvernului nr. 903 din 07.11.2017 cu privire la modificarea și completarea Hotărârii Guvernului nr. 455 din 21 iunie 2017. (Government Decision no. 903 of 07.11.2017 on amendment and completion of the Government Decision no. 455 of 21 June 2017).*

106. Monitorul Oficial al RM nr. 73-77 din 10.03.2017 (Official Gazette of the RM no. 73-77 din 10.03.2017), *Hotărârea Guvernului nr. 132 din 07.03.2017 privind implementarea Programului de asistență tehnică și financiară acordată de Guvernul României pentru instituțiile preșcolare din Republica Moldova. (Government Decision no. 132 of 07.03.2017 on implementation of the technical and financial assistance program provided by the Romanian Government for pre-school institutions in the Republic of Moldova).*

107. Monitorul Oficial al RM nr. 253-264 din 21.07.2017 (Official Gazette of the RM no. 253-264 of 21.07.2017), *Hotărârea Guvernului nr. 554 din 14.07.2017 pentru aprobarea Planului de acțiuni privind implementarea Programului de conservare și sporire a fertilității solurilor pentru anii 2017-2020. (Government Decision no. 554 of 14.07.2017 approving the Action Plan on implementation of the Soil Conservation and Soil Fertility Enhancement Program for 2017-2020).*

108. Monitorul Oficial al RM nr. 109-118 din 07.04.2017 (Official Gazette of the RM no. 109-118 din 07.04.2017), *Parlamentul RM. Legea nr. 11 din 02.03.2017 privind evaluarea strategică de mediu.(Parliament of the RM. Law no. 11 of 02.03.2017 on Strategic Environmental Assessment).*

109. Monitorul Oficial al RM nr. 201-213 din 23.06.2017 (Official Gazette of the RM no. 201-213 of 23.06.2017), *Hotărârea Guvernului nr. 455 din 21.06.2017 cu privire la modul de repartizare a mijloacelor Fondului Național de Dezvoltare a Agriculturii și Mediului Rural. (Government Decision no. 455 of 21.06.2017 on allocation of the funds of the National Agriculture and Rural Development Fund).*

110. Monitorul Oficial al RM nr. 162-170 din 26.05.2017 (Official Gazette of the RM no. 162-170 of 26.05.2017), *Parlamentul RM. Legea nr. 78 din 04.05.2017 pentru ratificarea Acordului de la Paris. (Parliament of the Republic of Moldova. Law no. 78 of 04.05.2017 on ratification of the Paris Agreement).*

111. Monitorul Oficial al RM nr. 119-126 din 14.04.2017 (Official Gazette of the RM no. 119-126 of 14.04.2017), *Hotărârea Guvernului nr. 203 din 29.03.2017 cu privire la aprobarea Documentului unic de program pentru anii 2017-2020 (Government Decision no. 203 of 29.03.2017 on approval of the Common Programming Document for 2017-2020).*

112. Monitorul Oficial al RM nr. 92-102 din 31.03.2017 (Official Gazette of the RM no. 92-102 of 31.03.2017), *Hotărârea Guvernului nr. 1471 din 30.12.2016 cu privire la aprobarea Planului național de acțiuni în domeniul eficienței energetice pentru anii 2016-2018 (Government Decision no. 1471 of 30.12.2016 approving the National Action Plan on Energy Efficiency for 2016-2018).*

113. Monitorul Oficial nr. 103-108 din 31.03.2017 (Official Gazette of the RM no. 103-108 of 31.03.2017), *Hotărârea Guvernului nr. 1472 din 30.12.2016 cu privire la aprobarea Planului național de acțiuni pentru implementarea Acordului de Asociere Republica Moldova-Uniunea Europeană în perioada 2017–2019 (Government Decision no. 1472 of 30.12.2016 approving the National Action Plan for implementation of the Moldova-EU Association Agreement in 2017-2019).*

114. Monitorul Oficial al RM nr. 85-91 din 24.03.2017 (Official Gazette of the RM no. 85-91 of 24.03.2017), *Hotărârea Guvernului RM nr. 1470 din 30.12.2016 cu privire la aprobarea Strategiei de dezvoltare cu emisii reduse a Republicii Moldova până în anul 2030 și a Planului de acțiuni pentru implementarea acesteia (Government Decision no. 1470 of 30 December 2016 approving the Low-Emission Development Strategy of the Republic of Moldova until 2030 and the Action Plan for its implementation).*

115. Monitorul Oficial al RM nr. 67-71 03.03.2017 (Official Gazette of the RM no. 67-71 of 03.03.2017) *, Legea nr. 276 din 16.12.2016 cu privire la principiile de subvenționare a producătorilor agricoli. Data intrării în vigoare: 01.01.2017 (Law no. 276 of 16.12.2016 on the principles of subsidizing agricultural producers. Date of entry into force: 01.01.2017).*

116. Monitorul Oficial al RM nr. 30-39 din 03.02.2017 (Official Gazette of the RM no. 30-39 of 03.02.2017), *Hotărârea Guvernului RM nr. 41 din 30.01.2017 privind aprobarea proiectului de lege pentru ratificarea Acordului de la Paris, adoptat la 12 decembrie 2015 (Government Decision no. 41 of 30.01.2017 on the approval of the draft Law for the ratification of the Paris Agreement, adopted on 12 December 2015).*

117. Monitorul Oficial al RM nr. 30-39 din 03.02.2017 (Official Gazette of the RM no. 30-39 of 03.02.2017), *Parlamentul RM. Legea nr. 239 din 13.10.2016 pentru aprobarea Strategiei naționale de dezvoltare regională pentru anii 2016-2020 (Parliament of the RM. Law no. 239 of 13.10.2016 on approval of the National Regional Development Strategy for 2016-2020).*

118. Monitorul Oficial al RM nr. 60-66 din 24.02.2017 (Official Gazette of the RM no. 60-66 of 24.02.2017), *Agenția Națională pentru Reglementare în Energetică. Hotărârea nr. 352 din 27.12.2016 cu privire la aprobarea Regulamentului cu privire la indicatorii de calitate ai serviciului public de alimentare cu apă și de canalizare (National Agency for Energy Regulation. Resolution no. 352 of 27.12.2016 approving the Regulation on quality indicators of water supply and sewerage public service).*

119. Monitorul Oficial al RM nr. 459-471 din 23.12.2016 (Official Gazette of the RM no. 459-471 of 23.12.2016), *Legea nr. 209 din 29.07.2016 privind deșeurile. Data intrării in vigoare: 23.12.2017 (Law no. 209 of 29.07.2016 on Waste. Date of entry into force: 23.12.2017).*

120. Monitorul Oficial al RM nr. 405-414 din 25.11.2016 (Official Gazette of the RM no. 405-414 of 25.11.2016). *Hotărârea Guvernului RM nr. 1242 din 14.11.2016 pentru aprobarea Regulamentului cu privire la măsurile de reducere a emisiilor provenite de la sistemele de climatizare ale autovehiculelor (Government Decision no. 1242 of 14.11.2016 approving the Regulation on measures to reduce emissions from air conditioning systems of motor vehicles).*

121. Monitorul Oficial al RM nr. 69-77/413 din 08.07.2016 (Official Gazette of the RM no. 69-77/413 of 08.07.2016), *Parlamentul Republicii Moldova. Legea nr. 107 din 27.05.2016 cu privire la energia*

electrică (Parliament of the Republic of Moldova. Law no. 107 of 27.05.2016 on Electricity).

122. **Monitorul Oficial al RM nr. 232-244 din 29.07.2016 (Official Gazette of the RM no. 232-244 of 29.07.2016),** *Parlamentul RM. Legea nr. 896 din 21.07.2016 pentru aprobarea Regulamentului privind procedura de certificare a performanței energetice a clădirilor și a unităților de clădiri (Parliament of the RM. Law no. 896 of 21.07.2016 on approval of the Regulation on the procedure for certification of energy performance of buildings and of building units).*

123. **Monitorul Oficial al RM nr. 277-287 din 28.06.2016 (Official Gazette of the RM no. 277-287 of 28.06.2016),** *Parlamentul RM. Legea nr. 163 din 07.07.2016 privind ratificarea Acordului de grant dintre Republica Moldova, S.A. „CET-Nord" și Banca Europeană pentru Reconstrucție și Dezvoltare privind grantul investițional acordat din Fondul Regional al Parteneriatului Europei de Est pentru Eficiență Energetică și Mediu (E5P) pentru realizarea proiectului „Sistemul termoenergetic al municipiului Bălți (S.A. „CET-Nord")" (Parliament of the RM. Law no. 163 of 07.07.2016 on Ratification of the Grant Agreement between the Republic of Moldova, JSC „CET-Nord" and the European Bank for Reconstruction and Development regarding the investment grant from the Regional Fund of the Eastern Europe for EE (E5P) „Thermal energy system of Bălți (SA" CET-Nord").*

124. **Monitorul Oficial al RM nr. 100-105 din 15.04.2016 (Official Gazette of the RM no. 100-105 of 15.04.2016),** *Hotărârea Guvernului nr. 414 din 08.04.2016 cu privire la aprobarea Regulamentului privind reducerea conținutului de sulf din anumiți combustibili lichizi (Government Decision no. 414 of 08.04.2016 approving the Regulation on reduction the content of sulfur in certain liquid fuels).*

125. **Monitorul Oficial al RM nr. 69-77 din 25.03.2016 (Official Gazette of the RM no. 69-77 of 25.03.2016),** *Parlamentul RM. Legea nr. 10 din 26.02.2016 privind promovarea utilizării energiei din surse regenerabile (Parliament of the RM. Law no. 10 of 26.02.2016 on promotion of use of energy from renewable sources).*

126. **Monitorul Oficial al RM nr. 2-12 din 15.01.2016 (Official Gazette of the RM no. 2-12 of 15.01.2016),** *Hotărârea Guvernului nr. 903 din 31.12.2015 cu privire la Instituția publică „Fondul de Dezvoltare Durabilă Moldova" (Government Decision no. 903 of 31.12.2015 regarding the Public Institution „Sustainable Development Fund Moldova").*

127. **Monitorul Oficial al RM nr. 370-376 din 31.12.2015 (Official Gazette of the RM no. 370-376 of 31.12.2015),** *HG nr. 890 of 28.12.2015 cu privire la aprobarea posibilității de recoltare a masei lemnoase în procesul tăierilor de produse principale pentru perioada 2016-2020 (GD no. 890 of 28.12.2015 approving the permission for harvesting wood mass during the main products cutting for 2016-2020).*

128. **Monitorul Oficial nr. 144-149 din 12.06.2015 (Official Gazette of the RM no. 144-149 of 12.06.2015)**, *Parlamentul RM. Legea nr. 92 din 14.05.2015 pentru ratificarea Acordului de contribuție dintre Guvernul Republicii Moldova și Banca Europeană pentru Reconstrucție și Dezvoltare privind participarea Republicii Moldova la Fondul Regional al Parteneriatului Europei de Est pentru Eficiență Energetică și Mediu (Parliament of the RM. Law no. 92 of 14.05.2015 on ratification of the Agreement between the Government of the Republic of Moldova and the European Bank for Reconstruction and Development on the participation of the Republic of Moldova in the Eastern Europe Regional Partnership Fund for Energy Efficiency and Environment).*

129. **Monitorul Oficial al RM nr. 317-323 din 27.11.2015 (Official Gazette of the RM no. 317-323 of 27.11.2015),** *Decretul Președintelui RM nr. 1815 din 12.11.2015 privind promulgarea Legii pentru ratificarea Acordului de finanțare dintre Guvernul Republicii Moldova și Comisia Europeană privind implementarea Programului ENPARD Moldova – suport pentru agricultură și dezvoltare rurală (Decree of the President of the Republic of Moldova no. 1815 of 12.11.2015 on promulgation of the Law on ratification of the Financing Agreement between the Government of the Republic of Moldova and the European Commission on implementation of the ENPARD Moldova Program - support for agriculture and rural development).*

130. **Monitorul Oficial al RM nr. 211-212 din 11.08.2015 (Official Gazette of the RM no. 211-212 of 11.08.2015),** *Parlamentul RM. Legea nr. 148 din 30.07.2015 privind ratificarea Acordului de finanțare dintre Republica Moldova și Banca Internațională pentru Reconstrucție și Dezvoltare în vederea realizării Proiectului de îmbunătățire a eficienței sectorului de alimentare centralizată cu energie termică (Parliament of the RM. Law no. 148 of 30.07.2015 on the of the Financing Agreement between the Republic of Moldova and the International Bank for Reconstruction and Development for implementing the Project for improving the district heating sector efficiency).*

131. **Monitorul Oficial al RM nr. 297-300 din 30.10.2015 (Official Gazette of the RM no. 297-300 of 30.10.2015),** *Hotărârea Guvernului nr. 742 din 21.10.2015 pentru aprobarea Planului de acțiuni privind implementarea Strategiei naționale de dezvoltare agricolă și rurală pentru anii 2014-2020 (Government Decision no. 742 of 21.10.2015 approving the Action Plan on implementation of the National Strategy for Agricultural and Rural Development for 2014-2020).*

132. **Monitorul Oficial al RM nr. 177-184 din 10.07.2015 (Official Gazette of the RM no. 177-184 of 10.07.2015,** *Hotărârea Guvernului RM nr. 409 din 16.06.2015 cu privire la foile de parcurs în domeniul energetic pentru perioada 2015-2030 (Government Decision no. 409 of 16.06.2015 on Energy Road Map for 2015-2030).*

133. **Monitorul Oficial al RM, nr. 224-233 din 21.08.2015 (Official Gazette of the RM no. 224-233 of 21.08.2015)**, *Hotărârea Guvernului nr. 561 din 19.08.2015 cu privire la reglementarea cadrului instituțional și mecanismului de coordonare a asistenței externe acordate Republicii Moldova de organizațiile internaționale și țările donatoare (Government Decision no. 561 of 19.08.2015 on the regulation of the institutional framework and coordination mechanism for the external assistance granted to the Republic of Moldova by international organizations and donor countries).*

134. **Monitorul Oficial al RM nr. 110-114 din 08.05.2015 (Official Gazette of the RM no. 110-114 of 08.05.2015)**, *Hotărârea Guvernului RM nr. 235 din 06.05.2015 pentru aprobarea Programului privind repartizarea mijloacelor fondului rutier pe anul 2015 (Government Decision no. 235 of 06.05.2015 approving the Program for distribution of the Road Fund funds for 2015).*

135. **Monitorul Oficial al RM nr. 52-57 din 06.03.2015 (Official Gazette of the RM no. 52-57 of 06.03.2015),** *Parlamentul RM. Legea nr. 15 din 20.02.2015 privind ratificarea Acordului de finanțare dintre Republica Moldova și Banca Europeană pentru Reconstrucție și Dezvoltare în vederea realizării Proiectului „Sistemul termoenergetic al municipiului Bălți (S.A. «CET-Nord»)" (Parliament of the RM. Law no. 15 of 20.02.2015 on ratification of the Financing Agreement between the Republic of Moldova and the European Bank for Reconstruction and Development for implementation of the Balti Municipality Heat Project (SA «CET-Nord»).*

136. **Monitorul Oficial al RM nr. 131-138 din 29.05.2015 (Official Gazette of the RM no. 131-138 of 29.05.2015),** *HG nr.274 din 18.05.2015 cu privire la aprobarea Strategiei privind diversitatea biologică a Republicii Moldova pentru anii 2015-2020 și a Planului de acțiuni pentru implementarea acesteia (GD no.274 of 18.05.2015 approving the Biological Diversity Strategy of the Republic of Moldova for 2015-2020 and the Action Plan for its implementation).*

137. **Monitorul Oficial al RM nr. 131-138/249 din 29.05.2015 (Official Gazette of the RM no. 131-138/249 of 29.05.2015)**, *Parlamentul*

RM. Legea nr. 75 din 30.04.2015 cu privire la locuințe (Parliament of the RM. Law no. 75 of 30.04.2015 on Housing).

138. **Monitorul Oficial al RM nr. 372-384 din 19.12.2014 (Official Gazette of the RM no. 372-384 of 19.12.2014),** *HG nr.1009 din 10.12.2014 cu privire la aprobarea Strategiei Republicii Moldova de adaptare la schimbarea climei până în anul 2020 și a Planului de acțiuni pentru implementarea acesteia (GD no.1009 of 10.12.2014 approving the Climate Change Adaptation Strategy of the Republic of Moldova until 2020 and the Action Plan for its implementation).*

139. **Monitorul Oficial al RM nr. 270-274 din 12.09.2014 (Official Gazette of the RM no. 270-274 of 12.09.2014),** *Hotărârea Guvernului nr. 731 din 08.09.2014 cu privire la aprobarea Acordului de parteneriat între Guvern și Academia de Științe a Moldovei pentru anul 2014 (Government Decision no. 731 of 08.09.2014 approving the Partnership Agreement between the Government and the Academy of Sciences of Moldova for 2014).*

140. **Monitorul Oficial al RM nr. 340-343 din 14.11.2014 (Official Gazette of the RM no. 340-343 of 14.11.2014),** *Hotărârea Guvernului nr. 933 din 12.11.2014 cu privire la armonizarea reglementărilor tehnice și a standardelor naționale în domeniul construcțiilor cu legislația și standardele europene (Government Decision no. 933 of 12.11.2014 on harmonization of technical regulations and national standards in the field of construction with European legislation and standards).*

141. **Monitorul Oficial al RM nr. 178-184 din 11.07.2014 (Official Gazette of the RM no. 178-184 of 11.07.2014),** *Parlamentul RM. Legea nr. 92 din 29.05.2014 cu privire la energia termică și promovarea cogenerării (Parliament of the RM. Law no. 92 of 29.05.2014 on Heat and Promotion of Cogeneration).*

142. **Monitorul Oficial al RM nr. 297-309 din 10.10.2014 (Official Gazette of the RM no. 297-309 of 10.10.2014),** *Parlamentul RM. Legea nr. 128 din 11.07.2014 privind performanța energetică a clădirilor(Parliament of the RM. Law no. 128 of 11.07.2014 on Energy Performance of Buildings).*

143. **Monitorul Oficial al RM nr. 310-312/616 din 10.10.2014 (Official Gazette of the RM no. 310-312/616 of 10.10.2014),** *Parlamentul Republicii Moldova. Legea nr. 151 din 17.07.2014 privind cerințele în materie de proiectare ecologică aplicabile produselor cu impact energetic (Parliament of the RM. Law no. 151 of 17.07.2014 on ecodesign requirements for energy-related products).*

144. **Monitorul Oficial al RM nr. 310-312/628 din 10.10.2014 (Official Gazette of the RM no. 310-312/628 of 10.10.2014),** *Parlamentul Republicii Moldova. Legea nr. 188 din 28.09.2014 cu privire la unele măsuri referitor la procedura falimentului Societății pe Acțiuni „Termocom" (Parliament of the RM. Law no. 188 of 28.09.2014 on some measures regarding the „Termocom"SA bankruptcy procedure).*

145. **Monitorul Oficial al RM nr. 297-309 din 10.10.2014 (Official Gazette of the RM no. 297-309 of 10.10.2014),** *Hotărârea Guvernului nr. 808 din 07.10.2014 cu privire la aprobarea Planului național de acțiuni pentru implementarea Acordului de Asociere Republica Moldova-Uniunea Europeană în perioada 2014-2016 (Government Decision no. 808 of 07.10.2014 approving the National Action Plan for the Implementation of the Moldova-EU Association Agreement over 2014-2016).*

146. **Monitorul Oficial al RM nr. 152 din 10.06.2014 (Official Gazette of the RM no. 152 of 10.06.2014),** *HG nr. 409 din 04.06.2014 cu privire la aprobarea Strategiei naționale de dezvoltare agricolă și rurală pentru anii 2014-2020 (GD no. 409 of 04.06.2014 approving the National Strategy for Agricultural and Rural Development for 2014-2020).*

147. **Monitorul Oficial al RM nr. 4-8 din 10.01.2014 (Official Gazette of the RM no. 4-8 of 10.01.2014),** *Hotărârea Guvernului RM nr. 1073 din 27.12.2013 cu privire la aprobarea Planului național de acțiuni în domeniul energiei din surse regenerabile pentru anii 2013-2020 (Government Decision no. 1073 of 27.12.2013 approving the National Action Plan on Renewable Energy for 2013-2020).*

148. **Monitorul Oficial al RM nr. 256-260 din 29.08.2014 (Official Gazette of the RM no. 256-260 of 29.08.2014),** *Hotărârea Curții de Conturi nr. 38 din 15.07.2014 cu privire la Raportul auditului mediului privind utilizarea durabilă a terenurilor agricole (Decision of the Court of Accounts no. 38 of 15.07.2014 on the Environmental Audit Report on the Sustainable Use of Agricultural Land).*

149. **Monitorul Oficial al RM nr. 185-199 din 18.07.2014 (Official Gazette of the RM no. 185-199 of 18.07.2014),** *Parlamentul RM. Legea nr. 112 din 02.07.2014 pentru ratificarea Acordului de Asociere între Republica Moldova, pe de o parte, și Uniunea Europeană și Comunitatea Europeană a Energiei Atomice și statele membre ale acestora, pe de altă parte (Parliament of the RM. Law no. 112 of 02.07.2014 on ratification of the Association Agreement between the Republic of Moldova on the one hand, and the European Union and the European Atomic Energy Community and their Member States on the other).*

150. **Monitorul Oficial al RM nr. 53-59 din 07.03.2014 (Official Gazette of the RM no. 53-59 din 07.03.2014),** *Hotărârea Guvernului nr. 141 din 24.02.2014 privind crearea sistemului de statistică energetică (Government Decision no. 141 of 24.02.2014 regarding creation of the energy statistics system).*

151. **Monitorul Oficial al RM nr. 153-159/473 din 13.06.2014 (Official Gazette of the RM no. 153-159/473 of 13.06.2014),** *Hotărârea Guvernului RM nr. 436 din 10.06.2014 privind implementarea Programului de asistență tehnică și financiară acordată de Guvernul României pentru instituțiile preșcolare din Republica Moldova (Government Decision no. 436 of 10.06.2014 on implementation of the Program of technical and financial assistance granted by the Government of Romania for pre-school institutions in the Republic of Moldova).*

152. **Monitorul Oficial al RM nr. 104-109 din 06.05.2014 (Official Gazette of the RM no. 104-109 of 06.05.2014),** *HG nr. 301 din 24.04.2014 cu privire la aprobarea Strategiei de mediu pentru anii 2014-2023 și a Planului de acțiuni pentru implementarea acesteia (GD no. 301 of 24.04.2014 approving the Environmental Strategy for 2014-2023 and the Action Plan for its implementation).*

153. **Monitorul Oficial al RM nr. 99-102 din 25.04.2014 (Official Gazette of the RM no. 99-102 din 25.04.2014),** *Parlamentul RM. Legea nr. 44 din 27.03.2014 privind etichetarea produselor cu impact energetic (Parliament of the RM. Law no. 44 of 27.03.2014 on Energy Labeling).*

154. **Monitorul Oficial al RM nr. 174-177 din 04.07.2014 (Official Gazette of the RM no. 174-177 din 04.07.2014),** *Parlamentul RM. Legea nr. 86 din 29.05.2014 privind evaluarea impactului asupra mediului (Parliament of the RM. Law no. 86 of 29.05.2014 on Environmental Impact Assessment).*

155. **Monitorul Oficial al RM nr. 60-65 din 14.03.2014 (Official Gazette of the RM no. nr. 60-65 din 14.03.2014),** *Hotărârea Guvernului RM nr. 168 din 11.03.2014 pentru aprobarea Programului privind repartizarea mijloacelor fondului rutier pe anul 2014 (Government Decision no. 168 of 11.03.2014 approving the Program for distribution of the Road Fund funds for 2014).*

156. **Monitorul Oficial al RM nr. 293-296 din 03.10.2014 (Official Gazette of the RM no. 293-296 of 03.10.2014),** *Parlamentul RM. Legea nr. 121 din 03.07.2014 privind modificarea și completarea anexei la Legea nr. 166 din 11 iulie 2012 pentru aprobarea Strategiei naționale de dezvoltare „Moldova 2020"(Parliament of the RM. Law no. 121 of 03.07.2014 amending and supplementing the Annex to Law no. 166 of 11*

July 2012 on approval of the National Development Strategy „Moldova 2020").

157. **Monitorul Oficial al RM nr. 49-52 din 28.02.2014 (Official Gazette of the RM no. nr. 49-52 of 28.02.2014),** *HG nr. 138 din 24.02.2014 pentru aprobarea Planului de acțiuni privind implementarea Programului de conservare și sporire a fertilității solurilor pentru anii 2014-2016 (GD no. 138 of 24.02.2014 approving the Action Plan on implementation of the Soil Conservation and Soil Fertility Enhancement Program for 2014-2016).*

158. **Monitorul Oficial al RM nr. 42 din 17.02.2014 (Official Gazette of the RM no. 42 din 17.02.2014),** *Hotărârea Guvernului nr. 111 din 12.02.2014 pentru aprobarea Regulamentului pentru inventarierea tehnică și pașaportizarea blocurilor locative construite (Government Decision no. 111 of 12.02.2014 approving the Regulation for technical inventory and passporting the existing residential buildings).*

159. **Monitorul Oficial al RM nr. 35-41 din 14.02.2014 (Official Gazette of the RM no. 35-41 din 14.02.2014),** *Hotărârea Guvernului RM nr. 101 din 10.02.2014 cu privire la aprobarea Planului național de extindere a suprafețelor cu vegetație forestieră pentru anii 2014-2018 (Government Decision no. 101 of 10.02.2014 approving the National Plan for expanding areas covered with forest vegetation for 2014-2018).*

160. **Monitorul Oficial al RM nr. 315-319 din 31.12.2013 (Official Gazette of the RM),** *Hotărârea Guvernului nr. 1070 din 27.12.2013 pentru aprobarea Regulamentului cu privire la biocombustibil solid (Government Decision no. 1070 of 27.12.2013 approving the Regulation on solid biofuels.).*

161. **Monitorul Oficial al RM nr. 82 din 12.04.2013 (Official Gazette of the RM),** *Hotărârea Guvernului RM nr. 248 din 10.04.2013 cu privire la aprobarea Strategiei de gestionare a deșeurilor în Republica Moldova pentru anii 2013-2027 (Government Decision no. 248 of 10.04.2013 approving the Waste Management Strategy of the Republic of Moldova for 2013-2027).*

162. **Monitorul Oficial al RM nr. 206-211 din 20.09.2013 (Official Gazette of the RM no. 206-211 of 20.09.2013),** *Hotărârea Guvernului nr. 714 din 12.09.2013 cu privire la aprobarea Acordului de parteneriat între Guvern și Academia de Științe a Moldovei pentru anul 2013 (Government Decision no. 714 of 12.09.2013 approving the Partnership Agreement between the Government and the Academy of Sciences of Moldova for 2013).*

163. **Monitorul Oficial al RM nr. 198-204 din 13.09.2013 (Official Gazette of the RM no. 198-204 of 13.09.2013),** *Hotărârea Guvernului nr. 685 din 04.09.2013 cu privire la aprobarea Strategiei naționale de dezvoltare regională pentru anii 2013-2015 (Government Decision no. 685 of 04.09.2013 approving the National Regional Development Strategy for 2013-2015).*

164. **Monitorul Oficial al RM nr. 145 din 09.07.2013 (Official Gazette of the RM no. 145 of 09.07.2013),** *Hotărîrea Guvernului nr. 493 din 04.07.2013 cu privire la Programul pe termen mediu de elaborare a planurilor urbanistice la nivel de localități pe anii 2013-2016 (Government Decision no. 493 of 04.07.2013 on the Medium-Term Program for develoing urban-planning settlements plans for 2013-2016).*

165. **Monitorul Oficial al RM nr. 27-30 din 08.02.2013 (Official Gazette of the RM no. 27-30 din 08.02.2013),** *Hotărârea Guvernului RM nr. 102 din 05.02.2013 cu privire la Strategia energetică a Republicii Moldova până în anul 2030 (Government Decision no. 102 of 05.02.2013 on the Energy Strategy of the Republic of Moldova until 2030).*

166. **Monitorul Oficial al RM nr. 284-289 din 06.12.2013 (Official Gazette of the RM no.284-289 of 06.12.2013),** *Hotărârea Guvernului RM nr. 952 din 27.11.2013 cu privire la aprobarea Strategiei inovaționale a Republicii Moldova pentru perioada 2013-2020 „Inovații pentru competitivitate"(Government Decision no. 952 of 27.11.2013 on approval of the Innovation Strategy of the Republic of Moldova for 2013-2020 „Innovations for Competitiveness").*

167. **Monitorul Oficial al RM nr. 64-68 din 29.03.2013 (Official Gazette of the RM no. 64-68 of 29.03.2013,** *Parlamentul RM. Legea nr. 57 din 10.03.2006 viei și vinului (Parliament of the RM. Law no. 57 din 10.03.2006 on Vineyards and Wine).*

168. **Monitorul Oficial al RM nr. 31-35 din 15.02.2013 (Official Gazette of the RM no. 31-35 of 15.02.2013),** *Hotărârea Guvernului RM nr. 113 din 07.02.2013 cu privire la aprobarea Planului național de acțiuni în domeniul eficienței energetice pentru anii 2013-2015 (Government Decision no. 113 of 07.02.2013 approving the National Action Plan for Energy Efficiency for 2013-2015).*

169. **Monitorul Oficial al RM nr. 243-247 din 01.11.2013 (Official Gazette of the RM no. 243-247 of 01.11.2013),** *Hotărârea Guvernului RM nr. 827 din 28.10.2013 cu privire la aprobarea Strategiei de transport și logistică pe anii 2013-2022 (Government Decision no. 827 of 28.10.2013 on the approval of the Transport and Logistics Strategy for the years 2013-2022).*

170. **Monitorul Oficial al RM nr. 243-247/ 931 din 01.11.2013 (Official Gazette of the RM no. 243-247/ 931 of 01.11.2013).** *Hotărârea Guvernului nr. 802 din 9 octombrie 2013 cu privire la aprobarea Regulamentului privind condițiile de deversare a apelor uzate în corpurile de apă (Government Decision no. 802 of 9 October 2013 approving the Regulation on conditions for the discharge of waste water into water bodies).*

171. **Monitorul Oficial al RM nr. 243-247 din 01.11.2013 (Official Gazette of the RM no. 243-247 of 01.11.2013).** *Hotărârea Guvernului nr. 827 din 28.10.2013 cu privire la aprobarea Strategiei de transport* și logistică pe anii 2013-2022 *(Government Decision no. 827 of 28.10.2013 approving the Transport and Logistics Strategy for 2013-2022).*

172. **Monitorul Oficial al RM nr. 270-272 din 25.12.2012 (Official Gazette of the RM no. 270-272 of 25.12.2012),** *Hotărârea Guvernului nr. 966 din 21.12.2012 cu privire la modificarea tabelelor nr.1, 2, 3, 5, 6, 8 și 9 din anexa nr.1 la Acordul de parteneriat între Guvern și Academia de Științe a Moldovei pentru anii 2009-2012 (Government Decision no. 966 of 21.12.2012 on amendments to tables no.1, 2, 3, 5, 6, 8 and 9 of Annex no.1 to the Partnership Agreement between the Government and the Academy of Sciences of Moldova for 2009-2012).*

173. **Monitorul Oficial al RM nr. 245-247 din 30.11.2012 (Official Gazette of the RM no. 245-247 of 30.11.2012),** *Parlamentul RM. Legea nr. 166 din 11.07.2012 pentru aprobarea Strategiei naționale de dezvoltare „Moldova 2020" (Parliament of the RM. Law no. 166 of 11.07.2012 on approval of the National Development Strategy „Moldova 2020").*

174. **Monitorul Oficial al RM nr. 228 din 31.10.2012 (Official Gazette of the RM no. 228 of 31.10.2012),** *GD nr. 796 din 25.10.2012 cu privire la abrogarea unor acte normative ale Guvernului (GD no. 796 of 25.10.2012 on abrogation of some normative acts of the Government).*

175. **Monitorul Oficial al RM nr. 190-192/644 din 14.09.2012 (Official Gazette of the RM no. 190-192/644 of 14.09.2012),** *Parlamentul Republicii Moldova. Legea nr. 178 din 11.07.2012 pentru modificarea și completarea unor acte legislative (Parliament of the RM. Law no. 178 of 11.07.2012 on amending and completing some legislative acts).*

176. **Monitorul Oficial al RM nr. 143-148 din 13.07.2012 (Official Gazette of the RM no. 143-148 of 13.07.2012),** *HG nr. 486 din 04.07.2012 cu privire la aprobarea Strategiei de dezvoltare a serviciilor de extensiune rurală pentru anii 2012-2022 (GD no. 486 of 04.07.2012*

approving the Strategy for development of rural extension services for 2012-2022).

177. **Monitorul Oficial al RM nr. 126-129 din 22.06.2012 (Official Gazette of the RM no.,** *Hotărârea Guvernului RM nr. 401 din 12.06.2012 cu privire la Fondul pentru Eficiență Energetică (Government Decision no. 401 of 12.06.2012 on the Energy Efficiency Fund).*

178. **Monitorul Oficial al RM nr. 93-98 din 18.05.2012 (Official Gazette of the RM no. 93-98 of 18.05.2012),** *Hotărârea Guvernului nr. 289 din 07.05.2012 cu privire la aprobarea Planului de acțiuni al Guvernului pentru anii 2012-2015 (Government Decision no. 289 of 07.05.2012 approving the Government Action Plan for 2012-2015).*

179. **Monitorul Oficial al RM nr. 81 din 26.04.2012 (Official Gazette of the RM no. 81 of 26.04.2012),** *Legea apelor, nr. 272 din 23.12.2011 (The Law on Water, no. 272 of 23.12.2011).*

180. **Monitorul Oficial al RM nr. 21-24 din 27.01.2012 (Official Gazette of the RM no. 21-24 of 27.01.2012),** *Parlamentul Republicii Moldova. Legea nr. 279 din 27.12.2011 pentru ratificarea Memorandumului de înțelegere între RM și UE privind asocierea RM la cel de-al Șaptelea Program-cadru al Comunității Europene pentru cercetare, dezvoltare tehnologică și activități demonstrative (2007-2013) (Parliament of the RM. Law no. 279 of 27.12.2011 on ratification of the Memorandum of Understanding between Moldova and the EU on the association of the Republic of Moldova to the Seventh Framework Program of the European Community for Research, Technological Development and Demonstration Activities (2007-2013).*

181. **Monitorul Oficial al RM nr. 233-236 din 27.12.2011 (Official Gazette of the RM no. 233-236 of 27.12.2011),** *Hotărârea Guvernului RM nr. 983 din 22.12.2011 cu privire la restructurarea corporativă, instituțională și financiară a sistemului centralizat de alimentare cu energie termică din mun. Chișinău (Government Decision no. 983 of 22.12.2011 regarding the corporate, institutional and financial restructuring of the centralized heat supply system in Chisinau municipality).*

182. **Monitorul Oficial al RM nr. 131-133 din 12.08.2011 (Official Gazette of the RM no. 131-133 of 12.08.2011),** *HG nr. 593 din 01.08.2011 cu privire la aprobarea Programului Național privind constituirea rețelei ecologice naționale pentru perioada 2011-2018 (GD no. 593 of 01.08.2011 approving the National Program for the establishment of the national ecological network for 2011-2018).*

183. **Monitorul Oficial al RM nr. 197-202 din 18.11.2011 (Official Gazette of the RM no. 197-202 of 18.11.2011),** *Hotărârea Guvernului RM nr. 833 din 10.11.2011 cu privire la Programul național pentru eficiență energetică 2011-2020 (Government Decision no. 833 of 10.11.2011 on the National Energy Efficiency Program 2011-2020).*

184. **Monitorul Oficial al RM nr. 139-145 din 26.08.2011 (Official Gazette of the RM no. 139-145 of 26.08.2011),** *HG nr. 626 din 20.08.2011 cu privire la aprobarea Programului de conservare și sporire a fertilității solurilor pentru anii 2011-2020 (GD no. 626 of 20.08.2011 approving the Soil Conservation and Soil Fertility Enhancement Program for 2011-2020).*

185. **Monitorul Oficial al RM nr. 99-101 din 17.06.2011 (Official Gazette of the RM no. 99-101 of 17.06.2011),** *Hotărârea Guvernului nr. 411 din 09.06.2011 cu privire la aprobarea Planului de acțiuni pentru remedierea situației în domeniul construcției de locuințe pe anii 2011-2012 (Government Decision no. 411 of 09.06.2011 approving the Action Plan on improving the situation in the field of housing construction for 2011-2012).*

186. **Monitorul Oficial al RM nr. 91-94 din 03.06.2011 (Official Gazette of the RM no. 91-94 of 03.06.2011),** *Ordinul Ministerului Agriculturii și Industriei Alimentare nr. 98 din 26.05.2011, cu privire la unele măsuri de ameliorare genetică a taurinelor prin metoda însămânțării artificiale (Government Decision no. 648 of 26.08.2011 approving the amendments operated to the Partnership Agreement between the Government and the Academy of Sciences of Moldova for 2009-2012).*

187. **Monitorul Oficial al RM nr. 46-52 din 01.04.2011 (Official Gazette of the RM no. 46-52 of 01.04.2011),** *Hotărârea Guvernului nr. 179 din 23.03.2011 cu privire la aprobarea Planului de acțiuni al Guvernului pentru anii 2011-2014 (Government Decision no. 179 of 23.03.2011 approving the Government Action Plan for 2011-2014).*

188. **Monitorul Oficial al RM nr. 254-256 din 24.12.2010 (Official Gazette of the RM no. 254-256 of 24.12.2010),** *HG nr. 1184 din 22.12.2010 cu privire la aprobarea posibilității de recoltare a masei lemnoase în procesul tăierilor de produse principale pentru perioada 2011-2015 (GD no. 1184 of 22.12.2010 approving yhe permission for harvesting wood mass during the main products cutting for 2011-2015).*

189. **Monitorul Oficial al RM nr. 254-256 din 24.12.2010 (Official Gazette of the RM no. 254-256 of 24.12.2010),** *Hotărârea Guvernului RM nr. 1173 din 21.12.2010 cu privire la Agenția pentru Eficiență Energetică (Government Decision no. 1173 of 21.12.2010 on the Energy Efficiency Agency).*

190. **Monitorul Oficial nr. 247-251 din 17.12.2010 (Official Gazette of the RM no. 247-251 din 17.12.2010),** *Parlamentul RM. Legea fondului rutier nr. 720 din 02.02.1996 (Parliament of RM. The Law no. 720 of 02.02.1996 on the Road Fund).*

191. **Monitorul Oficial al RM nr. 227-230 din 19.11.2010 (Official Gazette of the RM no. 227-230 of 19.11.2010),** *Hotărârea Guvernului nr. 1052 din 11.11.2010 cu privire la aprobarea modificărilor și completărilor ce se operează în anexele nr.1 și nr.3 la Acordul de parteneriat între Guvern și Academia de Științe a Moldovei pentru anii 2009-2012 (Government Decision no. 1052 of 11.11.2010 approving the amendments and additions to annexes 1 and 3 to the Partnership Agreement between the Government and the Academy of Sciences of Moldova for 2009-2012).*

192. **Monitorul Oficial al RM nr. 241-246 din 10.12.2010 (Official Gazette of the RM no. 241-246 of 10.12.2010,** *Parlamentul Republicii Moldova. Legea nr. 228 din 23.09.2010 cu privire la protecția plantelor și la carantina fitosanitară (Parliament of the RM. Law no. 228 of 23.09.2010 on Plant Protection and Phytosanitary Quarantine).*

193. **Monitorul Oficial al RM nr. 131-134 din 30.07.2010 (Official Gazette of the RM no. 131-134 of 30.07.2010),** *HG nr. 667 din 23.07.2010 pentru aprobarea Regulamentului cu privire la pășunat și cosit (GD no. 667 of 23.07.2010 approving the Regulation on grazing and mowing).*

194. **Monitorul Oficial al RM nr. 54-55 din 16.04.2010 (Official Gazette of the RM no. 54-55 of 16.04.2010),** *Ordinul Ministerului Agriculturii și Industriei Alimentare nr. 58 din 02.04.2010 cu privire la unele măsuri de ameliorare genetică a taurinelor prin metoda însămânțării artificiale (Order of the Ministry of Agriculture and Food Industry no. 58 of 02.04.2010 on some measures for genetic improvement of cattle by artificial insemination).*

195. **Monitorul Oficial al RM nr. 52-53 din 14.04.2010 (Official Gazette of the RM no. 52-53 din 14.04.2010),** *Parlamentul RM. Legea nr. 371 din 15.02.1995 privind selecția și reproducția în zootehnie (Parliament of the RM. Law no. 371 of 15.02.1995 on selection and reproduction in animal husbandry).*

196. **Monitorul Oficial al RM nr. 44-46 din 30.03.2010 (Official Gazette of the RM no. 44-46 of 30.03.2010),** *Hotărârea Guvernului nr. 217 din 23.03.2010 cu privire la aprobarea modificărilor și completărilor ce se operează în Acordul de parteneriat între Guvern și Academia de Științe a Moldovei pentru anii 2009-2012 (Government Decision no. 217 of*

23.03.2010 approing the amendments and additions to the Partnership Agreement between the Government and the Academy of Sciences of Moldova for 2009-2012).

197. **Monitorul Oficial al RM nr. 155-158 din 03.09.2010 (Official Gazette of the RM no. 155-158 of 03.09.2010),** *Parlamentul RM. Legea nr. 142 din 02.07.2010 cu privire la eficiența energetică (Parliament of the RM. Law no. 142 of 02.07.2010 on Energy Efficiency).*

198. **Monitorul Oficial al RM nr. 155-158/549 din 03.09.2010 (Official Gazette of the RM no. 155-158/549 of 03.09.2010),** *Parlamentul RM. Legea nr. 163 din 09.07.2010 privind autorizarea executării lucrărilor de construcție (Parliament of the RMa. Law no. 163 of 09.07.2010 on construction works authorization).*

199. **Monitorul Oficial al RM nr. 8-10 din 22.01.2010 (Official Gazette of the RM no. 8-10 of 22.01.2010),** *Parlamentul RM. Legea nr. 117 din 23.12.2009 pentru aderarea Republicii Moldova la Tratatul de constituire a Comunității Energetice (Parliament of the RM. Law no. 117 of 23.12.2009 on the Accession of the Republic of Moldova to the Energy Community Treaty).*

200. **Monitorul Oficial al RM nr. 115-117 din 24.07.2009 (Official Gazette of the RM no. 115-117 of 24.07.2009),** *Hotărârea Guvernului nr. 428 din 15.07.2009* **cu privire la aprobarea** *Reglementării tehnice „Cerințe de randament pentru cazanele noi de apă caldă cu combustie lichidă sau gazoasă". (Government Decision no. 428 of 15.07.2009* **approving the** *Technical Regulation „Efficiency Requirements for New Liquid or Gas Combustion Hot Water Boilers").*

201. **Monitorul Oficial al RM nr. 49-50 din 06.03.2009 (Official Gazette of the RM no. 49-50 of 06.03.2009),** *Ordinul Ministerului Agriculturii și Industriei Alimentare nr. 46 din 24.02.2009, cu privire la unele măsuri de ameliorare genetică a taurinelor prin metoda însămânțării artificiale (Order of the Ministry of Agriculture and Food Industry no. 46 of 24.02.2009 on certain measures for genetic improvement of cattle by artificial insemination).*

202. **Monitorul Oficial al RM nr. 19-21 din 03.02.2009 (Official Gazette of the RM no. 19-21 of 03.02.2009),** *Hotărârea Guvernului nr. 27 din 22 ianuarie 2009 cu privire la aprobarea Acordului de parteneriat între Guvern și Academia de Științe a Moldovei pentru anii 2009-2012 (Government Decision no. 27 of 22 January 2009 approving the Partnership Agreement between the Government and the Academy of Sciences of Moldova for the years 2009-2012).*

203. **Monitorul Oficial nr.45-46/172 din 27.02.2009 (Official Gazette of the RM no. 45-46/172 of 27.02.2009),** *Agenția Națională pentru Reglementare în Energetică. Hotărârea nr. 321 din 22.01.2009 privind Metodologia determinării, aprobării și aplicării tarifelor la energia electrică produsă din surse regenerabile de energie și biocombustibil (National Agency for Energy Regulation. Resolution no. 321 of 22.01.2009 on the Methodology of determination, approval and application of tariffs for electricity produced from renewable energy sources and biofuel).*

204. **Monitorul Oficial al RM nr. 30-31 din 12.02.2008 (Official Gazette of the RM no., 30-31 of 12.02.2008),** *Hotărârea Guvernului RM nr. 85 din 01.02.2008 cu privire la aprobarea Strategiei infrastructurii transportului terestru pe anii 2008-2017 (Government Decision no. 85 of 01.02.2008 approving the Strategy for Land Transport Infrastructure for 2008-2017).*

205. **Monitorul Oficial al RM nr. 47-48 din 07.03.2008 (Official Gazette of the RM no. 47-48 of 07.03.2008),** *Parlamentul Republicii Moldova. Legea nr. 278 din 14.12.2007 cu privire la tutun și la articolele din tutun (Parliament of the RM. Law no. 278 of 14.12.2007 on Tobacco and Tobacco Products).*

206. **Monitorul Oficial al RM nr. 99-101 din 06.06.2008 (Official Gazette of the RM no. 99-101 of 06.06.2008),** *Ordinul Ministerului Agriculturii și Industriei Alimentare nr. 101 din 21.05.2008 cu privire la unele măsuri de ameliorare genetică a taurinelor prin metoda însămânțării artificiale (Order of the Ministry of Agriculture and Food Industry no. 101 of 21.05.2008 on certain measures for genetic improvement of cattle by artificial insemination).*

207. **Monitorul Oficial al RM nr. 99-101 din 06.06.2008 (Official Gazette of the RM no. 99-101 of 06.06.2008),** *Parlamentul Republicii Moldova. Legea nr. 39 din 29.02.2008 privind protecția soiurilor de plante (Parliament of the RM. Law no. 39 of 29.02.2008 on Plant Varieties Protection).*

208. **Monitorul Oficial al RM nr. 99-101 din 06.06.2008 (Official Gazette of the RM no. 99-101 of 06.06.2008),** *Ordinul Ministerului Agriculturii și Industriei Alimentare nr. 101 din 21.05.2008 cu privire la unele măsuri de ameliorare genetică a taurinelor prin metoda însămânțării artificiale (Order of the Ministry of Agriculture and Food Industry no. 101 of 21.05.2008 on certain measures for genetic improvement of cattle by artificial insemination).*

209. **Monitorul Oficial al RM nr. 57-60 din 21.03.2008 (Official Gazette of the RM no. 57-60 of 21.03.2008),** *Hotărârea Guvernului RM nr. 282 din 11.03.2008 cu privire la aprobarea Strategiei naționale de dezvoltare durabilă a complexului agroindustrial al Republicii Moldova (2008-2015) (Government Decision no. 282 of 11.03.2008 approving the National Strategy for Sustainable Development of agriculture and processing industry of the Republic of Moldova (2008-2015).*

210. **Monitorul Oficial al RM nr. 51-54 din 14.03.2008 (Official Gazette of the RM no. 51-54 of 14.03.2008),** *Hotărârea Guvernului nr. 226 din 29.02.2008 pentru aprobarea Reglementării tehnice cu privire la produsele pentru construcții (Government Decision no. 226 of 29.02.2008 approving the Technical Regulation on construction products).*

211. **Monitorul Oficial al RM nr. 51-54 din 14.03.2008 (Official Gazette of the RM no. 51-54 of 14.03.2008),** *Parlamentul Republicii Moldova. Legea nr. 221 din 19.10.2007 privind activitatea sanitar-veterinară (Parliament of the RM. Law no. 221 of 19.10.2007 on Sanitary-Veterinary Activity).*

212. **Monitorul Oficial al RM nr. 42-44 din 29.02.2008 (Official Gazette of the RM no. 42-44 of 29.02.2008),** *Hotărârea Guvernului RM nr. 191 din 25.02.2008 pentru aprobarea Planului de acțiuni privind implementarea Strategiei naționale de dezvoltare pe anii 2008-2011 (Government Decision no. 191 of 25.02.2008 approving the Action Plan on Implementation of the National Development Strategy for 2008-2011).*

213. **Monitorul Oficial al RM nr. 40-41 din 26.02.2008 (Official Gazette of the RM no. 40-41 of 26.02.2008),** *Legea regnului vegetal, nr. 239 din 08.11.2007 (Law of the Vegetable Kingdom, no. 239 of 08.11.2007).*

214. **Monitorul Oficial al RM nr. 18-20 din 29.01.2008 (Official Gazette of the RM no. 40-41 of 26.02.2008),** *Parlamentul RM. Legea nr. 295 din 21.12.2007 pentru aprobarea Strategiei naționale de dezvoltare pe anii 2008-2011 (Parliament of the RM. Law no. 295 of 21.12.2007 on approval of the National Development Strategy for 2008-2011).*

215. **Monitorul Oficial al RM nr. 146-148 din 14.09.2007 (Official Gazette of the RM no. 146-148 of 14.09.2007),** *Hotărârea Guvernului RM nr. 987 din 30.08.2007 privind Strategia de dezvoltare a aviației civile în perioada anilor 2007-2012 (Government Decision no. 987 of 30.08.2007 on the Civil Aviation Development Strategy for 2007-2012).*

216. **Monitorul Oficial al RM nr. 127-130 din 17.08.2007 (Official Gazette of the RM no. 127-130 of 17.08.2007),** *Parlamentul RM.*

Legea nr. 160 din 12.07.2007 energiei regenerabile (Parliament of the RM. Law no. 160 of 12.07.2007 on Renewable Energy).

217. **Monitorul Oficial al RM nr. 141-145 din 07.09.2007 (Official Gazette of the RM no. 141-145 of 07.09.2007),** *Hotărârea Guvernului nr. 958 din 21.08.2007 cu privire la Strategia energetică a Republicii Moldova până în anul 2020 (Government Decision no. 958 of 21.08.2007 on the Energy Strategy of the Republic of Moldova until 2020).*

218. **Monitorul Oficial al RM nr. 43-46 din 30.03.2007 (Official Gazette of the RM no. 43-46 of 30.03.2007),** *Hotărârea Guvernului nr. 304 din 17.03.2007 cu privire la aprobarea Programului Național de asigurare a securității ecologice pentru anii 2007-2015 (Government Decision no. 304 of 17.03.2007 on approval of the National Program for Environmental Security for 2007-2015).*

219. **Monitorul Oficial al RM nr. 164-167 din 20.10.2006 (Official Gazette of the RM no. 164-167 of 20.10.2006),** *Hotărârea Guvernului RM nr. 1149 din 05.10.2006 cu privire la Strategia de dezvoltare a industriei pe perioada până în anul 2015 (Government Decision no. 1149 of 05.10.2006 on the Industry Development Strategy until 2015).*

220. **Monitorul Oficial al RM nr. 75-78 din 19.05.2006 (Official Gazette of the RM no. 75-78 of 19.05.2006),** *Parlamentul Republicii Moldova. Legea nr. 578 din 10.03.2006 viei și vinului (Parliament of the RM. Law no. 578 of 10.03.2006 on Vineyards and Wine).*

221. **Monitorul Oficial al RM nr. 170-173 din 03.11.2006 (Official Gazette of the RM no. 170-173 of 03.11.2006),** *Hotărârea Guvernului RM nr. 1199 din 17.10.2006 cu privire la aprobarea Strategiei de dezvoltare a sectorului agroalimentar în perioada anilor 2006-2015 (Government Decision no. 1199 of 17.10.2006 approving the Agri-Food Sector Development Strategy for 2006-2015).*

222. **Monitorul Oficial al RM nr. 31-34/199 din 24.02.2006 (Official Gazette of the RM no. 31-34/199 of 24.02.2006),** *Hotărârea Guvernului nr. 149 din 10.02.2006 pentru implementarea Legii cu privire la producția agroalimentară ecologică (Government Decision no. 149 of 10.02.2006 on implementation of the Law on organic agri-food production).*

223. **Monitorul Oficial al RM nr. 83 din 02.06.2006 (Official Gazette of the RM no. 83 of 02.06.2006),** *Hotărârea Guvernului RM nr. 554 din 22.05.2006 privind aprobarea Programului de consolidare a terenurilor agricole (Government Decision no. 554 of 22.05.2006 approving the Program for agricultural lands consolidation).*

224. **Monitorul Oficial al RM nr. 184-185 din 01.12.2006 (Official Gazette of the RM no. 184-185 of 01.12.2006),** *HG nr. 1360 din 28.11.2006 cu privire la aprobarea volumului de tăieri silvice suplimentare (GD no. 1360 of 28.11.2006 approving additional forestry cuttings).*

225. **Monitorul Oficial al RM nr. 172-175 din 23.12.2005 (Official Gazette of the RM no. 172-175 of 23.12.2005),** *HG nr. 1337 din 16.12.2005 cu privire la aprobarea posibilității de recoltare a masei lemnoase în procesul tăierilor de produse principale pentru perioada 2006-2010 (GD no. 1337 of 16.12.2005 approving the permission to harvest wood mas during main products cuttinsg for 2006-2010).*

226. **Monitorul Oficial al RM nr. 71-73 din 20.05.2005 (Official Gazette of the RM no. 71-73 of 20.05.2005),** *Hotărârea Guvernului nr. 242 din 01.03.2005 cu privire la aprobarea Programului Național „Satul Moldovenesc" (2005-2015) (Government Decision no. 242of 01.03.2005 approving the „Moldovan Village" National Program (2005-2015).*

227. **Monitorul Oficial al RM nr. 20-23 din 04.02.2005 (Official Gazette of the RM no. 20-23 of 04.02.2005),** *Hotărârea Guvernului nr. 80 din 28 ianuarie 2005 cu privire la aprobarea Acordului de parteneriat între Guvern și Academia de Științe a Moldovei pentru anii 2005-2008 (Government Decision no. 80 of 28 January 2005 approving the Partnership Agreement between the Government and the Academy of Sciences of Moldova for the years 2005-2008).*

228. **Monitorul Oficial al RM nr. 46 din 25.03.2005 (Official Gazette of the RM no. 46 of 25.03.2005),** *Hotărârea Guvernului RM nr. 288 din 15.03.2005 cu privire la aprobarea Obiectivelor de Dezvoltare ale Mileniului în Republica Moldova până în anul 2015 și a Primului Raport Național „Obiectivele de Dezvoltare ale Mileniului în Republica Moldova" (Government Decision no. 288 of 15.03.2005 approving the Millennium Development Goals in the Republic of Moldova until 2015 and the First National Report „Millennium Development Goals in the Republic of Moldova").*

229. **Monitorul Oficial al RM nr. 5 din 14.01.2005 (Official Gazette of the RM no. 5 of 14.01.2005),** *Parlamentul Republicii Moldova Legea nr. 398 din 02.12.2004 privind aprobarea Strategiei de Creștere Economică și Reducere a Sărăciei (2004-2006) (Parliament of the RM. Law no. 398 of 02.12.2004 on approval of the Economic Growth and Poverty Reduction Strategy (2004-2006).*

230. **Monitorul Oficial al RM nr. 189-192/384 din 22.10.2004 (Official Gazette of the RM no. 189-192/384 of 22.10.2004),** *Ministeriul Mediului. Instrucțiunea privind evaluarea prejudiciului cauzat aerului atmosferic la gestionarea deșeurilor de producție și menajere din 08.06.2004 (Ministry of Environment. Instruction on assessing the atmospheric air damage caused in the course of production and household waste management, 08.06.2004).*

231. **Monitorul Oficial al RM nr. 186 din 15.10.2004 (Official Gazette of the RM no. 186 of 15.10.2004),** *Ministerul Mediului. Instrucțiunea privind evaluarea prejudiciului cauzat aerului atmosferic în urma poluării de către sursele staționare nr. 381 din 16.08.2004 (Ministry of the Environment. Instruction on assessing the air pollution damage caused by stationary sources no. 381 of 16.08.2004).*

232. **Monitorul Oficial al RM nr. 138-146 din 13.08.2004 (Official Gazette of the RM no. 138-146 of 13.08.2004),** *Hotărârea Guvernului RM nr. 841 din 26.07.2004 cu privire la aprobarea Programului de valorificare a terenurilor noi și de sporire a fertilității solurilor (Partea a II-a. Sporirea fertilității solurilor) (Government Decision no. 841 of 26.07.2004 approving the New Lands Reclamation and Soil Fertility Enhancement Program (Part II: Soil Fertility Enhancement).*

233. **Monitorul Oficial al RM nr.125-129 din 30.07.2004 (Official Gazette of the RM no. 125-129 of 30.07.2004),** *Parlamentul Republicii Moldova Codul nr. 259-XV din 15.07.2004 cu privire la știință și inovare al Republicii Moldova (Parliament of the RM. Code no. 259-XV of 15.07.2004 on Science and Innovation of the Republic of Moldova).*

234. **Monitorul Oficial al RM nr. 100-103 din 25.06.2004 (Official Gazette of the RM no. 100-103 of 25.06.2004),** *Parlamentul Republicii Moldova. Legea nr. 119 din 22.06.2004 cu privire la produsele de uz fitosanitar și la fertilizanți (Parliament of the RM. Law no. 119 of 22.06.2004 on Plant Protection Products and Fertilizers).*

235. **Monitorul Oficial al RM nr. 132-137 din 06.08.2004 (Official Gazette of the RM no. 132-137 of 06.08.2004),** *Parlamentul Republicii Moldova. Legea nr. 238 din 08.07.2004 privind impozitul unic în agricultură (Parliament of the RM. Law no. 238 of 08.07.2004 on the Integrated Agricultural Tax).*

236. **Monitorul Oficial al RM nr. 132-137 din 06.08.2004 (Official Gazette of the RM no. 132-137 of 06.08.2004),** *Parlamentul Republicii Moldova. Legea nr. 243 din 08.07.2004 privind asigurarea subvenționată a riscurilor de producție în agricultură (Parliament of the RM. Law no. 243 of 08.07.2004 on the subsidized insurance of production risks in agriculture).*

237. **Monitorul Oficial al RM nr. 83 din 28.05.2004 (Official Gazette of the RM no. 83 of 28.05.2004),** *Parlamentul RM. Legea nr. 78 din*

18.03.2004 privind produsele alimentare (Parliament of the RM. Law no. 78 of 18.03.2004 on Foodstuffs).

238. **Monitorul Oficial al RM nr. 19 din 30.01.2004 (Official Gazette of the RM no. 19 of 30.01.2004),** *Parlamentul Republicii Moldova. Hotărârea nr. 566 din 25.12.2003 cu privire la aprobarea Priorităților strategice ale cercetării-dezvoltării pentru anii 2004-2010 (Parliament of the RM. Resolution no. 566 of 25.12.2003 approving the Strategic Research and Development Priorities for 2004-2010).*

239. **Monitorul Oficial al RM nr. 6-12 din 01.01.2004 (Official Gazette of the RM no. 6-12 of 01.01.2004),** *Hotărârea Guvernului nr. 1574 din 26.12.2003 privind instituirea Comisiei naționale pentru implementarea și realizarea prevederilor Convenției-cadru a Organizației Națiunilor Unite cu privire la schimbarea climei, precum și a mecanismelor și prevederilor Protocolului de la Kyoto (Government Decision no. 1574 of 26.12.2003 on establishing the National Commission for implementation of the Provisions of the United Nations Framework Convention on Climate Change, and the mechanisms and provisions of the Kyoto Protocol).*

240. **Monitorul Oficial al RM nr. 200 din 19.09.2003 (Official Gazette of the RM no. 200 of 19.09.2003),** *Hotărârea Guvernului RM nr. 1095 din 08.09.2003 cu privire la unele măsuri de regenerare a resurselor genetice suine (Government Decision no. 1095 of 08.09.2003 on some measures for regeneration of swine genetic resources).*

241. **Monitorul Oficial al RM nr. 200-203 din 19.09.2003 (Official Gazette of the RM no. 200-203 of 19.09.2003),** *Hotărârea Guvernului nr. 1078 din 05.09.2003 cu privire la aprobarea Programului național de conservare a energiei pentru anii 2003-2010 (Government Decision no. 1078 of 05.09.2003 approving the National Energy Conservation Program for 2003-2010).*

242. **Monitorul Oficial al RM nr. 14-17 din 07.02.2003 (Official Gazette of the RM no. 14-17 of 07.02.2003),** *Parlamentul RM. Legea nr. 1402 din 24.10.2002 serviciilor publice de gospodărie comunală (Parliament of Moldova. Law no. 1402 of 24.10.2002 on Public Amenities).*

243. **Monitorul Oficial al RM nr. 126-131 din 27.06.2003 (Official Gazette of the RM no. 126-131 of 27.06.2003),** *Hotărârea Guvernului RM nr. 739 din 17.06.2003 cu privire la implementarea Strategiei dezvoltării durabile a sectorului forestier național (Government Decision no. 739 of 17.06.2003 on implementation of the Strategy for sustainable development of the national forest sector).*

244. **Monitorul Oficial al RM nr. 99-103 din 06.06.2003 (Official Gazette of the RM no. 99-103 of 06.06.2003),** *HG nr. 636 din 26.05.2003, despre aprobarea Programului de valorificare a terenurilor noi și de sporire a fertilității solurilor (GD no. 636 of 26.05.2003, approving the New Land Reclmation and Soil Fertility Enhancement Program).*

245. **Monitorul Oficial al RM nr. 191-195 din 05.09.2003 (Official Gazette of the RM no. 191-195 of 05.09.2003),** *Hotărârea Guvernului nr. 1059 din 29.08.2003 despre aprobarea Programului Național de renovare și descentralizare a sistemelor de alimentare cu căldură a localităților din Republica Moldova (Government Decision no. 1059 of 29.08.2003 approving the National Program for Renovation and Decentralization of the Heat Supply Systems in the Settlements of the Republic of Moldova).*

246. **Monitorul Oficial al RM nr. 50 din 21.03.2003 (Official Gazette of the RM no. 050 of 21.03.2003),** *Hotărârea Guvernului nr. 286 din 13.03.2003 despre aprobarea Acordului cu privire la colaborarea statelor-membre ale Comunității Statelor Independente în domeniul asigurării eficienței energetice și conservării energiei (Government Decision no. 286 of 13.03.2003 approving the Agreement on the Commonwealth of Independent States Member' Collaboration in energy efficiency and energy conservation).*

247. **Monitorul Oficial al RM nr. 48 din 18.03.2003 (Official Gazette of the RM no. 48 of 18.03.2003),** *Parlamentul RM. Legea nr. 29 din 13.02.2003 pentru aderarea Republicii Moldova la Protocolul de la Kyoto la Convenția-cadru a Organizației Națiunilor Unite cu privire la schimbarea climei (Parliament of the RM. Law no. 29 of 13.02.2003 on accession of the Republic of Moldova to the Kyoto Protocol of the United Nations Framework Convention on Climate Change).*

248. **Monitorul Oficial al RM nr. 132-133 din 01.07.2003 (Official Gazette of the RM no. 132-133 of 01.07.2003),** *HG nr. 737 din 17.06.2003 cu privire la aprobarea Programului de stat de regenerare și împădurire a terenurilor fondului forestier pe anii 2003-2020 (GD no. 737 of 17.06.2003 approving the State Program for regeneration and afforestation of the forestfund lands for 2003-2020).*

249. **Monitorul Oficial al RM nr. 190-197 din 31.12.2002 (Official Gazette of the RM no. 190-197 of 31.12.2002),** *Hotărârea Guvernului nr. 1643 din 19.12.2002 cu privire la aprobarea Programului național de gazificare a Republicii Moldova (Government Decision no. 1643 of 19.12.2002 approving the National Program on Gasification of the Republic of Moldova).*

250. **Monitorul Oficial nr. 67-71 03.03.2017 (Official Gazette of the RM no. 67-71 03.03.2017),** *Legea nr. 276 din 16.12.2016 cu privire la principiile de subvenționare a producătorilor agricoli. Data intrării în vigoare: 01.01.2017 (Law no. 276 of 16.12.2016 on the principles of subsidizing agricultural producers. Date of entry into force: 01.01.2017).*

251. **Monitorul Oficial al RM nr. 50-52 din 11.04.2002 (Official Gazette of the RM no. 50-52 of 11.04.2002),** *Hotărârea Guvernului nr. 421 din 05.04.2002 cu privire la renovarea și reabilitarea termică a blocurilor de locuit construite (Government Decision no. 421 of 05.04.2002 on renovation and thermal rehabilitation of the existing residential buildings).*

252. **Monitorul Oficial al RM nr. 5-8 din 10.01.2002 (Official Gazette of the RM no. 5-8 of 10.01.2002),** *Hotărârea Guvernului nr. 1415 din 19.12.2001 cu privire la aprobarea Strategiei de dezvoltare social-economică a Republicii Moldova pe termen mediu (până în anul 2005) (Government Decision no. 1415 of 19.12.2001 approving the Medium Term Social-Economic Development Strategy of the Republic of Moldova (up to 2005).*

253. **Monitorul Oficial al RM nr. 5-8 din 10.01.2002 (Official Gazette of the RM no. 5-8 of 10.01.2002),** *Hotărârea Guvernului nr. 1491 din 28.12.2001 cu privire la Concepția dezvoltării durabile a localităților din Republica Moldova (Government Decision no. 1491 of 28.12.2001 on the Settlements Sustainable Development Concept of the Republic of Moldova).*

254. **Monitorul Oficial al RM nr. 117-119 din 15.08.2002 (Official Gazette of the RM no. 117-119 of 15.08.2002),** *Hotărârea Guvernului nr. 1057 din 06.08.2002 cu privire la Măsurile de reducere a cheltuielilor pentru resursele energetice în economia națională (Government Decision no. 1057 of 06.08.2002 on Measures to reduce expenditures for energy resources in the national economy).*

255. **Monitorul Oficial al RM nr. 149 din 07.11.2002 (Official Gazette of the RM no. 149 of 07.11.2002),** *Parlamentul Republicii Moldova. Hotărârea nr. 1401 din 24.10.2002 pentru aprobarea Listei direcțiilor prioritare de cercetare-dezvoltare pe anii 2003-2010, finanțate din bugetul de stat (Parliament of the RM. Resolution no. 1401 of 24.10.2002 approving the List of R & D Priority Directions for 2003-2010, financed from the state budget).*

256. **Monitorul Oficial al RM nr. 54-55/383 din 18.04.2002 (Official Gazette of the RM no. 54-55/383 of 18.04.2002),** *Parlamentul RM.*

Legea pentru aprobarea Regulamentului cu privire la regimul comercial și reglementarea utilizării hidrocarburilor halogenate care distrug stratul de ozon, nr. 852-XV din 14.02.2002 (modificată în 2007 și 2017) (Parliament of the RM. The Law on approval of the Regulation on the commercial regime and regulation of the use of ozone layer depleting halogenated hydrocarbons, no. 852-XV of 14.02.2002 (amended in 2007 and 2017).

257. **Monitorul Oficial al RM nr. 161 din 03.12.2002 (Official Gazette of the RM no. 161 of 03.12.2002,** *Hotărârea Guvernului nr. 1527 din 26.11.2002 cu privire la crearea Agenției Naționale pentru Conservarea Energiei (Government Decision no. 1527 of 26.11.2002 on establishing the National Agency for Energy Conservation).*

258. **Monitorul Oficial al RM nr. 135-136 din 03.10.2002 (Official Gazette of the RM no. 135-136 of 03.10.2002),** *Hotărârea Guvernului nr. 1247 din 24.09.2002 „Cu privire la unele măsuri pentru revitalizarea complexului avicol în anii 2002-2010 (Government Decision no. 1247 of 24.09.2002 „On some measures for revitalization of poultry farms in 2002-2010).*

259. **Monitorul Oficial al RM nr. 29-31 din 28.02.2002 (Official Gazette of the RM no. 29-31 of 28.02.2002),** *Hotărârea Guvernului RM nr. 191 din 19.02.2002 despre aprobarea Regulamentului cu privire la modul de prestare și achitare a serviciilor locative, comunale și necomunale pentru fondul locativ, contorizarea apartamentelor și condițiile deconectării acestora de la/reconectării la sistemele de încălzire și alimentare cu apă (Government Decision no. 191 of 19.02.2002 approving the Regulation on provision and payment for housing, communal and non-communal services for the housing stock, metering of apartments and conditions for disconnecting / reconnecting to the heating and water supply systems).*

260. **Monitorul Oficial al RM nr. 133 din 08.11.2001 (Official Gazette of the RM no. 133 of 08.11.2001),** *Hotărârea Parlamentului nr. 350 din 12.07.2001 pentru aprobarea Strategiei dezvoltării durabile a sectorului forestier din Republica Moldova (Parliament's Decision no. 350 of 12.07.2001 approving the Strategy for Sustainable Development of the Forestry Sector of the Republic of Moldova).*

261. **Monitorul Oficial al RM nr. 147-149 din 06.12.2001 (Official Gazette of the RM no. 147-149 of 06.12.2001),** *Parlamentul RM. Legea nr. 1308 din 25.07.1997 privind prețul normativ și modul de vânzare-cumpărare a pământului (Parliament of the RM. Law no. 1308 of 25.07.1997 on the normative price and sale-purchase of land).*

262. **Monitorul Oficial nr. 147-149 din 06.12.2001 (Official Gazette of the RM no. 147-149 of 06.12.2001),** *Parlamentul Republicii Moldova. Legea nr. 1308 din 25.07.1997 privind prețul normativ și modul de vânzare-cumpărare a pământului (Parliament of the RM. Law no. 1308 of 25.07.1997 on the normative price and sale-purchase of land).*

263. **Monitorul Oficial al RM nr. 57-58 din 31.05.2001 (Official Gazette of the RM no. 57-58 of 31.05.2001),** *HG nr. 32 din 16.01.2001 cu privire la măsurile de stabilire a zonelor și fâșiilor riverane de protecție a apelor râurilor și bazinelor de apă (GD no. 32 of 16.01.2001 on measures for establishment of riparian zones and strips for rivers water and water basins protection).*

264. **Monitorul Oficial al RM nr. 107 din 04.09.2001 (Official Gazette of the RM no. 107 of 04.09.2001),** *Cod nr. 828 din 25.12.1991, Codul funciar (Law no. 828 of 25.12.1991, Land Code).*

265. **Monitorul Oficial al RM nr. 107 din 04.09.2001 (Official Gazette of the RM no. 107 of 04.09.2001),** *Parlamentul RM. Legea nr. 828 din 25.12.1991, Codul funciar (Parliament of the RM/ Law no. 828 of 25.12.1991, Land Code).*

266. **Monitorul Oficial al RM nr. 92-93 din 03.08.2001 (Official Gazette of the RM no. 92-93 of 03.08.2001),** *Parlamentul Republicii Moldova. Legea nr. 386 din 19.07.2001 cu privire la tutun și la produsele din tutun (Parliament of the Republic of Moldova. Law no. 386 of 19 July 2001 on Tobacco and Tobacco Products).*

267. **Monitorul Oficial al RM nr. 090 din 02.08.2001 (Official Gazette of the RM no. 090 of 02.08.2001),** *Hotărârea Parlamentului cu privire la aprobarea Strategiei naționale și a Planului de acțiune în domeniul conservării diversității biologice, nr.112-XV din 27.04.2001 (Parliament's decision on the approval of the National Strategy and the Action Plan on Biological Diversity Conservation, no.112-XV of 27.04.2001).*

268. **Monitorul Oficial al RM nr. 090 din 02.08.2001 (Official Gazette of the RM no. 090 of 02.08.2001),** *Parlamentul RM. Hotărârea nr. 112 din 27.04.2001 cu privire la aprobarea Strategiei naționale și a Planului de acțiune în domeniul conservării diversității biologice (Parliament of the RM. Resolution no. 112 of April 27, 2001 approving the National Strategy and the Action Plan for biological diversity conservation).*

269. **Monitorul Oficial al RM nr. 157-159 din 21.12.2000 (Official Gazette of the RM no. 157-159 of 21.12.2000),** *Parlamentul RM. Legea nr. 1136 din 13.07.2000 privind conservarea energiei (Parliament of the RM. Law no. 1136 of 13.07.2000 on energy conservation).*

270. **Monitorul Oficial al RM nr. 130-132/915 din 19.10.2000 (Official Gazette of the RM no. 130-132/915 of 19.10.2000),** *Parlamentul RM. Legea nr. 913 din 30.03.2000 privind condominiul în fondul locativ (Parliament of the RM. Law no. 913 of 30.03.2000 on Housing Condominium).*

271. **Monitorul Oficial al RM nr. 141 din 09.11.2000 (Official Gazette of the RM no. 141 of 09.11.2000),** *Hotărârea Guvernului nr. 1092 din 31.10.2000 cu privire la utilizarea resurselor energetice regenerabile (Government Decision no. 1092 of 31.10.2000 on the use of renewable energy resources).*

272. **Monitorul Oficial al RM nr. 141 din 09.11.2000 (Official Gazette of the RM no. 141 of 09.11.2000),** *Legea nr. 1041 din 15.06.2000 pentru ameliorarea prin împădurire a terenurilor degradate (the Law no. 1041 of 15.06.2000 on afforestation of degraded lands).*

273. **Monitorul Oficial al RM nr. 81-83 din 13.07.2000 (Official Gazette of the RM no. 81-83 of 13.07.2000),** *Hotărârea Guvernului nr. 1228 din 05.07.2000 cu privire la unele măsuri de reglementare a procesului de contorizare a consumurilor de apă și energie termică (Government Decision no. 1228 of 05.07.2000 on some measures for regulating the process of water and heat consumption metering).*

274. **Monitorul Oficial al RM nr. 152 din 07.12.2000 (Official Gazette of the RM no. 152 of 07.12.2000),** *Hotărârea Guvernului nr. 1216 din 29.10.2000 cu privire la utilarea instituțiilor bugetare cu lămpi luminescente compacte de eficiență energetică sporită (Government Decision no. 1216 of 29.10.2000 on providing energy efficient compact luminescent lamps to state institutions).*

275. **Monitorul Oficial al RM nr. 042 din 20.04.2000 (Official Gazette of the RM no. 042 of 20.04.2000),** *Hotărârea Guvernului nr. 360 din 10.04.2000 cu privire la aprobarea Strategiei energetice a Republicii Moldova până în anul 2010 (Government Decision no. 360 of 10.04.2000 approving the Energy Strategy of the Republic of Moldova until 2010).*

276. **Monitorul Oficial al RM nr. 12 din 03.02.2000 (Official Gazette of the RM no. 12 of 03.02.2000),** *Parlamentul Republicii Moldova. Legea nr. 652 din 28.10.1999 cu privire la certificare (Parliament of the RM. Law no. 652 of 28.10.1999 on Certification).*

277. **Monitorul Oficial al RM nr. 12-13 din 03.02.2000 (Official Gazette of the RM no. 12-13 of 03.02.2000),** *Hotărârea Guvernului nr. 72 din 25.01.2000 despre aprobarea Regulamentului privind antrenarea publicului în elaborarea și adoptarea deciziilor de mediu (Government Decision no. 72 of 25.01.2000 approving the Regulation on involving the public in the development and adoption of environmental decisions).*

278. **Monitorul Oficial al RM nr. 84-87 din 21.01.2000 (Official Gazette of the RM no. 84-87 of 21.01.2000),** *Hotărârea Guvernului nr. 669 din 11.07.2000. Protocol nr.2000* **între Ministerul Mediului şi** *amenajării teritoriului al Republicii Moldova şi Ministerul Lucrărilor publice şi amenajării teritoriului din România privind cooperarea în domeniul lucrărilor publice, amenajării teritoriului şi gospodăriei comunale (Government Decision no. 669 of 11.07.2000. Protocol Nr.2000 between the Ministry of Environment and Territorial Planning of the Republic of Moldova and the Ministry of Public Works and Territorial Planning of Romania on cooperation in the field of public works, landscaping and public amenities).*

279. **Monitorul Oficial al RM nr. 153-155 din 29.12.1999 (Official Gazette of the RM no. 153-155 of 29.12.1999),** *Parlamentul Republicii Moldova. Legea culturilor nucifere nr. 658 din 29.10.1999 (Parliament of the RM. Law of Nuts Crops no. 658 of 29.10.1999).*

280. **Monitorul Oficial al RM nr. 73-77 din 15.07.1999 (Official Gazette of the RM no. 73-77 of 15.07.1999),** *Parlamentul Republicii Moldova Legea zootehniei nr. 412 din 27.05.1999 (Parliament of the Republic of Moldova Law no. 412 of 27.05.1999 on Animal Husbandry).*

281. **Monitorul Oficial al RM nr. 53-54 din 27.05.1999 (Official Gazette of the RM no. 53-54 of 27.05.1999),** *Hotărârea Guvernului nr. 414 din 10.05.1999 cu privire la Programul de asistență tehnică pentru anii 1999-2000 (Government Decision no. 414 of 10.05.1999 on the Technical Assistance Program for 1999-2000).*

282. **Monitorul Oficial al RM nr. 50-52 din 20.05.1999 (Official Gazette of the RM no. 50-52 of 20.05.1999) ,** *Hotărârea Guvernului nr. 416 din 10.05.1999 cu privire la aprobarea Strategiei pieței spațiului locativ și altor bunuri imobiliare (Government Decision no. 416 of 10.05.1999 approving the Strategy of the housing and other real estate market).*

283. **Monitorul Oficial al RM nr. 039 din 22.04.1999 (Official Gazette of the RM no. 039 of 22.04.1999),** *Hotărârea Guvernului nr. 270 din 08.04.1999 cu privire la aprobarea Programului de activitate a Guvernului Republicii Moldova pentru anii 1999-2002 „Supremația legii, revitalizare economică, integrare europeană" (Government Decision no. 270 of 08.04.1999 approving the Government of the RM Activity Program for 1999-2002 „The Rule of Law, Economic Revitalization, European Integration").*

284. **Monitorul Oficial al RM nr. 133-134 din 02.12.1999 (Official Gazette of the RM no. 133-134 of 02.12.1999),** *Parlamentul Republicii Moldova. Legea nr. 612 din 01.10.1999 cu privire la protecția plantelor (Parliament of the Republic of Moldova. Law no. 612 of 1 October 1999 on Plant Protection).*

285. **Monitorul Oficial al RM nr. 003 din 14.01.1999 (Official Gazette of the RM no. 003 of 14.01.1999),** *Hotărârea Guvernului nr. 1224 din 21.12.1998 privind aprobarea Regulilor provizorii de exploatare a locuințelor, întreținere a blocurilor locative și teritoriilor aferente* **în Republica Moldova** *(Government Decision no. 1224 of 21.12.1998 approving the Provisional rules for management and maintenance of housing stock and adjacent territories in the Republic of Moldova).*

286. **Monitorul Oficial al RM nr. 92-93 din 08.10.1998 (Official Gazette of the RM no. 92-93 of 08.10.1998),** *Hotărârea Guvernului nr. 988 din 21.09.1998 despre aprobarea Regulamentului privind fondurile ecologice (Government Decision no. 988 of 21.09.1998 approving the Regulation on the ecological funds).*

287. **Monitorul Oficial al RM nr. 54-55 din 18.06.1998 (Official Gazette of the RM no. 54-55 of 18.06.1998),** *Parlamentul RM. Legea nr. 1540 din 25.02.1998 privind plata pentru poluarea mediului (Parliament of the RM. Law no. 1540 of 25.02.1998 on environmental pollution payments).*

288. **Monitorul Oficial al RM nr. 44-46 din 21.05.1998 (Official Gazette of the RM no. 44-46 of 21.05.1998) ,** *Parlamentul RM. Legea nr. 1422 din 17.12.1997 privind protecția aerului atmosferic (Parliament of the RM. Law no. 1422 of 17.12.1997 on Atmospheric Air Protection).*

289. **Monitorul Oficial al RM nr. 50-51 din 04.06.1998 (Official Gazette of the RM no. 50-51 of 04.06.1998),** *Parlamentul RM. Legea nr. 1525 din 19.02.1998 cu privire la energetică (Parliament of the RM. Law no. 1525 of 19.02.1998 on Energy).*

290. **Monitorul Oficial al RM nr. 060 din 02.07.1998 (Official Gazette of the RM no. 060 of 02.07.1998),** *Hotărârea Guvernului nr. 434 din 09.04.1998 despre aprobarea Regulamentului cu privire la furnizarea și utilizarea energiei termice (Government Decision no. 434 of 09.04.1998 approving the Regulation on Supply and Use of Thermal Energy).*

291. **Monitorul Oficial al RM nr. 071 din 30.10.1997 (Official Gazette of the RM no. 071 of 30.10.1997),** *Hotărârea Guvernului nr. 767 din 11.08.1997 cu privire la Agenția Națională pentru Reglementare în Energetică (Government Decision no. 767 of 11.08.1997 on the National Agency for Energy Regulation).*

292. **Monitorul Oficial al RM nr. 4-5/36 din 16.01.1997 (Official Gazette of the RM no. 4-5/36 of 16.01.1997),** *Codul silvic, nr. 887-XIII din 21.06.1996 (Forestry Code, no. 887-XIII of 21.06.1996).*

293. **Monitorul Oficial al RM nr. 77 din 28.11.1996 (Official Gazette of the RM no. 77 of 28.11.1996),** *Parlamentul Republicii Moldova. Legea nr. 915 din 11.07.1996 privind protecția soiurilor de plante (Parliament of the RM. Law no. 915 of 11.07.1996 on Plant Varieties Protection).*

294. **Monitorul Oficial al RM nr. 078 din 05.12.1996 (Official Gazette of the RM no. 078 of 05.12.1996),** *HG nr. 595 din 29.10.1996 cu privire la perfecționarea gestionării gospodăriei silvice și protejarea vegetației forestiere (GD no. 595 of 29.10.1996 on improving forest management and protection of forest vegetation).*

295. **Monitorul Oficial al RM nr. 25 din 25.04.1996 (Official Gazette of the RM no. 25 of 25.04.1996),** *Parlamentul RM. Legea nr. 721 din 02.02.1996 privind calitatea în construcții (Parliament of the RM. Law no. 721 of 02.02.1996 on quality in construction).*

296. **Monitorul Oficial al RM nr. 17-18 din 21.03.1996 (Official Gazette of the RM no. 17-18 of 21.03.1996),** *Parlamentul Republicii Moldova. Legea nr. 728 din 06.02.1996 cu privire la pomicultură (Parliament of the RM. Law no. 728 of 06.02.1996 on Horticulture).*

297. **Monitorul Oficial al RM nr. 011 din 22.02.1996 (Official Gazette of the RM no. 011 of 22.02.1996),** *Hotărârea Guvernului nr. 23 din 16.01.1996 cu privire la contorizarea gazelor consumate de populație, instituții publice și agenți economic (Government Decision no. 23 of 16.01.1996 on metering of gas consumed by the population, public institutions and companies).*

298. **Monitorul Oficial al RM nr. 50 din 07.09.1995 (Official Gazette of the RM no. 50 of 07.09.1995),** *Hotărârea Guvernului nr. 490 din 17.07.1995 despre aprobarea Concepției actualizării Sistemului național de documente normative în construcții (Government Decision no. 490 of 17.07.1995 approving the Concept of updating the National system of Rules in Construction).*

299. **Monitorul Oficial al RM nr. 20 din 06.04.1995 (Official Gazette of the RM no. 20 of 06.04.1995),** *Parlamentul Republicii Moldova. Legea nr. 371 din 15.02.1995 privind selecția și reproducția în zootehnie (Parliament of the Republic of Moldova. Law no. 371 of 15.02.1995 on Selection and Reproduction in Animal Husbandry).*

300. **Monitorul Oficial al RM nr. 55 din 05.10.1995 (Official Gazette of the RM no. 55 of 05.10.1995),** *Hotărârea Guvernului nr. 337 din 25.05.1995 cu privire la contorizarea apei și a energiei termice consumate de populație, instituții publice și agenți economici (Government Decision*

no. 337 din 25.05.1995 on metering of gas consumed by the population, public institutions and companies).

301. **Monitorul Oficial al RM nr. 43 din 03.08.1995 (Official Gazette of the RM no. 43 of 03.08.1995),** *Legea nr. 440 din 27.04.95 cu privire la zonele și fâșiile de protecție a apelor râurilor și bazinelor de apă (Law no. 440 of 27.04.95 on rivers water and water basins protection zones and strips).*

302. **Monitorul Oficial al RM nr. 006 din 30.06.1993 (Official Gazette of the RM no. 006 din 30.06.1993,** *Hotărârea Guvernului nr. 334 din 02.06.1993 cu privire la măsurile de economisire riguroasă a resurselor energetice (Government Decision no. 334 of 02.06.1993 on measures for rigorous saving of energy resources).*

303. **Monitorul Fiscal FISC.MD. Serviciul Fiscal de Stat al Republicii Moldova (2017),** *Investițiile străine directe: date, probleme, facilități.* Editorial din 15.11.2017. (State Tax Service of the Republic of Moldova (2017), *Foreign direct investment: data, problems, facilities.* Editorial as of 15.11.2017. <https://monitorul.fisc.md/editorial/investitiile-straine-directe-date-probleme-facilitati.html>

304. **Monitorul Parlamentului nr. 10 din 01.10.1993,** *Parlamentul RM. Legea nr. 1515 din 16.06.1993 privind protecția mediului înconjurător. (Parliament of the RM. Law no. 1515 of 16.06.1993 on Environmental Protection).*

305. **National Bureau of Statistics of the Republic of Moldova (2005)**, *Energy Balance of the Republic of Moldova 2004.* Chisinau.

306. **National Bureau of Statistics of the Republic of Moldova (2006)**, *Energy Balance for 2005 for the Republic of Moldova.* Chisinau.

307. **National Bureau of Statistics of the Republic of Moldova (2006)**, *Statistical Yearbooks of the Republic of Moldova, 2006.* Chisinau, (S.E.. F.E.-P. Central Printing House) – Statistics of Moldova, – 560 p.

308. **National Bureau of Statistics of the Republic of Moldova (2007)**, *Energy Balance of the Republic of Moldova 2006. Collection of Statistics.* Chisinau: Statistica, 2007 (Printing and Publishing), – 121 p.

309. **National Bureau of Statistics of the Republic of Moldova (2007)**, *Statistical Yearbooks of the Republic of Moldova, 2007.* Chisinau, 2007, – 560 p.

310. **National Bureau of Statistics of the Republic of Moldova (2008)**, *Energy Balance of the Republic of Moldova 2007. Collection of Statistics.* Chisinau: Statistica, 2008 (Printing and Publishing), – 129 p.

311. **National Bureau of Statistics of the Republic of Moldova (2008),** *Statistical Yearbooks of the Republic of Moldova, 2008.* Chisinau, 2008, (F.E.-P. Central Printing House). - (Statistics of Moldova). – 580 p.

312. **National Bureau of Statistics of the Republic of Moldova (2009)**, *Energy Balance of the Republic of Moldova 2008. Collection of Statistics.* Chisinau: Statistica, 2009 (Printing and Publishing), – 129 p.

313. **National Bureau of Statistics of the Republic of Moldova (2009),** *Statistical Yearbooks of the Republic of Moldova, 2009.* Ch.: Statistica, 2009 (F.E.-P. Central Printing House). - (Statistics of Moldova). – 576 p.

314. **National Bureau of Statistics of the Republic of Moldova (2010)**, *Energy Balance of the Republic of Moldova 2009. Collection of Statistics.* Chisinau: Statistica, 2010 (Statistics of Moldova), 178 p.

315. **National Bureau of Statistics of the Republic of Moldova (2010),** *Statistical Yearbooks of the Republic of Moldova, 2010.* Ch.: Statistica, 2010 (F.E.-P. Central Printing House). - (Statistics of Moldova). – 572 p.

316. **National Bureau of Statistics of the Republic of Moldova (2011)**, *Energy Balance of the Republic of Moldova 2010. Collection of Statistics.* Chisinau: Statistica, 2011 (Statistics of Moldova), – 71 p.

317. **National Bureau of Statistics of the Republic of Moldova (2011),** *Statistical Yearbooks of the Republic of Moldova, 2011.* Ch.: Statistica, 2011 (EUROPRES). - (Statistics of Moldova). – 564 p.

318. **National Bureau of Statistics of the Republic of Moldova (2012)**, *Energy Balance of the Republic of Moldova 2011. Collection of Statistics.* Chisinau: Statistica, 2012 (Statistics of Moldova), – 73 p.

319. **National Bureau of Statistics of the Republic of Moldova (2012),** *Statistical Yearbooks of the Republic of Moldova, 2012.* Ch.: Statistica, 2012 (S.E. F.E.-P. Central Printing House). - (Statistics of Moldova). – 560 p.

320. **National Bureau of Statistics of the Republic of Moldova (2013)**, *Energy Balance of the Republic of Moldova 2012. Collection of Statistics.* Chisinau: Statistica, 2013 (Statistics of Moldova). - 92 p.

321. **National Bureau of Statistics of the Republic of Moldova (2013),** *Statistical Yearbooks of the Republic of Moldova, 2013.* Ch.: Statistica, 2013 (S.E. F.E.-P. Central Printing House). - (Statistics of Moldova). – 556 p.

322. **National Bureau of Statistics of the Republic of Moldova (2014)**, *Energy Balance of the Republic of Moldova 2013. Collection of Statistics.* Chisinau: Statistica, 2014 (Statistics of Moldova), 67 p.

323. **National Bureau of Statistics of the Republic of Moldova (2014),** *Statistical Yearbooks of the Republic of Moldova, 2014.* Ch.: Statistica, 2014 (S.E. F.E.-P. Central Printing House). - (Statistics of Moldova). – 558 p.

324. **National Bureau of Statistics of the Republic of Moldova (2015)**, *Energy Balance of the Republic of Moldova 2014. Collection of Statistics.* Chisinau: Statistica, 2015 (Statistics of Moldova), 79 p.

325. **National Bureau of Statistics of the Republic of Moldova (2015),** *Statistical Yearbooks of the Republic of Moldova, 2015.* Ch.: Statistica, 2015, (S.E. F.E.-P. Central Printing House) – (Statistics of Moldova). 556 p.

326. **National Bureau of Statistics of the Republic of Moldova (2016)**, *Energy Balance of the Republic of Moldova 2015. Collection of Statistics.* Chisinau: Statistica, 2016 (Statistics of Moldova), 57 p.

327. **National Bureau of Statistics of the Republic of Moldova (2016),** *Statistical Yearbooks of the Republic of Moldova, 2016.* Ch.: Statistica, 2016, (S.E. F.E.-P. Central Printing House) – (Statistics of Moldova). 668 p.

328. **National Bureau of Statistics of the Republic of Moldova (2017)**, *Energy Balance of the Republic of Moldova 2016. Collection of Statistics.* Chisinau: Statistica, 2017 (Statistics of Moldova), 64 p.

329. **National Bureau of Statistics of the Republic of Moldova (2017),** *Statistical Yearbooks of the Republic of Moldova, 2017.* Ch.: Statistica, 2017, (S.E. F.E.-P. Central Printing House) – (Statistics of Moldova). 486 p.

330. **National Bureau of Statistics of the Republic of Moldova (2017),** Statistical Reports PRODMOLD-A „Total production, as a natural expression, in the Republic, by product type for *2005-2016"* Chisinau.

331. **National Bureau of Statistics (1990-2017),** *Statistical Annual Report No. 24-agr „Animal Breeding Sector". The Number of Livestock and Poultry in All Households Categories as of 1st of January (Annual Reports for 1990-2016).*

332. **National Bureau of Statistics (1990-2017),** *Statistical Annual Report No. 24-agr „Animal Breeding Sector". Basic Indicators of Animal Breeding Sector Development in all Households Categories in the RM (Annual Reports for 1990-2016).*

333. **National Bureau of Statistics of the Republic of Moldova (2017),** Statistical Database: <http://statbank.statistica.md/pxweb/Dialog/varval.asp?ma=IND0301&ti=Productia+principalelor+produse+i

ndustriale%2C+1997-2016&path=../Database/RO/14%20IND/IND03/&lang=1>

334. **Natural Foam Blowing Agents, Sustainable Ozone- and Climate-Friendly Alternatives to HCFCs (2012),** *PROKLIMA International Programme of the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, commissioned by the Federal Ministry for Economic Cooperation and Development (BMZ) Environment and Sustainable Use of Natural Resources Division*. Eschborn, September 2012. p. 178.

335. **OECD Environment Directorate International Energy Agency.** *Institutional Capacity and Climate Actions*. <http://www.oecd.org/env/cc/21018790.pdf>

336. **Pequot Publishing Inc. – 1998.** *Gas Turbine World, For Project Planning, Design and Construction*, Handbook.

337. **Sagar A. (2000),** *Capacity development for the environment: A view from the south, a view from the north*. Annual Review of Energy and Environment 25, 2000, pages 377-439.

338. **Serviciul Fiscal de Stat al Republicii Moldova (State Tax Service of the Republic of Moldova)**. *Investițiile străine directe: date, probleme, facilități.* Publicația periodică „Monitorul Fiscal FISC.MD". Editorial din 15.11.2017. (*Foreign direct investment: data, problems, facilities*. Periodicalpublication „Monitorul Fiscal FISC.MD" Editorial as of 15.11.2017.) <https://monitorul.fisc.md/editorial/investitiile-straine-directe-date-probleme-facilitati.html>

339. **State Committee on Statistics of the Moldavian Soviet Socialist Republic (1989),** *National Economy of MSSR, 1988. Statistical Yearbook (in Romanian)*. Chisinau, Cartea Moldoveneasca, 1989. – 387 p.

340. **State Committee on Statistics of the Transnistrian Moldovan Republic (1998),** *Statistical Yearbook of the Transnistrian Moldovan Republic, Statistical Collection (for 1990, 1995-1997).* TMR (ATULBD). – Tiraspol, 1998. – 254 p. (in Russian).

341. **State Committee on Statistics of the Transnistrian Moldovan Republic (2000),** *Statistical Yearbook of the Transnistrian Moldovan Republic, Statistical Collection (for 1990, 1995-1999).* TMR (ATULBD). – Tiraspol, 2000. – 185 p. (in Russian).

342. **State Department for Statistical Analysis of the Republic of Moldova (1992)**, *National Economy of the Republic of Moldova, 1991. Statistical Yearbook*. Chisinau: C.P.C. Publishing House, 406 p.

343. **State Ecological Inspectorate (2009),** *SEI Yearbook – 2008 „Environment Protection in the Republic of Moldova"* / Stamatin I., Apostol A., Mustea M. [et al.]. – Chisinau: „A.V.i.T. Publ", 2009 (Publishing House "Continental-Grup"). – 288 p.

344. **State Ecological Inspectorate (2011),** *SEI Yearbook – 2010 „Environment Protection in the Republic of Moldova"*; editorial board: Prisacaru G., Tapis V., Stangaci V. [et al.]. – Ch.: S.n., 2011 (Publishing House - "Sirius" SRL) – 232 p.

345. **State Ecological Inspectorate (2012),** *SEI Yearbook – 2011 „Environment Protection in the Republic of Moldova"*; editorial board: Prisacaru G., Tapis V., Stingaci V. [et al.]. – Chisinau: Continental Grup, 2012. – 248 p.

346. **State Ecological Inspectorate (2013),** *SEI Yearbook -2012 „Environment Protection in the Republic of Moldova"*; editorial board: V. Untila [et al.]. - Chisinau: Pontos, 2013 (Publishing House „Europres").

347. **State Ecological Inspectorate (2014),** *SEI Yearbook -2013 „Environment Protection in the Republic of Moldova"*; editorial board: V. Curari [et al.]. - Chisinau: Pontos, 2014 (Publishing House „Europres").

348. **State Ecological Inspectorate (2015),** *SEI Yearbook, 2014 „Environment Protection in the Republic of Moldova"*; editorial board: V. Stangaci; D. Osipov. – Chisinau: Pontos, 2015, (Publishing House "Europres"), 336 p.

349. **State Ecological Inspectorate / Ministry of Environment (2016),** *SEI Yearbook -2015 „Environment Protection in the Republic of Moldova"*; editorial board.: I. Talmazan [et al.]; D. Osipov. – Chisinau: Pontos, 2016, (Publishing House „Europres"), 348 p.

350. **State Ecological Inspectorate / Ministry of Environment (2017),** *SEI Yearbook -2016 „Environment Protection in the Republic of Moldova"*; editorial board.: V. Nani [et al.]; D. Osipov [et al.]. – Chisinau: Pontos, 2017, (Publishing House „Europres"), 356 p.

351. **State Statistical Service of the Ministry of Economy of the Transnistrian Moldovan Republic (2002),** *Statistical Yearbook of the Transnistrian Moldovan Republic - 2002, Statistical Collection (for 1996-2001).* TMR (ATULBD). – Tiraspol, 2002. – 190 p. (in Russian).

352. **State Statistical Service of the Ministry of Economy of the Transnistrian Moldovan Republic (2005),** *Statistical Yearbook of the Transnistrian Moldovan Republic - 2005, Statistical Collection (for 2000-2004).* TMR (ATULBD). – Tiraspol, 2005. – 189 p. (in Russian).

353. **State Statistical Service of the Ministry of Economy of the Transnistrian Moldovan Republic (2006),** *Statistical Yearbook of the Transnistrian Moldovan Republic - 2006, Statistical Collection (for 2001-2005).* TMR (ATULBD). – Tiraspol, 2006. – 188 p. (in Russian).

354. **State Statistical Service of the Ministry of Economy of the Transnistrian Moldovan Republic (2009),** Express Information, Key Performance Indicators for the Industry, Road Transport, Trade and Paid Services Sectors for 2009 - Tiraspol, 2009 – 15 p. (in Russian).

355. **State Statistical Service of the Ministry of Economy of the Transnistrian Moldovan Republic (2010),** *Statistical Yearbook of the Transnistrian Moldovan Republic -2009, Statistical Collection (for 2005-2009).* TMR (ATULBD). – Tiraspol, 2010 – 181 p. (in Russian).

356. **State Statistical Service of the Ministry of Economy of the Transnistrian Moldovan Republic (2010),** Express Information, Key Performance Indicators for the Industry Sector in the Republic for January-December 2010 (Preliminary Data). - Tiraspol, 2011 – 13 p. (in Russian).

357. **State Statistical Service of the Transnistrian Moldovan Republic (2010),** *Socio-Economic Development of the TMR for 2009*, Tiraspol, 2010 – 75 p. (in Russian).

358. **State Statistical Service of the Ministry of Economy of the Transnistrian Moldovan Republic (2011),** *Statistical Yearbook of the Transnistrian Moldovan Republic -2010, Statistical Collection (for 2006-2010).* TMR (ATULBD). – Tiraspol, 2011 – 184 p. (in Russian).

359. **State Statistical Service of the Ministry of Economy of the Transnistrian Moldovan Republic (2011),** Express Information, Key Performance Indicators for the Industry Sector in the Republic for 2010. Tiraspol, 2011 – 13 p. (in Russian).

360. **State Statistical Service of the Transnistrian Moldovan Republic** (2011), *Socio-Economic Development of the TMR for 2010*, Tiraspol, 2011. – 79 p. (in Russian).

361. **State Statistical Service of the Ministry of Economy of the Transnistrian Moldovan Republic (2012),** *Statistical Yearbook of the Transnistrian Moldovan Republic - 2011, Statistical Collection (for 2007-2011).* TMR (ATULBD). – Tiraspol, 2012 – 188 p. (in Russian).

362. **State Statistical Service of the Ministry of Economy of the Transnistrian Moldovan Republic (2012),** Express Information, Key Performance Indicators for the Industry Sector in the Republic for 2011. Tiraspol, 2012 – 13 p. (in Russian).

363. **State Statistical Service of the Transnistrian Moldovan Republic** (2012), *Socio-Economic Development of the TMR for 2010*, Tiraspol, 2012. – 85 p. (in Russian).

364. **State Statistical Service of the Ministry of Economy of the Transnistrian Moldovan Republic (2012),** Press-Release *The State of housing and communal services of the Republic in 2011*. TMR - Tiraspol, 2012 – 6 p. (in Russian).

365. **State Statistical Service of the Ministry of Economy of the Transnistrian Moldovan Republic (2013),** Analytical note «Ecological situation in the Transnistrian Moldovan Republic in 2012». Tiraspol, 2013. 4 p. (in Russian).

366. **State Statistical Service of the Ministry of Economy of the Transnistrian Moldovan Republic (2013),** *Statistical Yearbook of the Transnistrian Moldovan Republic* - 2012: *Statistical Collection (for* 2008–2012). TMR (ATULBD). - Tiraspol, 2013 – 190 p. (in Russian).

367. **State Statistical Service of the Ministry of Economy of the Transnistrian Moldovan Republic (2013),** Express Information, Key Performance Indicators for the Industry Sector in the Republic for 2012. Tiraspol, 2013 – 13 p. (in Russian).

368. **State Statistical Service of the Transnistrian Moldovan Republic** (2013), *Socio-economic Development of the TMR for 2012*, Tiraspol, 2013. 85 p. (in Russian).

369. **State Statistical Service of the Ministry of Economy of the Transnistrian Moldovan Republic (2013),** Press-Release *The State of housing and communal services of the republic in 2012*. TMR - Tiraspol, 2013 – 6 p. (in Russian).

370. **State Statistical Service of the Ministry of Economy of the Transnistrian Moldovan Republic (2014),** Analytical note «Ecological situation in the Transnistrian Moldovan Republic in 2013». Tiraspol, 2014. 4 p. (in Russian).

371. **State Statistical Service of the Ministry of Economy of the Transnistrian Moldovan Republic (2014),** *Statistical Yearbook of the Transnistrian Moldovan Republic* - 2013: *Statistical Collection (for* 2009–2013). TMR (ATULBD). - Tiraspol, 2014 – 180 p. (in Russian).

372. **State Statistical Service of the Ministry of Economy of the Transnistrian Moldovan Republic (2014),** Express Information, Key Performance Indicators for the Industry Sector in the Republic for 2013 (other than the Small Industries). - Tiraspol, 2014 – 14 p. (in Russian).

373. **State Statistical Service of the Transnistrian Moldovan Republic** (2014), *Socio-Economic Development of the TMR, 2013 (final data).* Tiraspol, 2014 – 88p. (in Russian).

374. **State Statistical Service of the Ministry of Economy of the Transnistrian Moldovan Republic (2014),** Press-Release *The State of housing and communal services of the republic in 2013*. TMR - Tiraspol, 2014 – 6 p. (in Russian).

375. **State Statistical Service of the Transnistrian Moldovan Republic (2015)**, *Socio-economic Development of the TMR, 2014 (final data).* Tiraspol, 2015 – 81p. (in Russian).

376. **State Statistical Service of the Ministry of Economy of the Transnistrian Moldovan Republic (2015),** Press-Release *The State of housing and communal services of the republic in 2014*. TMR - Tiraspol, 2015 – 6 p. (in Russian).

377. **State Statistical Service of the Ministry of Economic Development of the Transnistrian Moldovan Republic (2016),** *Socio-Economic Development of the TMR, 2015 (final data).* Tiraspol, 2016 – 81p. (in Russian).

378. **State Statistical Service of the Ministry of Economy of the Transnistrian Moldovan Republic (2016),** Press-Release *The State of housing and communal services of the republic in* 2015. TMR – Tiraspol, 2016 – 6 p. (in Russian).

379. **State Statistical Service of the Ministry of Economy of the Transnistrian Moldovan Republic (2016),** Express Information, Key Performance Indicators for the Industry Sector in the Republic for 2016 (other than the Small Industries). Tiraspol, 2016, 13 p. (in Russian).

380. **State Statistical Service of the Ministry of Economy of the Transnistrian Moldovan Republic (2016),** *Socio-Economic Development of the TMR,* 2015 (*final data).* Tiraspol, 2016, 81 p. (in Russian).

381. **State Statistical Service of the Ministry of Economy of the Transnistrian Moldovan Republic (2016),** *Statistical Yearbook of the Transnistrian Moldovan Republic* - 2016: *Statistical Collection (for* 2011–2015). Tiraspol, 2016,185 p. (in Russian).

382. **State Statistical Service of the Ministry of Economy of the Transnistrian Moldovan Republic (2017),** Express Information, Key Performance Indicators for the Industry Sector in the Republic for 2017 (other than the Small Industries). Tiraspol, 2017 - 11 p. (in Russian).

383. **State Statistical Service of the Ministry of Economy of the Transnistrian Moldovan Republic (2017),** Press-Release *The State of housing and communal services of the republic in* 2016. TMR, Tiraspol, 2017 - 6 p. (in Russian).

384. **State Statistical Service of the Ministry of Economy of the Transnistrian Moldovan Republic (2017),** *Socio-Economic Development of the TMR,* 2016 (*final data*). Tiraspol, 2017 - 81 p. (in Russian).

385. **State Statistical Service of the Ministry of Economy of the Transnistrian Moldovan Republic (2017),** *Statistical Yearbook of the Transnistrian Moldovan Republic - 2016: Statistical Collection (for 2011–2016)*. TMR, Tiraspol, 2017 - 188 p. (in Russian).

386. **U.S. Environmental Protection Agency (2011),** *EPA-430-F-11-005, Transition to low-GWP alternatives in building/construction foams.* February 2011. <https://www.epa.gov/sites/production/files/2015-07/documents/transitioning_to_low-gwp_alternatives_in_building_and_construction_foams.pdf>

387. **385. Taranu L. (2014),** *An Assessment of Climate Change Impact on the Republic of Moldova's Agriculture Sector: A Research Study Complementing the Vulnerability and Adaptation Chapter of the Third National Communication of the Republic of Moldova under the United Nations Framework Convention on Climate Change. Ed.: Vasile Scorpan, Marius Taranu; Climate Change Office, Ministry of Environment of the Republic of Moldova, United Nations Environment Programme,* – Chisinau: S. n., 2014 (I.S. F.E.-P. Central Publishing House), – 260 p.

388. **Taranu, L., Deveatii, D., Croitoru, C., Mironova, T. et al. (2018),** *Vulnerability Assessment and Climate Change Impacts in the Republic of Moldova. Researches, Studies, Solutions. A Research Study Complimenting the Vulnerability and Climate Change Impacts Chapter of the Fourth National Communication of the Republic of Moldova under the United Nations Framework Convention on Climate Change.* – Ch.: 2018, „Bons Office" SRL - 352 p.

389. **U.S. Environmental Protection Agency (2016),** *Transitioning to low-GWP alternatives in aerosols. EPA-450-F-16-003. December 2016.* <https://www.epa.gov/sites/production/files/2016-12/documents/transitioning_to_low-gwp_alternatives_in_aerosols.pdf>

390. **UNFCCC (2017),** *NAMAs seeking support for implementation.* <http://www4.unfccc.int/sites/nama/SitePages/NamaImplementation.aspx>

391. **Ziarul „Timpul" (The newspaper „Timpul").** *(Studiu Național) Biomasa poate asigura 22% din necesarul de resurse energetice, 21.06.2013. (National Study) Biomass can provide 22% of the energy resources needed, 21.06.2013.*

WEB PAGES

1. **A World Bank Group.** *Doing Business in Moldova.* <http://www.doingbusiness.org/data/exploreeconomies/moldova?topic=starting-a-business>
2. **A World Bank Group.** *Flagship Report.* <http://www.doingbusiness.org/~/media/WBG/DoingBusiness/Documents/Annual-Reports/English/DB2018-Full-Report.pdf>
3. **A World Bank.** District Heating Efficiency Improvement Project <http://projects.worldbank.org/P132443/district-heating-efficiency-improvement-project?lang=en&tab=overview>
4. **A World Bank.** *Moldova Proiecte și Programe.* <http://www.worldbank.org/ro/country/moldova/projects>
5. **A World Bank.** *Moldova Proiecte și Programe.* <http://www.worldbank.org/en/country/moldova/projects/all>
6. **AC&Heating Connect**. *HFC Refrigerants Used in Commercial Air Conditioning,* <http://www.ac-heatingconnect.com/facility-managers/hfc-refrigerants-commercial-ac/>
7. **Agenția Informațională de Stat Moldpres (State News Agency Moldpress)**. <http://www.moldpres.md/news/2017/03/07/17001818>
8. **Agenția pentru eficiența energetică (AEE) (Energy Efficiency Agency (EEA)**. *„Consolidarea capacităților locale privind efectuarea auditului energetic" („Local capacity building for energy auditing"* <http://www.aee.md/primele-stiri/buletin-comunicat-anun/479-consolidarea-capacit-ilor-locale-privind-efectuarea-auditului-energetic>
9. **Aid Management Platform (AMP).** *Project document.* <http://amp.gov.md/contentrepository/downloadFile.do?uuid=d67dcbfe-3161-48dc-963b-3fb64f7c6190>
10. **ARANER Refrigeration**. *Which refrigerants are used in industrial refrigeration plants?* <http://www.araner.com/blog/refrigerants-used-in-industrial-refrigeration-plants/>
11. **ASHRAE journal.** *Refrigerant use in Europe.* <https://www.usgbc.org/Docs/LEED_tsac/Energy/ASHRAE%20Journal%2009-00%20Refrigerant%20Use%20in%20Europe.pdf>
12. **Cambridge University Press.** *Globalization and Global Justice. Shrinking Distance, Expanding Obligations.* <http://web.worldbank.org/WBSITE/EXTERNAL/ / PROJECTS/0,,pagePK:64392398~piPK:64392037~theSitePK: 40941~countrycode:MD~menuPK:64820000,00.html>
13. **Camera de comerț și industrie A RM. (Chamber of Commerce and Industry of the RM.)** *CCI a RM și Oficiul Băncii Mondiale în Republica Moldova vor coopera pentru susținerea producătorilor autohtoni. (The CCI of the RM and the World Bank Office in Moldova will cooperate to support domestic producers.)* <http://chamber.md/cci-a-rm-si-oficiului-bancii-mondiale-in-republica-moldova-vor-coopera-pentru-sustinerea-producatorilor-autohtoni/>
14. **Camera de comerț și industrie a RM. (Chamber of Commerce and Industry of the RM.)** *Proiecte de instruire a Republicii Moldova. (Training projects of the Republic of Moldova.)* <http://dezvoltarea.chamber.md/ro/proiecte/39-programul-european-energy-manager-%E2%80%93-eurem>
15. **Comunicate.md**. *Difuzare comunicate de presa „DE la om la om". (Dissemination of press releases „From people to people".* <http://www.comunicate.md/index.php?task=articles&action=view&article_id=7054>
16. **Danfoss**. *Environmental consciousness Refrigerant options now and in the future Danfoss helps define your refrigerant choice.* <http://files.danfoss.com/TechnicalInfo/Dila/ra/dkrape300a302.pdf>
17. **Data on the EBRD's work in Moldova.** <http://www.ebrd.com/where-we-are/moldova/data.html>
18. **Department of energy technology.** *In short about R1234ze.* <https://www.kth.se/en/itm/inst/energiteknik/forskning/ett/projekt/koldmedier-med-lag-gwp/low-gwp-news/kort-om-r1234ze-1.561807>
19. **DuPont.** *Retrofit Guidelines for DuPont ISCEON MO29 (R422-D) Refrigerant.* <https://www.chemours.com/Refrigerants/en_US/assets/downloads/k10942_ISCEON_MO29_retrofit_guide.pdf>
20. **EC.** *R22 retrofit with R422D in German Supermarkets* <https://ec.europa.eu/clima/sites/clima/files/docs/0007/epta_r22_supermarket_retrofits_en.pdf>
21. **Econsulting.** *Eficient consulting.* <www.moreeff.org>
22. **Emerging Technologies**. *Demystifying the Refrigerant Landscape.* <http://www.emersonclimate.com/europe/documents/resources/tge124_refrigerant_report_en_1009.pdf>
23. **Emerson Climate 2005.** *Refrigerant for comercial refrigeration applications. Emerson Climate Technologies.*<http://www.emersonclimate.com/White%20Papers/White%20Papers%20Soon%20To%20Be%20Deleted/ECT2005ECT162.pdf>
24. **EMERSON Climate Technologies**. *How to Meet Energy and Efficiency Regulations in Commercial AC.* <https://climate.emerson.com/documents/tucson-%E2%80%93-how-to-meet-energy-efficiency-regulations-in-commercial-ac-en-us-3721864.pdf>
25. **EPA (United States Environmental Protection Agency)** <www.epa.gov/climatechange/emissions/ghginventorycapacitybuilding>
26. **EPA.** *Transitioning to low-gwp alternatives in Aerosols.* <https://www.epa.gov/sites/production/files/2016-12/documents/transitioning_to_low-gwp_alternatives_in_aerosols.pdf>
27. **Europe's Propane Refrigeration Proliferation**. <https://climate.emerson.com/documents/v2-n3-feature-%E2%80%93-europe%E2%80%99s-propane-refrigeration-proliferation-en-us-1573110.pdf>
28. **European Bank of Reconstruction and Development.** *Project Summary Documents* <http://www.ebrd.com/work-with-us/project-finance/project-summary-documents.html?1=1&filterCountry=Moldova>
29. **European Commission.** *Technology Roadmap in preparatory/ review study on.* <http://www.ecodesign-fridges.eu/Documents/Household%20Refrigeration%20Review%20TECHNOLOGY%20ROADMAP%20FINAL%2020160304.pdf>
30. **Fonduri Structurale România. (Structural Funds Romania.)** *Programul Operațional Comun România-Ucraina-Moldova. (Joint Operational Program Romania-Ukraine-Moldova.)* <2007-2013> http://www.fonduri-structurale.ro/Document_Files/transf-rontaliera/00000041/yujkx_POC_Ro-Ua-Md_feb_romana.pdf>
31. **Global Environment Facility (GEF) Moldova.** Country-At-A-Glance. <https://www.thegef.org/country/moldova>
32. **Global Environment Facility (GEF) Moldova.** *Projects* <https://www.thegef.org/projects?f[]=field_country:109>
33. **Global Environment Facility (GEF)**. *Joint Summary of the Chairs 52 nd GEF Council Meeting May 23 – 25, 2017.* <https://www.thegef.org/sites/default/files/council-meeting-documents/EN_GEF.C.53.03_APMR%2BScorecard.pdf>
34. **Honeywell.** *Solstice ze Refrigerant (HFO-1234ze). The Environmental Alternative to Traditional Refrigerants.* <https://www.honeywell-refrigerants.com/europe/wp-content/uploads/2014/10/Solstice-ze-brochure-Fourth-Generation-LR-140925.pdf>
35. **Intergovernmental panel of Climate Change (IPCC).** *Methodological and Technological Issues in Technology Transfer. 2.3 Mechanisms for technology transfer.* <http://www.ipcc.ch/ipccreports/sres/tectran/index.php?idp=517>
36. **MADRM.** (MARDE) *Ordin cu privire la crearea grupului de lucru responsabil de elaborarea capitolului privind protecția mediului din Strategia Națională de Dezvoltare „Moldova 2030". (Order on establishing the working*

group responsible for development of the environmental protection chapter in the National Development Strategy „Moldova 2030".) 07.03.2018. <http://particip.gov.md/proiecte.php?l=ro&ktag=1&an=all&luna=all&ord=3>

37. **MADRM (MARDE) (2018),** *Proiectul Hotărîrii Guvernului „cu privire la instituirea și funcționarea Sistemului național de monitorizare și raportare a emisiilor de gaze cu efect de seră și altor informații relevante pentru schimbările climatice" (Draft Government Decision „on establishing and functioning of the National System for Monitoring and Reporting GHG Emissions and Other Climate Change related Information". 07.02.2018.)* <http://www.particip.gov.md/proiectview.php?l=ro&idd=4992>
38. **MADRM (MARDE) (2018),** *Proiectul Hotărârii Guvernului cu privire la aprobarea Strategiei privind protecția aerului atmosferic pentru anii 2018-2028 și a Planului de acțiuni pentru implementarea acesteia. 22.02.2018. (Draft Government Decision approving the Atmospheric Air Protection Strategy for 2018-2028 and the Action Plan for its Implementation).*
39. **MEI (MEI) (2017),** *Proiectul de Lege cu privire la eficiența energetică (în redacție nouă). 19.05.2017. (Draft Law on Energy Efficiency (New version).* < http://www.particip.gov.md/proiectview.php?l=ro&idd=4185>
40. **MEI (MEI) (2018),** *Proiectul Hotărârii Guvernului privind modificarea și completarea Hotărârii Guvernului nr.401 din 12.06.2012 cu privire la Fondul pentru Eficiență Energetică. 06.03.2018. (Draft Government Decision on the amending and completing the Government Decision no. 401 of 12.06.2012 on the Energy Efficiency Fund).*
41. **Moldova Europeana. (European Moldova)** *Pagina Proiectului „Responsabilitate individuală și cetățenie activă". (Page of the „Individual Responsibility and Active Citizenship" Project)* <http://infoeuropa.md/files/aa-3.pdf>
42. **MoREEFF.** <http://moreeff.info/statistica-moreeff/>
43. **MoSEFF.** <www.moseff.org>
44. **OECD Environment Directorate International Energy Agency**. *Institutional Capacity and Climate Actions.* <http://pdf.wri.org/inst_capacity_climate_change.pdf>
45. **Oficiul Schimbarea Climei**. (**Climate Change Office**.) *Comunicări naționale. (National Communications)* <http://clima.md/lib.php?l=ro&idc=81&>
46. **Oficiul Schimbarea Climei**. (**Climate Change Office**.) *Rapoarte. (Reports)* <http://clima.md/lib.php?l=ro&idc=82&>
47. **Oficiul Schimbarea Climei (Climate Change Office) (2015),** *Raport privind revizuirea tehnică a inventarului național al gazelor cu efect de seră pentru sectorul silvicultură, folosința terenurilor și schimbarea folosinței terenurilor al Republicii Moldova pentru perioada 1990-2013. (Report on the technical review of the GHG national inventory for the LULUCF sector of the Republic of Moldova for 1990-2013.* <http://clima.md/doc.php?l=ro&idc=82&id=3853>; *Report on the technical review of the National Greenhouse Gas (GHG) Inventories of the Republic of Moldova–Energy Sector.* <http://clima.md/doc.php?l=en&idc=82&id=3852>
48. **Organizația pentru dezvoltarea sectorului intreprinderilor mici și mijlocii (Organization for Small and Medium Enterprise Development)** <http://www.odimm.md>
49. **Pagina Proiectului "Responsabilitate individuală și cetățenie activă" (Page of the „Individual Responsibility and Active Citizenship" Project)** <http://infoeuropa.md/een/>
50. **Platforma pentru gestionarea asistentei externe (PGA) (External Assistance Management Platform (PGA)** <http://amp.gov.md/portal/activities?search=&da=&ba=&psec=&loc=>
51. **Proiectul Energie și Biomasă (Energy and Biomass project)** <www.biomasa.md>
52. **Rețeaua de Transfer Tehnologic a Moldovei (RTTM) (Moldovan Technology Transfer Network (RTTM)** <http://www.rttm.md/>
53. **Sursa electronică „Mold street" (Electronic source „Mold Street")** <https://www.mold-street.com/?go=news&n=7507>
54. **Sursa electronică „Sputnik Moldova" (Electronic source „Sputnik Moldova")** <https://sputnik.md/politics/20180415/18572318/guvernul-a-decis-coordona-asistenta-externa.html>
55. **Sursa electronică „Sputnik Moldova" (Electronic source „Sputnik Moldova")** <https://ro.sputnik.md/moldova/20180210/17216677/populatia-moldovei-migratie-depopulare.html>
56. **Sursa electronica Prime1 (Electronic source Prime1)** <http://www.prime.md/ro/parcurile-industriale-din-republica-moldova-au-atras-mai-multe-investitii-in-comparatie-cu-anul-trec_64530.html>
57. **SWEP**. *Refrigerant types.* <https://www.swep.net/refrigerant-handbook/5.-refrigerants/sd4/>
58. **The Australian Refrigeration Council Ltd (ARC)**. <https://www.arctick.org/information/autogas/r1234yf-refrigerant/>
59. **The Heritage Foundation**. *International Economies. Report.* <http://www.heritage.org/international-economies/report/2017-index-economic-freedom-trade-and-prosperity-risk>
60. **The Linde Group. Industry insight.** *Refrigerant gases: an industry in transition.* <http://www.linde-gas.com/internet.global.lindegas.global/en/images/Industry%20Insight%20-%20Refrigerant%20gases.%20An%20industry%20in%20transition17_110874.pdf?v=4.0>
61. **The world bank. IBRD. IDA.** *Moldova Overview.* <http://www.worldbank.org/en/country/moldova/overview>
62. **Timpul.md.** *Biomasa poate asigura 22% din necesarul de resurse energetice (Biomass can provide 22% of its energy resources) <http://www.timpul.md/articol/%28studiu-naional%29-biomasa-poate-asigura-22-din-necesarul-de-resurse-energetice-45053.html>*
63. **Topten.eu.** *Selection Criteria Storage Refrigerators and Freezers.* <http://www.topten.eu/english/criteria/professional-storage-refrigerators.html&fromid=>
64. **UE.** *Asistența UE pentru Moldova* (EU *assistance to Moldova.*) <http://infoeuropa.md/asistenta-ue-pentru-moldova/>
65. **UNDP. Moldova.** *The Small Grants Programme of the Global Environment Facility*. <http://www.md.undp.org/content/moldova/en/home/projects/the-gef-small-grants-programme.html>
66. **UNFCCC.** <http://unfccc.int/parties_and_observers/roster_of_experts/items/534.php>
67. **UNFCCC.** *NAMA Seeking Support for Implementation.* <http://clima.md/lib.php?l=ro&idc=243&>
68. **UNFCCC.** *Project search.* <http://cdm.unfccc.int/Projects/projsearch.html>, <http://clima.md/lib.php?l=ro&idc=242&>
69. **UNFCCC.** *Project search.* <https://cdm.unfccc.int/Projects/projsearch.html>
70. **UNFCCC**. *Publuc NAMA implementation. NAMAs seeking support for implementation*. <http://www4.unfccc.int/sites/nama/SitePages/NamaImplementation.aspx>
71. **Unitatea Consolidata pentru Implementarea Proiectelor în Energetică (Consolidated Energy Projects Implementation Unit)** <http://www.mepiu.md/>
72. **United States Environmental Protection Agency (EPA).** *Transitioning to low-gwp alternatives in commercial refrigeration.* <https://www.epa.gov/sites/production/files/2015-07/documents/transitioning_to_low-gwp_alternatives_in_commercial_refrigeration.pdf>
73. **United States Environmental Protection Agency (EPA).** *Transitioning to low-gwp alternatives in building/construction foams.* <https://www.epa.gov/sites/production/files/2015-07/documents/transitioning_to_low-gwp_alternatives_in_building_and_construction_foams.pdf>
74. **World Economic Forum**. *The Global Competitiveness Report 2017-2018.* <http://www3.weforum.org/docs/GCR2017-2018/05FullReport/TheGlobalCompetitivenessReport2017%E2%80%932018.pdf>