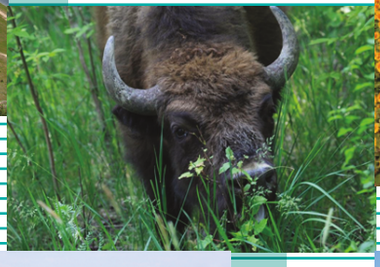
FIRST BIENNIAL UPDATE REPORT OF THE REPUBLIC OF MOLDOVA

Under the United Nations Framework Convention on Climate Change







March, 2016

Ministry of Environment

FIRST BIENNIAL UPDATE REPORT OF THE REPUBLIC OF MOLDOVA

Under the United Nations Framework Convention on Climate Change

UNEP
UNITED NATIONS ENVIRONMENT PROGRAME

gef
GLOBAL ENVIRONMENT FACILITY

Chisinau, 2016

551.583:502/504(478)(047)
F 91

The First Biennial Update Report of the Republic of Moldova has been developed within the Project „Republic of Moldova: Enabling Activities for the Preparation of the First Biennial Update Report and the Fourth National Communication under the United Nations Framework Convention on Climate Change" implemented by Ministry of Environment (MoEN) and United Nations Environment Programme (UNEP), with financial support of the Global Environment Facility (GEF).

Table of References

Title:	First Biennial Update Report of the Republic of Moldova under the United Nations Framework Convention on Climate Change
Coordinators:	Valeriu MUNTEANU, Minister of Environment Suzanne LEKOYIET, Programme Manager, United Nations Environment Programme
Synthesis Team:	Vasile SCORPAN, Project Manager, Climate Change Office, Ministry of Environment Marius TARANU, Coordinator of National GHG Inventory, Climate Change Office, Ministry of Environment Ion COMENDANT, Coordinator of the Climate Change Mitigation and MRV Working Group, Climate Change Office, Ministry of Environment Lilia TARANU, Coordinator of Climate Modelling, Vulnerability and Adaptation Assessment Working Group, Climate Change Office, Ministry of 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 Environment, 156A Mitropolit Dosoftei St., of. 37, MD-2004, Chisinau, Republic of Moldova, tel./fax: +373 22 232247, E-mail: <clima@clima.md>

CIP description of the National Book Chamber

First Biennial Update Report of the Republic of Moldova under the United Nations Framework Convention on Climate Change / Min. of Environment (MoEN), United Nations Environment Progr.(UNEP); Coord.: Valeriu Munteanu, Suzanne Lekoyiet; Synthesis Team: Vasile Scorpan, Marius Țăranu, Ion Comendant, Lilia Țăranu. - Chisinău: S.n., 2016 (Tipogr. "Bons Offices"). - 220 p. Bibliographical references in footer. - Published with financial support of the Global Environment Facility (GEF). - 50 cop.
ISBN 978-9975-87-078-8.

Ministry of Environment of the Republic of Moldova
Address:
9 Constantin Tanase St., MD 2005,
Chisinau, Republic of Moldova
Tel.: +373 22 204507
Fax: +373 22 226858
Email: <secretariat@mediu.gov.md>
Web: http://www.mediu.gov.md

United Nations Environment Programme
Address:
UNEP, United Nations Avenue, Gigiri,
P.O. Box 30552, Nairobi, Kenya
Tel.: +254 20 624166
Fax: +254 20 624041
Email: <unepweb@unep.org>
Web: http://www.unep.org

ISBN 978-9975-87-078-8.

CONTRIBUTORS

Ministry of Environment
Valeriu Munteanu, Inga Podoroghin

Ministry of Economy
Iurii Torcunov

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

National Agency for Energy Regulation
Andrei Sula

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

State Hydrometeorological Service
Lidia Trescilo, Tatiana Mironova, Gherman Bejenaru

Climate Change Office, Ministry of Environment
Vasile Scorpan, Marius Taranu, Ion Comendant, Lilia Taranu, Igor Bercu

Ozone Office, Ministry of Environment
Anatolie Tarita

Environmental Pollution Prevention Office, Ministry of Environment
Tatiana Tugui, Tamara Guvir

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

Institute of Power Engineering of the ASM
Mihai Tirsu, Ion Comendant, Elena Bicova, Tatiana Kirillova, Larisa Moraru

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
Ion Bacean, Victor Sfecla

Technical University of Moldova
Ion Sobor, Andrei Chiciuc, Larisa Tcaci, Natalia Beglet

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

"TERMOELECTRICA" J.S.C.
Serghei Burtev

„Ecotera" NGO
Stefan Lozinschi

FOREWORD

It is well known that climate change is a global ecological problem that endangers 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 First 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 First Biennial Update Report and the Fourth National Communication under the United Nations Framework Convention on Climate Change", initiated on July 7, 2014, managed by the United Nations Environment Programme and implemented by the Climate Change Office of the Ministry of Environment of the Republic of Moldova.

In comparison to the Third National Communication of the Republic of Moldova under the United Nations Framework Convention on Climate Change, 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 identifying these needs and mitigation targets for the future has been taken based on potential GHG mitigation scenarios at national and sectoral level until 2030, considered to be for the Republic of Moldova as the most likely. These assessments served as basis for developing the mitigation targets included in the Intended Nationally Determined Contributions, prepared in accordance with Decisions 1/CP.19 and 1/CP.20, in the context of adopting at COP 21 (2015) the Paris Agreement - an agreed outcome with legal force under the Convention, applicable to all Parties, in line with keeping global warming by 2100 below 2°C, as compared to the preindustrial period.

By the end of 2016, the Republic of Moldova intends to approve its Low Emissions Development Strategy until 2030. The Strategy will include national appropriate mitigation actions, the implementation of which will determine, by 2030, an unconditional decrease of net GHG emissions by circa 64-67 per cent compared to its 1990 level, as well as a comprehensive list of national appropriate mitigation actions supported by the international community, which could increase, conditionally, the reduction commitment up to 78 per cent below the reference year level.

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

Valeriu MUNTEANU
Minister of Environment

LIST OF ACRONYMS, ABBREVIATIONS AND UNITS

ADA	Austrian Development Agency
ADD	Acute Diarrheal Diseases
AEE	Agency on Energy Efficiency
AGEPI	State Agency for Intellectual Property
AGeoM	Agency for Geological Production and Exploration
AITT	Agency for Innovation and Technology Transfer
AOGCMs	Coupled Atmosphere–Ocean Global Climate Models
ANRE	National Agency for Energy Regulation
AR4	IPCC Forth Assessment Report
AR5	IPCC Fifth Assessment Report
Art.	Article
a.s.	Active substance
ASM	Academy of Science of Moldova
ATULBD	Administrative-Territorial Units on the Left Bank of Dniester
B	Billion
BAS	Business Advisory Service
BAU	Business as Usual Scenario
BMZ	Federal Ministry for Economic Cooperation and Development, Germany
BSP	Budget Support Programme
BUR	Biennial Update Report
°C	Celsius degrees
C	Carbon
Ca^{++}	Calcium ions
¢	Cents
CAA	Central Administrative Authorities
CBD	Convention on Biological Diversity
CCAS	Climate Change Adaptation Strategy
CEDB	Council of Europe Development Bank
CCl_4	Carbon tetrachloride
CCO	Climate Change Office
CCPP	Combined Cycle Power Plant
CDM	Clean Development Mechanism
CE	Council of Europe
CER	Certified Emission Reductions
CF_4	Perfluormetnane
C_2F_6	Perfluorethane
C_3F_8	Perfluorpropane
C_4F_{10}	Perfluorbutan
c-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
CHP	Combined Heat Power Plant
CHE	Hydro Power Plant
CHEAP	Hydro-power plant with accumulation by pumping
Cl^-	Ions of chlorine
CO	Carbon monoxide
CO_2	Carbon dioxide
COEST	Committee for Eastern Europe and Central Asia of the Council of the European Union
COP	Conference of the Parties
COPS	Comite politique et de securite (Political and Security Committee - PSC)
CORINAIR	European Emissions Inventory Guidebook developed by European Environment Agency
CPS	Country Partnership Strategy
cm	centimeter
cm^2	Square centimeter
CNG	Compressed natural gas
CPA	Central Public Authorities
CPA	Cooperation and Partnership Agreement
CPP	Condensing Power Plant
CS	Country Specific
CSC	Carbon Storage and Capture
CzDA	Czech Development Agency
D	Default
Dal	Dekaliter
DCFTA	Deep and Comprehensive Free Trade Agreement
DEPA	Danish Environment Protection Agency
DKK	Danish Krone
DOC	Degradable Organic Carbon
DOC_F	Dissimilated DOC fraction
dm	Decimeter
d.m.	Dry matter
DNA	Designated National Authority
EaP	Eastern Partnership
EaPIC	Eastern Partnership Integration and Cooperation Programme
EB	Energy Balance
EBRD	European Bank for Reconstruction and Development
EEA	European Environment Agency
EEE	Electrical and Electronic Equipment
EEA	Energy Efficiency Agency
EEF	Energy Efficiency Fund
EF	Emission Factor
EFRC	Environmental Fiscal Reform Commission
EHGeoM	Hydrogeological Expedition of Moldova
EIA	European Integration Alliance
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
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
EP	Eastern Partnership
E5P	Eastern Europe Energy Efficiency and Environmental Partnership
ESCO	Energy Service Company
ETD	Electrical Transport Department in Chisinau
EV	Emissions Volume
EU	European Union
EUA	European Union Allowances
EU ETS	European Union Emission Trading Scheme
EUREM	European Energy Manager Training
EUR	Euro
eq	Equivalent
FAO	Food and Agriculture Organization

FEEF-MO	Funding for Energy Efficiency of the European Union for the Republic of Moldova
FNC	First National Communication
F.O.B.	Free on Board
FOD	First Order Decay Method
FP7	EU's 7th Framework Programme for Research and Development
FRMI	Forestry Research and Management Institute
g	grams
g.c.c.	Grams of coal equivalent
Gcal	Gigacalory
GCM	Global Climate Model
GCOS	Global Climate Observing System
GD	Government Decision
GDP	Gross Domestic Product
GEF	Global Environmental Facilities
Gg	Gigagram (10^9 grams)
GHG	Greenhouse Gases
GIS	Geographic Information System
GPG	Good Practice Guidance
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
GNI	Gross National Income
GOST	Regional Standardization System used by the Euro-Asiatic Council for Standardization, Metrology and Certification
GSTI	Gas-Steam Turbine Installations
GWP	Global-warming potential
h	hour
ha	hectare
H_2CO_3	Carbonic acid
HCl	Hydrochloric acid
HFC	Hydrofluorcarbons
HNO_3	Nitric acid
HP	Heat Plant
HR	Human Resources
H_2S	Hydrogen sulphide
HUF	Hungarian Forint
HUN-IDA	Hungarian International Development Assistance
JHA	Justice and Home Affairs
JJA	Summer season: June, July, August
JICA	Japan International Cooperation Agency
JSC	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
IDA	International Development Association
IDC	International Development Cooperation
IE	Included Elsewhere
IFAD	International Fund for Agricultural Development
IFC	International Finance Corporation
IFI	International Financial Institutions
ILO	International Labor Organization
IMF	International Monetary Fund
IMPACT	Emission calculation model, from ENPEP software package
INOGATE	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
ITC	International Trade Center
ITTA	Innovation and Technology Transfer Agency
IWM	Integrated Water Management
JICA	Japan International Cooperation Agency
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
kPa	kilopascal
kt	kiloton
kV	kilovolt
kW	kilowatt
kWh	kilowatt-hour
l	liter
L	Level
LEAP	the Long range Energy Alternatives Planning System
LECB	Low Emission Capacity Building Programme
LEDS	Low Emissions Development Strategy
LED	Light-emitting diode
LNG	Liquefied Petroleum Gases
LPA	Local Public Authorities
LPG	Liquefied Petroleum Gases
Ltd.	Limited responsibility company
LULUCF	Land Use, Land-Use Change and Forestry
m	meter
m^2	Square meter
m^3	Cubic meter
MAED	Model for Analysis of the Energy Demand
MAFI	Ministry of Agriculture and Food Industry
MARCAL	Market Allocation Model
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
MEC	Ministry of Economy
MEdu	Ministry of Education
MF	Ministry of Finance
MFAEI	Ministry of Foreign Affairs and European Integration
MJ	Ministry of Justice
Mg^{++}	Ions of magnesium
Mg	Milligram
MH	Ministry of Health
MIA	Ministry of Internal Affairs
mil.	million
ml	milliliter
MLFSP	Ministry of Labor, Family and Social Protection
MJ	Megajoule (10^6 joule)
MIGA	Multilateral Investment Guarantee Agency
MITC	Ministry of Information Technology and Communication
mm	millimeters
MOP	Meeting of the Parties to the Kyoto Protocol
MOST	Moldovan Office for Science and Technology
MoEN	Ministry of Environment
MoSEFF	Moldovan Sustainable Energy Financing Facility
MoREFF	Moldovan Residential Energy Efficiency Financing Facility
MR	Moldovan Railways
MRDC	Ministry of Regional Development and Constructions
MRV	Monitoring, Reporting and Verification
MSU	Moldova State University
MTRI	Ministry of Transport and Road Infrastructure
Mt	Megatonne (10^6 tons)
MTTP	Moldovan Thermal Power Plant
MW	Megawatt (10^6 watt)
MYS	Ministry of Youth and Sport
Na^+	Ions of sodium
NaOH	Sodium Hydroxide
NA	Non Applicable

NAER	National Agency for Energy Regulation
NAMA	National Appropriate Mitigation Actions
NAP	National Adaptation Plan
NATO	North Atlantic Treaty Organization
NBM	National Bank of Moldova
NBS	National Bureau of Statistics
NCEFR	National Commission for Environmental Fiscal Reform
NE	Not Estimated
NECP	National Energy Conservation Programme
NEEG	Norwegian Energy Efficiency Group
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	Neighborhood Investment Facility
NIP	National Indicative Programme
NIR	National Inventory Report
NMVOC	Non Methane Volatile Organic Compounds
NO	Not Occurring
NO_x	Nitrogen Oxide
NO_3^-	Nitrate
N_2O	Nitrous Oxide
NPAI	National Public Audiovisual Institution
NRS-UNFCCC	National Reporting System within UNFCCC
NSCE	Norwegian Society of Charted Engineers
NSPCPM	National Scientific and Practice Centre for Preventive Medicine
O_3	Tropospheric Ozone
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
OHCHR	Office of the High Commissioner for Human Rights
OSCE	Organization for Security and Cooperation in Europe
P	Precipitations
PC7	Seventh Framework Programme of the European Union
PDD	Project Document Design
PDN	Power Distribution Network
PE	Potential Evaporation
PFC	Perfluorcarbons
PIN	Project Identification Note
PJ	Petajoule (10^{15} joule)
PM10	10 μm fraction particulate matter
PPP	Purchasing Power Parity
PPPs	Private-Public Partnerships
POP	Persistent Organic Pollutants
ppb	Parts per billion of volume
ppm	Parts per million of volume
ppt	Parts per trillion of volume
PST	Pre-Service Training
q	quintals
R	Sum precipitation level
R^2	Coefficient of Determination
r	Pearson Correlation Coefficient
RBEC	UNDP Bratislava Regional Center
REC	Regional Environment Center
RES	Renewable Energy Source
RM	Republic of Moldova
s	second
SAICM	Strategic Approach to International Chemicals Management
SAIP	State Agency for Intellectual Property
SAR	IPCC Second Assessment Report
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
STDSC	Science and Technological Development Supreme Council
SWOT	Analysis of Strengths, Weaknesses, Opportunities and Threats
$	Dollars
t	tone
T	Temperature
T1	Tier 1
T2	Tier 2
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
TG	Teragram (10^{12} grams)
TJ	Terajoule (10^{12} joule)
TNA	Technology Needs Assessment
TNC	Third National Communication
TRACECA	Transport Corridor Europe-Caucasus-Asia
TUE	Total Updated Expenditures
TSU	Tiraspol State University
TTNM	Technology Transfer Network of Moldova
TUM	Technical University of Moldova
UCTE	Union pour la Coordination du Transport de l'Electricite
UN	United Nations
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNCTAD	United Nations Conference on Trade and Development
UNECE	United Nations Economic Commission for Europe
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFPA	United Nations Population Fund
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNICEF	United Nations Children's Fund
UNCITRAL	United Nations Commission on International Trade Law
UNDAF	United Nations Development Action Framework
UNIDO	United Nations Program for Industrial Development
UNHCR	United Nations High Commissioner for Refugees
UNODC	United Nations Office on Drugs and Crime
USA	United States of America
USAID	United States Agency for International Development
US EPA	United States Environment Protection Agency
USD	$ US
USSR	Union of Soviet Socialist Republics
UTA	Autonomous Territorial Unit
VAT	Value Added Tax
WASP	Wien Automatic System Planning
WB	World Bank
WCAS	Worst-case Alternative Scenario
WG	Working Groups
WMO	World Meteorological Organization
WS	Wind Source
Σ	Sum
Δ	Difference
σ	Standard deviation
°	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 under the *UNEP-GEF Project "Enabling Activities for the preparation of the Second National Communication under the UNFCCC",* Republic of Moldova developed its SNC under the UNFCCC, while in 2010-2013, respectively the Third National Communication under the UNFCCC.

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.

According to Lima Call for Climate Action, countries were invited to communicate their intended nationally determined contributions (INDC), 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 is fully committed to the UNFCCC negotiation process towards adopting at COP 21 the Paris Agreement - an agreed outcome 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. Following this statement, at 25th of September 2015, the Republic of Moldova communicated its 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. The emission reduction targets will be developed into an emission budget covering the period from 1st January 2021 to 31st December 2030.

In order to implement the Intended Nationally Determined Contribution, the country's Parliament needs to consider and approve a series of legislative acts. By end of 2016 year, the Republic of Moldova will develop a Low Emission Development Strategy (LEDS) for the period up to 2030, a strategic document allowing

the country to adjust its development path towards a low-carbon economy and to achieve a green sustainable development, based on the national socio-economic and development priorities. The measures considered by the Action Plan accompanying the LEDS will include appropriate national mitigation actions (NAMAs). LEDS will provide information on implementation procedures and timeframes, as well as provisions on monitoring, measurement, reporting and assessment of the results. After wide consultations at the national level, the LEDS of the Republic of Moldova until 2030 will be subject to approval by the Government. The Strategy will fully consider the stipulations of the Association Agreement Republic of Moldova – EU, signed on June 27, 2014, as well as other national legislative acts.

ES.2. National Circumstances

ES.2.1. Physical Context

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).

Climate. 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 average annual air temperatures vary between 6.3-12.3°C, and amount of precipitations, respectively between 307-960 mm per year. As regarding to the historic climate change trends, over the last 127 years (1887-2014), the RM has experienced changes in temperature and mean precipitation. The country has become warmer, with the average temperature increase greater than 1.0°C; while the increase in precipitations constituted only around 54.7 mm.

ES.2.2. Natural Resources

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 kilometre 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 3.5 thousand water storage reservoirs. There are also about 6200 boreholes and 250 thousand water-wells and springs, estimated at 1811 thousand 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.2.3. Administrative-Territorial Organization, Population and Human Context

Administrative-Territorial Organization. The Republic of Moldova is administratively divided into 32 districts (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. As of 01.01.2014, Moldova's population represented 4064.7 thousand people, with the density of approximately 120.1 persons per square kilometer. Females prevail with 52.2 per cent in the nation's population - as opposed to 47.8 per cent of males in the total population. The majority of the population is concentrated in the rural areas. The existing 1614 rural settlements have 2223.3 thousand residents or 54.7 per cent of the total population, on average circa 1400 residents per settlement. The urban population is 1841.4 thousand residents or 45.3 per cent, on average circa 27 thousand residents per settlement. According to the data of the latest, 2004 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 71.5 per cent, Ukrainians – 11.2 per cent, Russians – 9.4 per cent, Gagauz – 3.8 per cent, Bulgarians – 2.0 per cent, Gypsies – 0.3 per cent, Jews – 0.1 per cent and other nationalities – 1.6 per cent.

Demographic situation. During 1990-2013 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 2013, the birth rate was 10.6‰ (17.7‰ in 1990), slightly lower the mortality rate (10.7‰ in 2013, 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 17.1 per cent (27.9 per cent in 1990), and the age group of persons above 57/62 years increased to16.8 per cent (12.6 per cent in 1990); the 'average life expectancy at birth' indicator represented circa 71.9 years (69.0 years in 1990), 68.1 years for males (63.9 years in 1990) and 75.6 years for females (71.9 years in 1990).

Public Health. By the end of 2013 the health facilities network in the Republic of Moldova included: 85 hospitals, 947 medical facilities of ambulatory or polyclinic type, 42 sanitary-epidemiological facilities, 132 emergency stations and posts, three children homes and two tuberculosis sanatoriums. The number of beds in hospitals represented circa 20.760 thousand or 58.4 beds per 10,000 populations; respectively, the total number of doctors was 12.934 thousand, or 36.4 doctors per 10,000 populations. The health care expenditures included in the project of State Budget for 2013 increased by 8.3 per cent compared to the previous year. Within the GDP, the share of health care expenditures (5.1 per cent) increased by 0.2 per cent compared to the approved budget for 2012 year. Over the period from 1990 to 2013 the overall mortality rate tended to increase. The mortality breakdown analysis has demonstrated that cardiovascular pathologies are still the main cause of death (58.1 per cent), followed by tumors (15.3 per cent), intestinal diseases (8.8 per cent), injuries, poisoning and other consequences of external causes (7.5 per cent) and respiratory diseases (4.5 per cent). The mortality rates by region are not uniform, registering dramatic differences between the regions. In the last few years the lowest mortality rates were reported in urban areas (the municipality of Chisinau and in Balti), whereas the highest rates in northern districts (Donduseni, Briceni, Ocnita, Edinet, Drochia, Riscani, Soldanesti and Glodeni).

Educational System. The Ministry of Education, the Municipal Education Departments, Regional General Departments of Education and Educational Establishments are responsible for the delivery of the primary, secondary general, secondary professional, secondary vocational and university education. At the beginning of the 2013/2014 school year the RM had 1374 operating primary and secondary general educational establishments, 67 secondary professional educational establishments, 45 secondary vocational education establishments (colleges), and 32 higher education establishments (post graduate studies for a doctoral degree being provided in 49 scientific research institutes and higher education establishments). The share of education within the GDP is continuously decreasing starting with 2009, when it reached its highest level of 9.4 per cent. Still, the expenditures for education from the State Budget are growing, for example, compared to 2009, in 2013, it increased by 1.45 billion MDL, thus accounting for 7.2 per cent of the GDP.

ES.2.4. Institutional Arrangements

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

ES.2.5. Economical Context

Gross Domestic Product. In 2014, the share of Industry Sector in the GDP structure was 14.1 per cent, Agriculture – 12.8 per cent, Transport and Communications – 9.9 per cent, Constructions – 3.6 per cent, Wholesale and Retail Trade – 13.8 per cent, Financial Activities – 4.7 per cent, Other Sectors – 27.1 per cent, Net Product and Import Taxes – 15.7 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 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. 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 2014 the GDP reached only 69.6 per cent of the 1990 level (Figure ES-1).

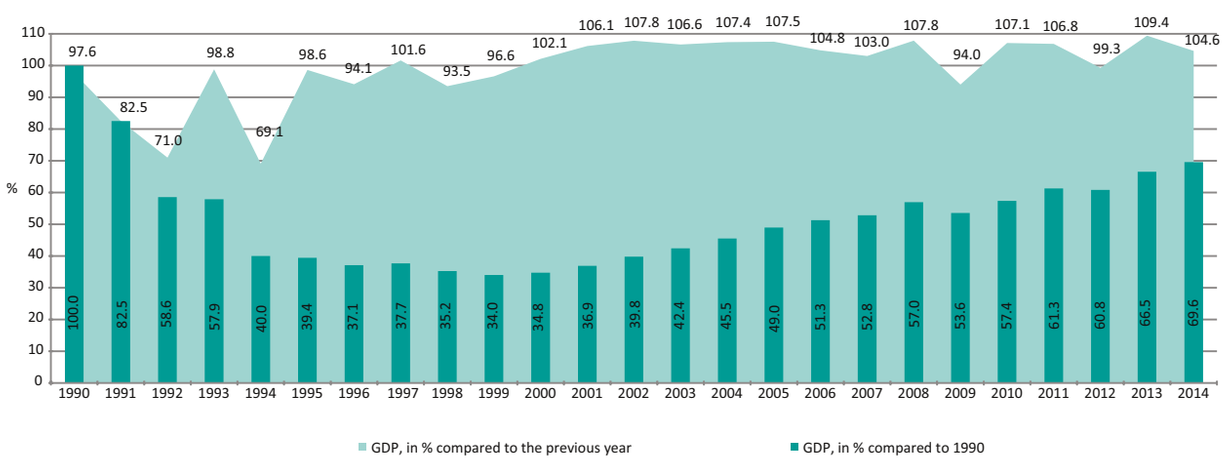


Figure ES-1: Gross Domestic Product in the Republic of Moldova during 1990-2014 time series, in % compared to 1990 and respectively, to the previous year

Inflation. The inflation rate grew dramatically up to approximately 788.5 per cent in 1993 and slowed down to 7.7 per cent in 1998. The 1998 depreciation of the Russian Rubble caused rapid growth of the inflation up to 39.3 per cent. Later, the RM achieved a significant progress in terms of controlling its inflation rate, and the inflation rate decreased to 5.2 per cent in 2002; however, the 2003 average inflation rate for the year increased up to 11.7 per cent driven by the growing prices for agricultural products (as result of a severe drought), and the above growth pattern persisted in the subsequent years; the inflation reached 12.4 per cent in 2004, but decreased to 11.9 per cent in 2005 – only to grow up to 12.7 per cent in 2006, in particular due to the increased prices for the natural gas imported from Russian Federation, for fuels and medications. The average inflation rate for the year was about 12.4 per cent in 2007 and 12.7 per cent in 2008. This increase was determined by the growing prices for public utilities, increasing food demand and the growth of the purchasing power. In 2009, the inflation rate represented about 0.006 per cent, increasing up to 7.4 per cent in 2010 and to 7.6 per cent in 2011, in particular, due to the more evident growth of food and fuels prices, and partly being influenced by developments in the foreign exchange markets. Between 2012 and 2013, the risk balance continued to be influenced by external and internal factors, with a slight emphasizes on post-inflationary factors. In 2014, the inflation rate was 5.1 per cent, which is by 0.5 percentage points higher compared to the previous year. The price increase was generally due to higher prices for non-food goods, especially fuel, clothing, cars and shoes.

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 24.0 per cent of the GDP in 2000, up to 37.5 per cent of the GDP in 2014. 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. 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. In 2014 the total net inflow of foreign currency from the Moldovans employed abroad was approximately USD 2.0746 billion or circa 26.1 per cent of the GDP. Globally, the RM is among the leaders regarding the share of remittances in GDP[1].

Investments. Investments play an essential role in the economic growth of the country, increasing significantly over the last years. In 2014, investments in the national economy represented about 20.353 billion MDL, equivalent of USD 1.450 billion (18.3 per cent of the GDP). At the same time, in 2014 the direct foreign investments attracted to the national economy (net values) accounted for USD 0.353 billion (4.4 per cent of the GDP). The top investor countries for the Republic of Moldova include: the Netherlands, Russian Federation, Spain, USA, Germany, Romania, France, UK and Turkey. The international investment position represented at the end of 2014 remained net debtor and accounted USD 5.62 billion, increasing by 5.6 per cent compared to the end of the previous year. As of 31.12.2014, the stock of liabilities to foreign direct investments represented USD 3.65 billion, or 39.3 per cent of the total. The stock of official reserve assets amounted to USD 2.16 billion at 31.12.2014, covering 4.4 months of goods and services imports and 90.6 per cent of short term external debt. The country's gross external debt as of December 31, 2014 recorded USD 6.49 billion, decreasing by 2.7 per cent compared to the end of the previous year.

Social Sphere. In 2014, the average monthly salary of an employee in the national economy was MDL 4,172, a 5.4 per cent increase compared to the same period of 2013. The average monthly old-age pension was MDL 1,087.6 as of January 1, 2015, increasing by 6.6 per cent compared to its level as of January 1, 2014. The number of pensioners registered by the social security authorities as of January 1, 2015, represented 669.9 thousand people, with 10.3 thousand more compared to January 1, 2014. The number of unemployed in 2014 was 47.5 thousand, compared to 63.1 thousand in 2013. The unemployment rate (unemployed persons as a percentage of the total economically active population) recorded at the country level represents 3.9 per cent (2.3 per cent for males and 1.5 per cent for females).

ES.2.6. Current State of the National Economy

Industry. In 2014, the industrial production reached circa 58 per cent of the 1990 level. During 1990-2014 the industrial production featured certain fluctuations, showing the best performance between 2001 and 2003, and the worst performance in 1992, 1994, 1998, 1999 and 2009. The situation in the manufacturing industry was determined mainly by the processing industry which account for 83.5 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 2013 in the RM accounted for as little as circa 21.7 per cent compared to 1990 (electricity consumption – 50.0 per cent, and heat consumption, respectively circa 18.6 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 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).

Agriculture. In 2013, the agriculture production by all categories of producers accounted for only 63.8 per cent of the 1990 level (Figure ES-2).

[1] <http://data.worldbank.org/indicator/BX.TRF.PWKR.CD.DT/countries/1W?order=wbapi_data_value_2008%20wbapi_data_value%20wbapi_data_ value-first&sort=asc&display=default>.

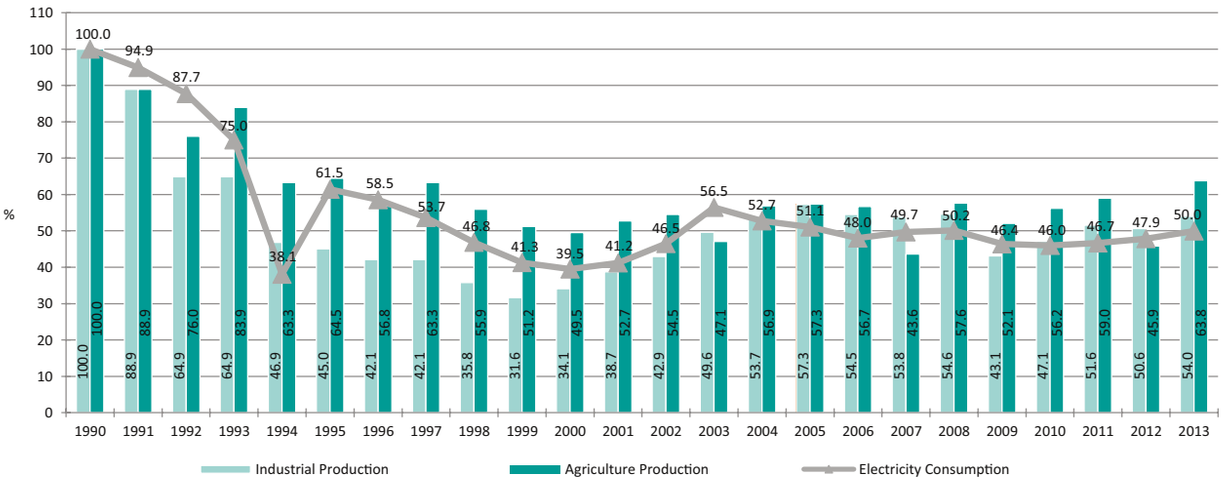


Figure ES-2: The Main Economic Indicators of the Republic of Moldova during 1990-2013 time series, in % compared to 1990

The agricultural production over 1991-2014 was characterized by fluctuations, with the best performance reported in 1993, 1997, 2004 and 2008, and with poor results – respectively in 1992, 1994, 1996, 1998, 2003, 2007 and 2012, in most cases being caused by unfavorable climate conditions (severe droughts in 2003, 2007 and 2012). Compared to 1990, the amount of synthetic and organic fertilizer applied to soil has reduced significantly: 54.8 kt of synthetic fertilizers and 43 kt of organic fertilizers were applied in 2013 or by 76.4 per cent, respectively 99.6 per cent less than in 1990 (232.4 kt of synthetic fertilizers and 9.74 kt 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 82.2 per cent (1060.7 thousand in 1990, 188.9 thousand in 2013), sheep – by 42.7 per cent (1244.8 thousand in 1990, 713.7 thousand in 2013), swine – by 77.3 per cent (1850.1 thousand in 1990, 420.0 thousand in 2013) and poultry – by 55.3 per cent (24625.0 thousand in 1990, 11455.6 thousand in 2013), horses – by 4.7 per cent (47.2 thousand in 1990, 45.0 thousand in 2013); at the same time, increased the number of: goats - by 265.4 per cent (37.1 thousand in 1990, 135.5 thousand in 2013), asses and mules – by 26.7 per cent (1.7 thousand in 1990, 2.1 thousand in 2013) and rabbits – by 4.7 per cent (283.0 thousand in 1990, 296.2 thousand in 2013).

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 10,826 km (including 9,352 km – on the right bank of Dniester, 1,474 km – on the left bank of Dniester; hard-surface roads: 8,836 km – on the right bank of Dniester and 1,430 km – on the left bank of Dniester). The network of roads is sufficiently developed (the public roads density represents about 320 km/1000 km^2, while the hard-surface roads - circa 303 km/1000 km^2), but the state of the roads and the infrastructure in general is deplorable, though in the last six years repairs and restoration of the national road network are being widely performed. Between 1990 and 2013 the number of road vehicles in the RM has significantly increased: trucks - by 100.9 per cent (from 76.909 thousand to 154.537 thousand), buses and minibuses - by 92.8 per cent (from 11.305 thousand to 21.792 thousand) and cars - by 192.8 per cent (from 208.984 thousand to 611.812 thousand). The history of railway transportation dates back 140 years. The total length of railway lines is 1,157 km, while the density per 1,000 km^2 is 34.2 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 89.2 per cent: from 331.1 mill. tons in 1990, to 35.7 mill. tons in 2013), as well as freight transportation distance (by 73.9 per cent: from 21,648 mill. tons - km in 1990, to 5,652 mill. tons - km in 2013). The same period of time witnessed the significant reduction in number of passengers (by 68.7 per cent: from 757.7 mill. passengers in 1990, to 237.1 mill. passengers in 2013), as well as in passengers transportation distance (by 54.8 per cent: from 10,102 mill. passengers - km in 1990, to 4,570.5 mill. passengers - km in 2013).

ES.3. National Greenhouse Gases Inventory

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

Republic of Moldova's historical responsibility regarding GHG emissions is small. In 2013, the country's contribution accounted for circa 12.8 Mt CO_2 equivalent (without LULUCF) and 12.7 Mt CO_2 equivalent (with LULUCF), under 0.03 per cent of total global GHG emissions. 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 1990-2013 time series, the total national GHG emissions (without LULUCF) decreased by 70.4 per cent: from 43.4 to 12.8 Mt CO_2 eq.

ES.3.2. Institutional Arrangements

Within the Ministry of Environment (MoEN), 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 six main sectors, 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) and indirect (NO_x, CO, NMVOC and SO_2) greenhouse gases were estimated based on methodologies contained in the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories (IPCC, 1997), Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories (IPCC, 2000), Good Practice Guidance for LULUCF (IPCC, 2003), Atmospheric Emissions Inventory Guidebook (EMEP/EEA 2009, 2013) and 2006 IPCC Guidelines for National Greenhouse Gas Inventories (IPCC, 2006).

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 Good Practice Guidance (IPCC, 2000), the key categories were identified for the time series 1990 through 2013, the analysis of which was carried out based on Tier 1 methodological approach, with LULUCF: – 17 key categories by level (L) and 17 key categories by trend (T); and, respectively without LULUCF: 17 key categories by level (L) and 13 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 Republic of Moldova included detailed specific procedures implied by Tier 1 approach (general procedures) and Tier 2 approach (source-specific), and standard verification and quality control forms and checklists that serve to standardize the process of implementing quality assurance and quality control activities meant to ensure the quality of the national inventory; 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, as well as further documentation of the national inventory development process. As the entity responsible for the national inventory development, the Climate Change Office (CCO) holds all documentation used for inventory compilation.

ES.3.6. Recalculations

The GHG Inventory Team revised and recalculated GHG emissions and CO_2 removals for each calendar year covered by the Third National Communication (TNC) (it contains the GHG Inventory for the period from 1990 through 2010).

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 tier methodologies; revision of previously used methodological approaches, emission factors and activity data; inclusion of new emission sources; use of new methodological approaches and errors correction).

In comparison with the results reported under the TNC, the changes performed during the development of the current inventory, resulted in an insignificant increase of total GHG emissions for 1990, 1992-1995, 1998, 2007, 2009-2010, respectively, a decrease of GHG emissions in 1991, 1996-1997, 1999-2006, 2008.

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 1990-2013 using a Tier 1 methodological approach (IPCC, 2000), that is ±7.55 per cent uncertainty by level, and ±3.11 per cent uncertainty by trend.

ES.3.8. Completeness Assessment

Generally speaking, the national inventory of the Republic of Moldova is a complete register of the following direct greenhouse gases – CO_2, CH_4, N_2O, HFC, PFC and SF_6. The national inventory also covers the following indirect greenhouse gases: CO, NO_x, NMVOC and SO_2.

Despite the effort to cover all existent source/sink categories, the inventory still has some gaps, most being determined by lack of activity data needed to estimate certain GHG emissions and removals.

ES.3.9. Reporting Direct Greenhouse Gas Emissions

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

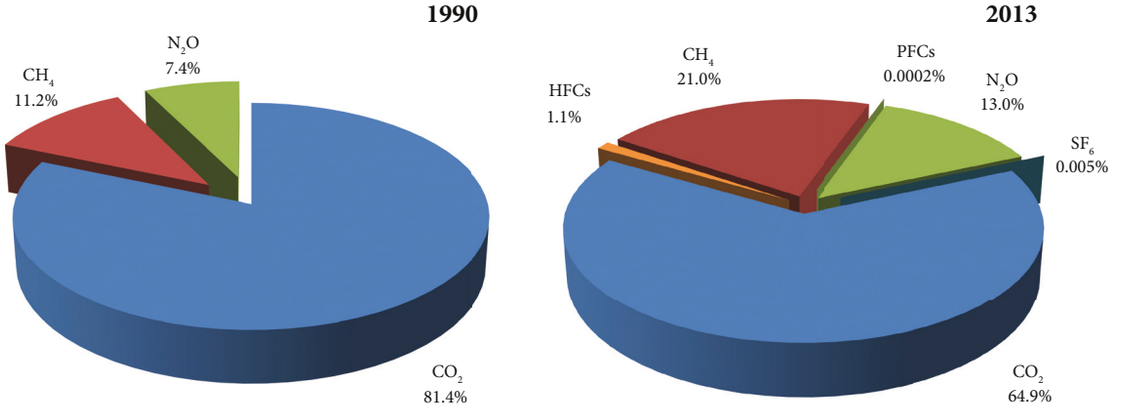


Figure ES-3: Republic of Moldova's Direct GHG Emissions by Gas, 1990 and 2013

In the time series from 1990 through 2013, the total CO_2 emissions (without LULUCF) decreased by circa 76.4 per cent; emissions of CH_4 (without LULUCF) have decreased by circa 44.7 per cent, while emissions of N_2O (without LULUCF) decreased by circa 47.9 per cent (Table ES-1). Evolutions of F-gases emissions show a steady trend towards increase, though their share in the total national GHG emissions structure is insignificant for now.

Table ES-1: GHG Emission Trends in the RM within 1990-2013 time periods, Mt CO_2 equivalent

	1990	1991	1992	1993	1994	1995	1996	1997
CO_2 (without LULUCF)	35.3337	31.0500	21.8049	16.5695	14.9980	11.5527	11.6556	10.6885
CO_2 (with LULUCF)	29.4438	25.7222	17.4179	15.0653	12.8319	10.5207	10.4871	10.5485
CH_4 (without LULUCF)	4.8724	4.7236	4.5852	4.3179	4.1921	3.9534	3.8140	3.4065
CH_4 (with LULUCF)	4.8747	4.7256	4.5871	4.3204	4.1935	3.9553	3.8153	3.4088
N_2O (without LULUCF)	3.2128	2.9738	2.3644	2.3306	1.8014	1.9159	1.7903	1.9239
N_2O (with LULUCF)	3.2138	3.0032	2.3651	2.3316	1.8020	1.9166	1.7908	1.9248
HFCs	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	0.0019	0.0041	0.0066
PFCs	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO
SF_6	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO
Total (without LULUCF)	43.4188	38.7474	28.7545	23.2180	20.9914	17.4240	17.2640	16.0256
Total (with LULUCF)	37.5322	33.4510	24.3701	21.7173	18.8274	16.3946	16.0973	15.8886
	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
CO_2 (without LULUCF)	9.0630	7.1544	6.3884	6.9920	6.6679	7.4392	7.9122	8.3103
CO_2 (with LULUCF)	8.3375	6.0167	4.9951	6.2404	6.1349	5.8844	7.8086	7.9346
CH_4 (without LULUCF)	3.2493	3.0418	2.9138	2.8462	2.8444	2.7640	2.7233	2.7555
CH_4 (with LULUCF)	3.2513	3.0439	2.9146	2.8473	2.8447	2.7641	2.7235	2.7557
N_2O (without LULUCF)	1.7225	1.5641	1.4151	1.5663	1.6100	1.3882	1.6369	1.6477
N_2O (with LULUCF)	1.7233	1.5649	1.4154	1.5668	1.6101	1.3883	1.6371	1.6478
HFCs	0.0095	0.0115	0.0134	0.0165	0.0195	0.0259	0.0320	0.0394
PFCs	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO
SF_6	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	0.0000	0.0000	0.0000
Total (without LULUCF)	14.0442	11.7718	10.7307	11.4210	11.1419	11.6173	12.3044	12.7530
Total (with LULUCF)	13.3216	10.6370	9.3385	10.6710	10.6092	10.0626	12.2012	12.3776
	2006	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
CO_2 (without LULUCF)	7.6519	8.0283	8.7278	9.0304	9.5523	9.6871	9.3542	8.3255
CO_2 (with LULUCF)	7.0124	4.9594	8.6673	7.7449	8.8950	9.2572	6.8814	8.2261
CH_4 (without LULUCF)	2.6644	2.5860	2.6488	2.6332	2.7027	2.7335	2.6933	2.6937
CH_4 (with LULUCF)	2.6646	2.5877	2.6495	2.6335	2.7029	2.7337	2.6946	2.6947
N_2O (without LULUCF)	1.5797	0.9835	1.6053	1.3856	1.5814	1.6080	1.1901	1.6743
N_2O (with LULUCF)	1.5799	0.9848	1.6056	1.3859	1.5815	1.6081	1.1912	1.6750
HFCs	0.0471	0.0604	0.0763	0.0871	0.1024	0.1124	0.1260	0.1422
PFCs	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SF_6	0.0003	0.0004	0.0004	0.0005	0.0006	0.0006	0.0006	0.0007
Total (without LULUCF)	11.9433	11.6586	13.0587	13.1368	13.9394	14.1417	13.3642	12.8363
Total (with LULUCF)	11.3042	8.5926	12.9992	11.8519	13.2823	13.7120	10.8939	12.7387

Abbreviations: NE – Not Estimated; NO – Not Occurring.

Energy Sector is the most important source of national direct GHG emissions, its share varying from 79.6 per cent to 65.5 per cent over the time series from 1990 through 2013. Other relevant sources are represented by the Agriculture Sector, Waste Sector and Industrial Processes Sector (Figure ES-4).

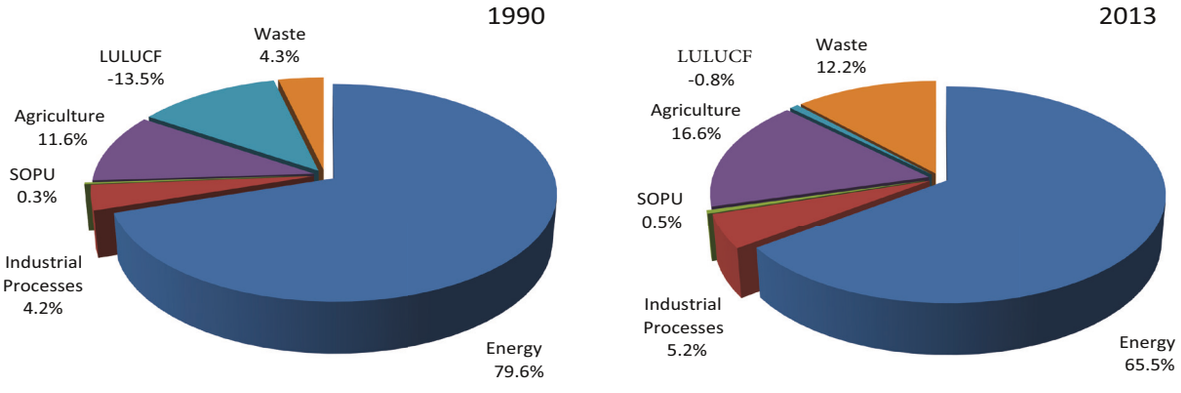


Figure ES-4: Sectoral Breakdown of the Republic of Moldova's total GHG Emissions in 1990 and 2013

In the time series from 1990 through 2013, total GHG emissions in the RM tended to decrease, thus emissions under Energy Sector decreased by 75.7 per cent, Industrial Processes Sector – by circa 63.5 per cent, Solvents and Other Products Use Sector – by circa 47.2 per cent, Agriculture Sector – by 58.0 per cent, LULUCF Sector – by 98.3 per cent, while from Waste Sector – by 16.1 per cent (Table ES-2).

Table ES-2: Sectoral Breakdown of the RM's Direct GHG Emissions within 1990-2013, Mt CO_2 equivalent

	1990	1991	1992	1993	1994	1995	1996	1997
1. Energy	34.5213	30.2217	21.3789	16.4721	15.0185	11.7222	11.9472	10.7884
2. Industrial Processes	1.8420	1.7560	1.1472	0.7394	0.6077	0.4784	0.4256	0.4778
3. SOPU	0.1261	0.1009	0.0764	0.0576	0.0438	0.0346	0.0300	0.0258
4. Agriculture	5.0639	4.6906	4.0899	3.9268	3.3627	3.2844	3.0403	2.9853
5. LULUCF	-5.8866	-5.2964	-4.3844	-1.5008	-2.1641	-1.0294	-1.1666	-0.1369
6. Waste	1.8655	1.9782	2.0621	2.0221	1.9587	1.9044	1.8209	1.7483
	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
1. Energy	9.2725	7.3732	6.6728	7.2688	6.9519	7.7253	8.1841	8.4684
2. Industrial Processes	0.3321	0.2971	0.2702	0.2620	0.3204	0.3715	0.4201	0.5605
3. SOPU	0.0195	0.0268	0.0288	0.0426	0.0363	0.0329	0.0417	0.0675
4. Agriculture	2.7514	2.5192	2.2899	2.4549	2.5085	2.1956	2.3790	2.3588
5. LULUCF	-0.7226	-1.1349	-1.3922	-0.7500	-0.5327	-1.5547	-0.1032	-0.3754
6. Waste	1.6686	1.5555	1.4690	1.3927	1.3247	1.2920	1.2795	1.2978
	2006	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
1. Energy	7.6334	7.7455	8.3514	9.0709	9.6473	9.8255	9.4690	8.4046
2. Industrial Processes	0.6563	0.9385	1.0150	0.5137	0.5594	0.6011	0.6227	0.6726
3. SOPU	0.0772	0.0981	0.1328	0.1197	0.0612	0.0689	0.0759	0.0666
4. Agriculture	2.2656	1.5124	2.1006	1.9181	2.1007	2.0865	1.6400	2.1267
5. LULUCF	-0.6391	-3.0660	-0.0595	-1.2849	-0.6571	-0.4296	-2.4704	-0.0976
6. Waste	1.3109	1.3640	1.4589	1.5145	1.5707	1.5597	1.5567	1.5658

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. The national GHG inventory of the RM includes emissions of the following ozone precursors and aerosol gases: NOx, CO, NMVOC and SO_2. In 1990-2013, NO_x emissions decreased by circa 71.6 per cent; CO emissions decreased by 68.3 per cent; NMVOC emissions - by 80.4 per cent, while SO_2 emissions decreased by circa 93.2 per cent (Table ES-3).

Table ES-3: Ozone and Aerosol Precursors Emission Trends in the RM within 1990-2013, Gg

	1990	1991	1992	1993	1994	1995	1996	1997
NO_x	137.4740	118.1256	78.5301	63.2389	56.8169	47.8562	45.0918	41.8912
CO	433.8751	375.0938	194.1732	157.3955	142.4926	140.5712	137.7967	132.6081
NMVOC	517.8048	432.5641	339.5211	269.2725	175.9493	161.5871	147.7475	73.8989
SO_2	294.7812	256.0414	170.0244	145.5388	102.5450	60.9425	58.8845	33.8644
	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
NO_x	35.1409	25.7394	24.4303	26.6523	27.3799	30.7111	32.1177	32.8714
CO	117.3456	80.7215	77.0622	79.4615	95.8651	112.8889	115.2139	117.7508
NMVOC	61.2282	38.2089	36.5216	44.6699	44.8823	47.1698	55.6361	67.1886
SO_2	26.9025	13.9042	9.8013	9.3216	10.4256	12.2190	11.1254	10.7556
	2006	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
NO_x	30.9001	32.4470	34.8352	35.0592	39.1098	39.9538	37.0639	36.3703
CO	112.1234	112.4844	116.8356	114.1050	137.6408	149.8077	139.7743	146.9860
NMVOC	75.5299	145.4701	114.0611	84.8130	101.6484	88.6763	108.2620	128.2985
SO_2	10.9519	9.0310	13.2886	17.6388	19.9704	19.6706	18.6718	21.8608

ES.4. Climate Change Mitigation Policies and Measures

At present, the only document aimed at climate change challenges is the Environmental Strategy for the years 2014-2023 and the Action Plan for its implementation[2], published in June 2014. The Strategy envisages creation of an integrated air quality management system, reducing emissions of pollutants into the atmosphere by 30% by 2023 and greenhouse gas emissions by 2020 by at least 20% compared to the baseline scenario, including by sector. Alongside, the Government is finalizing the Low Emissions Development Strategy (LEDS) until 20130 which will be approved by the end of 2016 year. This Strategy enables the Republic of Moldova to adjust its development path towards a low-carbon emissions economy and achieve the objectives outlined in the Intended Nationally Determined Contribution to the Paris Agreement under the

[2] GD no. 301 of 24.04.2014

UNFCCC (2015) through sustainable green development based on the country's socio-economic and development priorities. The document sets the targets for reducing GHG emissions for 2030.

Harnessing the greenhouse gas emissions reduction potential seems possible to be achieved mainly through the Clean Development Mechanism (CDM) of the Kyoto Protocol and advancing the mechanism for implementation of the nationally appropriate mitigation actions (NAMA), unilaterally and with the donors' support. Until now 11 CDM projects applications were registered, of which eight were approved and are being implemented. Regarding NAMA, the key element to success of this initiative seems to be primarily the appropriate strengthening of national capacities enabling the implementation of this type of projects. With the international donors support (UNDP, EU, the governments of Australia and the Federal Republic of Germany), the 'Low Emission Capacity Building Program' (LECB) project was launched and is being implemented in 2014-2016. Currently, four NAMA project documents are being developed in line with the UNFCCC requirements, with the support of two international consultants.

The Republic of Moldova doesn't have a carbon trading market and specially designated budget for carbon reductions. However, this idea is being discussed.

ES.4.1. Climate Change Mitigation Policies and Measures by Sector

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 Sector

Given the 87.1%[3] energy dependence on imported energy, the energy policies of the state are geared at increasing energy security in two ways: in terms of energy production - by attracting the renewable energy sources into the energy balance, and in terms of energy demand - by promoting energy efficiency. Thus, by 2020 energy demand is expected to be reduced by 533 ktoe compared to the baseline scenario (20% reduction), and energy demand for by this year is expected to be covered by 430 ktoe of energy from renewable sources (20% of demand). Achieving these targets will obviously cause imminent corresponding reduction of GHG emissions. The currently existing legal framework aimed at achieving the set objectives covers mostly the whole range of regulations needed in this respect, from laws to action plans, with the Energy Strategy of the Republic of Moldova until year 2030 and the Energy Sector Roadmap for years 2015-2030 standing out.

Industrial Sector

The environment related issues in the industrial sector are reflected episodically and, as a rule, very generically, in some legislative acts. However, the RM has signed the international Protocol on Substances that Deplete the Ozone Layer, and approved a respective law. Reducing GHG emissions through energy efficiency is laid down in several normative acts, with significant contribution from foreign donors.

Agriculture Sector

In the agriculture the target will be to reduce nitrogen mineralization in soils, i.e. to promote sustainable agriculture, including by use of green fertilizers in parallel with the implementation of the conservation agriculture tillage systems based on "No-Till" and "Mini- Till" technologies, increasing the share of organic fertilizers in the soil, leaving the main crop residues in the field to form the mulch, etc. Aiming at achieving the goal to increase livestock productivity, programs and strategies improving the genetic pool of livestock and poultry are implemented. At the same time, the manure will be used to produce biogas for energy purposes and raise soil fertility, which also will help to reduce GHG emissions. The respective policies are reflected in strategies, programs and action plans mentioned in the respective chapter.

Forestry Sector

Policies used to develop mitigation scenarios in the forestry sector are aimed at expanding the afforestated areas to 15% of the country's area by 2020, with further increase of the wood mass remaining after harvesting; diminishing fire-prone areas; gradual expansion of forest protection belts, trees and shrubs groves, orchards and vineyards, improving the quality of plantations. However, grassland areas are not expected to increase. Moreover, they will follow a decreasing trend, as the number of livestock is continuously reducing.

Waste Sector

The current Moldovan legal framework related to environmental protection regulates the reduction of GHG emissions in the waste sector only in general terms. It lacks stipulations on equipping the solid waste disposal sites and wastewater treatment plants with biogas recovery systems. Indirectly, policies aimed at reducing the GHG emissions in waste sector are reflected in a number of laws. The GHG emissions mitigation measures in the waste sector include: development of the regional waste disposal infrastructure by building regional solid waste disposal sites and transfer stations in accordance with Waste Management Strategy for the years 2013-2027 of the Republic of Moldova and application of the EU and national standards; extension of the current primary waste collection and storage system from urban to rural areas; improving the water and sanitation infrastructure. The two on-going CDM projects: "Production of biogas from sugar beet pulp pressed at the Südzucker Moldova sugar plant" (Drochia) and "Biogas recovery and electricity generation from the landfill in Tintareni" (Chisinau) also contribute to GHG emissions reduction in the waste sector.

ES.5. GHG Emissions Projections, Impacts, Assumptions and Methods

ES.5.1. Assumptions and Tools Used for Each Sector

The GHG emission projections were made for three scenarios: (1) business-as-usual scenario (BAU); (2) with measures (WM) scenario; and (3) with additional measures (WAM) scenario, for the following sectors: Energy (including Transport), Industrial Processes, Solvents and Other Product Use, Agriculture, LULUCF, Waste; and the following gases: CO_2, CH_4, N_2O and F-gases. The direct GHG emissions projections were made based on methodological approaches set out in the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventory (IPCC, 1997), Good Practices Guidance (IPCC, 2000), 2006 IPCC Guidelines for National Greenhouse Gas Inventories (IPCC, 2006), and based on country specific methodologies and emission factors. To assess GHG emissions / removals in the LULUCF sector Good Practice Guidance for Land Use, Land-Use Change and Forestry

[3] Energy Balance of the Republic of Moldova. Statistical compilation 2014. National Bureau of Statistics of the Republic of Moldova. Chisinau. - 2015. <http://www.statistica.md/public/files/publicatii_electronice/balanta_energetica/BE_2015_rom.pdf>.

(IPCC, 2003) was used. Other calculation tools used: WASP, LEAP (energy), standard IPCC calculation tools and partially, regression analysis method based on the information available in the "*National Inventory Report: 1990-2013. GHG Emissions Sources and Sinks in the Republic of Moldova*". The key parameters used for generating scenarios were the GDP, number of population, energy prices, energy demand, sector specific parameters, etc.

ES.5.2. Projections of Aggregate GHG Emissions

As a result of 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 (Figure ES-5). The study covered the entire country, including the region of the left bank of the Dniester River (Transnistrian region).

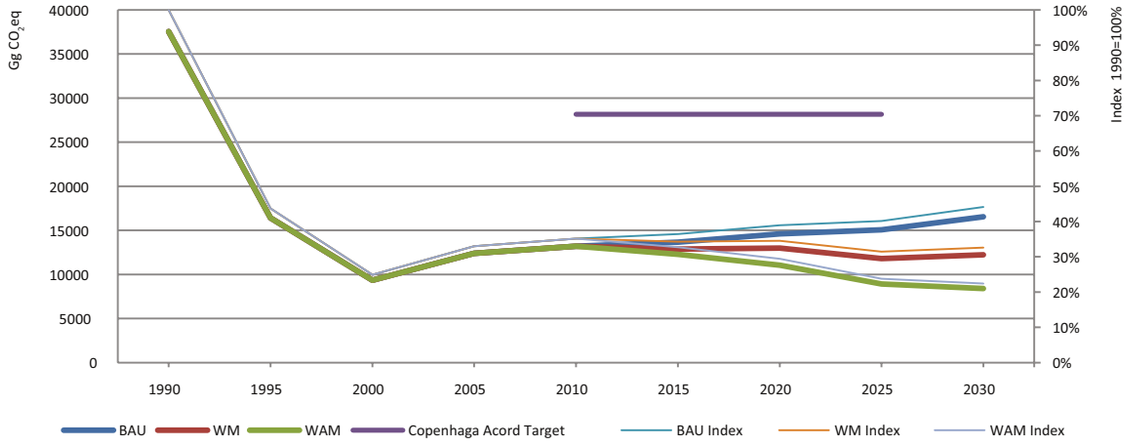


Figure ES-5: Total net GHG emissions in RM

GHG emissions in all scenarios are consistent with the commitments made by the RM under the Copenhagen Accord. The level of net emissions in 2020 compared to 1990 is within the limits of 29% (WAM), 35% (WM) and 39% (BAU) against the 75% set forth in the document (see 'Copenhagen Accord Target" Figure ES-5). The above commitment remains relevant for 2030, the year when the emissions levels remains relatively low compared to emissions recorded in 1990, ranging as 22% (WAM), 33% (WM) and 44% (BAU).

Figure ES-6 shows the trends in aggregate individual gas emissions impacting climate change for WM and WAM scenarios expressed as comparisons with 1990 levels. The increased amount of N_2O over the entire period under review is explained by the gradual growth of livestock and poultry until 2030, and carbon loss through mineralization due to changes in agricultural land use and soil management practices.

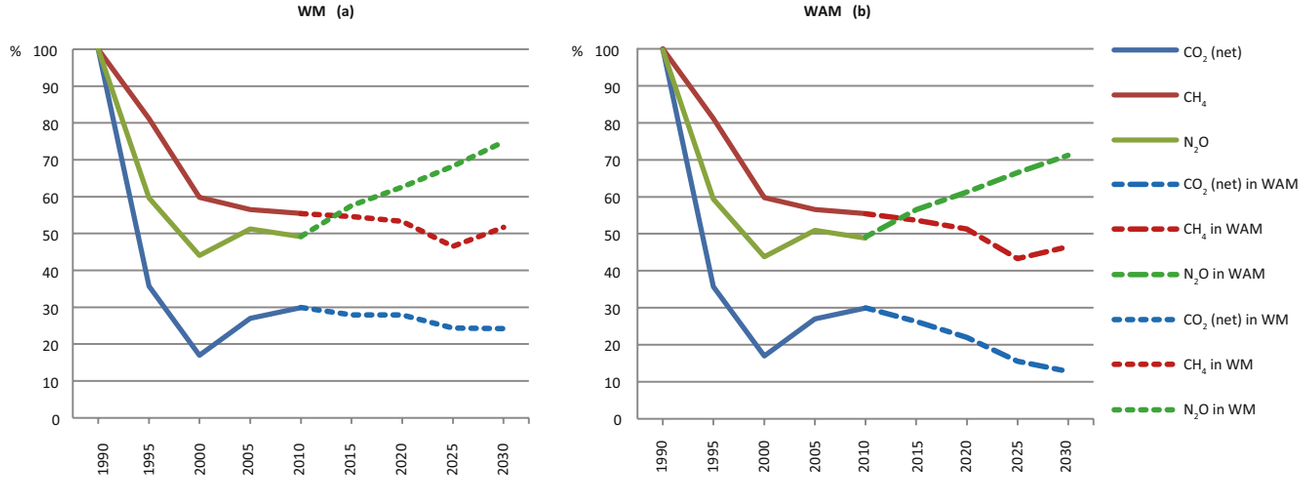


Figure ES-6: GHG emissions in WM (a) and WAM (b), the gases compared to 1990, in %

ES.5.3. Projections of Direct GHG Emissions by Sector

Energy Sector

Energy Sector, distinguished by the largest contribution to GHG emissions in the Republic of Moldova (67% in 2010) will substantially contribute to meeting the country's commitments to reduce GHG emissions. In 2020, the GHG emissions under the BAU, WM and WAM will account for only 27.6%, 25.5% and 21.6% of 1990' level, and in 2030, will feature 35%, 30.3% and 23.3%, respectively. In 2010, around 93% of emissions were CO_2 emissions, circa 6% - CH_4 emissions and other 0.6% - N_2O emissions, the absolute values of CH_4 and N_2O changing insignificantly throughout the period under review.

Industrial Processes Sector

Industrial Processes Sector contributed with 4.3% only of all GHG emissions of the RM (2010), of which 81.6% were CO_2 emissions (specifically from "Mineral Products" and "Metal Production" categories), while 18.4% were F-gas emissions. In 2020 GHG emissions related to Industrial Processes Sector under the BAU, WM and WAM feature as 54%, 42% and 38%, respectively, of the 1990 levels.

Agriculture Sector

CH_4 emissions from livestock and N_2O emissions from manure management and agriculture soils are monitored in the agriculture sector. CH_4 emissions from enteric fermentation exceed the emissions from manure management by almost 10 times, what would require much more significant measures aimed at optimizing the structure of livestock and poultry, and attention in terms of mitigating GHG emissions in this sector. However, manure management is a source of N_2O emissions, which are at the same level as the emissions from enteric fermentation. So, the mitigation effort in the livestock sector is to be divided almost equally between these two categories. N_2O emissions from agricultural soils exceed the emissions from manure management by two times. In 2020, GHG emissions under the BAU, WM and WAM, will be 56%, 52% and 50%, respectively, of 1990 levels.

Land Use, Land-Use Change and Forestry Sector

CO_2 emissions and removals are monitored under the Land Use, Land-Use Change and Forestry (LULUCF) Sector. CH_4 and N_2O emissions are not considered because the values recorded for these emissions lie outside the accuracy of calculations, given the stubble burned areas and areas prone to forest fires are continuously decreasing. Up to year 2030 significant changes can be identified in the sub-category 5B2 "Annual changes in carbon stocks in mineral soils". With a CO_2 removal value of -1490.4 Gg in 1990, this sub-category becomes a source of emissions in the years after 1993, in 2010 emissions amounting to 3458.2 Gg CO_2, with no expectation that this sub-category to re-become a CO_2 removals sink category by 2030. In 2020, the CO_2 removals under the BAU, WM and WAM will be 6%, 12% and 18%, respectively, of 1990 levels.

Waste Sector

CH_4 and N_2O emissions are monitored under the waste sector. CH_4 emissions come from solid waste disposal sites, and wastewater treatment, while N_2O emissions are generated by human sludge. Under the BAU the GHG emissions related to waste sector amount to 91.4% of the base year (1990). GHG emissions under the WM and WAM are lower compared to 1990, but not significantly, reaching 77% and 74% respectively.

International Transport

Of the two types of international transport, waterborne and airborne, only international airborne transport is applicable to the RM, as fuel consumption in waterborne transport is inexistent following the national statistical system in place. The below projections made for international air transport are not taken into account in determining the total national aggregate GHG emissions. It is estimated that emissions from international aviation will increase by 2020 by 38% and by 2030 by 69% of 2010 levels.

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

ES.6.1. Capacity Needs in the Area of GHG Inventory

For future inventory cycles, a series of improvements will be expected take place. Thus, the estimation process of anthropogenic GHG emissions and carbon dioxide removals could be enhanced through the following institutional and procedural improvements: (I) strengthening institutional arrangements in order to ensure the constant development of GHG national inventories, through a legislative/regulatory framework to be considered and approved by the Government of the Republic of Moldova by the end of 2016; (II) reinforcing the main elements of the National Reporting Systems under the United Nations Framework Convention on Climate Change (NRS-UNFCCC) by using the United States Environment Protection Agency Template Workbook "Developing a National Greenhouse Gas Inventory System" (<www.epa.gov/climatechange/emissions/ghginventorycapacitybuilding>), in order to develop/update by the end of each inventory cycle a *„Report on the National GHG Inventory System of the Republic of Moldova"*, which have to contain information according to six templates: (1) a description of institutional arrangements for National Inventory Systems; (2) methods and data documentation; (3) a description of quality assurance and quality control procedures; (4) a description of archiving system; (5) a description of key category analysis; and (6) a description of the National Inventory Improvement Plan; (III) enhancing on regular basis the level of knowledge of national experts and institutions involved in developing the national GHG emission inventory, in particular within the energy sector, as well as for the LULUCF sector (i.e., the employees of the Institute of Power Engineering of the Academy of Sciences of Moldova, the Technical University of Moldova, National Bureau of Statistics, etc.; respectively, the employees of the Forest Research and Management Institute, Agency „Moldsilva", Institute of Pedology, Agrochemistry and Soil Protection „Nicolae Dimo", State Agrarian University of Moldova, etc.), by organizing a series of seminars and thematic trainings; (IV) developing a data management system for tracking and archiving the inventory information used in each inventory cycle; (V) gradual transition to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories in all sectors and enhancing the professional capacities of national experts involved in the inventory process, as well as transitioning from default EFs and Tier 1 methodologies to country specific emission factors and Tier 2 and 3 methodologies, particularly focusing on key categories.

ES.6.2. Sectorial Constraints in the Area of Climate Change Mitigation

Energy Sector

Reduced payment capacity of consumers and relatively high cost of capital in the Republic of Moldova (RM) make investments in this sector difficult to implement, or unaffordable expensive. The investment risks in the RM are determined mainly by Transnistrian separatism and low political and economic stability, what does not favor access to foreign loans. The availability of electricity generation sources (Ukraine, MTPP) at lower prices than the price of electricity produced by the new installation, limits the investors' interest for construction of new power plants in the country. Promotion of renewable energy sources becomes problematic, given that tariffs for electricity produced from such sources are not known in advance.

Transport Sector

In recent years the number of vehicles in the RM continued to grow, with the largest share of second-hand vehicles as a result of weak purchasing power of the population who cannot afford purchase of new vehicles. The problem becomes widespread especially in large cities where inadequate infrastructure and heavy traffic cause intensive GHG emissions due to traffic jams, inefficient public transport and underdeveloped "pro-environment" culture. Other issues include poor urban planning and inadequate institutional mechanisms for managing transport demand in urban areas.

Buildings Sector

Many energy efficiency projects in buildings sector are too small to attract the attention of investors and financial institutions. The small size of the project, together with disproportionately high transaction costs hampers energy efficiency investments. Typically, residents resort to thermal insulation of external walls of the apartment buildings only if they have installed individual heating systems, as an alternative to low quality district heating services.

Industrial Sector

The main barriers to low carbon development in the industrial sector are associated with instability of legislation, particularly in fiscal and budgetary policies; growing deficit of technical engineering personnel and skilled workers in industry; reduced possibilities of the state to financially support the process of industrial enterprises restructuring; outdated standards (GOST type) that do not allow product diversification and contribute to maintaining the high level of emissions.

Agriculture Sector

Agricultural activity in the Republic of Moldova remains highly volatile and vulnerable to such risks as climatic factors (droughts, frosts, floods, hail, and erosion). The main barriers to low carbon development in agriculture are associated with scarce financial resources, insufficient financial resources for the Fund subsidizing agricultural producers, insufficient development of the agriculture insurance market; excessive fragmentation of agricultural land, underdevelopment of conservation agriculture; inefficient statistical system accounting crops, livestock and poultry.

Forestry Sector

The biggest problems identified in this sector relate to inadequate forest management, low bio-productive potential and insufficient protection. Also, the sector faces serious problems of insufficient institutional and management framework for the sites and elements of natural areas protected by the state and lack of funding needed to ensure sustainable management, insufficient dimensions of the natural areas protected by the state (only 5.5% of the territory), and of forests (11.1% of the country's territory), insufficient insurance and underdeveloped sustainable management of forests, green spaces, grasslands, wetlands, continuous degradation of forest protection belts of rivers and water basins causing loss of habitats and ecosystems.

Waste Sector

Waste management sector in the RM is still underdeveloped, it requires restructuring of both legal and institutional framework and development of an integrated waste recycling and recovery system.

ES.6.3. Climate Change Mitigation Capacity Building Needs

The GHG emissions mitigation capacity needs are relevant and cover four dimensions: (I) climate studies, research and assessments; (II) formulation of climate strategies and policies; (III) implementation of climate strategies and policies; and (IV) negotiation of climate issues internationally, primarily to attract financing.

Capacity to carry out climate studies, research and assessments

The RM has a wide network of research institutions in different areas, but no structures specialized in GHG emissions mitigation studies.

Capacity to formulate climate strategies and policies

The targets set in climate strategies and policies so far are more like wishes, as they have no financial and organizational back up in terms of social, technical and economic impacts, capacity to invest, etc.

Capacity to implement climate strategies and policies

As already mentioned above, the first document to expressly reflect the country's climate policies is the Environmental Strategy of the Republic of Moldova for 2014-2023, approved in 2014 year. So, its implementation capacity is still being developed now.

Capacity to negotiate climate issues internationally

It should be noted that the capacity of the RM to negotiate funding for reducing GHG emissions is limited, even in the early stage of consolidation. It is expected that the respective capacities will be more developed under the "Low Emissions Capacity Building Program" (LECB) project, implemented by the UNDP.

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

In order to strengthen the country's capacity to solve low carbon emissions development related problems, about US$ 1.91 million would be needed over the next five years, of which annually about $US 0.21 million for climate studies, research and assessments, other resources being a onetime involvement in the form of aid, principally from international donors.

Aiming at accomplishing WM and WAM scenarios, the following additional investment to the BAU would be needed for: (I) WM - US$ 1,371 million during the years 2016-2020; US$ 3,741 million during the years 2016-2030; (II) WAM - US$ 4,022 million during the years 2016-2020; US$ 8,642 million during the years 2016-2030.

ES.6.5. Technology Transfer and Access to Technology for Climate Change Mitigation

IPCC identifies three major dimensions needed to ensure efficient technology transfer: capacity building; enabling business environment; technology transfer mechanisms.

Capacity Building for Technology Transfer

So far a number of actions aimed at strengthening innovation and technology transfer capacities were undertaken in the RM, those geared specifically toward reducing GHG emissions becoming perceivable in the last decade only. In 2004 the Agency for Innovation and Technology Transfer (AITT) was created under the auspices of the Academy of Sciences of Moldova (ASM). In 2014 AITT funded three technology transfer projects in energy efficiency and use of renewable energy sources. AITT created three scientific-technological parks and 73 innovation incubators.

The Organization for Development of Small and Medium Enterprises is active on the market. Creation of industrial parks is in full swing. During the period 2010-2014, on the basis of the Government Decisions seven enterprises were awarded the title of industrial parks, including the Industrial Park "Bioenergagro" created in Tarigrad, Drochia with the purpose to capitalize the first private investment in biogas production by the "Bioenergagro"

SRL company. Since 2011 the Republic of Moldova has become a partner of Enterprise Europe Network (EEN). A significant impact on technology transfer is being felt since the establishment of the Energy Efficiency Agency (EEA) in 2010 and the Energy Efficiency Fund (EEF) in 2012. The EBRD credit lines MoREFF and MoSEFF, the EU - Moldova bilateral programs for 2011-2016, the Energy Package launched by the World Bank, also contribute to capacity building.

The experience accumulated in the field of technology transfer in the Republic of Moldova demonstrates that its promotion encounters two basic impediments: (a) lack of beneficiaries' capacity to come up with implementation wise feasible projects, and (b) lack of financial capacity to implement respective projects on their own. For this reason external support is further needed, to overcome the first problem, as well as ease the investment burden to those who intend to implement advanced technologies.

Enabling Business Environment

Business environment in the Republic of Moldova is characterized by unjustified financial costs essentially exceeding the level of such costs in developed countries, which discourage productivity and innovation oriented fair competition. The World Bank's international ranking "Ease of Doing Business" for 2014 ranks the RM 78 of 189 countries, while in terms of Economic Freedom Index, the RM 2014 ranked 110 of 178 countries in 2014.

Technology Transfer Mechanisms

According to the IPCC paper "Methodological and technological aspects of technology transfer", the technology transfer mechanisms include: national innovation system, official development assistance, the Global Environment Facility, multilateral development banks, CDM of the Kyoto Protocol.

National Innovation System

The innovation system in the RM include research institutions, Agency for Innovation and Technology Transfer (AITT), the State Agency for Intellectual Property, scientific-technological parks ("Academy", "INAGRO"), incubators of innovation, universities, organization of SME development (ODIMM); the system however is still at an early stage of development and lacks essential elements of a modern innovation system.

Official Development Aid

The RM has fortified its attempts to refocus from the survival assistance to sustainable development assistance. However, the unstable political environment and lack of financial resources leaves the Government in a more vulnerable and keeps it dependent on current donors' priorities. In this context, by June 1, 2015 the donors' commitments to the RM amounted to 4,315 billion EUR, with total disbursements amounting to 2,432 billion EUR for a total of 1,761 projects. As regards financial resources in the context of Low Carbon Emission Development, the RM enjoyed the support of the Global Environment Facility (GEF), World Bank (WB), EBRD, the EU, etc.

ES.7. Domestic Measurement, Reporting and Verification Arrangements

Currently, in terms of impact of mitigation measurements, the MRV system existing in the RM manifests itself both through the mechanisms established by the UNFCCC to report actual and future expected emissions produced in the country; and through a series of energy efficiency and renewable energy promoting activities; as well as through CDM projects.

The Ministry of Environment (MoEN) is the state authority responsible for the development and promotion of policies and strategies that address environmental protection, rational use of natural resources and biodiversity conservation. Within the MoEN, the Climate Change Office (CCO) is responsible for preparatory activities for the National Inventory Reports, Biennial Update Reports and National Communications. The National Commission for the implementation of UNFCCC provisions and the provisions and mechanisms of the Kyoto Protocol, created by the GD No. 1574 of 26.12.2003 is operational.

The RM has committed to implement an adequate national MRV system, in line with subsequent decisions adopted at the recent Conferences of Parties to UNFCCC. To achieve this objective, the country was granted the support of the UNDP through the "Low Carbon Capacity Building Program" Project. The National MRV concept for NAMA[4] implementation was developed with the support of an international consultant, with further effective implementation over the next few years. The Ministry of Environment will hold overall responsibility for the MRV system, while the National Commission will have the mandate to prioritize, evaluate, approve/reject and monitor the NAMA proposal/projects and the related MRV system (three types of MRV will be implemented: for GHG emissions; for unilateral NAMA, and for NAMA implemented with donor support).

[4] <http://clima.md/doc.php?l=en&idc=267&id=3640>.

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 First Biennial Update Report of the Republic of Moldova to UNFCCC reflects the degree of compliance with the Convention provisions nominated nationwide, updated for 2013/2014 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 First Biennial Update Report and Forth National Communication under the United Nations Framework Convention on Climate Change"*, initiated on July 7, 2014 and implemented by the Climate Change Office of the Ministry of Environment (MoEN) and United Nations Environment Programme (UNEP), with financial support of the Global Environment Facility (GEF). The Report outlines a series of actions in the areas indicated above, revealing directions for future work and establishing effective partnerships.

As a signatory Party of the Convention and a country that has ratified the Kyoto Protocol, the Republic of Moldova is concerned with analyzing opportunities arising from the fullest implementation of the flexible mechanisms available under the Kyoto Protocol, while actively taking part in post-Kyoto international negotiations, which are currently in progress.

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 First Biennial Update Report and the Fourth National Communication strengthened the country's potential, both for assessing climate change impact, as well as to promote and implement strategies, politics, action plans, programmes and technologies focused on mitigation the effects caused by such changes and adapt to new climate conditions.

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.

This Report helped establish the mitigation targets included within the Intended Nationally Determined Contribution (INDC), developed in accordance with Decisions 1/CP.19 and 1/CP.20, in the context of adopting at COP 21 (2015) the Paris Agreement – an agreed outcome with legal force under the Convention, applicable to all Parties, in line with keeping global warming below 2°C.

By the end of 2016, the RM intends to approve its Low Emissions Development Strategy of the Republic of Moldova until 2030. The LEDS will include national appropriate mitigation actions that would reduce, by 2030, the GHG emissions according to the targets proposed within the INDC.

CHAPTER 1: NATIONAL CIRCUMSTANCES

1.1. Physical Context

1.1.1. Geographical Location

The Republic of Moldova (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 809.6 thousand people (NBS, 2015). 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 1-1). 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.

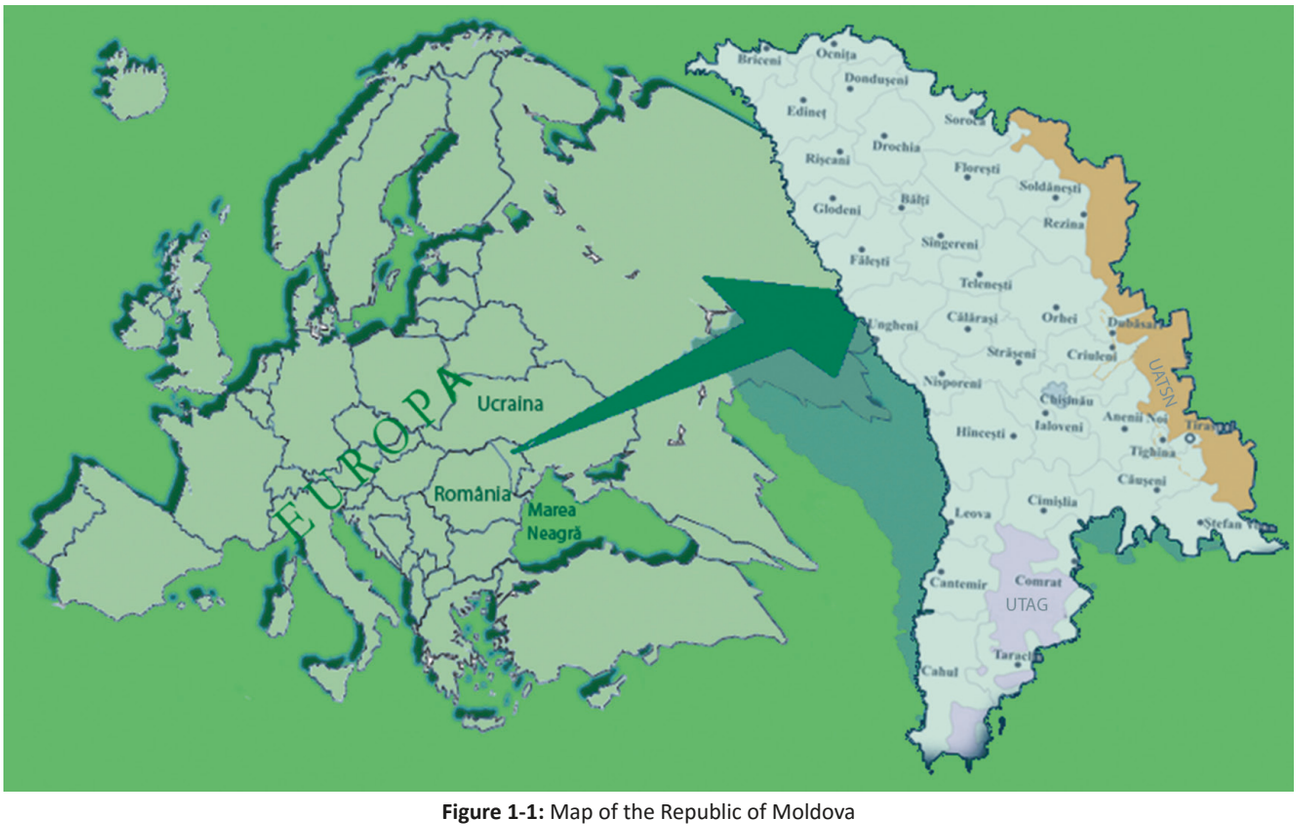


Figure 1-1: Map of the Republic of Moldova

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.

1.1.2. 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.

1.1.3. Climate Change Trends

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 127 years (1887-2014), the RM has experienced changes in temperature and mean precipitation. The country has become warmer, with the average temperature increase greater than 1.0°C (Figure 1-2); while the increase in precipitations constituted only around 54.7 mm (Figure 1-3).

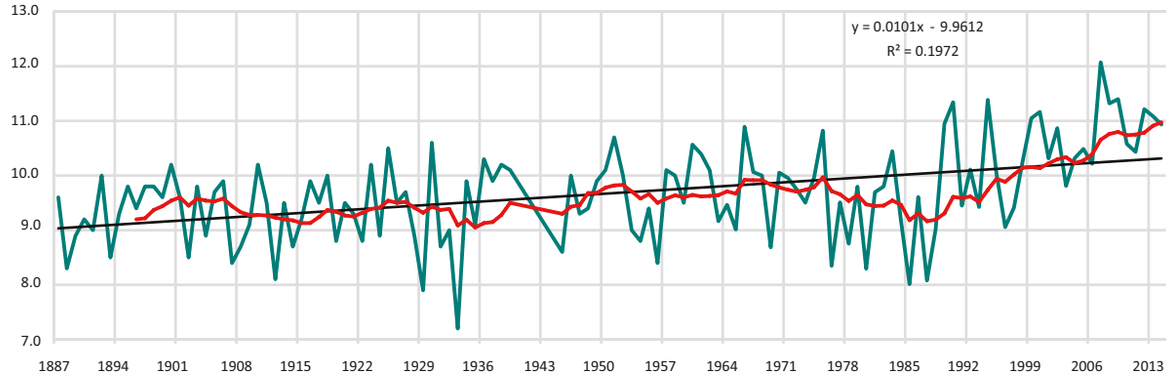


Figure 1-2: Trends of annual average air temperature change (°C) for 1887-2014: green (actual course trend), black solid line (linear trend secular course) and red line (10 year moving average trend) at the meteorological station Chisinau, central part of the country

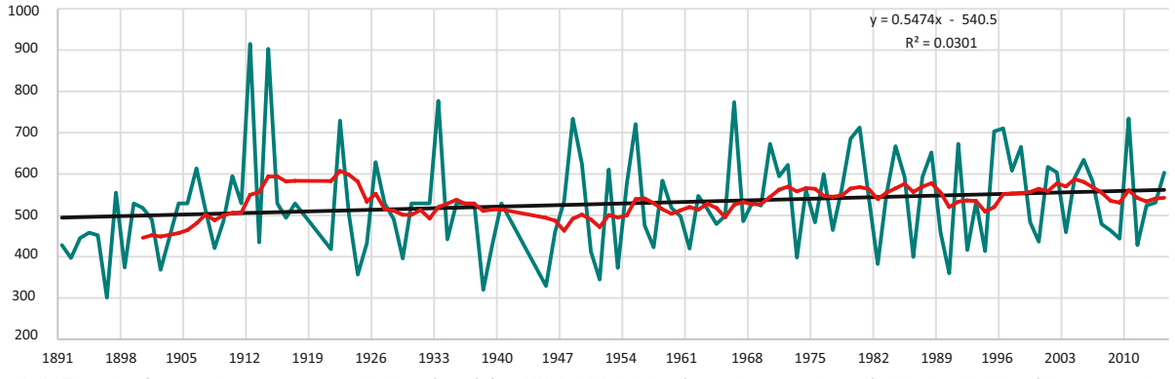
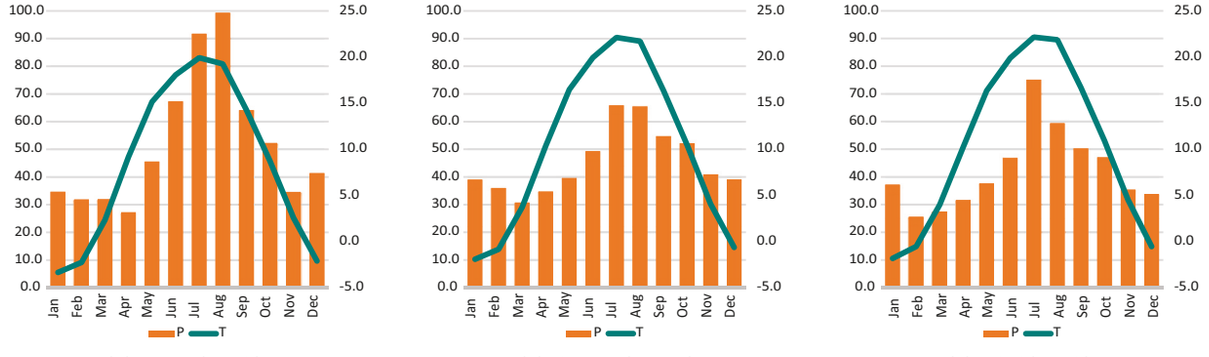


Figure 1-3: Trends of annual average precipitation (mm) for 1891-2014: blue (actual course trend), black solid line (linear trend secular course) and red line (10 year moving average trend) at the meteorological station Chisinau, central part of the country

The annual course of mean air temperature in the RM, with a maximum in July and a minimum in January, and total precipitation, maximum in June and minimum in March, is shown in Figure 1-4.



(A) Briceni (North) (B) Chisinau (Center) (C) Cahul (South)

Figure 1-4: Diagrams of total monthly precipitation (columns) with superimposed curves of mean monthly temperatures in different areas

Their average numerical values in the seasonal aspect are listed in Table 1-1. The temperature rise in a southern direction is clearly seen (from an average annual value of 8.5°C in the North to 10.3°C in the South, followed by a decrease in the amount of annual precipitation, respectively, from 622 mm to 508 mm. 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.

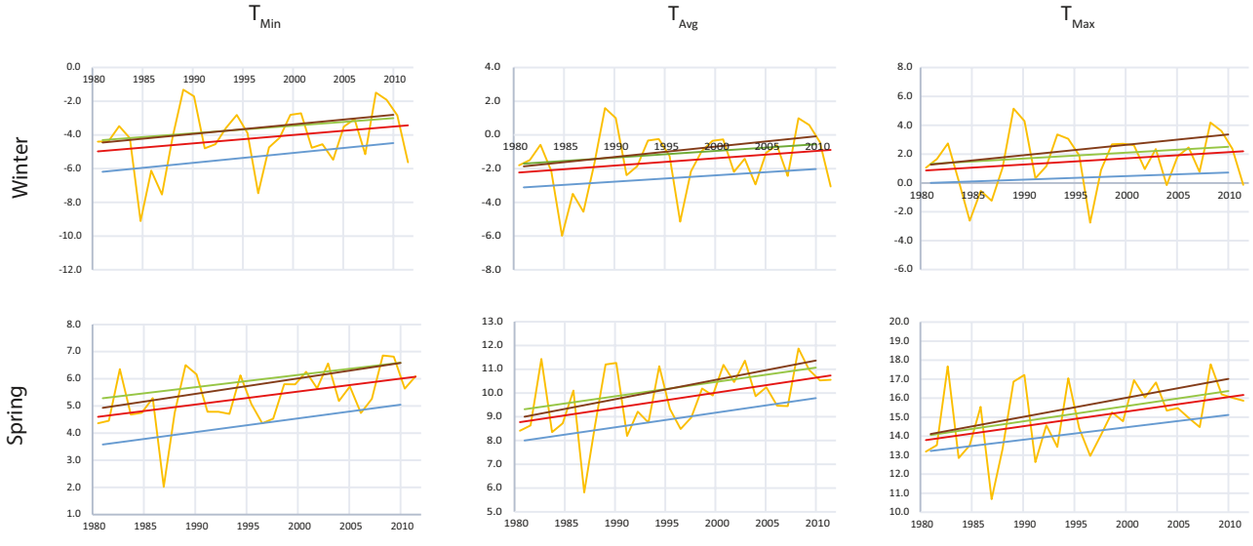
$$CV = \frac{\sigma}{x} \times 100\%$$

The temperature is the most variable in the winter, reaching 50% 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 4.7 to 7.4%. With regard to annual temperatures, they range from 7.9 (Briceni) - 8.2% (Cahul) for maximum temperatures to up to 13.1 (Cahul) - 20% (Briceni) for minimum temperatures. Variability of precipitation is considerably higher and it is >30% for all seasons, with the exception of the annual precipitation.

Table 1-1: Mean air temperatures and total precipitation over the period 1981-2010 and their inter-annual variability

Season	Observations at the meteorological stations					
	Briceni		Chisinau		Cahul	
	X	CV,%	X	CV,%	X	CV,%
Maximal air temperature, °C						
Winter	0.4	>50	1.9	>50	2.3	>50
Spring	14.2	11.6	15.2	11.4	15.6	12.1
Summer	24.8	4.7	26.7	5.4	27.0	5.5
Autumn	13.2	9.4	14.7	8.0	15.4	8.5
Annual	13.1	7.9	14.6	7.9	15.1	8.2
Mean air temperature, °C						
Winter	-2.6	>50	-1.1	>50	-1.0	>50
Spring	8.9	14.7	10.2	13.1	10.2	13.7
Summer	19.1	5.7	21.3	5.5	21.3	5.6
Autumn	8.5	11.0	10.3	10.4	10.7	10.6
Annual	8.5	12.4	10.2	9.6	10.3	9.8
Minimal air temperature, °C						
Winter	-5.3	39.0	-3.7	48.4	-3.6	44.3
Spring	4.3	23.6	5.9	17.1	5.8	17.5
Summer	14.0	7.4	16.5	6.0	16.3	5.6
Autumn	4.8	23.8	6.7	16.2	6.9	15.4
Annual	4.5	20.0	6.4	13.6	6.3	13.1
Precipitation, mm						
Winter	99.6	42.0	105.8	48.4	90.4	40.8
Spring	140.2	35.5	123.7	43.8	116.1	49.8
Summer	255.3	30.8	186.1	41.0	184.8	51.9
Autumn	128.3	48.7	132.2	55.3	116.3	44.2
Annual	622.4	23.0	547.7	19.8	507.6	23.4

Trends in air temperature and precipitation calculated by linear regression analysis for the period since 1981[5] to 2010 are shown in Figures 1-5 and 1-6, and more details are provided in Table 1-2.



[5] The early 1980s are generally regarded as a kind of "breaking point" in the long-term air temperature curve, from which the human influence on the atmosphere is expressed most distinctly (IPCC, 2007).

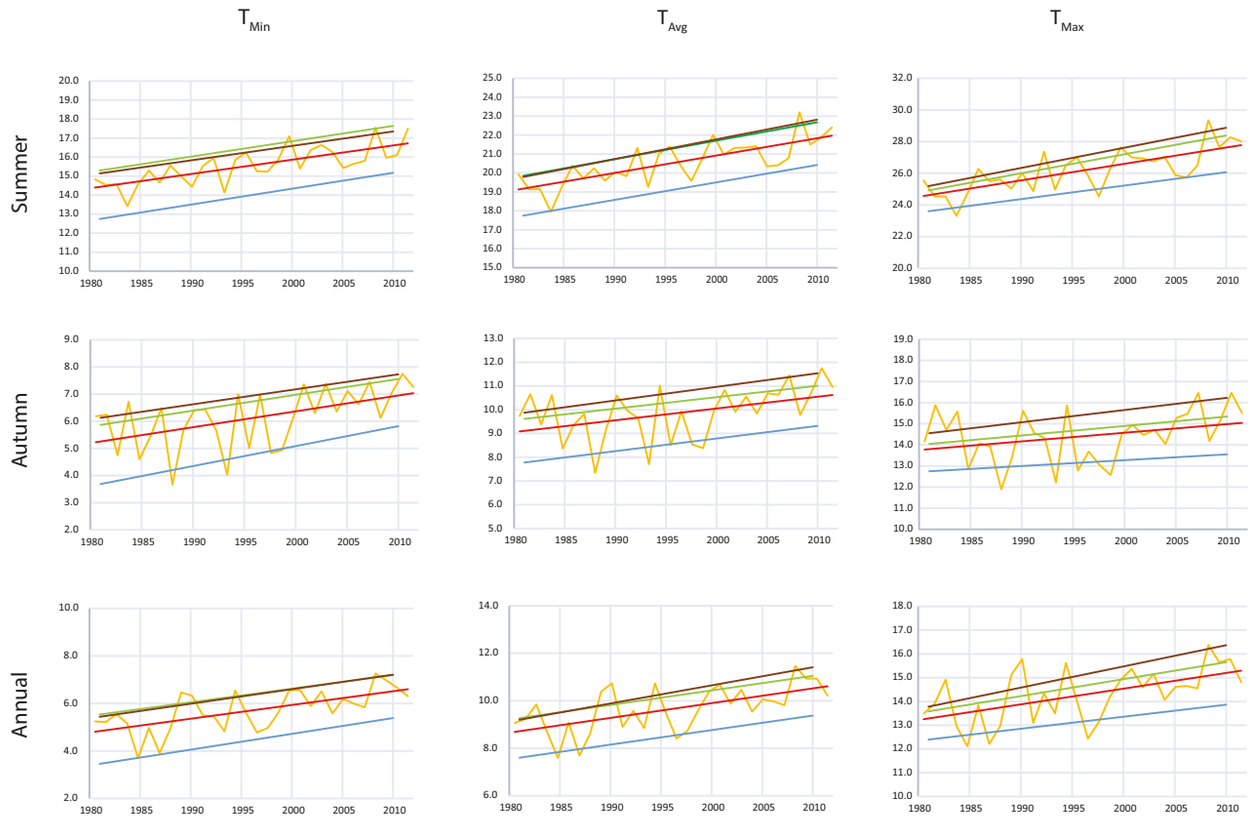


Figure 1-5: Trends in air temperature for 1981-2010: Briceni - blue, Chisinau - green, Cahul - brown, the red linear trend - the average for the RM; the yellow curve shows the inter-annual temperature variability for the Republic of Moldova

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 rise on the territory of the RM over the years 1981-2010 bears no doubt and it is most clearly seen during the warm season, especially in summer, when the mean temperature rises by 0.9-1.0°C, and Tmax - by 0.9-1.3°C per decade with a very high degree of certainty. Climate is getting warmer to a lesser degree during the winter months, by 0.4-0.6°C per decade and this growth is statistically significant (p≥0.10) only for Cahul.

For the southern regions, the greatest temperature rise is registered due to Tmax, while for the northern and central regions - due to Tmin. In the transitional seasons, the greatest statistically significant increase in temperature is observed for Tmax in the spring of 0.7°C (Briceni) to 1.0°C (Cahul) over the decade, and the lowest over autumn of 0.3°C (Briceni) to 0.6°C (Cahul) per decade. However, Tmin shows a reverse pattern with autumn growth of 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 Tmax 0.9°C per decade is observed in Cahul against 0.5°C in Briceni, while the largest increase in Tmin is observed, on the contrary, in Briceni 0.7°C per decade as opposed to 0.6°C in Cahul (Table 1-2, Figure 1-6).

Table 1-2: 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	-0.02	0.025	0.5652	+1.28	0.041	0.3235	+1.20	0.072	0.0641
Spring	+13.15	0.066	0.0569	+13.98	0.080	0.0266	+14.01	0.100	0.0095
Summer	+23.51	0.086	0.0001	+24.80	0.120	0.0000	+25.07	0.127	0.0000
Autumn	+12.72	0.029	0.2982	+13.99	0.045	0.0716	+14.49	0.058	0.0348
Annual	+12.34	0.051	0.0169	+13.51	0.071	0.0020	+13.69	0.089	0.0002
Mean air temperature, °C									
Winter	-3.15	0.038	0.3689	-1.74	0.040	0.3000	-1.92	0.061	0.0725
Spring	+7.94	0.062	0.0223	+9.25	0.060	0.0287	+8.92	0.081	0.0037
Summer	+17.65	0.092	0.0000	+19.76	0.097	0.0000	+19.69	0.104	0.0000
Autumn	+7.73	0.053	0.0149	+7.96	0.042	0.0708	+9.82	0.057	0.0139
Annual	+7.54	0.061	0.0008	+9.21	0.061	0.0014	+9.13	0.076	0.0000

Season	Observation site								
	Briceni			Chisinau			Cahul		
	r_0	r_1	p	r_0	r_1	p	r_0	r_1	p
Minimal air temperature, °C									
Winter	-6.25	0.059	0.1854	-4.35	0.045	0.2376	-4.51	0.057	0.0955
Spring	+3.52	0.051	0.0159	+5.24	0.045	0.0328	+4.87	0.057	0.0050
Summer	+12.67	0.084	0.0000	+15.22	0.081	0.0000	+15.07	0.076	0.0000
Autumn	+3.61	0.073	0.0083	+5.81	0.058	0.0083	+6.07	0.055	0.0111
Annual	+3.39	0.067	0.0000	+5.48	0.057	0.0007	+5.38	0.061	0.0000
Precipitation, mm									
Winter	96.215	0.156	0.8621	86.464	1.248	0.2548	94.854	-0.288	0.7181
Spring	142.52	-0.150	0.8890	120.76	0.187	0.8733	130.09	-0.903	0.4693
Summer	208.41	3.022	0.0678	207.85	-1.406	0.3919	194.98	-0.656	0.7519
Autumn	105.96	1.440	0.2813	112.19	1.291	0.4118	101.90	0.930	0.4006
Annual	553.10	4.470	0.1409	527.27	1.321	0.5725	521.83	-0.916	0.7219

Legend: r_0 – free term; $r_{1\text{ - regression coefficient}}$ (trend coefficient); grey cells are used to mark statistically significant *p-values*

Unlike temperature, statistically significant changes in precipitation are not observed, except for a statistically significant increase in summer precipitation of 30 mm per decade for Briceni. The upward trend in mean annual rainfall is observed in the North (44.7 mm) and the Centre (13.2 mm) per decade, while for the South the trend is towards a reduced growth of autumn precipitation of 9.2 mm per decade. Moreover, a trend towards decrease of precipitation is observed in the South during all seasons, except autumn, while in the center decrease is seen only in summer.

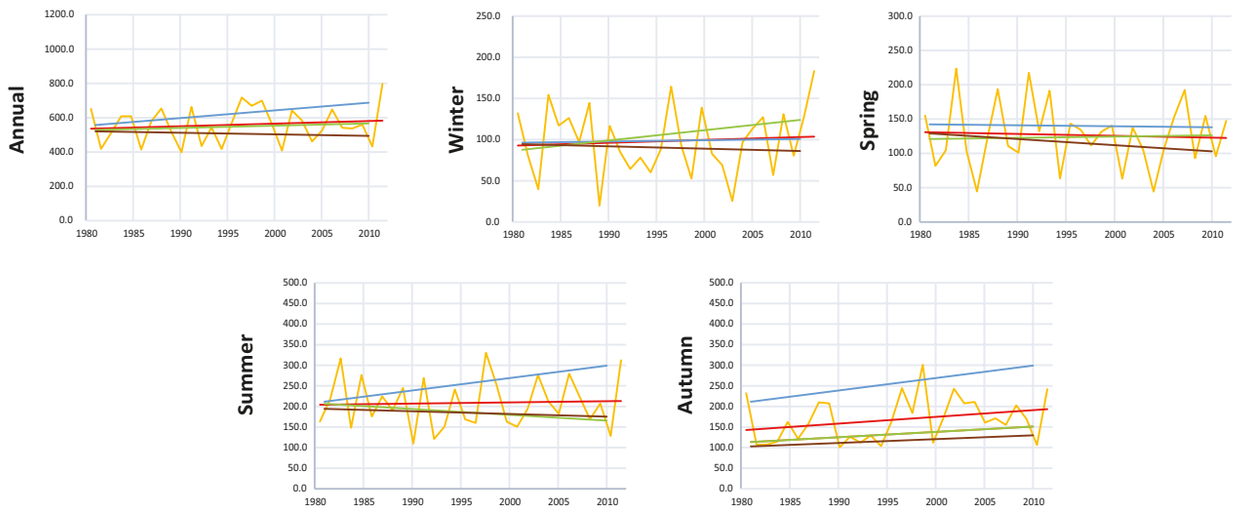


Figure 1-6: Trends in precipitation over period 1981-2010: Briceni - blue, Chisinau - green, Cahul - brown, red linear trend - the average for the RM; the yellow curve shows the inter-annual fluctuations in precipitation for the RM

1.2. Natural Resources

1.2.1. Land Resources

Moldova 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, 2014, RM's total available land amounted to 3384.6 thousand hectares (NBS, 2014), including 2,500.1 thousand ha (73.9 per cent) of agricultural land; of which 1,816.1 thousand ha (53.7 per cent) – arable land, 295.3 thousand ha (8.7 per cent) – perennial plantations; 350.0 thousand ha (10.4 per cent) – hayfields and pastures; 38.4 thousand ha (1.1 per cent) – fallow land; 465.2 thousand ha (13.7 per cent) – forest land and areas covered with woody vegetation; 96.9 thousand ha (2.9 per cent) – rivers, lakes, water basins and ponds and 322.4 thousand ha (9.5 per cent) – other lands (Table 1-3).

Table 1-3: Available Land by Category in the Republic of Moldova, 1992-2014, thousand ha

	1992	1995	2000	2005	2010	2011	2012	2013	2014
Land – total, including:	3376.0	3385.1	3384.4	3384.6	3384.4	3384.4	3384.6	3384.6	3384.6
Agricultural land:	2565.9	2556.7	2550.3	2521.6	2501.1	2498.3	2498.0	2497.8	2500.1
Arable land	1736.3	1758.7	1813.8	1840.2	1816.7	1812.7	1810.5	1814.1	1816.1
Perennial plantations:	474.8	430.7	352.3	297.8	301.0	298.8	298.7	295.3	295.3

	1992	1995	2000	2005	2010	2011	2012	2013	2014
Orchards	224.5	208.3	170.8	131.9	132.5	133.3	134.5	135.1	135.8
Vineyards	215.8	202.6	168.9	155.5	153.5	149.6	147.3	142.6	141.2
Pastures	350.5	365.2	373.9	370.8	352.1	350.4	350.3	348.9	348.0
Hayfields	4.3	2.1	2.5	2.7	2.2	2.2	2.0	2.1	2.0
Fallow land	0.0	0.0	7.8	10.1	29.1	34.2	36.5	37.4	38.7
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
Rivers, lakes, water basins and ponds	88.7	92.6	95.5	96.8	96.4	99.6	99.5	99.2	96.9
Other lands	299.7	310.5	315.9	326.7	324.3	323.6	324.4	323.4	322.4

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

Of the total land of the country – 2,497.9 thousand ha, the owners of agricultural lands manage 2,008.9 thousand ha (59.3 per cent of the total or 80.4 per cent of the agricultural lands), including 1,651.1 thousand ha (66.2 per cent) of arable land, 244.3 thousand ha (9.8 per cent) – perennial plantations, of which 120.2 thousand ha of orchards and 113.6 thousand ha of vineyards, 33.1 thousand ha (1.3 per cent) – hayfields and pastures from the appropriate land use categories.

According to the General Land Cadaster of the Republic of Moldova, in 2013, the use of agricultural land by various landowners was as it follows: 74 state agribusiness enterprises with a total area of 270.9 thousand ha (13.4 per cent); 75 scientific research and education institutions with a total area of 22.4 thousand ha (1.1 per cent); 132 of other enterprises and auxiliary households in state ownership – 70.8 thousand ha (3.5 per cent); 52.7 thousand lands in the public property of the administrative-territorial units with a total area of 56.4 thousand ha (2.8 per cent); 185 production cooperatives with a total area of 97.8 thousand ha (4.8 per cent); 152 joint stock companies with a total area of 36.6 thousand ha (1.8 per cent); 40.0 thousand limited liability companies – 724.9 thousand ha (35.8 per cent); 381.6 thousand peasant farms – 537.2 thousand ha (26.5 per cent); 822.3 thousand lands used individually by private owners with a total area of 233.8 thousand ha (11.6 per cent); 35.4 thousand of orchard farms – 2.5 thousand ha (0.1 per cent) and 56.3 thousand of other lands with a total area of 63.6 thousand ha (3.1 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.

1.2.2. Water Resources

Rivers. There are 3621 rivers and water-springs in the Republic of Moldova. 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 in the Republic of Moldova. Most of them are lakes located in the high-water beds of the rivers Prut (Beleu, Rotunda, Fontan) and Dniester (Old Dniester, Cuciurgan). In addition, there are above 3,500 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 (735.0 mil. m^3) on the river Prut jointly with Romania; and Dubasari (277.4 mil. m^3) on the Dniester river.

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.

The country has 17 horizons and water systems of various ages and uneven distribution[6]. 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-

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

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. About 6,200 artesian wells and circa 250 thousand fountains fed from groundwater wells supply circa 40 per cent of rural population, which provides 1,811 thousand m^3/day confirmed groundwater 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[7]. 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 Republic of Moldova 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°C, and the water debit of the wells is 10-100 m^3 per day.

1.2.3. 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 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.

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

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.

1.2.4. 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. In 2013, the volume of calcareous stones extraction used for carving or construction represented 286.3 kt, while the volume of other types of rocks used with a similar purpose – about 648.2 kt. Gypsum, another widely used mineral reached, in 2012, an extracted volume of 375.9 kt. Other minerals, widely used in the Republic of Moldova, are granite, sand and gravel-sand used for mortar and concrete production in construction. In 2013, it was recorded a total extraction volume of: 1516.9 kt of sand; circa 2486.3 kt of broken stone (gravel), boulders and flint; respectively, circa 1290.1 kt of sand and gravel mix. Most of the minerals are extracted from open mines, and only certain limestone varieties are mined from stone quarries (underground galleries).

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, UTA 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 2013, circa 10 thousand tons of oil was extracted from Valeni oil fields and about 118 thousand cubic meters of natural gas were extracted from Victorovca gas fields.

1.3. Administrative-Territorial Organization, Population and Human Context

1.3.1. 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 1-7).

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, 2015, the number of population in the districts varied between a minimum of 28.6 thousand people (Basarabeasca district) to a maximum of 124.6 thousand people (Cahul district).

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.

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 (161.8 thousand people)[8], while the area of ATULBD is respectively about 4163 km^2 (505.2 thousand people)[9]. 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.

1.3.2. Population

As of 01.01.2014 the population of the RM was 4064.7 thousand people, with the density of approximately 120.1 persons per square

[8] <http://statbank.statistica.md/pxweb/Dialog/varval.asp?ma=POP0103_t&ti=Populatia+stabila+pe+orase+si+raioane%2C+la+1+ianuarie%2C+2005-2015&path=../Database/RO/02%20POP/POP01/&lang=1>.
[9] <http://www.mepmr.org/pechatnye-izdaniya/statisticheskij-ezhegodnik-pmr>.

Figure 1-7: Administrative-Territorial Map of the Republic of Moldova

kilometer. Thus, numerically the Republic of Moldova outruns such European countries as Lithuania, Ireland or Slovenia.

During 1990-2013, the population decreased by about 6.8 per cent or by 297.0 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 per square kilometer in 1990 down to 120.1 persons per square kilometer at the beginning of 2013. 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 52.2 per cent in the nation's population, as opposed to 47.8 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 2223.3 thousand residents or 54.7 per cent of the total population, averaging about 1400 residents per settlement. The urban population is 1841.4 thousand residents or 45.3 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 8 thereof can boast the population exceeding 35 thousand residents: Chisinau (809.6 thousand people), Balti (150.2 thousand people), Tiraspol (134.8 thousand people), Bender (92.4 thousand people), Rabnita (48.5 thousand people), Cahul (39.6 thousand people), Ungheni (38.4 thousand people) and Soroca (37.6 thousand people).

According to the data of the 2004 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 71.5 per cent of the country's population (64.5 per cent in 1989), Ukrainians – 11.2 per cent (13.8 per cent in 1989), Russians – 9.4 per cent (13.0 per cent in 1989), Gagauz – 3.8 per cent (3.5 per cent in 1989), Bulgarians – 2.0 per cent (2.2 per cent in 1989), Gypsies – 0.3 per cent (0.3 per cent in 1989), Jews – 0.1 per cent (1.5 per cent in 1989), other nationalities – 1.6 per cent (1.3 per cent in 1989), etc. (Table 1-4).

Table 1-4: Resident Population by the Main Nationalities in the Republic of Moldova (according to the 2004 population census data)

Ethnic origin	Republic of Moldova (Right Bank of Dniester)	%	ATULBD (Left Bank of Dniester)	%	Republic of Moldova (total)	%
Moldovans	2564.8	75.8	177.1	31.9	2741.9	69.6
Ukrainians	282.4	8.3	159.8	28.8	442.2	11.2
Russians	201.2	5.9	168.4	30.4	369.6	9.4
Gagauz	147.5	4.4	4.1	0.7	151.6	3.8
Romanians	73.3	2.2	1.0	0.2	74.3	1.9
Bulgarians	65.7	1.9	13.8	2.5	79.5	2.0
Gypsies	12.3	0.4	0.1	0.0	12.4	0.3
Jews	3.6	0.1	1.2	0.2	4.8	0.1
Other	32.5	1.0	28.9	5.2	61.4	1.6
TOTAL	3383.3	100.0	554.4	100.0	3937.7	100.0

1.3.3. Demographic Situation

Between 1990 and 2013, the demographic processes registered a distinctive negative development pattern (Table 1-5), which showed itself in the general instability of demographic indicators and phenomena as well as falling birth rate, growing mortality, depopulation, demographic ageing, etc.

For example, the 2013 birth rate – 10.6‰ (a significant decrease in comparison with the 1990 rate of 17.7‰) was slightly lower the mortality rate - 10.7‰ (increasing compared to 1990 - 9.7‰). The infant mortality rate remained among the highest in Europe (9.4 ‰) but was lower than the 1990 figures (19.0‰). Between 1999 and 2010, the natural balance of the population was profoundly negative, while within 2011-2013 time series, it varied insignificantly around 0.0‰ (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.

Table 1-5: The Dynamic of Demographic Indicators in the Republic of Moldova (the Right Bank of Dniester), 1990-2013

	Live Births	Deceased	Infant Mortality	Natural Balance	Marriages	Divorces
1990	77085	42427	1482	34658	40809	13135
1991	72020	45849	1441	26171	39609	13879
1992	69654	44522	1294	25132	39340	14821
1993	66179	46637	1437	19542	39469	14468
1994	62085	51514	1422	10571	33742	13811
1995	56411	52969	1214	3442	32775	14617
1996	51865	49748	1065	2117	26089	13440
1997	45583	42957	901	2626	22106	10153
1998	41332	39922	738	1410	21814	10156
1999	38501	41315	714	-2814	23524	8913
2000	36939	41224	681	-4285	21684	9707
2001	36448	40075	597	-3627	21065	10808
2002	35705	41852	528	-6147	21865	12698
2003	36471	43079	522	-6608	24961	14672
2004	38272	41668	464	-3396	25164	14918
2005	37695	44689	468	-6994	27187	14521
2006	37587	43137	442	-5550	27128	12594
2007	37973	43050	428	-5077	29213	13923
2008	39018	41948	473	-2930	26666	12601
2009	40803	42139	493	-1336	26781	11884
2010	40474	43631	476	-3157	26483	11504
2011	39182	39249	431	-67	25900	11120
2012	39435	39560	387	-125	24262	10637
2013	37871	38060	359	-189	24449	10775

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

During 1990-2013, the share of population aged under 15 decreased down to 17.1 per cent (from 27.9 per cent in 1990), and the age group of persons above 57/62 years increased, respectively, to 16.8 per cent (from 12.6 per cent in 1990) (Table 1-6).

Table 1-6: The RM's Population by Age, Area and Sex, in early 2014 (the Right Bank of Dniester)

	Total			Urban			Rural		
	Total by Sex	Males	Females	Total by Sex	Males	Females	Total by Sex	Males	Females
Total, thousand people	**3,557.6**	**1,711.5**	**1,846.1**	**1,503.0**	**706.5**	**796.5**	**2,054.6**	**1,005.0**	**1,049.7**
Under the working age (0-15 years)	610.0	314.1	295.9	220.4	114.4	106.0	389.6	199.7	189.9
Working age (16-56/61 years)	2,349.2	1,213.2	1,135.9	1,033.9	517.1	516.8	1,315.2	696.1	619.1
Above the working age (57/62 years)	598.5	184.2	414.3	248.6	75.0	173.6	349.8	109.1	240.7
Total, % of the 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)	17.1	18.4	16.0	14.7	16.2	13.3	19.0	19.9	18.1
Working age (16-56/61 years)	66.0	70.9	61.5	68.8	73.2	64.9	64.0	69.3	59.0
Above the working age (57/62 years)	16.8	10.8	22.4	16.5	10.6	21.8	17.0	10.9	22.9

Source: <http://statbank.statistica.md/pxweb/Dialog/varval.asp?ma=POP0106&ti=Populatia+stabila+pe+grupe+de+virsta%2C+ani%2C+medii+si+sexe%2C+la+inceputul+anului%2C+2000-+2014&path=../Database/RO/02%20POP/POP01/&lang=1>.

During 1990-2013, the 'average life expectancy at birth' indicator somewhat increased - from 68.0 years in 1990, to 71.9 years in 2013 (the respective indicator increased from 63.9 years to 68.1 years for males and from 71.9 years to 75.6 years for females) (Table 1-7). 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.

Table 1-7: Average Life Expectancy at Birth by Area in the Republic of Moldova (the Right Bank of Dniester) 1990-2013, years

	Total			Urban			Rural		
	Total by Sex	Males	Females	Total by Sex	Males	Females	Total by Sex	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

Source: <http://statbank.statistica.md/pxweb/Dialog/varval.asp?ma=POP0205&ti=Speranta+de+viata+la+nastere+pe+medii%2C+1958-2013&path=../Database/RO/02%20POP/POP02/&lang=1>.

1.3.4. Public Health

It is believed that the state of public health is determined by four major groups of factors: life style (accounting for 50-55 per cent), the environmental situation (20-25 per cent), genetics (15-20 per cent) and the effectiveness of the health care and preventive health care facilities (8-10 per cent). The nature of the environmental factors affecting public health may be chemical, physical, biological, psychological, genetic, cultural, or behavioral.

The current environmental situation in the Republic of Moldova cannot be characterized as the one contributing to healthy and long life. The main problems are caused by the negative impact of polluted air, water, soil and food on human health. The neglect of the public health problems - in particular in the rural areas, which are caused by the environmental factors, threatens with severe consequences for the public as well as for the national economy. During 2000-2013, the overall mortality rates tended to increase (Table 1-8).

Table 1-8: The Mortality Rates in the RM (the Right Bank of Dniester) during 2000-2011, by Disease Classes, per 1,000 Residents

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Disease classes - total	**631.9**	**609.4**	**634.6**	**770.3**	**665.0**	**678.5**	**655.3**	**664.9**	**685.5**	**736.3**	**736.0**	**759.3**	**753.5**	**770.1**
Infectious and parasitic diseases	55.8	51.6	49.7	44.6	39.9	39.0	36.9	37.4	46.5	37.9	38.1	35.8	34.6	34.1
Tumors	17.6	16.5	17.5	18.5	21.1	20.6	20.7	21.4	22.3	23.7	26.3	25.9	21.2	20.6
Endocrine, nutritional and metabolic diseases	17.8	18.0	20.4	21.5	23.5	26.7	27.6	28.6	29.6	30.8	35.6	40.0	45.4	51.9
Diseases of the blood and blood forming organs and certain disorders involving the immune mechanism	9.4	10.3	11.5	12.4	13.0	14.0	13.8	14.0	13.7	13.8	14.0	14.9	14.8	13.4
Mental and behavioral disorders	43.0	42.1	43.9	45.0	48.0	44.4	45.5	44.6	48.5	46.7	43.5	46.4	46.3	46.4
Diseases of the nervous system and sense organs	52.3	50.8	51.9	52.3	58.3	54.3	49.7	48.1	47.8	49.2	50.9	53.6	55.7	52.0
Diseases of the circulatory system	83.3	56.7	60.0	64.8	78.0	92.3	98.8	110.2	116.2	123.4	125.0	132.5	141.7	151.5
Respiratory diseases	148.5	125.6	130.9	135.4	125.9	132.0	121.0	119.8	111.4	155.7	130.9	149.1	127.9	144.8
Intestinal diseases	71.1	75.1	77.3	76.3	76.7	80.9	78.3	80.8	82.3	88.0	93.2	97.3	95.4	92.7
Diseases of the genitourinary system	43.3	44.2	45.5	48.1	48.6	51.1	47.0	46.6	47.1	48.3	48.9	51.2	54.2	52.2
Complications of pregnancy, childbirth and the puerperium	36.3	46.5	52.1	37.2	40.6	42.1	36.7	36.0	41.6	43.5	48.9	50.6	50.7	47.6
Diseases of the skin and subcutaneous tissue	32.7	32.7	32.4	32.4	34.2	30.1	27.3	26.3	24.4	23.4	24.1	22.5	23.6	20.6
Osteoarthrities, muscle and connective tissue diseases	26.6	26.7	28.4	30.8	33.0	29.9	29.9	30.6	31.2	31.8	33.9	35.3	39.2	37.2
Congenital malformations, deformations and chromosomal abnormalities	3.6	3.4	3.7	3.5	3.4	3.7	3.7	3.5	3.6	3.4	3.8	4.0	4.2	4.3
Traumas, intoxications and other consequences of external causes	41.8	39.3	43.2	46.1	45.2	42.7	40.6	38.6	45.9	44.9	52.4	34.9	36.4	34.2

Source: <http://statbank.statistica.md/pxweb/Dialog/varval.asp?ma=SAN0202&ti=Morbiditatea+populatiei+pe+principalele+clase+de +boli%2C +2001-2013&path=../Database/RO/08%20SAN/SAN02/&lang=1>.

The mortality breakdown analysis has demonstrated that diseases of the circulatory system are the main cause of death (19.7 per cent), followed by respiratory diseases (18.8 per cent), intestinal diseases (12.0 per cent), diseases of the nervous system and sense organs (6.8 per cent), followed by diseases of the genitourinary system (6.8 per cent), endocrine, nutritional and metabolic diseases (6.7 per cent), complications of pregnancy, childbirth and the puerperium (6.2 per cent), mental and behavioral disorders (6.0 per cent), osteoarthrities, muscle and connective tissue diseases (4.8 per cent), infectious and parasitic diseases (4.4 per cent), traumas, intoxication and other consequences of external causes (4.4 per cent), tumors (2.7 per cent), diseases of the skin and subcutaneous tissue (2.7 per cent) and diseases of the blood and blood forming organs and certain disorders involving the immune mechanism (1.7 per cent).

The situation regarding infectious diseases remains severe. According to the data provided by the Ministry of Health for 2013, the number of flu and hepatitis cases causing death increased, as well as the number of acute respiratory infections (259.9 thousand cases compared to 199.1 thousand cases recorded in 2012).

Within the structure of infectious diseases, the most widely spread remain the acute respiratory infections. In 2013, per 100 thousand people, on average there were 7.3 thousand cases of acute respiratory diseases, the highest incidence being recorded in Balti and Chisinau municipalities, respectively with 17.7 thousand cases and 12.2 thousand cases per 100 thousand people. In comparison, the situation in the territory was as follows: Criuleni – 10.3 thousand cases per 100 thousand people, Anenii Noi – 9.2 thousand cases, Ialoveni – 8.5 thousand cases, Straseni – 7.8 thousand cases etc.

In 2013, per 100 thousand people, on average there were 448 cases of acute intestinal infections, 86 cases of tuberculosis of the respiratory organs, 7 cases of viral hepatitis and 250 cases of "socially constructed" diseases. Over the last five years, it was recorded a significant decrease in bacterial dysentery cases, from 592 cases in 2009 (17 cases per 100 thousand people), to 355 cases in 2013 (10 cases per 100 thousand people). The number of viral hepatitis cases varied, decreasing to 163 cases in 2012 (circa 5 cases per 100 thousand people) and increasing in 2013 to 242 cases (7 cases per 100 thousand people). The same decreasing trend was recorded regarding the number of tuberculosis cases, from 3.3 thousand cases in 2009 (93 cases per 100 thousand people) to 3.1 thousand cases to 2013 (86 cases per 100 thousand people). Prophylactic vaccination and appropriate preventive measures helped to reduce the mortality rate caused by epidemic parotiditis: from 7 cases per 100 thousand people recorded in 2009, to 1.5 cases per 100 thousand people in 2013. In 2013, there were recorded 467 HIV cases or with 15 less than in 2012, the overall HIV incidence is 13.1 per 100 thousand people. At the same time, 176 AIDS cases were recorded.

To be noted that between 2000 and 2013, the overall mortality rate varied significantly. The overall mortality rate is an integral indicator among those defining the state of public health. The mortality breakdown analysis has demonstrated that in 2013, the cardiovascular pathologies was still the main cause of death (58.1 per cent), followed by tumors (15.3 per cent), intestinal diseases (8.8 per cent), traumas, intoxication and other consequences of external causes (7.5 per cent) and respiratory diseases (4.5 per cent) (Table 1-9). It should be noted that during 2000-2013 the rates of mortality, caused by tumors tended to increase.

Table 1-9: The mortality rates in the RM during 2000-2013, by the main cause of death (per 100 thousand residents)

Year	Tumors	Diseases of the circulatory system	Respiratory diseases	Intestinal diseases	Traumas and intoxication	Total
2000	125.0	632.0	69.4	103.4	92.9	1132.8
2001	128.2	618.2	64.6	109.5	98.4	1103.8
2002	134.7	654.8	74.4	110.0	98.4	1155.4
2003	138.5	679.6	79.0	114.1	103.2	1192.6
2004	141.5	653.7	69.3	116.3	101.6	1156.4
2005	145.8	700.1	79.2	128.6	108.4	1243.2
2006	153.4	671.4	72.9	122.5	105.0	1203.2

Year	Tumors	Diseases of the circulatory system	Respiratory diseases	Intestinal diseases	Traumas and intoxication	Total
2007	150.6	675.9	72.1	119.4	101.9	1203.6
2008	155.2	657.4	68.9	112.3	99.4	1175.0
2009	158.7	663.2	64.7	115.5	97.0	1181.8
2010	157.6	688.1	68.3	121.9	103.6	1224.9
2011	158.3	633.4	53.4	100.2	86.3	1102.5
2012	161.1	641.6	48.8	103.1	86.6	1111.4
2013	163.8	621.9	48.1	94.5	79.8	1069.5

Source: Statistical Yearbooks of the RM for 2014 (page 52), 2013 (page 52), 2012 (page 52), 2011 (page 52), 2010 (page 52), 2009 (page 52), 2008 (page 56), 2006 (page 65), 2005 (page 54), 2003 (page 67), 2001 (page 53); Public Health in Moldova in 2006. Ministry of Health of the Republic of Moldova, Chisinau, 2007.

The mortality rates by region are not uniform, registering dramatic differences between the regions. In 2013, the lowest mortality rates were reported in the municipality of Chisinau and in Balti, whereas the highest rates in Donduseni, Briceni, Ocnita, Edinet, Drochia, Riscani, Soldanesti and Glodeni. In the recent years, the Republic of Moldova has made considerable efforts to improve the national public health situation.

1.3.5. Education

The Ministry of Education and Youth, the Municipal Education Departments, Regional General Departments of Education and educational establishments are responsible for the delivery of the primary, secondary general, secondary professional, secondary vocational and university (higher) education. The legal framework for the education system is the Concept Paper on education development in the Republic of Moldova and the Curriculum by disciplines.

Primary and secondary general education. At the beginning of the 2013/14 school year, the Republic of Moldova (Right Bank of Dniester) had 1374 operating primary and secondary general educational establishments, with 23 institutions less than in the school year 2012/13 (Figure 1-8). Educational institutions providing day classes include 112 primary schools, 771 gymnasiums, 466 lyceums and 23 specialized schools for children with mental or physical development deficiencies.

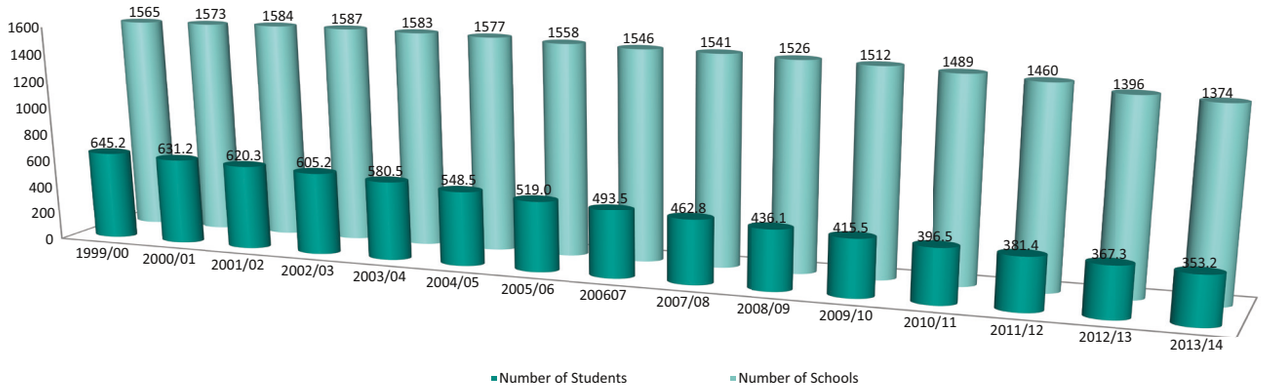


Figure 1-8: Number of Schools, Gymnasiums and Lyceums (units) and Number of Students (thousand) in the Republic of Moldova

As a result of the optimization process related to the secondary general educational establishments, the new configuration of the primary and secondary general education network is as follows: 8.2 per cent – primary schools (an increase by 2.1 per cent compared to 2009/10 school year), 56.2 per cent - gymnasiums (+ 9.2 per cent), 34.0 per cent - lyceums (+1.3 per cent) and 1.7 per cent - specialized schools for children with mental or physical development deficiencies. At the same time, compared to the school year 2012/13, the number of lyceums decreased (by 25 units), while both the number of primary schools and gymnasiums increased (each by 4 units). Of the total primary and secondary general educational establishments, 335 institutions operate in urban areas, while 1037 – in rural areas. Of the total institutions operating in urban areas, 69 per cent are represented by lyceums, while in rural areas, 68 per cent are gymnasiums.

At the beginning of the 2013/2014 school year, the total number of students enrolled in primary and secondary general educational establishments was 352.0 thousand or by 3.8 per cent less than in the preceding year. In this school year, 2 institutions offered evening classes with 1.2 thousand students, or 0.3 per cent of the total number of students enrolled in primary and secondary general educational establishments. The students structure on educational levels show that students enrolled in gymnasiums and primary schools prevail. In recent years, the number of students enrolled in primary schools is growing, while the number of students enrolled in gymnasiums is decreasing.

In the school year 2013/2014, the average number of students in a class was 20, while the ratio of students per one teacher represented 11 students per teacher. The number of students starting the first grade who were enrolled in preschool programs represented 34.8 thousand or 97.3 per cent, similar to the previous year. The number of students enrolled in specialized schools for the school year 2013/2014 represented 2.3 thousand or by 21.7 per cent less compared to the previous year. Most of such students have mental development deficiencies – 76.9 per cent, hearing impairment – 10.5 per cent and impaired eyesight – 6.0 per cent.

Secondary professional education. During the school year 2013/14, the number of secondary professional educational establishments represented 67 units (Figure 1-9). The number of students enrolled in the secondary professional education is decreasing continuously, recording 18.2 thousand students, compared to 19.6 thousand during the preceding year.

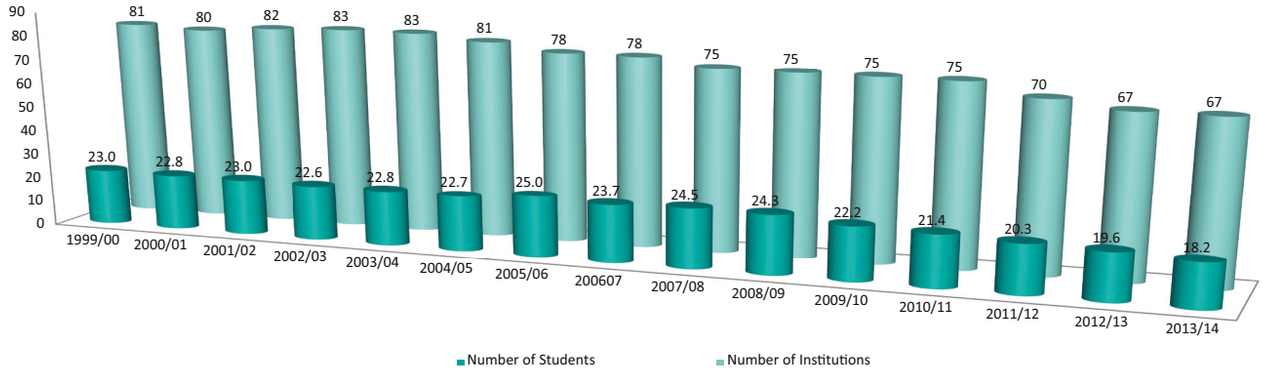


Figure 1-9: Number of Secondary Professional Educational Establishments (units) and Number of Students (thousand) in the Republic of Moldova

In the school year 2013/14, 11.2 thousand students were enrolled in professional secondary education establishments, or by 5.9 per cent less compared to the previous year. Most of the students were enrolled based on gymnasium education – 9.4 thousand (83.9 per cent of the total). The most demanded professions/occupations are: cook (11.2 per cent of the total number of enrolled students compared to 11.8 per cent in 2012/13), car mechanic (11.2 per cent compared to 11.0 per cent), plasterer (8.3 per cent compared to 9.0 per cent), welder-fitter (electric and gas welding) (6.0 per cent compared to 6.1 per cent), tailor/dressmaker (5.2 per cent compared to 5.3 per cent), computer operator (4.7 per cent compared to 5.3 per cent), carpenter (3.5 per cent compared to 3.1 per cent), tractor driver (3.4 per cent compared to 3.3 per cent), etc.

Secondary vocational education. In the school year 2013/14, the secondary vocational education was organized in 45 colleges (Figure 1-10), including 41 state colleges and 4 private colleges (by 2 units less compared to the previous year). The number of students represented 29.3 thousand, a decrease by 4.6 per cent compared to the previous year. Most of the students were enrolled in state colleges (94.4 per cent).

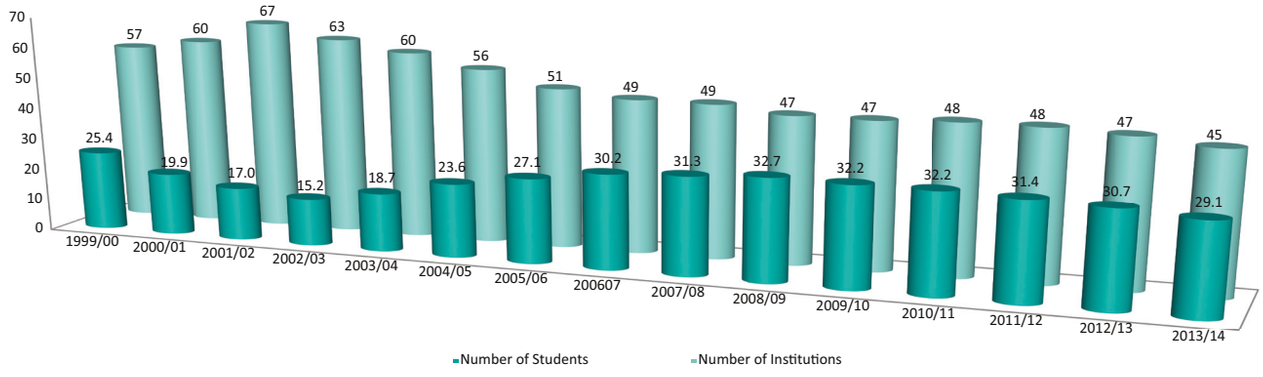


Figure 1-10: Number of Secondary Vocational Educational Establishments (units) and Number of Students (thousand) in the Republic of Moldova

In the school year 2013/14, 8.2 thousand students were enrolled in colleges or by 6.8 per cent less than in previous year. The most demanded sectors were: economy (14.3 per cent of the total enrolled compared to 11.9 per cent in 2012/13), medicine (13.6 per cent compared to 12.7 per cent), transport (9.8 per cent compared to 9.4 per cent), services (6.8 per cent compared to 6,5 per cent), mechanics (5.5 per cent compared to 5.2 per cent), construction (5.4 per cent compared to 5.3 per cent), computer sciences (5.3 per cent compared to 5.0 per cent) etc.

Higher Education. In the 2013/14 academic year, the total number of higher education establishments (universities) in the Republic of Moldova was 32, of which 19 were state-owned. Compared to the previous year, the number of private universities has decreased by 2 units. At the beginning of the academic year, the number of students represented 97.3 thousand or by 5.2 thousand less compared to the previous year. (Figure 1-11).

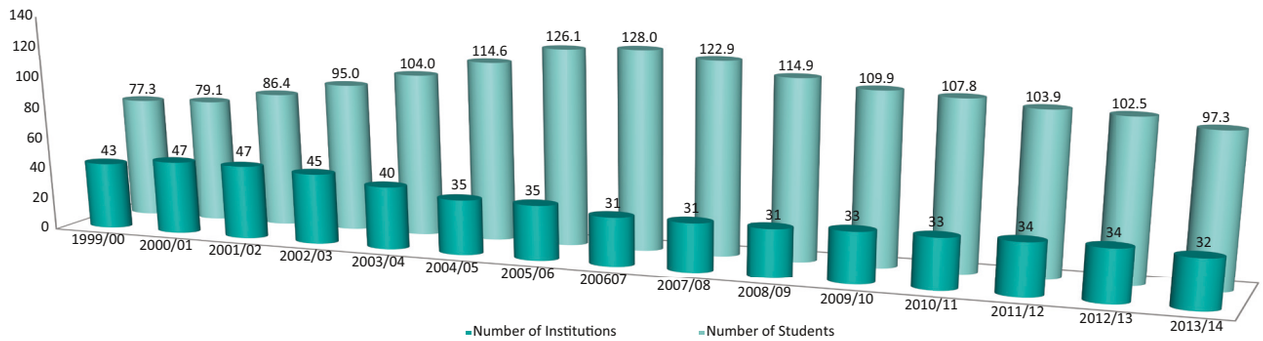


Figure 1-11: Number of Higher Education Establishments (units) and Number of Students (thousand) in the Republic of Moldova

Most students were enrolled in state-owned universities – 78.9 thousand (81.1 per cent), of which 35.6 per cent were receiving training free of charge, funded from the budget. The students were distributed as follows: 77.5 thousand were enrolled for a university programme, the first cycle; 14.8 thousand students were enrolled for a master degree programme, the second cycle; 0.8 thousand students – for integrated university studies and 4.1 thousand students were enrolled for a medical and pharmaceutical programme.

In the 2013/14 academic year, the universities had 19.2 thousand first-year students enrolled for the first cycle (by 1.2 thousand less compared to the previous year) and 7.2 thousand enrolled for the second cycle (-0.5 thousand). Among the specialty areas the biggest share of first-year students chose: economy – 22.8 per cent of the total first year students compared to 19.9 per cent in 2012/13, education – 16.8 per cent compared to 18.1 per cent, engineering – 12.7 per cent compared to 14.2 per cent, law – 8.4 per cent compared to 7.7 per cent. As for the second cycle, the students enrolled for a master degree programme had the following preferences: economy – 24.2 per cent of the total enrolled compared to 28.6 per cent in 2012/13, law – 18.3 per cent compared to 18.5 per cent and education – 16.3 per cent compared to 14.0 per cent.

Post-graduate education. Among the total of research (R&D) institutions operating in the Republic of Moldova as at the beginning of 2014, 49 institutions offered post-graduate studies (doctoral degree). The total number of post graduate students represented 1522, recording a significant increase by 27.4 per cent compared to 1999 (Figure 1-12).

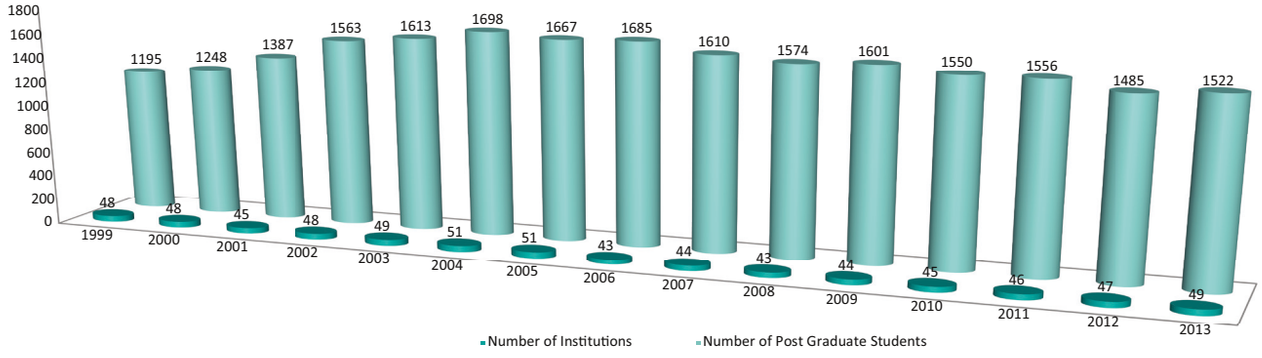


Figure 1-12: Number of Institutions (units) Providing Post Graduate Education and Number of Post Graduate Students (persons) in the Republic of Moldova

At the beginning of 2013, the number of the institutes offering post-doctoral studies was 20 (Figure 1-13). The total number of post-doctoral students was 35. Compared to 1999, in 2013 the total number of post-doctoral students grew by 2.5 times.

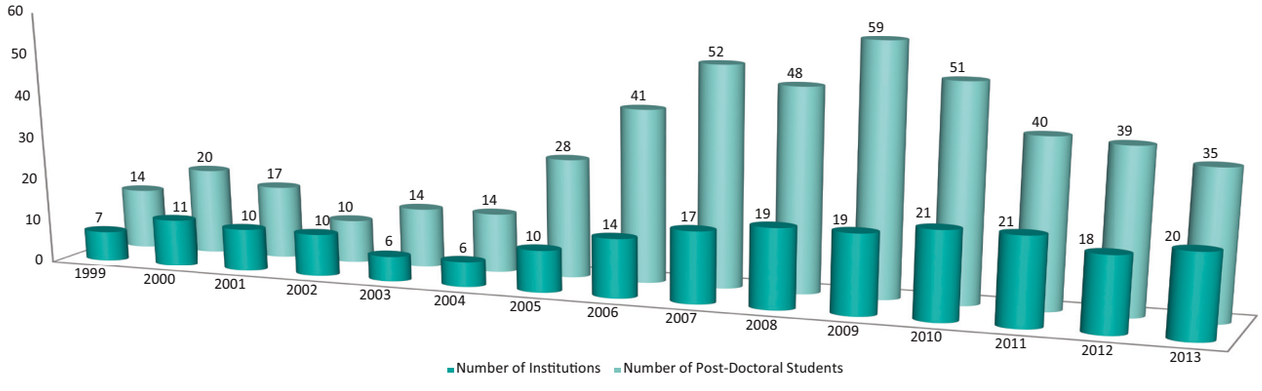


Figure 1-13: Number of Institutions (units) Providing Post-Doctoral Education and Number of Post-Doctoral Students (persons) in the Republic of Moldova

1.4. Institutional Arrangements

1.4.1. 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. Prior to the amendments to the Constitution introduced in 2000 presidential elections used to be direct. Currently the President is elected by the Parliament for the term of 4 years 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 is comprised of 16 ministries:

1. Ministry of Economy (MEC) (www.mec.gov.md)
2. Ministry of Finance (MF) (www.mf.gov.md)
3. Ministry of Justice (MJ) (www.justice.gov.md)

4. Ministry of Internal Affairs (MIA) (www.mai.gov.md)
5. Ministry of Foreign Affairs and European Integration (MFAEI) (www.mfa.gov.md)
6. Ministry of Defense (MD) (www.army.gov.md)
7. Ministry of Regional Development and Constructions (MRDC) (www.mdrc.gov.md)
8. Ministry of Agriculture and Food Industry (MAFI) (www.maia.gov.md)
9. Ministry of Transport and Road Infrastructure (MTRI) (www.mtid.gov.md)
10. Ministry of Environment (MoEN) (www.mediu.gov.md)
11. Ministry of Education (MED) (www.edu.gov.md)
12. Ministry of Culture (MC) (www.mc.gov.md)
13. Ministry of Labor, Family and Social Protection (MLFSP) (www.mmpsf.gov.md)
14. Ministry of Health (MH) (www.ms.gov.md)
15. Ministry of Information Technology and Communication (MITC) (www.mtic.gov.md)
16. Ministry of Youth and Sport (MYS) (www.mts.gov.md)

The nation's supreme legislative authority is the one-chamber Parliament. It is composed of 101 deputies (MPs) elected directly for the term of four years. The Parliament has two ordinary sessions per year; furthermore, it is possible to convene an extraordinary parliamentary session. 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.

1.4.2. Institutional Arrangements Relevant for NCs, BURs and NIRs Preparation

The Ministry of Environment (MoEN) of the Republic of Moldova is the state authority vested with the power to:

- develop and promote policies and strategies addressing environment protection, rational use of natural resources and biodiversity conservation;
- identify priorities, develop and promote national programs and action plans which address such priorities, coordinate relevant actions and monitor their implementation in the best way;
- integrate environment protection policies in the social-economic processes and corresponding parts of sector policies based on principles of sustainable development and harmonization of relevant legislation with the EU legislation;
- promote the state policy and determine the priority directions of the environmental research and development, make possible and coordinate implementation of research and development programs, promote implementation of new technologies, equipment and machinery;
- ensure international collaboration for the environment protection;
- gather, systematize and manage own information data base to support own activities, ensure maintenance and optimization of the sector information system;
- undertake regulatory and control actions to ensure ecological and biological security of the country;
- ensure state ecological expertise and exercise state control in the environment protection area, use of natural resources, implementation of forest extension programs and activities aimed at forests regeneration and exploitation, ecological reconstruction;
- manage the National Environmental Fund (NEF), coordinate the activity of local ecological funds;
- carry out integrated ecological monitoring, develop and broadcast synoptic, aeronautical, agro-meteorological and hydrological forecasts, forecast the dangerous meteorological phenomena and appropriately warn the public authorities, population and economic agents about their features and scale;
- involve mass-media, non-governmental organizations and population in implementation of environmental protection, promote educational activities with all categories of population.

On behalf of the Government of the Republic of Moldova, MoEN 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). Minister of 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 MoEN.

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 (NIRs);
  - 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.

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 Products 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 (Figure 1-14).

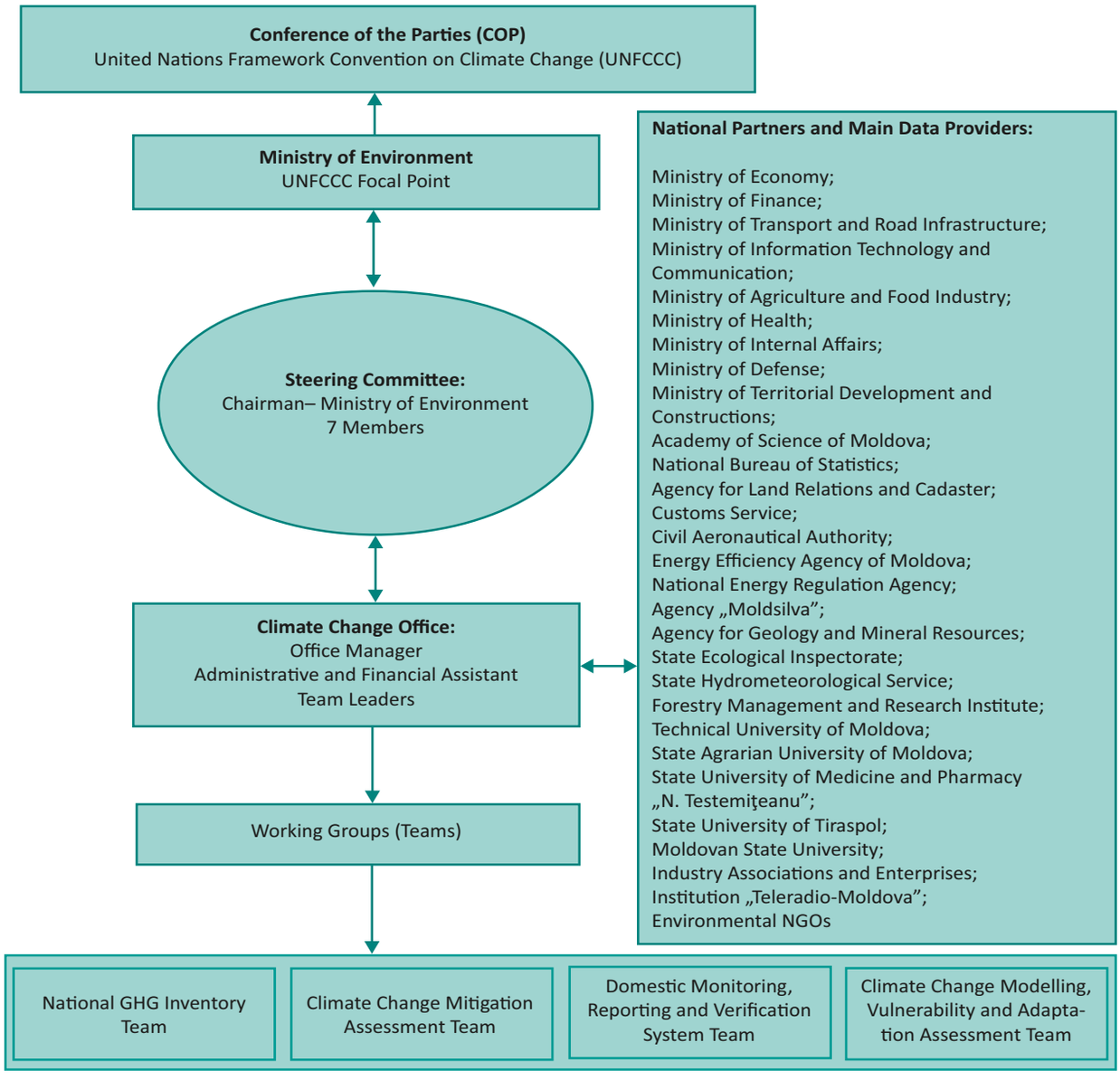


Figure 1-14: Institutional Arrangements Relevant for the Preparation of the National Communications, Biennial Update Reports and National Inventory Reports in the Republic of Moldova

The Climate Change Office comprises four working groups: National GHG Inventory Team, Climate Change Mitigation Assessment Team, Domestic Monitoring, Reporting and Verification System Team, and Climate Change Modelling and Vulnerability and Adaptation Assessment Team.

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 assessment methods, assessment at sectoral level, taking correction measures as a response to quality assurance and quality control activities as well as developing some 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.

The activity data needed for the National Communications, Biennial Update Reports and National Inventory Reports compilation are available in Annual Yearbooks, Energy Balances and others sectoral statistic publications of the National Bureau of Statistics of the Republic of Moldova.

Additional statistical data may be provided at request, in conformity with provisions of the *Law No. 412 as of 09.12.2004 on Official Statistics, Article 9 (2), item a) and b),* according to which *"the official statistics authorities must disseminate statistical data to users in the amount, manner and terms specified in the statistical works programme"*, as well as to *"to ensure access of all users to non-confidential statistics on equal conditions in terms of amount and terms of dissemination"*.

Also, based on the provisions of the *Law on Access to Information*, adopted by the Parliament Resolution No. 982-XIV as of 11.05.2000, other relevant activity data was/is collected periodically from various partner organizations and data providers, such as:

- Central Public Authorities and Subordinated Institutions:
  - Ministry of Transport and Road Infrastructure,
  - Ministry of Information Technology and Communication,
  - Ministry of Regional Development and Constructions,
  - Ministry of Agriculture and Food Industry,
  - Ministry of Internal Affairs,
  - Ministry of Economy,
  - Ministry of Health,
  - Ministry of Defense
  - National Agency for Energy Regulation,
  - Customs Service,
  - Energy Efficiency Agency,
  - Civil Aeronautical Authority,
  - Agency „Moldsilva",
  - Agency for Geology and Mineral Resources,
  - State Hidrometeorological Service,
  - State Ecological Inspectorate,
  - Offices under the Ministry of Environment (Ozone Office, Environmental Pollution Prevention Office)
- Central Administrative Authorities:
  - National Bureau of Statistics,
  - Land Relations and Cadaster Agency
- Academy of Sciences of Moldova with its institutional members:
  - Institute of Power Engineering,
  - Institute of Ecology and Geography,
  - Institute of Pedology, Agrochemistry and Soil Protection „Nicolae Dimo",
  - Institute of Scientific and Practical Animal Husbandry and Veterinary Medicine in Biotechnology
- Universities:
  - Technical University of Moldova,
  - State Agricultural University of Moldova,
  - State University of Medicine and Pharmaceutics „Nicolae Testemițeanu"
- Economic Agents:
  - S.E. „Moldavian Railways",
  - M.E. „Autosalubritate",
  - J.S.C. „Moldova-Gaz",
  - J.S.C. "Moldelectrica",
  - J.S.C."Termoelectrica" (CHP-1, CHP-2, Termocom),
  - J.S.C. Red Union Fenosa S.A. from Gas Natural Fenosa Group,
  - J.S.C. „Lafarge Ciment Moldova",
  - S.E. „Glass Factory in Chisinau",
  - M.E. „Glass Container Company" J.S.C.,
  - J.S.C. „Macon"
- Industry Associations:
  - Public Association of Refrigerating Engineers in the Republic of Moldova,
  - Union of Moldovan Sugar Producers

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 payment. 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 : (i) the request refers to a very big volume of information requiring their selection; (ii) 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 other laws contain provisions pertaining to wide public to environment protection related information. Thus, 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 NGO-s 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 of the Republic of Moldova No. 852-XV as of 14.02.2002*, stipulates the procedure of presenting by the MENR 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.

1.5. Economical Context

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 Republic of Moldova rated among the medium - low income countries in 1991, and it has turned currently to one of the lowest income country 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 Republic of Moldova's economy is closer to that of the Central Asia republics than that of the other 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 1993 the agricultural sector accounted for 31.2 per cent of GDP, and the manufacturing industry – for 39.0 per cent of GDP. By 2014, the share of GDP accounted for by the agriculture decreased to 12.8 per cent, and that of the manufacturing industry to 14.1 per cent (Table 1-10).

Nevertheless, the agriculture is still a dominating GDP driver, whereas the industrial sector is based to a considerable extent on food procession. According to the 2014 Statistical Yearbook of the RM, the manufacturing industry accounts for as little as 12.2 per cent of the total employment – as opposed to the agriculture accounting for 28.8 per cent.

Table 1-10: GDP Structure in the Republic of Moldova, 1993-2014, %

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
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	99.0	93.4	88.6	87.5	86.0	84.6	89.3	87.5	88.0	87.3	85.2
Production, total	70.2	58.6	54.3	50.6	46.2	42.5	41.9	41.7	41.1	38.3	35.9
Agriculture	31.2	27.3	29.3	27.5	26.0	25.8	24.9	25.4	22.4	21.0	18.3
Industry	39.0	31.4	25.0	23.1	20.2	16.7	17.0	16.3	18.7	17.3	17.6
Services, total	32.9	38.6	36.6	41.7	43.5	46.9	53.0	48.2	49.2	51.0	51.6
Wholesale and Retail Trade	7.9	7.8	8.0	8.3	8.2	10.3	15.3	12.5	12.0	11.0	10.7
Transports and Communications	4.4	6.3	5.1	5.6	6.5	7.4	8.2	9.5	10.4	10.0	10.8
Construction Sector	3.3	4.5	3.5	3.8	4.7	3.2	3.3	2.7	3.1	2.9	2.9
Financial Sector	4.8	5.2	3.7	6.6	6.0	7.4	8.2	5.3	4.5	4.3	4.5
Other	12.5	15.0	16.3	17.4	18.2	18.7	18.0	18.2	19.2	22.7	22.6
Agent (Intermediary) Services	-4.1	-3.9	-2.2	-4.7	-3.8	-4.8	-5.6	-2.4	-2.3	-2.1	-2.3
Product and Import Taxes, Net	1.0	6.6	11.4	12.5	14.0	15.4	10.7	12.5	12.0	12.7	14.8
	2004	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
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	85.9	84.0	83.4	83.1	82.3	84.1	83.4	83.0	83.5	83.3	84.3
Production, total	34.7	32.2	29.2	24.2	22.7	21.8	25.3	26.2	25.2	26.6	26.9
Agriculture	17.6	16.4	14.5	10.0	8.8	8.5	12.0	12.3	11.2	12.3	12.8
Industry	17.1	15.8	14.7	14.3	13.9	13.3	13.3	14.0	14.0	14.3	14.1
Services, total	53.5	53.8	56.7	61.2	61.7	63.9	60.1	59.0	60.3	58.4	59.4
Wholesale and Retail Trade	10.6	10.4	11.5	12.6	13.0	13.2	12.8	13.5	13.7	13.6	13.8
Transports and Communications	11.8	12.2	11.8	12.3	12.1	12.0	11.3	10.9	10.7	10.0	9.9
Construction Sector	3.4	3.3	4.0	4.8	5.0	3.5	3.4	3.3	3.4	3.4	3.6
Financial Sector	4.7	4.6	5.0	6.0	6.0	6.4	5.7	5.0	4.7	4.4	4.7
Other	23.0	23.2	24.5	25.4	25.7	28.9	26.9	26.2	27.7	27.0	27.4
Agent (Intermediary) Services	-2.3	-2.0	-2.5	-2.3	-2.1	-1.6	-2.1	-2.2	-2.0	-1.7	-2.0
Product and Import Taxes, Net	14.1	16.0	16.6	16.9	17.7	15.9	16.6	17.0	16.5	16.7	15.7

Source: Ministry of Economy of the Republic of Moldova, Department of Macroeconomic Analysis and Forecasts (July 2015).

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 (Tables 1-11, 1-12 and 1-13).

Table 1-11: GDP in the Republic of Moldova, 1990-2013, billion MDL (real)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
GDP, billion MDL (real)	13.00	25.90	191.90	1.82	4.74	6.48	7.80	8.92	9.12	12.32	16.02	19.05
% compared to the previous year	97.6	82.5	71.0	98.8	69.1	98.6	94.1	101.6	93.5	96.6	102.1	106.1
% compared to 1990	100.0	82.5	58.6	57.9	40.0	39.4	37.1	37.7	35.2	34.0	34.8	36.9
	2002	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
GDP, billion MDL (real)	22.56	27.62	32.03	37.65	44.75	53.43	62.92	60.43	71.89	82.35	88.23	100.51
% compared to the previous year	107.8	106.6	107.4	107.5	104.8	103.0	107.8	94.0	107.1	106.8	99.3	109.4
% compared to 1990	39.8	42.4	45.5	49.0	51.3	52.8	57.0	53.6	57.4	61.3	60.8	66.5

Source: Ministry of Economy of the Republic of Moldova, Department of Macroeconomic Analysis and Forecasts (July 2015).

Table 1-12: GDP in the Republic of Moldova, 1990-2013, billion 2010 US $

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
GDP, billion 2010 US $	9.894	8.311	5.892	5.821	4.023	3.966	3.760	3.820	3.572	3.450	3.523	3.738
% compared to the previous year	97.6	84.0	70.9	98.8	69.1	98.6	94.8	101.6	93.5	96.6	102.1	106.1
	2002	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
GDP, billion 2010 US $	4.029	4.295	4.614	4.960	5.197	5.356	5.772	5.427	5.812	6.207	6.163	6.712
% compared to the previous year	107.8	106.6	107.4	107.5	104.8	103.1	107.8	94.0	107.1	106.8	99.3	108.9

Source: Economic Research Service, US Department of Agriculture, 18/12/2014, <http://www.ers.usda.gov/data-products/international-macroeconomic-data-set.aspx#.UXFRlKJTCQo>.

Table 1-13: GDP in the Republic of Moldova, 1993-2014, billion US $ (real)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
GDP, billion US $ (real)	1.358	1.165	1.441	1.694	1.929	1.699	1.174	1.289	1.480	1.662	1.981
% compared to the previous year		85.7	123.8	117.5	113.8	88.1	69.1	109.8	114.9	112.3	119.2
GDP, billion US $ (PPP)	10.830	10.948	7.586	7.659	8.064	7.622	7.413	7.687	8.352	9.176	9.988
% compared to the previous year		101.1	69.3	101.0	105.3	94.5	97.3	103.7	108.7	109.9	108.9
GDP per capita, thousand MDL	0.493	1.287	1.798	2.167	2.440	2.498	3.379	4.402	5.246	6.227	7.646
% compared to the previous year	96.2	69.3	100.7	94.2	100.1	93.5	96.8	102.3	106.4	108.1	106.9
thousand US $	0.368	0.317	0.400	0.471	0.528	0.465	0.322	0.354	0.408	0.459	0.548
thousand US $ (PPP)	2.935	2.975	2.105	2.128	2.207	2.087	2.033	2.112	2.300	2.533	2.765
	2004	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
GDP, billion US $ (real)	2.598	2.988	3.408	4.402	6.056	5.438	5.813	7.016	7.286	7.983	7.942
% compared to the previous year	131.1	115.0	114.0	129.2	137.6	89.8	106.9	120.7	103.8	109.6	99.5
GDP, billion US $ (PPP)	7.307	8.490	9.190	9.740	10.734	10.091	10.926	11.916	15.035	16.612	17.348
% compared to the previous year	73.2	116.2	108.2	106.0	110.2	94.0	108.3	109.1	126.2	110.5	104.4
GDP per capita, thousand MDL	8.890	10.475	12.483	14.937	17.625	16.948	20.181	23.132	24.787	28.244	31.382
% compared to the previous year	107.6	107.8	105.1	103.2	108.0	94.1	107.2	106.9	99.3	109.4	104.6
thousand US $	0.721	0.831	0.951	1.231	1.696	1.525	1.632	1.971	2.047	2.243	2.235
thousand US $ (PPP)	2.028	2.362	2.563	2.723	3.007	2.856	3.101	4.179	4.224	4.668	4.883

Source: Ministry of Economy of the Republic of Moldova, Department of Macroeconomic Analysis and Forecasts (July 2015).

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.

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 and 2012, when a disastrous drought affected the RM, one of the most severe droughts in the entire instrumental record period) although it should be remembered that, according to the latest data available, in 2014 the GDP reached only 69.6 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.

1.5.2. Inflation

The inflation rate grew dramatically up to approximately 788.5 per cent in 1993 and slowed down to 7.7 per cent in 1998. The 1998 year depreciation of the Russian Rubble caused rapid growth of the inflation up to 39.3 per cent (Table 1-14).

Table 1-14: Consumer Price Index for Goods and Services in the RM, 1993-2014, %

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Inflation, average rate of consumption index increase, %	788.5	329.6	30.2	23.5	11.8	7.7	39.3	31.2	9.6	5.2	11.7
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Inflation, average rate of consumption index increase, %	12.4	11.9	12.7	12.4	12.7	0.0	7.4	7.7	4.6	4.6	5.1

Source: <http://www.indexmundi.com/moldova/inflation_rate_(consumer_prices).html>.

Later, the RM achieved a significant progress in terms of controlling its inflation rate, and the inflation rate decreased to 5.2 per cent in 2002; however, the 2003 average inflation rate for the year increased up to 11.7 per cent driven by the growing prices for agricultural products (as result of a severe drought), and the above growth pattern persisted in the subsequent years; the inflation reached 12.4 per cent in 2004, but decreased to 11.9 per cent in 2005 – only to grow up to 12.7 per cent in 2006, in particular due to the increased prices for the natural gas imported from Russian Federation, for fuel and medications. The average inflation rate for the year was about 12.4 per cent in 2007, and the nature of inflation was mainly non-monetary, because it was driven by the growing global prices for oil, increase of the government-regulated tariffs for certain services (utilities) and the growing purchasing power of the population owing to the increased salaries and old-age pensions as well as hard-currency flows to the Republic of Moldova from the Moldavians working abroad. The 2008 inflation rate remained relatively high (12.7 per cent), driven by the growing prices for public utilities, increasing food demand and the growth of the purchasing power. In 2009, the inflation rate represented about 0.006 per cent, increasing up to 7.4 per cent in 2010 and to 7.6 per cent in 2011, in particular, due to the more evident growth of food and fuel prices, and partly being influenced by developments in the foreign exchange market. Within 2012-2013 periods the inflation risk balance continued to be influenced by external and internal factors, with a slight emphasis on post-inflationary factors. The main factors that influenced the average rate of consumption index increase were oil prices on the international markets and increased food prices due to severe droughts. The main disinflation factors this year were represented by lower economic activity and weak domestic and foreign demand. In 2014, the inflation rate was 5.1 per cent, which is by 0.5 percentage points higher compared to the previous year. The price increase was generally due to higher prices for non-food goods, especially fuel, clothing, cars and shoes.

1.5.3. National Currency Exchange Rate

The national currency (MDL – Moldovan Lei) has been put into circulation in November 1993. During 1994-2014, the average MDL exchange rate for the year (in nominal terms) registered a significant depreciation against United States Dollars (USD) (Table 1-15). In 2014, the national currency exchange rate recorded 19.6 per cent depreciation in nominal terms against United States Dollars (from 13.06 MDL for 1 USD as of 01.01.2014 to 15.62 MDL as of 31.12.2014).

Table 1-15: The Average Annual Exchange Rate of the Republic of Moldova's National Currency (MDL) against United States Dollars (USD) in Nominal Terms, 1993-2014

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Exchange rate, MDL /US $	1.34	4.07	4.50	4.60	4.62	5.37	10.50	12.43	12.87	13.57	13.94
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Exchange rate, MDL /US $	12.33	12.60	13.13	12.14	10.39	11.11	12.37	11.74	12.11	12.59	14.04

Source: Ministry of Economy of the Republic of Moldova, Department of Macroeconomic Analysis and Forecasts (July 2015).

The main drivers of the above changes in the exchange rate were: inflows of currency from abroad, US dollar fluctuation on the international monetary markets, foreign trade dynamics and the interventions of the National Bank of Moldova on the exchange market. As of 31.12.2014, the National Bank of Moldova owned foreign currency provisions which totaled USD 2,156.6 billion, a decrease by 23.5 per cent compared to the level recorded at the end of 2013.

1.5.4. 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 1-16). That deficit reached 23.7 per cent of the GDP in 2000 and over 37.5 per cent of the GDP in 2014.

Table 1-16: Trade Balance Deficit of the Republic of Moldova, 1993-2014

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
GDP, billion US $	1.358	1.165	1.441	1.694	1.929	1.699	1.174	1.289	1.480	1.662	1.981
Exports (CIF), billion US $	0.483	0.565	0.746	0.795	0.874	0.632	0.463	0.471	0.565	0.644	0.790
% compared to the preceding year	102.8	117.1	131.9	106.6	109.9	72.3	73.3	101.7	119.9	113.8	122.7
Imports (FOB), billion US $	0.628	0.659	0.841	1.072	1.171	1.024	0.586	0.776	0.892	1.038	1.402
% compared to the preceding year	98.1	105.0	127.5	127.5	109.2	87.4	57.3	132.4	114.9	116.3	135.1
Trade balance deficit, billion US $	-0.145	-0.094	-0.095	-0.277	-0.297	-0.392	-0.123	-0.305	-0.327	-0.394	-0.612
Coverage of IMP with EXP, %	76.9	85.8	88.7	74.1	74.6	61.7	79.0	60.7	63.4	62.0	56.3
% of GDP: exports	26.5	48.5	51.7	46.9	45.3	37.2	39.5	36.6	38.2	38.7	39.9
imports	34.5	56.6	58.3	63.3	60.7	60.3	50.0	60.2	60.3	62.4	70.8
balance	-8.0	-8.1	-6.6	-16.4	-15.4	-23.1	-10.5	-23.7	-22.1	-23.7	-30.9

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
GDP, billion US $	2.598	2.988	3.408	4.402	6.056	5.438	5.813	7.016	7.286	7.983	7.942
Exports (CIF), billion US $	0.985	1.091	1.050	1.340	1.591	1.283	1.542	2.217	2.162	2.428	2.340
% compared to the preceding year	124.7	110.7	96.3	127.6	118.7	80.6	120.1	143.8	97.5	112.3	96.3
Imports (FOB), billion US $	1.769	2.292	2.693	3.690	4.899	3.278	3.855	5.191	5.213	5.492	5.317
% compared to the preceding year	126.1	129.6	117.5	137.0	132.8	66.9	117.6	134.7	100.4	105.4	96.8
Trade balance deficit, billion US $	-0.783	-1.201	-1.643	-2.350	-3.308	-1.995	-2.314	-2.974	-3.051	-3.064	-2.978
Coverage of IMP with EXP, %	55.7	47.6	39.0	36.3	32.5	39.1	40.0	42.7	41.5	44.2	44.0
% of GDP: exports	37.9	36.5	30.8	30.4	26.3	23.6	26.5	31.6	29.7	30.4	29.5
imports	68.1	76.7	79.0	83.8	80.9	60.3	66.3	74.0	71.6	68.8	67.0
balance	-30.2	-40.2	-48.2	-53.4	-54.6	-36.7	-39.8	-42.4	-41.9	-38.4	-37.5

Source: Ministry of Economy of the Republic of Moldova, Department of Macroeconomic Analysis and Forecasts (July 2015).

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.

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 2013, food and alcoholic drinks, textiles and textile articles accounted jointly with machinery, mechanical appliances and electrical equipment for 63.6 per cent of the total exports (Table 1-17).

Table 1-17: Structure of exports by group of goods within 2000-2013 periods in the RM, %

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Total exports, including:	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Live animals and animal products	4.8	3.2	2.4	3.6	2.0	1.6	1.5	1.0	0.6	0.7	1.7	1.7	1.7	1.5
Vegetable products	**14.0**	**13.9**	**16.5**	**11.6**	**12.2**	**12.1**	**13.0**	**12.1**	**13.2**	**20.6**	**22.1**	**21.2**	**16.7**	**20.9**
Animal or vegetable fats and oils	0.8	1.5	2.6	3.7	4.2	3.5	3.3	4.1	4.0	4.0	3.1	3.5	4.1	1.8
Food, drinks and tobacco	**42.1**	**44.5**	**41.5**	**39.8**	**35.1**	**36.3**	**26.3**	**20.5**	**19.6**	**21.9**	**20.6**	**14.9**	**18.1**	**17.6**
Mineral products	0.6	1.1	1.8	2.6	3.1	1.8	2.6	4.3	4.0	1.1	1.1	1.7	1.5	1.7
Chemical products	1.7	1.4	1.1	1.1	0.9	1.4	2.0	2.0	2.1	4.5	4.8	5.0	6.7	6.9
Plastics, rubber and articles thereof	0.4	0.5	0.4	0.7	0.8	1.1	1.5	2.5	2.4	2.1	1.7	2.8	2.8	2.6
Raw hides and skins, leather, fur skins and articles thereof	2.8	2.0	3.6	5.7	7.9	6.6	2.3	2.2	2.1	1.9	1.6	1.6	1.4	1.4
Wood and articles of wood (excluding furniture)	0.2	0.3	0.2	0.2	0.4	0.2	0.4	0.3	0.3	0.3	0.4	0.5	0.6	0.4
Paper, paper-board and articles thereof	0.4	0.6	0.8	1.3	0.8	1.1	1.8	2.0	1.0	0.6	0.8	1.1	0.9	1.1
Textiles and textile articles	**17.7**	**18.4**	**16.7**	**16.4**	**17.3**	**17.8**	**21.7**	**20.6**	**19.7**	**20.1**	**17.4**	**16.0**	**15.9**	**13.6**
Footwear, headgear, umbrellas and similar articles	0.8	0.9	1.5	1.9	2.2	2.4	2.9	3.0	3.0	2.1	2.0	2.3	1.9	1.5
Articles of stone, gypsum, cement, ceramic, glass or similar materials	3.1	2.4	2.2	2.0	1.7	1.7	3.1	3.8	3.3	2.0	2.3	2.1	1.7	2.4
Base metals and articles of base metals	2.5	0.5	1.1	2.5	3.0	4.5	7.2	8.2	7.5	2.3	3.8	5.1	3.4	5.1
Machinery and mechanical appliances, electrical equipment	**5.1**	**5.4**	**3.9**	**3.8**	**4.0**	**4.2**	**5.1**	**6.8**	**10.5**	**10.9**	**11.1**	**12.8**	**12.9**	**13.0**
Vehicles and associated transport equipment	1.1	1.3	2.1	1.4	2.3	1.4	1.6	1.4	1.0	1.2	1.4	2.1	3.0	1.9
Instruments and apparatus	0.7	1.1	1.0	0.9	0.8	0.7	1.2	1.7	1.8	0.9	0.8	1.0	1.5	1.7
Miscellaneous manufactured articles	1.1	0.7	0.7	0.8	1.1	1.6	2.6	3.3	3.8	3.0	3.4	4.4	5.0	4.9

Source: National Bureau of Statistics. Social-economic development of the Republic of Moldova in 2013. Chisinau, 2014.

The majority of the exports have as their destination the European Union member states (EU-28) –1140.9 mil. USD (by 12.5 per cent more compared to 2012), representing 47.6 per cent of the total (46.9 per cent in 2012), while de CIS countries account for 38.5 per cent of the total (in 2012 – 42.9 per cent), or 924.0 mil USD. The exports toward these countries, decreased by 0.4 per cent compared to 2012. The top 25 destination countries for RM's exports which accounted for about 90 per cent of the total exports were: Russian Federation (26.3 per cent in 2013, respectively 30.3 per cent in 2012), Romania (17.2 and 16.5 per cent), Italy (7.7 and 9.4 per cent), Ukraine (5.9 and 5.7 per cent), Turkey (5.3 and 2.6 per cent), Germany (4.7 and 3.2 per cent), United Kingdom (4.4 and 3.9 per cent), Belarus (3.8 and 3.7 per cent), Poland (3.6 and 3.4 per cent), Switzerland (2.0 and 0.2 per cent), Kazakhstan (1.2 and 2.3 per cent), France (1.5 and 1.4 per cent), Bulgaria (1.4 and 1.6 per cent), New Zeeland (1.4 and 1.2 per cent), Georgia (1.2 and 0.9 per cent), Czech Republic (1.1 and 0.8 per cent), Greece (1.1 and 0.6 per cent), USA (1.1 and 1.4 per cent), Austria (0.8 and 0.8 per cent), Netherlands (0.7 and 0.8 per cent), Hungary (0.7 and 1.3 per cent), Lithuania (0.6 and 0.7 per cent), Iraq (0.6 and 1.1 per cent), Spain (0.5 and 0.7 per cent) and Cyprus (0.4 and 0.2 per cent).

1.5.5. 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[10]. In 2014, the total net inflow of foreign currency from the Moldovans working abroad accounted for USD 2.075 billion or circa 26.1 per cent of the GDP (Table 1-18).

[10] <http://data.worldbank.org/indicator/BX.TRF.PWKR.CD.DT/countries/1W?order=wbapi_data_value_2008%20wbapi_data_value%20wbapi_data_ value-first&sort=asc&display=default>.

Table 1-18: Remittances from Moldovans Working Abroad, 1997-2014

	1997	1998	1999	2000	2001	2002	2003	2004	2005
GDP, million US $	1928.7	1699.0	1173.5	1288.8	1480.3	1662.3	1981.3	2597.9	2988.2
Remittances, million US $	114.4	124.3	111.9	178.6	243.3	323.7	486.6	705.2	915.1
% compared to the preceding year	131.2	108.7	90.0	159.7	136.2	133.1	150.3	144.9	129.8
% of the GDP	5.9	7.3	9.5	13.9	16.4	19.5	24.6	27.1	30.6
	2006	2007	2008	2009	2010	2011	2012	2013	2014
GDP, million US $	3408.1	4402.5	6056.3	5437.6	5813.0	7016.2	7285.5	7982.9	7941.7
Remittances, million US $	1175.8	1491.3	1888.0	1198.6	1351.4	1600.4	1793.3	1984.9	2074.6
% compared to the preceding year	128.5	126.8	126.6	63.5	112.7	118.4	112.1	110.7	104.5
% of the GDP	34.5	33.9	31.2	22.0	23.2	22.8	24.6	24.9	26.1

Source: World Bank, 2015.

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. It is possible that the flows of money transferred from abroad will decrease in the long term, as some of the immigrants settle for permanent residence in other countries.

1.5.6. 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 2014, the investments attracted by the national economy represented about 20.353 billion MDL, equivalent to about USD 1.450 billion (18.3 per cent of the GDP) (Table 1-19).

At the same time, in 2014, the direct net foreign investments (DFI) attracted to the national economy represented USD 353.1 million (4.4 per cent of GDP) (Table 1-20).

Table 1-19: Investments in the National Economy of the Republic of Moldova, 1993-2014

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Investments, billion MDL	0.171	0.712	0.845	0.987	1.202	1.444	1.592	1.759	2.315	2.804	3.622
Investments, billion US $	0.128	0.175	0.188	0.215	0.260	0.269	0.152	0.142	0.180	0.207	0.260
% of the GDP	9.4	15.0	13.0	12.7	13.5	15.8	12.9	11.0	12.2	12.4	13.1
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Investments, billion MDL	5.140	7.797	11.012	15.336	18.225	11.124	13.805	16.450	17.154	18.636	20.353
Investments, billion US $	0.417	0.619	0.839	1.264	1.754	1.001	1.116	1.402	1.417	1.480	1.450
% of the GDP	16.0	20.7	24.6	28.7	29.0	18.4	19.2	20.0	19.4	18.5	18.3

Source: Ministry of Economy of the Republic of Moldova, Department of Macroeconomic Analysis and Forecasts (July 2015).

Table 1-20: Direct Net Foreign Investments attracted to the National Economy within 1993-2014

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
GDP, million US $	1358.3	1164.8	1441.4	1694.3	1928.7	1699.0	1173.5	1288.8	1480.3	1662.3	1981.3
DFI, million US $	14.0	11.6	25.9	23.7	78.7	75.5	37.9	127.5	54.5	84.1	73.8
% compared to the previous year	82.4	82.6	224.0	91.6	331.7	95.9	50.2	336.6	42.8	154.1	87.7
% of the GDP	1.0	1.0	1.8	1.4	4.1	4.4	3.2	9.9	3.7	5.1	3.7
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
GDP, million US $	2597.9	2988.2	3408.1	4402.5	6056.3	5437.6	5813.0	7016.2	7285.5	7982.9	7941.7
DFI, million US $	87.7	190.7	258.7	536.0	726.6	135.2	212.0	301.4	204.87	249.04	353.1
% compared to the previous year	118.9	217.5	135.6	207.2	135.6	18.6	156.9	142.2	68.0	121.6	141.8
% of the GDP	3.4	6.4	7.6	12.2	12.0	2.5	3.6	4.3	2.8	3.1	4.4

Source: World Bank <http://data.worldbank.org/indicator/BX.KLT.DINV.CD.WD/countries/1W?display=default>.

That increase was driven in particular by the growing equity investments and income re-investments in the diverse sectors of the national economy (the investments were directed in particular to the energy industry, transports, communications and food industry). The top investor countries for the RM include: the Netherlands, Russian Federation, Spain, USA, Germany, Romania, France, UK and Turkey.

The international investment position represented at the end of 2014[11] remained net debtor and accounted 5.62 billion USD, increasing by 5.6 per cent compared to the end of the previous year: the foreign assets, representing 3.66 billion USD decreased by 9.7 per cent while the liabilities –9.28 billion USD decreased by 1.0 per cent. These changes determined the deterioration by 3.8 percentage points of the ratio between the stock of assets and foreign liabilities, from 43.2 per cent at the end of 2013, to 39.4 per cent by 31.12.2014.

As of 31.12.2014, the stock of liabilities to foreign direct investments represented 3.65 billion USD, or 39.3 per cent of the total. Relative to the GDP, the respective indices accounted for 45.9 per cent, a slow growth compared to the end of 2013 (45.4 per cent). The stock of official reserve assets amounted to 2.16 billion USD at 31.12.2014, covering 4.4 months of goods and services imports and 90.6 per cent of short term external debt. The country's gross external debt as of December 31, 2014 recorded 6.49 billion USD, decreasing by 2.7 per cent compared to the end of the previous year. Relative to the GDP, it represented 81.8 per cent, by 1.8 percentage points less

[11] <http://www.bnm.org/ro/content/conturile-internationale-ale-republicii-moldova-pentru-anul-2014-date-provizorii>.

than in 2013. Public debt as well as the publicly guaranteed debt represented 26.7 per cent of the total debt, totaling 1.73 billion USD and decreasing by 2.5 per cent over the year. Unsecured private debt amounted to 4.76 billion USD, decreasing by 2.7 per cent, of which the short term debt, more vulnerable to external risk, represents 36.6 per cent.

1.5.7. Social Sphere

In 2014, the average gross nominal salary of an employee in the national economy was 4,172 MDL, a 10.8 per cent increase compared to the previous year. The real salary (adjusted to the consumer price index) recorded an increase by 5.4 per cent compared to the same period of 2013 (Table 1-21).

Table 1-21: Average Monthly Salary and Average Monthly Old Age Pension, 1993-2014

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Nominal salary, MDL	31.2	108.4	143.2	187.1	219.8	250.4	304.6	407.9	543.7	691.5	890.8
Nominal salary growth, %	897.3	347.4	132.1	130.7	117.5	113.9	121.6	133.9	133.3	127.2	128.8
Real salary growth, %	69.9	59.2	101.6	105.4	104.9	105.5	87.3	102.1	121.6	120.9	115.4
Nominal salary, US $	23.3	26.7	31.9	40.7	47.5	46.6	29.0	32.8	42.2	51.0	63.9
Real salary growth, %		114.5	119.5	127.6	116.9	98.1	62.2	113.1	128.7	120.6	125.4
Nominal salary, US $ (CPI)	185.6	250.5	167.7	183.8	198.8	209.2	183.3	195.7	238.4	281.3	322.1
Real salary growth (%)		135.0	66.9	109.6	108.2	105.3	87.6	106.8	121.8	118.0	114.5
Old age pension, MDL	18.8	55.2	64.3	78.7	82.8	83.9	82.8	85.1	135.8	161.0	210.5
Old age pension, US $	14.0	12.9	14.3	16.7	17.6	10.1	7.1	6.9	10.4	11.6	15.9
	2004	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Nominal salary, MDL	1103.1	1318.7	1697.1	2065.0	2529.7	2748.4	2972.2	3193.9	3477.7	3765.1	4172.0
Nominal salary growth, %	123.8	119.5	128.7	121.7	122.5	108.6	108.1	111.6	108.9	108.3	110.8
Real salary growth, %	110.2	106.8	114.2	108.4	108.7	108.6	100.7	103.8	104.1	103.5	105.4
Nominal salary, US $	89.5	104.7	129.2	170.2	243.5	247.3	240.3	272.1	287.2	299.0	297.2
Real salary growth, %	140.0	117.0	123.5	131.7	143.1	101.6	97.2	113.2	105.5	104.1	99.4
Nominal salary, US $ (CPI)	251.7	297.4	348.4	376.4	431.6	463.2	456.7	577.0	592.7	622.3	649.1
Real salary growth (%)	78.1	118.2	117.2	108.0	114.7	107.3	98.6	126.3	102.7	105.0	104.3
Old age pension, MDL	325.3	383.4	442.3	548.3	646.4	775.5	810.9	874.1	957.6	1020.7	1087.6
Old age pension, US $	26.1	30.4	33.7	45.2	62.2	69.8	65.6	74.5	79.1	81.1	77.5

Source: Ministry of Economy of the Republic of Moldova, Department of Macroeconomic Analysis and Forecasts (July 2015).

In December 2014, the average monthly salary was 4,865.4 MDL, a 13.7 per cent increase compared to December 2013 and by 11.7 per cent higher than in November 2014. The real salary index for December 2014 represented 108.6 per cent compared to the same period of the previous year. In the public sector, in December 2014, the average monthly salary was 4,000.4 MDL (+14.4 per cent compared to December 2013), in the economic (real) sector – 5,233.5 MDL (+13.7 per cent compared to December 2013). The following national economy sectors have salaries below the national average: wholesale and retail; maintaining, repairing of cars, motorcycles – 3,903.8 MDL; education – 3,578.2 MDL; agriculture, forestry and fishing – 3,424.0 MDL; administrative and support services – 3,435.3 MDL; recreation, culture and sports – 3,022.5 MDL; accommodation and food service activities – 2,939.7 MDL.

As of January 1, 2015, the average monthly old-age pension was 1,087.6 MDL, increasing by 6.6 per cent compared to its level as of January 1, 2014. 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, 2015 represented 669.9 thousand people, with 10.3 thousand more compared to January 1, 2014. The 2014 unemployment, estimated according to the standards of the International Labor Organization (ILO), was 47.5 thousand (Table 1-22).

Table 1-22: Economically Active Population, Number of Unemployed and Unemployment Rate in the Republic of Moldova, 2002-2014

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Economically active population, thousand people	1615.0	1473.6	1432.5	1422.3	1357.2	1313.9	1302.8	1265.3	1235.4	1257.5	1214.5	1235.8	1232.4
Employees, thousand people	1505.1	1356.5	1316.0	1318.7	1257.3	1247.2	1251.0	1184.4	1143.4	1173.5	1146.8	1172.8	1184.9
Number of unemployed, thousand people	109.8	117.1	116.5	103.7	99.9	66.7	51.7	81.0	92.0	84.0	67.7	63.1	47.5
Males	64.4	69.9	70.1	59.8	61.7	41.5	30.0	50.8	57.3	49.6	42.2	38.0	28.9
Females	45.4	47.2	46.4	43.9	38.2	25.2	21.8	30.2	34.7	34.4	25.6	25.1	18.6
Urban	81.5	80.7	77.2	72.5	56.8	40.7	32.7	47.5	57.4	50.0	43.6	36.8	29.4
Rural	28.3	36.4	39.3	31.2	43.1	25.9	19.1	33.5	34.6	34.1	24.2	26.3	18.1
Unemployment rate, %	6.8	7.9	8.1	7.3	7.4	5.1	4.0	6.4	7.4	6.7	5.6	5.1	3.9
Males	4.0	4.7	4.9	4.2	4.5	3.2	2.3	4.0	4.6	3.9	3.5	3.1	2.3
Females	2.8	3.2	3.2	3.1	2.8	1.9	1.7	2.4	2.8	2.7	2.1	2.0	1.5
Urban	5.0	5.5	5.4	5.1	4.2	3.1	2.5	3.8	4.6	4.0	3.6	3.0	2.4
Rural	1.8	2.5	2.7	2.2	3.2	2.0	1.5	2.6	2.8	2.7	2.0	2.1	1.5

Source: Statistical Data Bank of the National Bureau of Statistics: <http://statbank.statistica.md/pxweb/Database/RO/03%20MUN/MUN01/MUN01.asp>, <http://statbank.statistica.md/pxweb/Database/RO/03%20MUN/MUN06/MUN06.asp>.

The unemployment rate (unemployed persons as a percentage of the total economically active population) recorded at the country level represents 3.9 per cent (2.3 per cent for males and 1.5 per cent for females). There still are significant differences between the unemployment rate in urban areas (2.4 per cent) and the rural areas (1.5 per cent).

According to data provided by the National Employment Agency, as of January 1, 2015, 20.7 thousand registered unemployed were looking for a job, while the business units dismissed every 13th. Of the total number of unemployed, 52 per cent are females. Over 9 per cent of the registered unemployed receive unemployment allowance. In December 2014, the average unemployment allowance represented 1,134.8 MDL. On average, the rate was 4 unemployed persons per one job.

1.6. Current State of National Economy

1.6.1. Industrial Production

The 2014 industrial production reached approximately 43.548 billion MDL (in current prices). Compared to the 2013 level, the industrial production level index increased by 7.3 per cent (under comparable conditions).

Table 1-23: Evolution of Industry Sector in the Republic of Moldova, 1990-2013

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Industry, billion MDL	11.500	22.200	129.800	1.186	3.747	4.265	4.690	5.889	5.982	7.191	8.168	10.428
% compared to 1990	100.0	88.9	64.9	64.9	46.9	45.0	42.1	42.1	35.8	31.6	34.1	38.7
Industry, billion US $				0.885	0.921	0.949	1.019	1.274	1.114	0.685	0.657	0.810
	2002	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Industry, billion MDL	12.624	15.963	17.591	20.770	22.371	26.174	29.988	22.644	28.140	34.194	36.362	39.024
% compared to 1990	42.9	49.6	53.7	57.3	54.5	53.8	54.6	43.1	47.1	51.6	50.6	54.0
Industry, billion US $	0.930	1.145	1.427	1.648	1.704	2.157	2.886	2.038	2.276	2.913	3.003	3.099

Source: Ministry of Economy of the Republic of Moldova, Department of Macroeconomic Analysis and Forecasts (July 2015).

During 1990-2013, the industrial sector featured certain fluctuations, showing the best performance in 2001 and 2003 and the worst performance in 1992, 1994, 1998, 1999 and 2009 (Figure 1-15).

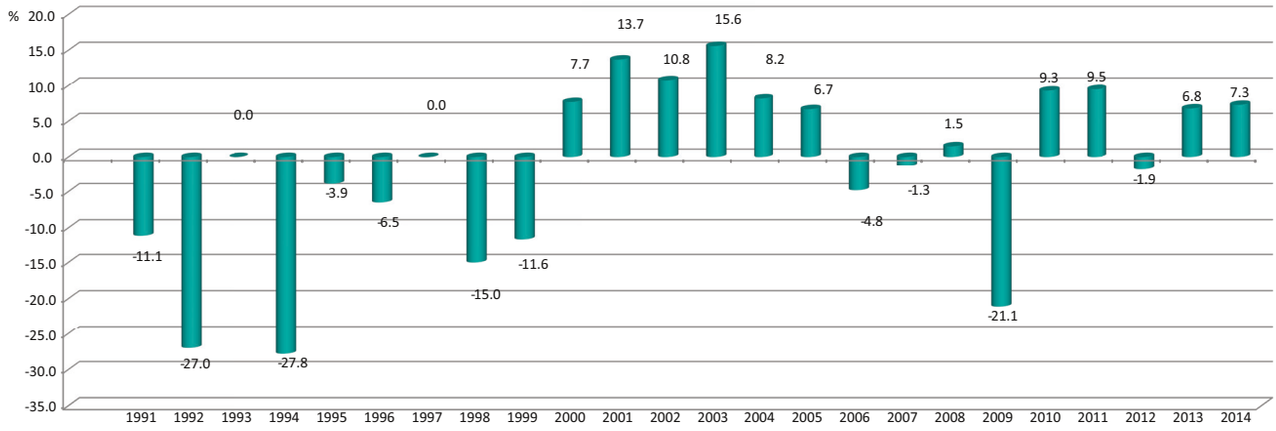


Figure 1-15: Evolution of Industry Sector in the Republic of Moldova within 1991-2014 periods, in % compared to the previous year

Processing Industry. The situation in the Industry Sector was determined mainly by the processing industry which accounted in 2014 for 83.5 per cent of the total production of the large enterprises whose main business was manufacturing. The production of those enterprises increased by 8.5 per cent compared to 2013. Food and drinks industry accounted for the highest share in the processing industry performance (Table 1-24).

Table 1-24: Production of Main Industrial Products by RM's Manufacturing Industry, 2005-2014

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Meat, kt	5.9	9.0	14.3	12.1	15.3	23.7	27.8	31.0	34.5	43.1
poultry, kt	2.3	4.8	5.8	7.6	10.4	12.5	14.0	16.7	21.3	26.6
Sausages, kt	14.2	14.6	17.0	18.9	14.1	13.2	14.5	15.9	17.2	16.3
Canned meat, kt	0.6	1.0	1.1	1.3	1.0	1.5	1.3	1.5	0.9	0.7
Fruit and vegetable juices, kt	25625	27721	47995	32196	23215	27115	29715	46055	49059	49075
Unconcentrated juices	7171	18398	26921	16959	11467	17461	16828	21099	22826	21483
concentrated juices	14642	9324	21074	15237	11747	9654	12887	24956	26234	27592
Canned fruits and vegetables, kt	33.0	44.4	22.7	41.9	26.5	29.9	26.3	24.3	25.1	30.4
..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
Crude oil, kt	83.2	81.2	84.7	79.2	83.7	80.7	89.7	93.5	53.9	109.6
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
Solid milk and cream, t	4565	3806	2676	2693	1821	1217	625	536	439	1042
Butter, tons	3393	3321	3387	4338	3819	4199	3878	3764	4159	4673
Fat cheese and young sheep cheese, t	2380	2008	2035	2519	1309	1779	2087	2113	2435	2427
Curd, curd cream, yogurt, kefir, sour cream and other fermented products, t	21032	21378	23851	23934	24464	25615	27314	29144	30216	31542
Ice-cream and other ice-forms with or without cocoa, t	12225	13258	12646	11477	10671	12491	12375	14064	15160	15633
Flour, kt	144	134	113	123	116	108	118	102	118	118
Cereals, kt	3.0	4.3	4.7	6.4	7.2	5.6	4.8	3.6	4.4	4.7
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
Bread and bakery foods, kt	108	112	123	138	131	129	130	129	133	128

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
..Fresh bread	106	109	119	134	127	124	126	125	127	122
..Other bakery products	2.7	3.5	3.4	3.8	3.9	4.8	4.2	4.5	5.7	6.1
Flour confectionary, kt	19.8	20.8	21.4	22.0	22.9	26.9	28.3	30.6	33.9	34.0
Sugar, kt	133.5	149.0	74.0	134.0	38.4	103.2	88.4	83.4	140.3	177.7
Molasses, kt	42.2	42.3	24.9	34.5	23.3	36.2	35.8	31.7	53.1	61.1
Sugar confectionery, kt	12.3	12.2	13.2	13.8	12.6	12.9	13.0	12.3	13.4	13.7
Macaroni, kt	7.8	7.2	6.9	5.7	6.1	6.3	6.5	5.6	6.3	5.6
Mayonnaise and other emulsified sauces, tons	2578	2141	1768	1066	827	540	466	476	486	549
Cognac (Divine), thousand dal	4781	2245	2022	2815	1785	1766	2395	3084	3451	2762
Vodka, thousand dal	4906	2625	2020	1418	1059	1290	1967	2601	3380	3264
Brandy and liqueurs, thousand dal	8133	6214	4627	3099	2433	2662	2719	3025	3896	3673
Sparkling wine, thousand dal	1051	402	541	572	500	556	686	654	596	514
Natural grape wine, mill. dal	36.3	19.3	12.3	15.4	12.5	12.7	12.5	14.1	15.3	13.9
Porto, Madeira, Sheary, Tokay wine and other, thou dal	3238	1337	753	922	693	1051	1112	528	651	348
Mineral and carbonated waters, mill. dal	9.6	10.6	12.9	12.3	11.1	11.6	10.8	10.7	9.5	10.8
Soft beverages, mill. dal	6.4	7.5	9.4	7.7	6.0	6.5	7.2	7.2	6.4	6.4
Fermented tobacco, kt	8.2	5.2	4.3	6.3	4.9	7.3	6.8	5.7	3.5	2.6
Fabrics, thousand m^2	116	107	201	174	111	55	20	10	13	-
Hosiery, thousand pairs	1082	1518	1428	1558	1463	1288	1470	1607	1056	1573
Knitwear, mln. pcs	17.0	16.5	16.9	19.3	17.6	20.2	17.2	18.6	18.2	16.9
Clothing for work, thousand pcs	3848	4528	5660	5581	4034	6191	6554	4791	3971	3684
Overcoats, raincoats, capes, cloaks, anoraks, thou pcs	938	860	939	791	776	650	616	524	694	758
Suits and assemblies, thousand pcs	344	215	435	270	127	98	136	102	95	81
Coats, jackets and blazers, thousand pcs	514	709	509	601	565	458	503	579	534	698
Trousers, shorts and overalls, thousand pcs	2452	2841	2258	1651	1530	1776	1613	1286	1188	1294
Dresses and sarafans, thousand pcs	121	343	671	1013	735	799	1034	1898	1372	1182
Skirts and divided skirts, thousand pcs	733	636	526	367	377	250	336	379	1307	635
Blouses and shirts for women and girls, thou pcs	1984	2549	1824	1939	1920	1916	1835	3310	2451	2060
Coffers, suitcases, trunks and similar containers of any material, thousand pcs	317	312	279	340	138	129	137	135	107	110
Bags for women of any material, thousand pcs	99	80	101	155	117	95	131	107	134	169
Footwear, thousand pairs	3650	3673	3796	3832	2221	2717	2849	3053	2942	2866
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
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
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
Paper and corrugated paper-board, mill 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
Printing services for newspapers and periodicals, appearing at least four times/week, mill. copies	57.4	63.4	66.3	57.8	37.6	33.0	30.6	28.7	-	-
Printing services for newspapers and periodicals, appearing at least four times/week, t	-	-	-	-	-	-	-	-	501.7	867.8
Copybooks, t	558	553	750	596	423	723	709	981	727	899
Oxygen, thousand m^3	1454	1496	1460	1417	1141	1789	1997	663	540	590
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
Soap, t	317	526	562	399	380	538	523	570	637	787
Washing and cleaning products, t	533	769	1034	451	482	618	727	798	1892	1416
Natural essential oil, t	62.5	66.9	41.5	72.4	46.0	67.9	50.9	13.1	50.3	47.2
Plastic tubes and pipes, t	714	2339	2135	1553	1578	1679	2048	2156	1989	2325
Boxes, cases, crates and similar plastic products, t	945	1219	668	555	470	298	160	193	214	182
Multiple-walled insulating glass, thousand m2	31	85	80	247	186	340	352	390	450	532
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
Glass Bottles and vials, mill. pcs	354.6	321.4	302.7	284.7	201.3	246.2	326.3	223.1	272.5	243.7
Ceramic building bricks for construction, thousand m^3	114	109	118	108	80	77	85	59	74	74
Dry gypsum mixtures, kt	132	188	331	380	136	142	159	188	162	172
Prefabricated structural components from cement, concrete or artificial stone for constructions, kt	231	233	224	223	177	202	184	221	207	241
Grey iron castings, tons	2214	1914	1878	1294	784	875	1009	953	898	902
Steel castings, tons	173.3	222.2	124.6	108.5	30.6	59.1	73.3	77.1	85.3	46.4
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
Doors, windows and their frames, thresholds, windowsills from ferrous metal, pcs.	1718	2525	4168	3967	3463	3110	4943	3687	4047	5414
Doors, windows and their frames, thresholds, windowsills from aluminium, pcs.	36806	29758	21382	31926	53675	64636	62709	61126	35382	41309

Source: National Bureau of Statistics, <http://statbank.statistica.md/pxweb/Dialog/varval.asp?ma=IND0301&ti=Productia+principalelor+produse+industriale%3A+2005-2014&path=../Database/RO/14%20IND/IND03/&lang=1>.

Food and drinks industry reported an increase of production by 12.3 per cent, in particular in the following sectors: vegetable and animal oils and fats production – by 2.1 times; meat and meat products production, processing and canning – by 21.6 per cent; soft beverages, mineral and carbonated waters production – by 11.2 per cent; cocoa, chocolate and sugar confectionary manufacture – by 6.6 per cent; dairy products – by 5.9 per cent and others.

The increase in overall industrial production was driven by increases in other manufacturing sectors such as: machinery and electrical equipment – by 54.3 per cent; chemical industry – by 42.4 per cent; textiles – by 20.4 per cent; wood and wood products processing excluding furniture; articles of straw and planting materials manufacture – by 20.3 per cent; metal industry – by 14.3 per cent; clothing manufacturing – 10.3 per cent; furniture manufacture – by 7.4 per cent; footwear manufacturing – by 6.3 per cent etc.

At the same time, a decreasing trend was registered in some other processing sectors, such as: manufacture of tobacco products – by 39.6 per cent; wine production from grapes – by 14.8 per cent; manufacture of basic pharmaceutical products – by 8.2 per cent; manufacture of macaroni, noodles and similar flour products – by 6.4 per cent; manufacture of mill products, starches and starch products – by 5.4 per cent; fish, crustaceans and mollusks processing and canning – by 3.2 per cent; machinery and equipment – by 2.8 per cent; computer, electronic and optical products manufacture – by 1.8 per cent; bread and fresh confectionary manufacturing – by 1.3 per cent etc.

Energy Industry. In 2014, the energy sector enterprises accounted for circa 14.7 per cent of the total production of the large enterprises where industrial manufacture was the main business. These enterprises generated the sales of circa 5.42 billion MDL (in current prices), decreasing by 1.2 per cent compared to 2013. At the same time, in 2014, an increase by 4.4 per cent was recorded including in such sectors as: electricity generation, transport and distribution – by 4.5 per cent; steam and air conditioning supply – by 4.2 per cent.

Brief Description of the Energy System of the Republic of Moldova

(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 2007-2013) of the electricity consumption of the country is covered by MTPP and imports from Ukraine.

It should be noted, however that between 1990-2013 electricity generation registered a decrease of 71.4 per cent in terms of physical volumes, while electricity consumption decreased by 50.0 per cent (Table 1-25).

Table 1-25: Electricity Generation and Consumption within the National Economy within 1990-2013, billion kWh

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Generation	15.690	13.154	11.248	10.376	8.308	6.168	6.240	5.375	4.841	4.110	3.624	4.912
Consumption	11.426	10.839	10.022	8.569	4.350	7.022	6.686	6.133	5.351	4.715	4.510	4.705
	2002	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Generation	4.408	4.062	4.179	4.225	2.867	3.869	4.026	6.195	6.115	5.785	5.801	4.491
Consumption	5.309	6.452	6.025	5.838	5.485	5.684	5.732	5.302	5.257	5.334	5.468	5.710

Source: Statistical Yearbooks of the RM for1994 (page 272), 1999 (page 311), 2003 (page 400), 2006 (page. 319), 2009 (page 313), 2012 (page 317); 2014 (page 311); 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).

The power transmission system operator Moldelectrica SE manages the internal transport network on the right bank of the Dniester River, including 5,977.5 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 one 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., 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".

Public 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 TPP 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 71.5 per cent between 1990 and 2014 at MTPP (Table 1-26).

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.

Table 1-26: Electricity Generation at MTPP, 1990-2014, billion kWh

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
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
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	%
Electricity Generation	2.793	2.891	2.701	1.347	2.482	2.622	4.862	4.723	4.494	4.615	3.031	3.868	-71.5

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).

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 2014, 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 40-60 per cent was exported to the right bank of Dniester River and the southern regions of Ukraine (Table 1-27).

Table 1-27: Electricity Generation in ATULBD, 1995-2014

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
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
MTPP Dnestrovsk, bil. kWh	4.747	4.560	3.629	3.296	2.687	2.463	3.366	2.942	2.793	2.891
HPP Dubasari, bil. kWh	0.240	0.280	0.295	0.297	0.286	0.257	0.283	0.286	0.223	0.266
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
Electricity Consumption in ATULBD, bill. kWh	2.878	2.589	2.364	1.929	2.098	2.031	2.183	1.899	2.112	2.124
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
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Electricity Generation, bill. kWh, including at:	2.996	1.675	2.769	2.929	5.164	5.051	4.770	4.869	3.586	4.387
MTPP Dnestrovsk, bil. kWh	2.701	1.347	2.482	2.622	4.862	4.723	4.494	4.615	3.031	3.868
HPP Dubasari, bil. kWh	0.295	0.296	0.275	0.307	0.303	0.328	0.276	0.235	0.265	0.258
Electricity Imports in ATULBD, bill. kWh	0.659	0.276	0.000	0.000	0.002	0.002	0.002	0.002	0.002	0.002
Electricity Consumption in ATULBD, bill. kWh	2.108	1.899	2.134	2.151	1.815	1.670	1.763	1.832	1.644	1.808
Electricity Exports from ATULBD, bill. kWh	1.547	0.052	0.636	0.793	3.358	3.391	3.023	3.054	1.962	2.611

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).

At the beginning of 2007, MTPP exported electricity to Belarus and the Russian Federation, but as a consequence of the increased fees adopted by Ukraine for electricity transit on its territory, the export of electricity was reoriented to Romania. Exports of energy take place through interconnection power transmission lines of 110 kW and 400 kW: MTPP (ATULBD) - Vulcanesti (RM) and Vulcanesti (RM) – Isaccea (Romania). The long-term strategy of the Russian company *Inter RAO EES* 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.

Public 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. Unlike the overall territory of the country, the right bank of Dniester River is deficient in terms of installed capacity for electricity generation. 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% and CHP-North in Balti, with a share of about 7%. 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 0.955 billion kWh in 2014 (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, 1990-2014, billion kWh

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Electricity Generation	1.901	1.655	1.581	1.442	1.240	1.181	1.400	1.451	1.248	1.137	0.904	1.263	1.180
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	%
Electricity Generation	1.046	1.022	1.229	1.192	1.100	1.097	1.031	1.064	1.016	0.932	0.905	0.955	-49.8

Source: NBS, Statistical Yearbooks for 1994 (page 272), 1999 (page 311), 2003 (page 400), 2006 (page 319), 2009 (page 313), 2012 (page 317), 2014 (page 311).

Public Heat Generation

There are several 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 1990-2013, the total amount of heat produced in the Republic of Moldova decreased by circa 80.6 per cent, from 22.212 million Gcal in 1990, to 4.307 million Gcal in 2013 (Table 1-29).

Table 1-29: Heat Generation in the Republic of Moldova, including ATULBD, 1990-2013, million Gcal

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Heat Generation	22.212	16.896	12.423	10.208	7.507	7.278	7.665	7.126	7.371	5.650	3.846	4.375
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Heat Generation	4.417	4.605	4.347	4.830	5.043	4.508	4.683	4.075	4.487	4.376	4.239	4.307

Source: Energy Balances of the Republic of Moldova for 1990-2013; 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).

Table 1-30 provides data regarding heat generation on the right bank of Dniester. As can be noted, about 61.7 per cent of the total heat generated was produced by combined heat and power plants (CHP), while 38.1 per cent was produced by heat plants (HP). For the right bank of the Dniester River it is characteristic a decreasing tendency of heat generation – during 1997-2013, the decrease represented about 59.3 per cent (from 6.590 million Gcal in 1997, to 2.681 million Gcal in 2013), while for the left bank of the Dniester River it was revealed a reversed tendency, compared to the production level recorded in 1997 (0.536 million Gcal), in 2013 it was produced by 3 times more heat (1.626 million Gcal).

Table 1-30: Heat Generation in the RM, 1990-2013, since 1993 only for the Right Bank of Dniester River, million Gcal

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

Source: Energy Balances of the Republic of Moldova, 1990-2013.

Mining and Quarrying. In 2014, the extractive industry enterprises accounted for about 1.8 per cent of the total production of large enterprises whose main business is manufacturing. These enterprises generated the sales of circa 658.3 million MDL (in current prices), by 11.8 per cent less than in 2013, while the production exceeded by 0.2 per cent the level recorded in 2013 year.

Table 1-31: Production of Main Industrial Products by the RM's Mining and Quarrying Industry, 2005-2014

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Calcareous stones for carving or construction, alabaster, kt	475	513	568	523	399	346	350	316	287	317
Other stones for carving or construction, exclusively granites or sandstones, kt	250	282	255	254	243	204	316	442	648	674
Sand, kt	1052	941	1483	1511	1071	1211	1287	1373	1522	1660
Pebbles, Gravel, Boulders and Silex, kt	1370	1785	1815	2055	1349	1640	2156	2014	2493	2871
Sand-gravel mixture, kt	152	286	273	206	144	258	656	876	1290	1412

Source: National Bureau of Statistics,<http://statbank.statistica.md/pxweb/Dialog/varval.asp?ma=IND0301&ti=Productia+principalelor+produse+industriale%3A+2005-2014&path=../Database/RO/14%20IND/IND03/&lang=1>.

1.6.2. Agricultural Production

In 2014, the agriculture production accounted circa 27.071 billion MDL (in current prices), an increase by 8.2 per cent compared to the previous year (in similar conditions). The respective trend was driven by a 10.4 per cent increase in vegetable production and a 4.0 per cent increase in animal production.

Between 1991 and 2014, the agricultural production was characterized by fluctuations, with the best performance reported in 1993, 1997, 2004 and 2008, and with poor results – respectively in 1992, 1994, 1996, 1998, 2003, 2007 and 2012 (Table 1-32, Figure 1-16).

Table 1-32: RM's Agricultural Production, 1990-2013

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Agriculture, billion MDL	6.100	11.300	97.300	1.067	3.212	4.243	4.639	5.100	4.775	6.396	8.268	8.646
% compared to 1990	100.0	88.9	76.0	83.9	63.3	64.5	56.8	63.3	55.9	51.2	49.5	52.7
Agriculture, billion USD				0.796	0.790	0.944	1.008	1.103	0.889	0.609	0.665	0.672
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Agriculture, billion MDL	9.474	10.354	11.819	12.688	13.734	12.825	16.503	13.300	19.873	22.619	19.922	23.814
% compared to 1990	54.5	47.1	56.9	57.3	56.7	43.6	57.6	52.1	56.2	59.0	45.9	63.8
Agriculture, billion USD	0.698	0.743	0.959	1.007	1.046	1.057	1.588	1.197	1.607	1.927	1.645	1.891

Source: Ministry of Economy of the Republic of Moldova, Department of Macroeconomic Analysis and Forecasts (July 2015).

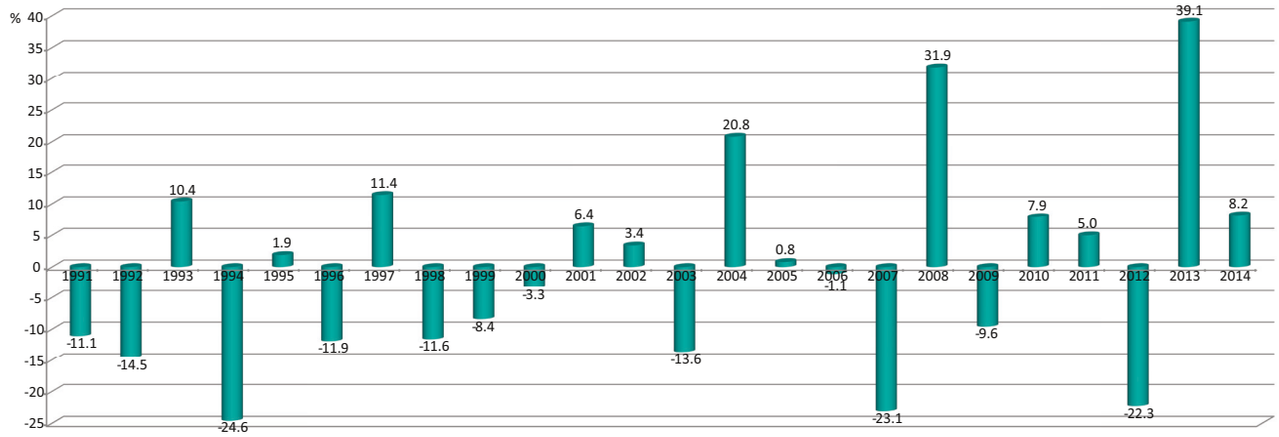


Figure 1-16: Dynamics of Agricultural Production, 1991-2014, % compared to the preceding year

As the analysis on the influence of production types on the rhythm of crop yields indicated, in 2014, compared to the previous year, a more significant positive influence was determined by the increasing productivity of: cereals and leguminous crops (by 8.9 per cent), livestock (by 7.3 per cent), soybeans (by 70.2 per cent), fruits, berries and walnuts (by 17.2 per cent), sun flower (by 10.1 per cent), vegetables (by 10.2 per cent), grain rapeseed (by 59.4 per cent), potatoes (by 11.8 per cent), sugar beet (by 14.7 per cent). This trend determined an increasing global agricultural production respectively by 2.2 per cent, 1.3 per cent, 1.0 per cent, 0.9 per cent, 0.8 per cent, 0.7 per cent, 0.5 per cent, 0.5 per cent and by 0.4 per cent.

In 2014, the share of crop yields within the total agricultural production represented 67 per cent (in 2013 – 66 per cent), of which: cereals and leguminous crops – 25.2 per cent (25.1 per cent), industrial crops – 14.4 per cent (12.9 per cent), potatoes – 4.3 per cent (4.2 per cent), vegetables – 7.0 per cent (6.9 per cent), fruits, berries and walnuts – 6.4 per cent (6.0 per cent), grapes – 6.8 per cent (7.6 per cent). The animal production accounted for 33 per cent (in 2013 – 34 per cent), of which livestock and poultry – 18.4 per cent (18.6 per cent), milk – 9.7 per cent (10.6 per cent), eggs – 3.1 per cent (3.3 per cent).

To be noted that between 1990 and 2013, the gross harvest of some agricultural crops significantly decreased in the Republic of Moldova, including: winter and spring wheat – by 10.6 per cent, winter and spring barley – by 43.5 per cent, leguminous crops – by 75.3 per cent, sugar beet – by 57.5 per cent, tobacco – by 96.7 per cent, leguminous crops – by 73.1 per cent, forage roots – by 98.1 per cent, maize for silo and green fodder – by 96.3 per cent, fruits, berries and walnuts – by 52.2 per cent, grapes – by 32.3 per cent. At the same time, in several sectors the production increased, including: grain maize – by 72.8 per cent, sun flower – by 134.8 per cent, soybeans – by 183.8 per cent and melons & gourds – by 61.9 per cent (Table 1-33). However, these positive results are due, in particular, to the expansion of sown areas and less to the crop yields increase (Table 1-34).

Table 1-33: Gross Harvest of Agricultural Crops, 1990-2013, kt

	1990	1991	1992	1993	1994	1995	1996	1997
Cereals and leguminous crops	**2538.6**	**3105.9**	**2099.8**	**3340.2**	**1753.8**	**2638.6**	**1981.2**	**3512.3**
...Wheat (Winter and Spring)	1129.0	1056.5	925.8	1392.6	658.8	1126.4	673.7	1152.6
...Winter rye	1.9	1.6	1.4	2.8	2.7	5.9	9.9	10.9
...Barley (Winter and Spring)	417.9	427.0	405.0	481.0	324.9	311.3	136.7	256.9
...Oat	3.8	5.0	6.8	10.7	7.1	9.8	4.2	10.3
...Millet	0.1	0.1	0.0	0.1	0.1	0.3	0.2	0.5
...Buckwheat	1.8	5.0	2.3	5.5	3.5	2.2	3.0	4.8
...Leguminous crops	97.1	105.7	121.8	121.6	70.2	55.5	31.6	63.2
...Grain maize	885.5	1501.2	635.6	1324.5	629.3	948.6	1006.6	1788.0
...Grain sorghum	1.2	3.1	1.1	1.4	1.1	0.8	0.1	0.5
...Other cereal crops	0.3	0.7	0.0	0.0	56.1	0.3	0.2	0.0
Industrial crops								
...Sugar beet	2374.5	1988.6	1783.4	2048.3	1526.7	1877.9	1682.1	1674.8
...Sun flower	252.2	151.4	176.2	173.7	149.2	208.1	284.0	174.3
...Soybeans	23.8	33.4	7.9	9.3	4.0	3.1	2.5	2.7
...Tobacco	66.2	62.8	42.4	50.2	41.5	39.7	51.3	168.8
...Grain rapeseed	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Potatoes, vegetables and melons & gourds								
...Potatoes	295.3	290.6	310.8	726.0	474.7	385.3	344.3	392.6
...Vegetables	1177.3	989.2	787.5	777.2	598.5	529.3	362.4	393.6
...Melons and gourds	34.4	35.6	9.3	18.6	12.6	21.6	23.3	30.4
Forage crops								
...Forage roots	1171.8	1416.4	922.5	988.6	547.0	545.6	336.5	310.2
...Maize for silo and green fodder	4509.0	4979.1	3025.9	3358.7	2285.7	1766.0	1212.0	1065.0
...Perennial grasses for green fodder, silage and fodder	4456.1	6053.5	3401.4	3514.6	2013.8	1704.7	1027.2	855.6
...Annual grasses for green fodder	288.9	420.7	339.0	339.1	190.7	222.3	143.4	96.7

	1998	1999	2000	2001	2002	2003	2004	2005
Cereals and leguminous crops	**2751.9**	**2375.0**	**2070.2**	**2823.6**	**2791.2**	**1654.4**	**3178.0**	**2954.3**
...Wheat (Winter and Spring)	951.9	797.8	725.0	1180.8	1113.1	102.4	861.2	1047.7
...Winter rye	7.0	6.3	5.0	9.1	5.9	0.8	5.1	3.6
...Barley (Winter and Spring)	242.2	203.1	152.3	246.9	241.7	74.4	284.1	226.7
...Oat	9.5	5.9	3.5	6.4	4.7	4.0	10.3	7.4
... Millet	0.1	0.0	0.1	0.0	0.1	0.1	0.3	0.2
...Buckwheat	4.3	6.1	8.0	5.6	1.4	1.6	1.2	1.0
...Leguminous crops	76.9	61.6	30.8	79.1	50.2	30.2	51.0	66.4
...Grain maize	1272.7	1151.3	1050.4	1134.3	1206.3	1440.2	1845.1	1502.7
... Grain sorghum	0.2	0.3	0.5	1.1	0.5	4.4	3.4	0.3
...Other cereal crops	4.7	6.0	3.2	5.7	4.2	0.7	3.7	12.3
Industrial crops								
...Sugar beet	1356.8	956.4	982.5	1117.8	1157.4	660.3	911.3	996.2
...Sun flower	196.4	291.6	305.1	275.6	340.9	421.4	354.8	347.7
...Soybeans	6.0	13.7	11.6	9.5	12.6	19.4	40.2	66.1
...Tobacco	169.6	196.8	121.4	105.7	69.0	36.5	7.9	6.7
... Grain rapeseed	0.0	1.2	1.1	1.0	1.0	1.2	1.1	3.3
Potatoes, vegetables and melons & gourds								
...Potatoes	372.5	330.6	330.4	385.3	326.0	303.2	321.8	388.9
... Vegetables	570.8	535.8	396.1	472.9	408.4	371.7	328.7	405.9
... Melons and gourds	25.9	33.9	31.7	38.8	29.0	72.7	57.3	48.7
Forage crops								
...Forage roots	286.4	170.1	125.0	63.4	67.9	55.7	52.7	40.9
...Maize for silo and green fodder	856.5	428.6	350.7	306.7	322.8	327.9	219.4	178.6
... Perennial grasses for green fodder, silage and fodder	498.5	506.8	317.4	201.5	173.4	145.4	206.7	183.8
... Annual grasses for green fodder	106.6	53.7	28.8	19.3	16.0	12.6	12.6	16.3
	2006	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Cereals and leguminous crops	**2371.2**	**932.5**	**3261.6**	**2375.5**	**2641.4**	**2761.5**	**1346.6**	**3075.2**
...Wheat (Winter and Spring)	682.3	406.5	1286.5	738.9	749.0	797.0	496.9	1009.2
...Winter rye	1.1	0.8	2.0	3.4	2.4	1.0	2.6	5.4
...Barley (Winter and Spring)	214.6	125.7	362.3	290.5	231.9	211.5	132.7	236.0
...Oat	6.1	1.4	3.9	1.6	2.9	3.6	2.0	3.7
... Millet	0.0	0.1	0.5	0.7	0.3	0.1	0.1	0.1
...Buckwheat	0.5	0.4	0.5	0.6	0.5	0.4	0.3	0.5
...Leguminous crops	68.4	14.4	38.0	32.0	39.7	33.0	17.2	24.0
...Grain maize	1327.6	363.2	1484.1	1159.6	1456.7	1539.6	586.0	1530.3
... Grain sorghum	0.5	0.1	0.1	0.2	0.2	0.1	0.1	0.1
...Other cereal crops	15.2	1.1	8.1	5.3	7.7	4.8	2.1	5.7
Industrial crops								
...Sugar beet	1177.3	612.3	960.7	337.4	837.6	588.6	587.0	1009.0
...Sun flower	396.1	158.7	387.2	310.2	434.3	489.9	335.1	592.1
...Soybeans	80.2	40.0	58.8	50.1	112.9	80.2	48.8	67.5
...Tobacco	4.9	3.6	3.9	4.4	7.6	5.4	2.9	2.2
... Grain rapeseed	6.9	34.9	100.1	81.6	50.9	67.5	8.1	58.1
Potatoes, vegetables and melons & gourds								
...Potatoes	384.1	200.9	273.7	264.8	286.4	362.7	191.0	243.4
... Vegetables	490.6	226.6	389.4	322.8	361.5	394.8	250.7	317.0
... Melons and gourds	92.6	41.2	69.9	102.4	104.5	84.8	52.1	55.7
Forage crops								
...Forage roots	34.9	13.8	26.4	20.0	31.7	23.1	10.6	22.2
...Maize for silo and green fodder	153.3	104.6	113.0	106.4	140.7	120.6	109.4	165.6
... Perennial grasses for green fodder, silage and fodder	194.9	177.0	364.2	213.4	323.9	238.5	97.6	198.6
... Annual grasses for green fodder	13.6	7.4	15.3	7.9	10.9	11.3	6.3	9.6

Source: NBS on-line database, Section "Sown Area, crops average yield and harvest within 1980-2013": <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).

Table 1-34: Average Yield per Hectare of Agricultural Crops in the RM, 1990-2013, t/ha

	1990	1991	1992	1993	1994	1995	1996	1997
Cereals and leguminous corps – total	**3.4**	**3.7**	**2.8**	**3.7**	**2.1**	**2.9**	**2.2**	**3.3**
...Wheat (Winter and Spring)	3.9	3.5	3.3	4.0	2.2	2.9	1.8	2.8
...Winter rye	2.1	2.0	2.0	2.6	1.6	2.2	2.1	2.8
...Barley (Winter and Spring)	3.5	3.2	3.3	3.5	2.2	2.3	1.3	2.0
...Oat	1.8	1.7	2.3	2.7	1.4	1.7	1.1	1.6
...Millet	1.0	1.0	0.4	1.0	0.6	1.4	0.7	1.6
...Buckwheat	0.5	0.8	0.3	0.8	0.4	0.4	0.4	0.7
...Leguminous crops	1.3	1.4	1.7	1.7	1.1	1.0	0.7	1.4
...Grain maize	3.4	4.8	2.5	3.9	2.2	3.0	2.9	4.0
...Grain sorghum	1.0	1.0	2.2	4.6	0.9	0.8	0.3	1.7
...Other cereal crops	3.0	3.1	2.6	2.8	2.1	0.3	1.4	0.0
Industrial crops– total								
...Sugar beet	29.1	24.9	21.6	22.5	16.7	20.8	20.0	22.0
...Sun flower	1.9	1.2	1.3	1.2	0.9	1.3	1.3	0.9
...Soybeans	0.9	1.4	0.5	1.0	0.7	0.9	1.0	1.1
...Tobacco	2.1	1.9	1.5	1.6	1.5	2.0	3.1	9.8
...Grain rapeseed	2.0	2.0	1.6	1.2	1.0	0.8	0.7	1.0
Potatoes, vegetables and melons & gourds – total								
...Potatoes	7.2	6.2	5.6	10.0	7.4	6.7	5.8	6.3
...Vegetables	16.6	12.7	10.7	8.7	7.2	7.3	5.9	6.2
...Melons and gourds	3.7	4.5	1.3	2.8	2.3	2.8	3.5	3.8
Forage plants – total								
...Forage roots	44.4	47.2	31.8	32.6	20.9	22.3	19.1	19.0
...Maize for silo and green fodder	15.4	24.9	10.1	13.8	7.5	9.7	6.7	10.8
...Perennial grasses for green fodder, silage and fodder	21.6	29.5	18.6	17.7	11.2	11.8	8.3	8.3
...Annual grasses for green fodder	9.2	15.7	9.7	10.4	4.9	7.6	5.3	5.8
	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Cereals and leguminous corps – total	**2.6**	**2.3**	**1.9**	**2.4**	**2.4**	**1.8**	**2.8**	**2.7**
...Wheat (Winter and Spring)	2.3	2.0	1.7	2.4	2.2	0.5	2.5	2.4
...Winter rye	1.9	1.6	1.3	1.7	1.6	0.6	2.0	1.7
...Barley (Winter and Spring)	1.8	1.6	1.2	2.2	1.8	0.8	2.0	1.7
...Oat	1.6	1.2	0.8	1.3	1.1	0.9	1.7	1.2
...Millet	0.4	0.1	0.2	0.8	0.5	0.5	0.7	0.9
...Buckwheat	0.4	0.4	0.7	0.4	0.3	0.3	0.3	0.3
...Leguminous crops	1.3	1.0	0.6	1.5	0.8	0.6	1.3	1.6
...Grain maize	3.1	2.8	2.3	2.3	2.7	2.5	3.1	3.3
...Grain sorghum	0.9	3.1	1.3	1.1	0.9	1.4	0.9	0.4
...Other cereal crops	2.1	3.6	161.2	7.5	6.0	0.9	1.5	2.0
Industrial crops– total								
...Sugar beet	17.8	14.6	14.8	17.7	22.3	16.6	26.1	29.0
...Sun flower	0.8	1.2	1.2	1.2	1.2	1.1	1.2	1.2
...Soybeans	0.9	0.8	1.0	1.0	1.2	1.1	1.4	1.8
...Tobacco	7.7	10.5	5.1	6.2	7.4	6.5	1.4	1.4
...Grain rapeseed	0.9	1.2	1.0	1.0	1.0	1.0	1.2	1.4
Potatoes, vegetables and melons & gourds – total								
...Potatoes	6.0	5.0	5.1	9.0	7.2	7.9	9.2	10.6
...Vegetables	9.7	9.5	7.0	7.0	7.0	8.5	8.6	10.5
...Melons and gourds	5.0	5.7	4.0	5.2	4.5	8.4	7.8	9.5
Forage plants – total								
...Forage roots	18.5	11.9	10.9	13.5	16.6	12.3	14.2	16.3
...Maize for silo and green fodder	8.8	6.8	7.1	7.8	9.2	7.4	8.9	11.2
...Perennial grasses for green fodder, silage and fodder	6.6	8.7	6.0	4.2	3.5	2.9	3.9	3.2
...Annual grasses for green fodder	6.2	3.2	2.6	2.4	1.8	1.1	2.1	2.2
	2006	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Cereals and leguminous corps – total	**2.5**	**0.9**	**3.2**	**2.3**	**2.6**	**2.8**	**1.3**	**2.9**
...Wheat (Winter and Spring)	2.2	1.2	3.0	1.9	2.0	2.3	1.4	2.4
...Winter rye	1.6	1.1	1.9	1.8	1.5	1.8	2.0	2.8
...Barley (Winter and Spring)	1.7	0.9	2.6	1.6	1.5	1.7	1.2	1.9
...Oat	1.3	0.3	1.4	0.7	1.0	1.6	0.9	1.5
...Millet	0.5	0.1	1.7	2.5	0.9	0.4	0.4	0.3
...Buckwheat	0.1	0.3	0.6	0.6	3.2	0.8	0.3	1.6
...Leguminous crops	1.6	0.4	1.3	0.9	1.0	1.1	0.7	1.0

	2006	2007	2008	2009	2010	2011	2012	2013
...Grain maize	2.9	0.8	3.5	2.8	3.4	3.3	1.1	3.2
...Grain sorghum	1.1	0.5	0.5	0.8	1.0	0.3	0.3	0.5
...Other cereal crops	2.0	0.8	2.1	1.7	1.8	1.9	1.9	2.0
Industrial crops– total								
...Sugar beet	27.8	17.9	38.9	14.4	31.6	23.2	18.8	35.2
...Sun flower	1.3	0.7	1.6	1.2	1.5	1.6	1.0	1.7
...Soybeans	1.4	0.8	1.9	1.0	1.9	1.4	0.8	1.6
...Tobacco	1.4	1.2	1.4	1.8	1.7	1.4	1.2	1.5
...Grain rapeseed	1.0	0.8	1.9	1.2	1.0	1.3	1.0	1.6
Potatoes, vegetables and melons & gourds – total								
...Potatoes	11.0	5.6	8.7	9.3	10.3	12.2	7.6	10.1
...Vegetables	11.0	5.7	9.3	8.7	9.0	10.6	7.2	8.6
...Melons and gourds	10.2	5.8	7.9	8.6	10.0	10.5	7.3	7.3
Forage plants – total								
...Forage roots	11.6	7.4	14.1	13.7	18.5	19.0	7.4	18.5
...Maize for silo and green fodder	9.6	4.2	11.0	9.4	14.4	12.3	5.0	19.4
...Perennial grasses for green fodder, silage and fodder	3.1	2.6	6.0	3.5	5.0	4.0	1.8	3.5
...Annual grasses for green fodder	2.3	1.3	3.3	2.2	1.8	2.9	1.9	2.3

Source: NBS on-line database, Section "Sown Area, crops average yield and harvest, 1980-2013": <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 (page96).

Plant production. In 2014, agricultural production data show a significant increase driven by the growth of average crop harvest due to the year good weather conditions. Thus, compared to 2013, in 2014 the crop yield increased as follows: cereals and leguminous crops – by 9 per cent (including wheat –by 9 per cent, grain maize – by 9 per cent), sugar beet - by 15 per cent, sun flower – by 11 per cent), grain rapeseed – by 59 per cent, potatoes - by 12 per cent, vegetables – by 13 per cent and fruits, berries and walnuts - by 17 per cent.

In 2014, the agricultural enterprises have the main share in the production of: sugar beet – 93 per cent, grain rapeseed – 93 per cent, tobacco – 85 per cent, soybeans – 77 per cent, sun flower – 73 per cent, cereals and leguminous crops (only maize)- 73 per cent from the total. Farm households and peasant (family) farms have the main share in the production of: melon & gourds - 98 per cent of the total, potatoes - 85 per cent, vegetables - 84 per cent, grapes - 77 per cent and grain maize - 70 per cent.

Over the 1990-2013 time periods, there was a significant reduction, by circa 76.4 per cent and respectively by 99.6 per cent, of the amount of synthetic and organic fertilizers applied to soils in the RM (Table 1-35). On average, about 33 kg of synthetic fertilizer were applied per one hectare of sown fields, recalculated to 100 per cent nutrients (active substance – a.s.), compared to 134 kg applied in 1990 (by 85.4 per cent less). As for the organic fertilizers, about 26 kg were applied per one hectare, compared to 5.6 tons in 1990.

Table 1-35: Applied Synthetic and Organic Fertilizers in the RM, 1990-2013, kt

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
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**
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
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
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
On average kg/1 sown ha	134	111	75	25	12	7	8	7	6	4	6	7
Organic fertilizers, kt	**9740**	**8600**	**5300**	**4200**	**1620**	**1779**	**906**	**353**	**227**	**122**	**83**	**98**
On average kg/1 sown ha	5620	5009	3097	2360	944	1031	527	204	132	73	49	57
	2002	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Synthetic fertilizers (a.s.), kt	**18.4**	**15.4**	**17.5**	**18.1**	**16.6**	**22.4**	**24.7**	**19.9**	**25.5**	**30.9**	**43.9**	**54.8**
nitrogen	18.0	14.6	16.1	16.1	13.8	18.8	21.9	17.0	20.6	25.0	34.1	42.1
phosphorus	0.3	0.6	1.0	1.5	2.0	2.4	1.7	2.0	3.3	4.0	7.1	9.6
potassium	0.1	0.2	0.4	0.5	0.8	1.1	1.1	0.9	1.6	1.8	2.7	3.1
On average kg/1 sown ha	11	10	10	11	11	14	16	13	16	20	28	33
Organic fertilizers, kt	**54**	**47**	**42**	**44**	**11**	**8**	**8**	**7**	**18**	**32**	**23**	**43**
On average kg/1 sown ha	31	30	25	27	7	5	5	5	11	20	14	26

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) and 2014 (page 345). 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).

In 2014, in agricultural enterprises and farm households there were introduced about 83.6 kg of synthetic fertilizers (recalculated to 100 per cent a.s.), respectively 0.03 tons of organic fertilizers per one hectare of sown fields. During the year under review, per one hectare of sown fields were used: 1.41 kg of insecticides, 2.68 kg of fungicides, 1.98 kg of herbicide, 5.62 kg of organic products and 1.78 kg of other phytosanitary products (as a comparison, in 2013, there were used about 1.52; 3.10; 2.19; 5.45 and 2.53 kg per one hectare of sown fields).

Livestock. Between 1990 and 2013, the livestock production significantly decreased in the RM, including cattle and poultry sold for slaughter (in live weight) – by 70.2 per cent, milk yield – by 67.2 per cent, egg production – by 42.6 per cent and wool production – by 37.6 per cent (Table 1-36).

Table 1-36: The Main Livestock Products Produced in the RM, 1990-2013

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Cattle and poultry sold for slaughter (in live weight), kt	530.0	433.0	334.0	228.0	193.0	183.6	173.0	165.6	151.0	151.7	126.0	117.6
Milk yield, kt	1503.0	1284.0	1128.0	867.0	805.0	811.1	717.8	630.7	626.3	602.7	576.6	580.6
Eggs, million pcs	1129.0	1061.0	813.0	530.0	418.0	515.1	556.3	528.5	547.8	566.2	578.5	620.2
Wool, tons	3043.0	2869.0	2616.0	2598.0	2812.0	2921.8	2833.2	2731.5	2449.4	2295.9	2079.9	2087.1
	2002	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Cattle and poultry sold for slaughter (in live weight), kt	122.1	121.4	120.7	122.3	135.3	150.9	108.9	126.8	152.7	162.0	159.5	158.1
Milk yield, kt	603.3	585.5	613.3	636.1	603.3	576.8	514.3	547.3	598.6	533.0	496.9	492.3
Eggs, million pcs	675.0	622.8	668.7	762.7	765.7	704.4	562.6	649.6	729.7	718.7	640.4	647.8
Wool, tons	2083.6	2066.7	2035.0	2085.4	2173.9	2148.2	2022.9	1997.8	2069.5	2045.2	1844.7	1900.2

Source: <http://statbank.statistica.md/pxweb/Dialog/varval.asp?ma=AGR0302&ti=Productia+principalelor+produse+animaliere+pe+categorii+de+gospodarii%2C+1980-2014&path=../Database/RO/16%20AGR/AGR03/&lang=1>. Statistical Yearbooks of the ATULBD for 2000 (page 116), 2002 (page 120), 2006 (page 111), 2009 (page 110), 2012 (page 117), 2014 (page 106).

In 2014, the share of livestock production represented 34.6 per cent of the total agricultural production (33.3 per cent in the previous year). Compared to 2013, the production of cattle and poultry in live weight increased for all categories of producers by 7.2 per cent (in agricultural enterprises – by 9.6 per cent, in farm households – by 6.0 per cent) due to increased weight gains for cattle and pigs, as well as due to increased average livestock for cattle and poultry. Egg production increased by 3.4 per cent. At the same time, milk production (for all categories) decreased by 0.6 per cent. During this year, farm households recorded an increased production for the following categories: milk – by 95.9 per cent, cattle and poultry – by 64.8 per cent, egg production – by 61.8 per cent.

Over the 1990-2013 time periods, the livestock population related to particular species decreased sharply: cattle – by 82.2 per cent (dairy cows – by 66.9 per cent, other cattle – by 91.3 per cent), sheep – by 42.7 per cent, horses – by 4.7 per cent, swine – by 77.3 per cent, poultry of all categories – by 55.3 per cent. At the same time, during the period under review it was reported an increase regarding other species such as: goats – by 265.4 per cent, asses and mules – by 26.7 per cent and rabbits – by 4.7 per cent (Table 1-37).

Table 1-37: Total Livestock and Poultry in all Households Categories in the Republic of Moldova in 1990-2013 (as of the end of the year), thousand heads

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Cattle	1060.7	1000.5	970.1	815.1	750.8	644.2	570.0	485.4	469.1	423.0	394.0	404.8
Cows	395.2	397.1	403.2	376.4	367.4	341.6	318.5	290.6	286.1	274.9	269.1	271.8
Other cattle	665.5	603.4	566.9	438.6	383.4	302.6	251.6	194.8	183.0	148.0	124.9	133.1
Sheep and goats	1281.9	1288.8	1357.2	1420.2	1483.1	1394.0	1344.4	1209.3	1120.3	1030.0	938.3	946.5
Sheep	1244.8	1239.3	1294.3	1346.3	1392.7	1301.3	1247.7	1115.4	1025.8	930.2	829.7	834.9
Goats	37.1	49.5	62.9	73.9	90.4	92.7	96.7	93.9	94.5	99.8	108.6	111.6
Horses	47.2	48.4	51.4	52.3	56.2	57.2	58.7	60.7	64.0	67.2	71.1	76.6
Asses and mules	1.7	1.8	2.1	2.2	2.9	3.2	3.1	3.0	3.2	3.4	3.8	4.3
Swine	1850.1	1753.0	1487.4	1012.8	946.1	910.3	866.5	724.3	860.1	682.6	447.0	448.9
Poultry	24625.0	23715.0	17128.0	11827.0	11774.6	11964.9	11423.1	11613.0	12088.4	12575.2	13041.1	14118.7
Rabbits	283.0	250.8	298.5	262.4	237.2	209.3	189.8	176.8	185.9	182.6	161.3	191.4
	2002	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Cattle	409.6	372.8	330.6	310.5	299.1	231.7	217.7	221.6	216.0	203.9	191.2	188.9
Cows	279.2	256.2	230.8	217.1	206.7	168.8	160.3	161.2	154.4	144.3	134.4	130.7
Other cattle	130.4	116.6	99.8	93.4	92.5	62.9	57.4	60.4	61.5	59.6	56.8	58.2
Sheep and goats	956.1	938.0	942.2	937.7	947.0	853.2	865.8	914.9	905.5	832.4	824.0	849.3
Sheep	829.7	817.1	822.8	818.3	835.1	753.9	761.9	803.7	787.9	709.9	695.1	713.7
Goats	126.3	120.9	119.4	119.4	111.9	99.3	103.9	111.2	117.6	122.5	128.9	135.5
Horses	78.2	77.4	72.5	69.1	66.8	58.4	55.5	54.4	52.2	49.6	46.4	45.0
Asses and mules	4.0	4.3	4.0	3.7	3.6	3.1	3.2	2.9	2.8	2.5	2.4	2.1
Swine	508.3	445.9	398.0	460.7	531.8	298.7	283.5	377.1	478.5	438.6	410.4	420.0
Poultry	14954.9	15755.6	17522.2	22234.5	22530.9	17157.1	18327.7	22456.7	23256.5	19322.9	15389.2	11455.6
Rabbits	190.7	205.4	239.1	278.9	326.0	263.4	248.5	274.5	277.0	277.4	267.0	296.2

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 1990-2013 time periods). Statistical Yearbooks of the ATULBD for 1998 (page 224), 2000 (page 114), 2002 (page 118), 2006 (page 109), 2010 (page.110), 2011 (page.111), 2012 (page.115), 2014 (page.104).

To be noted that as of 01.01.2015, the share of livestock within farm households accounted for 97.4 per cent for sheep and goats, 93.0 per cent for cattle (including 95.7 per cent for cows) and 59.4 per cent for swine. Compared to 2014, an increase was recorded within the agricultural enterprises for all livestock categories. The cattle and poultry production increased by 10 per cent, while the share of cattle and poultry sold for slaughter increased by 8 per cent. At the same time, within the reference period, the number of cattle showed an insignificant decrease in farm households – by 0.1 per cent, of which cows – by 0.7 per cent. In 2014, the agricultural enterprises improved the conditions for keeping the livestock of cattle, sheep and cows. Due to the increase of average annual livestock of cows by 13 per cent and their productivity by 18 per cent, the milk yield increased by 33 per cent. And though the number of laying hens decreased by 8 per cent, the total egg production registered an insignificant decrease, by 1 per cent.

1.6.3. Transport and Communication

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 10,826 km (including 9,352 km – on the right bank of Dniester, 1,474 km – on the left bank of Dniester; hard-surface roads: 8,836 km – on the right bank of Dniester and 1,430 km - on the left bank of Dniester) (Table 1-38) has the municipality of Chisinau as its principal hub, intersection of the principal national and international roads crossing the country.

Table 1-38: Length and Density of Road Communication Lines by the end of the year in the RM, per 1,000 km², 1996-2013

	1996	1997	1998	1999	2000	2001	2002	2003	2004
Public Roads – total, km	10665	10680	10679	10678	10655	10711	10739	10740	10743
On the Right Bank of Dniester, km	9388	9403	9402	9401	9378	9433	9461	9462	9464
On the Left Bank of Dniester, km	1277	1277	1277	1277	1277	1278	1278	1278	1279
With hard surface, km	10152	10143	10142	10141	10003	10059	10101	10102	10105
On the Right Bank of Dniester, km	8929	8920	8919	8918	8780	8835	8877	8878	8880
On the Left Bank of Dniester, km	1223	1223	1223	1223	1223	1224	1224	1224	1225
Density of Public Roads, km/1000 km²	315.1	315.6	315.5	315.5	314.8	316.5	317.3	317.3	317.4
On the Right Bank of Dniester, km	316.2	316.8	316.8	316.7	316.0	317.8	318.8	318.8	318.8
On the Left Bank of Dniester, km	306.7	306.7	306.7	306.7	306.7	307.0	307.0	307.0	307.2
With hard surface, km/1000 km²	299.9	299.7	299.7	299.6	295.6	297.2	298.5	298.5	298.6
On the Right Bank of Dniester, km	300.8	300.5	300.5	300.5	295.8	297.7	299.1	299.1	299.2
On the Left Bank of Dniester, km	293.8	293.8	293.8	293.8	293.8	294.0	294.0	294.0	294.3
	2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Public Roads – total, km	10746	10746	10615	10621	10817	10818	10826	10826	10826
On the Right Bank of Dniester, km	9467	9467	9337	9343	9344	9344	9352	9352	9352
On the Left Bank of Dniester, km	1279	1279	1278	1278	1473	1474	1474	1474	1474
With hard surface, km	10108	10112	10015	10034	10234	10239	10257	10265	10266
On the Right Bank of Dniester, km	8883	8887	8791	8810	8811	8811	8827	8835	8836
On the Left Bank of Dniester, km	1225	1225	1224	1224	1423	1428	1430	1430	1430
Density of Public Roads, km/1000 km²	317.5	317.5	313.6	313.8	319.6	319.6	319.9	319.8	319.7
On the Right Bank of Dniester, km	318.9	318.9	314.6	314.8	314.8	314.8	315.1	315.1	315.1
On the Left Bank of Dniester, km	307.2	307.2	307.0	307.0	353.8	354.1	354.1	353.2	352.4
With hard surface, km/1000 km²	298.6	298.8	295.9	296.5	302.4	302.5	303.0	303.2	303.1
On the Right Bank of Dniester, km	299.3	299.4	296.2	296.8	296.8	296.8	297.4	297.6	297.7
On the Left Bank of Dniester, km	294.3	294.3	294.0	294.0	341.8	343.0	343.5	342.7	341.9

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

The roads network is sufficiently developed (the public roads density represents about 320 km/1,000 km², while the hard-surface roads - circa 303 km/1,000 km²), but the state of the roads and the infrastructure in general is deplorable, though in the last six 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 1-39).

Table 1-39: Road Transportation Means Existent by the end of the year in the RM, 1990-2013, units

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

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). 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 67.8 per cent, while the number of cars increased by 192.8 per cent, buses and minibuses - by 92.8 per cent and trucks – by 100.9 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 2013, the total volume of freight transportation with motor vehicles represented 30.1 million tons which is a decrease by 88.6 per cent compared to the 1990 level, but an increase of 17.0 per cent as compared to 2012 (Table 1-42).

Buses and minibuses transported 114.7 million passengers, by 74.3 per cent less than in 1990 and by 2.9 per cent less than in 2012 (Table 1-43).

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 34.2 km (Table 1-40).

Table 1-40: Length (km) and Density (km per 1,000 km²) of Railways by the end of the year in the Republic of Moldova, 1990-2013

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Railways, km	1150	1150	1150	1150	1150	1150	1150	1140	1137	1140	1139	1121
on RBDR, km	977	977	977	977	977	977	977	967	964	967	999	981
on LBDR, km	173	173	173	173	173	173	173	173	173	173	140	140
Railways density, km/1000 km²	34.1	34.0	34.0	34.0	34.0	34.0	34.0	33.7	33.6	33.7	33.7	33.1
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
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
	2002	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Railways, km	1120	1111	1075	1139	1154	1154	1157	1157	1157	1157	1157	1157
on RBDR, km	980	971	970	1034	1049	1049	1043	1043	1043	1043	1043	1043
on LBDR, km	140	140	105	105	105	105	114	114	114	114	114	114
Railways density, km/1000 km²	33.1	32.8	31.8	33.7	34.1	34.1	34.2	34.2	34.2	34.2	34.2	34.2
on RBDR, km	33.0	32.7	32.7	34.8	35.3	35.3	35.1	35.1	35.1	35.1	35.1	35.1
on LBDR, km	33.6	33.6	25.2	25.2	25.2	25.2	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) and 2014 (page 397); Statistical Yearbooks of the ATULBD for 2000 (page 127), 2006 (page 121), 2009 (page 119), 2010 (page 123), 2012 (page 128), 2014 (page 117).

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 (by 57.4 per cent), Maneuvering Locomotives (by 51.8 per cent), Diesel Trains (by 52.3 per cent), Cargo Wagons (by 50.3 per cent) and Passenger Coaches (by 20.2 per cent) (Table 1-41).

Table 1-41: Railway Transport Means Existent by the end of the year in the RM, units

	1990	1995	1996	1997	1998	1999	2000	2001	2002	2003
Diesel Locomotives	324	113	103	97	82	78	76	78	89	100
Maneuvering Locomotives	139	114	100	75	72	50	42	44	48	54
Diesel Trains (Sections)	44	29	28	26	26	24	22	22	22	22
Cargo Wagons	14960	14097	13316	12838	12233	11010	10577	10033	9303	8723
Passenger Coaches	486	482	480	470	458	461	460	440	460	452
	2004	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Diesel Locomotives	95	100	100	100	90	57	57	150	139	138
Maneuvering Locomotives	50	56	56	56	53	39	39	67	67	67
Diesel Trains (Sections)	18	20	20	20	18	15	15	21	21	21
Cargo Wagons	8492	8318	8177	7940	7921	7919	7835	7606	7433	7435
Passenger Coaches	452	440	436	416	398	990	413	399	399	388

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.

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. The railway transport employs around 15 thousand 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 Bender 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 2013, railways accounted for 5.431 million tons of the total freight transportation, registering an decrease of 91.7 per cent as compared to 1990, but also an increase of 30.4 per cent as compared to 2012 (Table 1-42).

Table 1-42: Goods Transportation, by Types of Public Transport in the RM, 1990-2013

	1990	1995	1996	1997	1998	1999	2000	2001	2002	2003
Transported goods, million t										
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**
Railway transport, mill. tons	65.4	13.2	12.5	12.8	11.1	6.6	8.2	10.6	12.6	14.7
Road transportation, mill. tons	262.8	41.0	33.0	32.7	27.6	21.4	20.7	17.2	19.1	19.4
River navigation, kt	2885.5	19.7	19.7	39.1	13.1	15.9	30.8	103.7	107.5	120.0
Air transportation, kt	12.2	1.6	1.2	1.2	1.5	1.3	1.4	1.7	0.9	0.7
Turnover of goods, million t-km										
Transport – total, of which by:	**21648**	**4296**	**3891**	**3968**	**3597**	**2267**	**2605**	**3044**	**4007**	**4597**
Railway transport	15007	3134	2897	2937	2575	1191	1513	1980	2748	3019
Road transportation	6305	1159	992	1028	1018	1073	1088	1060	1257	1577
River navigation	317	0.20	0.15	0.32	0.01	0.18	0.06	2.60	0.30	0.35
Air transportation	19.0	3.0	1.5	2.4	3.6	3.3	4.1	2.0	1.3	0.9

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Transported goods, million t										
Transport – total, of which by:	**34.701**	**36.410**	**38.250**	**40.794**	**39.794**	**25.989**	**27.781**	**30.718**	**30.023**	**35.674**
Railway transport, mill. tons	13.310	11.704	11.093	11.847	11.006	4.415	3.852	4.554	4.164	5.431
Road transportation, mill. tons	21.271	24.593	27.015	28.780	28.585	21.391	23.801	26.013	25.713	30.080
River navigation, kt	119.7	111.8	141.5	166.5	202.0	182.0	127.2	149.1	144.2	162.6
Air transportation, kt	0.72	0.77	0.97	1.00	0.83	0.83	1.30	1.60	1.57	1.28
Turnover of goods, million t-km										
Transport – total, of which by:	**5168.7**	**5459.6**	**6242.2**	**5864.6**	**5840.6**	**3773.6**	**4193.1**	**4795.5**	**4916.3**	**5652.2**
Railway transport	3005.9	3052.9	3673.2	3120.2	2872.7	1058.2	958.6	1196.0	959.5	1227.5
Road transportation	2161.4	2405.3	2567.1	2742.5	2965.9	2713.7	3232.4	3597.3	3954.7	4423.1
River navigation	0.37	0.43	0.60	0.60	0.80	0.60	0.40	0.50	0.40	0.50
Air transportation	1.00	1.00	1.30	1.30	1.20	1.10	1.70	1.70	1.70	1.10

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

Around 4.092 million passengers used railway transportation services, which is 80.6 per cent less than in 1990, and 5.7 per cent less than in 2012 (Table 1-43).

Table 1-43: Passenger Transportation by Types of Public Transport in the RM, 1990-2013

	1990	1995	1996	1997	1998	1999	2000	2001	2002	2003
Passengers transported, million passengers										
Transport – total, of which by:	**757.7**	**410.9**	**373.5**	**337.5**	**384.7**	**406.1**	**326.6**	**211.5**	**280.6**	**296.2**
Railway transport	21.1	11.7	10.4	10.3	9.4	5.4	4.8	4.8	5.1	5.3
Buses	446.9	84	77.8	65.6	71.7	65.5	72.4	72.7	83.9	93.4
Taxi	13.7	0.7	0.5	0.4	0.3	0.3	0.7	0.7	0.6	0.7
Trolley-buses	272.6	314.2	284.6	261	303.1	334.7	248.5	133.0	190.7	196.5
River transport	2.5	–	–	–	–	–	0.03	0.1	0.1	0.1
Air transport	0.90	0.24	0.23	0.24	0.22	0.20	0.22	0.23	0.24	0.25
Passenger turnover, million passenger-km										
Transport – total, of which by:	**10102**	**3605**	**3296**	**3059**	**3013**	**2676**	**2415**	**2131**	**2624**	**2963**
Railway transport	1626	1019	882	789	656	343	315	325	355	352
Buses	4878	1163	1195	1071	1067	1013	1021	1069	1298	1640
Taxi	164	15	11	7	6	5	12	12	11	13
Trolley-buses	1063	1103	914	838	969	1074	814	435	636	654
River transport	19	–	–	–	–	–	0.1	0.2	0.2	0.3
Air transport	2352	305	294	354	315	240	253	290	324	304
	2004	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Passengers transported, million passengers										
Transport – total, of which by:	**306.868**	**316.439**	**318.141**	**319.061**	**326.060**	**291.843**	**232.455**	**237.100**	**240.379**	**237.129**
Railway transport	5.111	5.024	5.284	5.591	5.763	5.187	4.964	4.711	4.341	4.092
Buses	99.295	105.656	109.405	103.184	110.286	105.806	105.985	115.271	118.091	114.717
Taxi	1.057	1.007	1.098	3.414	4.259	3.836	4.262	4.086	3.724	3.736
Trolley-buses	200.963	204.255	201.855	206.338	205.172	176.436	116.477	112.209	113.434	113.812
River transport	0.134	0.135	0.103	0.119	0.105	0.119	0.119	0.123	0.116	0.116
Air transport	0.308	0.362	0.397	0.415	0.474	0.460	0.649	0.700	0.673	0.655
Passenger turnover, million passenger-km										
Transport – total, of which by:	**3347.4**	**3548.9**	**3793.7**	**4187.1**	**4429.7**	**3932.7**	**3993.4**	**4349.7**	**4472.3**	**4570.5**
Railway transport	346.1	355.0	471.4	468.2	485.6	422.8	398.8	363.1	347.2	329.8
Buses	1949.2	2058.7	2206.1	2475.5	2598.9	2300.1	2416.7	2733.4	2835.5	3000.3
Taxi	19.8	19.2	20.3	65.9	84.3	72.5	80.1	80.5	74.5	75.5
Trolley-buses	666.8	676.0	614.8	627.7	623.2	533.3	346.8	335.1	340.1	342.3
River transport	0.42	0.33	0.21	0.24	0.21	0.24	0.24	0.25	0.23	0.23
Air transport	365.1	439.7	480.9	549.6	637.5	603.8	750.8	837.3	874.8	822.4

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

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 Rabnita 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 1-44 and 1-45).

Table 1-44: River Transport Means Existent by the end of the year on the Right Bank of Dniester River, 1990-2013, units

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

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) and 2014 (page 399).

Table 1-45: River Transport Means Existent by the end of the year on the Left Bank of Dniester River, 1990-2013, units

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

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).

In 2013, the river ships transported 162.6 kt of freight, which is 94.4 per cent less than in 1990, but 12.8 per cent more than in 2012. The number of passengers transported by river transport means was 0.116 million persons, which is 95.3 per cent less than in 1990 and by 0.6 per cent more than in 2012.

Air Transportation. Currently above 30 entities and about 15 air-carrier companies have operations in the air transport segment, of which 3 air carriers offer regular scheduled flights, the other 11 offer charter flights while 5 companies offer specialized services. This segment employs above 2,000 persons. 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 2000, about 80 per cent of flights were operated by aircrafts produced in CIS countries, by 2013 their share decreased to 60 per cent. Most aircrafts used today are modern, low GHG emission, produced mainly in western countries. Table 1-46 provides information on the number of aircraft in use at the end of each year during 1996-2013.

Table 1-46: Air Transport Means Existing in the RM by the end of the year, units

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

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).

In 2013, 1.29 kt of freights were transported by air, a decrease by 89.5 per cent compared to 1990, respectively by 18.5 per cent compared to the previous year. The number of passengers using air transport services in 2013 was 0.655 million persons, by 27.2 per cent less than in 1990, respectively by 2.7 per cent compared to 2012.

Communications. In 2014, the number of phone calls using the fixed phone network increased by 2.7 per cent compared to the previous year, in particular due to the increase number of long-distance phone calls (+5.0 per cent). Compared to 2013 year, in 2014 it was recorded an increase of written correspondence (+19.0 per cent), newspapers and magazines delivered (+2.2 per cent). At the same time, there was a decrease in in the number of telegrams (-11.3 per cent), pensions, subsidies and allowances paid through post offices (-3.9 per cent), post and telegraph money order (-3.7 per cent), postal correspondence (-1.2 per cent). In the public telephone network, as of December 31, 2014 the number of main phone sets exceeded 1219.3 thousand units (1222.7 thousand units in 2013), of which 1072.3 thousand were home phone lines (1079.2 thousand in 2013) (Table 1-47).

Table 1-47: Main Indicators for Post Communications and Telecommunications in RM, 2000-2013

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Number of mailings:														
Written correspondence, million	11.9	17.0	25.2	30.6	34.3	37.3	38.5	38.3	40.8	41.2	41.9	44.8	48.6	50.1
Newspapers and magazines, million	19.0	21.2	22.0	22.8	29.5	28.7	28.5	28.7	26.8	25.1	23.8	21.8	20.6	19.4
Parcels, thousand	18.0	18.0	21.0	33.0	29.0	23.0	26.0	27.0	36.0	34.0	79.0	174.0	171.0	206.0
Money orders by post and telegraph, million	11.3	9.7	8.8	8.0	8.1	8.1	8.2	8.2	8.2	8.4	8.8	9.0	9.1	9.4
Number of telephone conversations ensured by means of fixed telephone service:														
Interurban (long-distance), million	117.4	163.0	195.9	246.7	293.8	340.8	373.3	348.1	294.0	246.1	212.9	194.3	225.7	220.8
International, million	17.5	18.6	21.4	25.3	30.7	33.1	37.4	49.4	46.2	31.6	26.3	22.7	19.1	16.8
Number of main phone sets in the public telephone network:														
Total, thousand	603.6	655.3	719.3	791.1	863.4	942.2	1018.1	1081.4	1115.8	1139.9	1162.3	1194.7	1207.0	1222.7
Of which home lines, thousand	513.3	564.6	625.7	695.5	761.5	838.5	957.6	1002.2	1030.6	1025.2	1042.5	1048.1	1045.5	1079.2
Number of phone sets per 100 residents:														
Public telephone network	16.6	18.1	19.9	21.9	24.0	26.3	28.4	30.3	31.3	32.0	32.6	33.6	33.9	34.4
Mobile telephone network	3.0	6.2	9.4	13.2	21.9	30.4	37.9	52.7	67.9	78.1	88.9	104.4	119.7	124.5

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Number of stations, at the end of the year:														
Television	47.0	50.0	50.0	50.0	76.0	76.0	76.0	94.0	130.0	178.0	15.0	15.0	15.0	15.0
Broadcasting	...	...	...	28.0	30.0	36.0	51.0	55.0	48.0	67.0	11.0	11.0	11.0	13.0

Source: Statistical Yearbooks of the RM for 2014 (pages 409-411), 2012 (pages 411-412), 2009 (pages 407- 409) and 2007 (pages 414-417).

1.6.4. Tourism

Currently, tourism accounts for a relatively insignificant share in the national economy. The modest infrastructure in the tourism and low incomes generated by the tourist businesses rates the RM among the countries where tourism is poorly developed. In 2014, the total tourist accommodation capacity of the collective accommodation facilities was 28.5 thousand beds, registering an increase by 1.7 per cent, compared to the previous year (Table 1-48).

Table 1-48: Main Indicators for Collective Tourist Accommodation in the RM, 2004-2014

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Accommodation facilities– total, including:	**184**	**191**	**211**	**222**	**229**	**249**	**250**	**247**	**257**	**264**	**275**
Hotels and motels	53	54	55	58	62	72	75	85	87	94	100
Tourist and agro-tourist boarding houses	5	7	12	13	11	15	13	15	19	19	24
Hostels for visitors	11	10	9	7	6	6	7	6	6	6	5
Health homes	7	7	6	7	6	6	6	7	7	7	7
Holiday villages and other holiday facilities	55	57	60	60	62	71	72	63	62	63	63
Summer camps for children	53	56	69	77	82	79	77	71	76	75	76
Rooms - total	7296	7374	7970	7960	8149	8349	8417	8172	8308	8385	8529
Beds - total	**23827**	**23992**	**27269**	**27608**	**28265**	**28448**	**28370**	**27511**	**27938**	**28067**	**28548**
Tourist serviced - total	286731	301656	311966	314619	280550	227888	229893	248309	268189	271541	283001
including foreign tourists	68829	67235	62771	70302	73288	59563	63593	75000	88956	95640	93897
Man-nights spent during the year - total,	1487585	1618558	1752963	1745178	1726885	1400063	1412166	1424441	1462423	1478849	1514273
including foreign tourists	174439	186590	213982	201006	201624	147762	162755	173893	190766	216115	217930
Accommodation capacity utilization rate, %	**37.9**	**43.0**	**44.5**	**44.3**	**46.7**	**36.8**	**32.7**	**32.2**	**30.7**	**34.0**	**35.5**

Source: Statistical Yearbooks of the RM for 2012 (pages 240-245), 2014 (pages 235-242).

In the total tourist accommodation capacity, hotels and motels account for 36.4 per cent, summer camps for children – 27.6 per cent, holiday villages and other holiday facilities – for 22.9 per cent, tourist and agro-tourist boarding houses – 8.7 per cent, health homes – 2.5 per cent, hostels for visitors – 1.8 per cent.

In 2014, the services of the collective tourist accommodation facilities were used by 283 thousand tourists, by 4.2 per cent more than in 2013, of which 93.9 thousand tourists were foreign nationals, by 1.8 per cent less than in the previous year.

In 2014, the countries accounting for the highest share in the total number of foreign tourists using the services of the accommodation facilities were: Romania (21.2 per cent), Russian Federation (13.9 per cent), Ukraine (10.7 per cent), Germany (4.9 per cent), Turkey (4.8 per cent), Italy (4.0 per cent), USA (3.9 per cent), Israel (3.7 per cent), Poland (3.0 per cent), United Kingdom (2.9 per cent), Bulgaria (2.7 per cent), Belarus (2.5 per cent), Netherlands (2.3 per cent), Austria (1.9 per cent), Sweden (1.7 per cent), France (1.3 per cent), etc.

The total number of man-nights spent by the tourists in the collective accommodation facilities in 2014 was 1514.3 thousand, an increase by 2.4 per cent as compared to 2013. The total net utilization rate of the operating tourist accommodation facilities was 35.5 per cent, including for health homes – 70.2 per cent, summer camps for schoolchildren – 54.8 per cent, hostels for visitors – 50.6 per cent, tourist villas, holiday villages and other holiday facilities – 18.5 per cent, hotels and motels – 18.2 per cent, tourist and agro-tourist boarding houses – 14.2 per cent.

Compared to 2013, in 2014 the number of existing hotels and other similar facilities increased by 8.4 per cent, thus increasing the accommodation capacity by 5.9 per cent, while the accommodation capacity utilization rate increased by 2.4 per cent (Table 1-49).

Table 1-49: Hotels and Similar Facilities in the RM, as of December 31st, 2004-2014

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Hotels and similar facilities - total, including:	**69**	**71**	**76**	**78**	**79**	**93**	**95**	**106**	**112**	**119**	**129**
4-5 stars	6	6	10	11	10	13	14	21	24	25	26
3 stars	4	5	11	11	12	20	22	21	26	32	35
2 stars	6	7	7	6	8	9	9	9	9	10	12
Rooms - total	2576	2475	2457	2297	2350	2517	2695	2864	2996	3053	3205
Accommodation capacity - total beds	**4850**	**4581**	**4519**	**4271**	**4415**	**4727**	**5112**	**5454**	**5667**	**5811**	**6152**
Man-nights spent during the year - total, thousand	404.1	434.8	483.7	428.0	416.9	330.2	371.7	368.4	381.7	409.1	415.0
Accommodation capacity utilization rate, %	**25.2**	**26.6**	**30.9**	**28.3**	**28.6**	**20.8**	**22.1**	**20.0**	**20.5**	**21.2**	**21.7**

Source: Statistical Yearbooks of the RM for 2012 (pages 240-245), 2014 (pages 235-242).

Between 2009 and 2010, the number of foreign tourists visiting the RM decreased (Table 1-50), but this pattern did not persisted and soon exceeded the numbers recorded before the beginning of the economic crisis in 2009, because both the infrastructure and the offered tourist destinations are developing rapidly.

In 2014, travel agencies and tour operators provided their services to 238 thousand of tourists and excursionists, by 16.2 per cent more than in 2013. The total number of foreign tourists and excursionists, who visited the RM and used the services of the Moldovan travel agencies and tour operators was 14.4 thousand (of which: 58.2 per cent arrived aiming to rest, for recreation and leisure; 34.5 per cent - for business and professional purpose; 7.3 per cent - for a treatment), by 9.2 per cent more than in 2013.

Table 1-50: Tourist Activities of the Travel Agencies and Tour Operators in the RM, 2004-2014

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of foreign tourists arrived - total	26045	25073	14239	14722	8710	9189	8956	10788	12797	13150	14362
Number of Moldovan tourists travelled abroad - total	67846	57231	67826	81790	85085	93294	117204	136095	146791	157556	180646

Source: Statistical Yearbooks of the RM for 2012 (pages 240-245), 2014 (pages 235-242).

The total number of Moldovan tourists and excursionists, who travelled abroad using the services of the Moldovan travel agencies and tour operators was 180.6 thousand (98.7 per cent travelled abroad for rest, recreation and leisure), by 14.7 per cent more than in 2013. The above statistics reflect only the trips arranged by the Moldovan travel agencies and tour operators and do not include trips arranged by the travelers personally.

1.6.5. Retail Trade and Sales of Personal Services

The 2014 retail sales registered a growing pattern. The population purchased consumer goods to the total amount of 62.524 billion MDL, or by 7.6 per cent more than in 2013 (Table 1-51).

Table 1-51: Retail Trade in the RM, 1990-2013

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Retail sales, billion MDL	6.400	11.000	47.300	0.432	1.363	2.757	3.840	3.971	3.679	3.602	6.012	7.612
% compared to the previous year		82.0	53.0	75.0	58.0	111.7	118.0	96.2	87.7	72.6	104.0	114.8
Retail sales, billion US$				0.322	0.335	0.613	0.834	0.859	0.685	0.343	0.484	0.591
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Retail sales, billion MDL	10.753	14.537	16.576	19.488	23.357	28.220	34.684	32.143	38.766	50.937	51.790	57.235
% compared to the previous year	134.2	118.2	105.6	105.3	106.9	107.6	108.8	95.1	104.5	112.2	103.4	107.2
Retail sales, billion US$	0.792	1.043	1.344	1.547	1.779	2.325	3.338	2.892	3.135	4.340	4.277	4.546

Source: Ministry of Economy, Department of Macroeconomic Analysis and Forecasts (July 2015).

In 2014, the trading volume for retail trade increased by 7.5 per cent (in comparable prices) as compared to the preceding year, while the sales of the retails companies recorded an increase by 12.0 per cent (in current prices) compared to the preceding year 2013. The 2014 sales of personal services totaled 23.3 billion MDL or by 5.1 per cent more in real terms than in 2013 (Table 1-52).

Table 1-52: Sales of Personal Services in the RM, 1990-2013

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Sales of personal services, bill. MDL	0.900	1.200	5.800	0.070	0.424	0.652	0.820	1.237	1.299	1.897	2.600	3.404
% compared to the previous year		81.0	55.0	67.0	52.0	100.1	78.1	110.2	88.3	89.8	100.1	121.2
Sales of personal services, bill. US$				0.052	0.104	0.145	0.178	0.268	0.242	0.181	0.209	0.265
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Sales of personal services, bill. MDL	4.222	5.299	6.970	8.210	9.964	11.569	13.153	14.590	16.670	19.044	20.988	22.180
% compared to the previous year	111.8	113.3	105.3	109.2	105.6	101.1	97.8	102.5	103.9	105.0	103.0	103.0
Sales of personal services, bill. US$	0.311	0.380	0.565	0.652	0.759	0.953	1.266	1.313	1.348	1.623	1.733	1.762

Source: Ministry of Economy, Department of Macroeconomic Analysis and Forecasts (July 2015).

In 2014, the trading volume for personal service sales increased by 7.4 per cent (in comparable prices) as compared to 2013, while the trading volume for personal service sales companies, recorded a positive trend, increasing by 10.2 per cent (in current prices) as compared to 2013 year.

1.6.6. Capital Investments

The 2014 data on the volumes of capital investments show a slight increase by 1.8 per cent compared to 2013 (Figure 1-17).

Between 1990 and 2014, the development of that indicator was characterized by certain fluctuations, positive results were recorded only in 1998 and, more recently, during 2001-2008, 2010-2011 and 2013-2014 time series (Table 1-53).

Between 1990 and 2014, the development of that indicator was characterized by certain fluctuations, positive results were recorded only in 1998 and, more recently, during 2001-2008, 2010-2011 and 2013-2014 time series (Table 1-53)

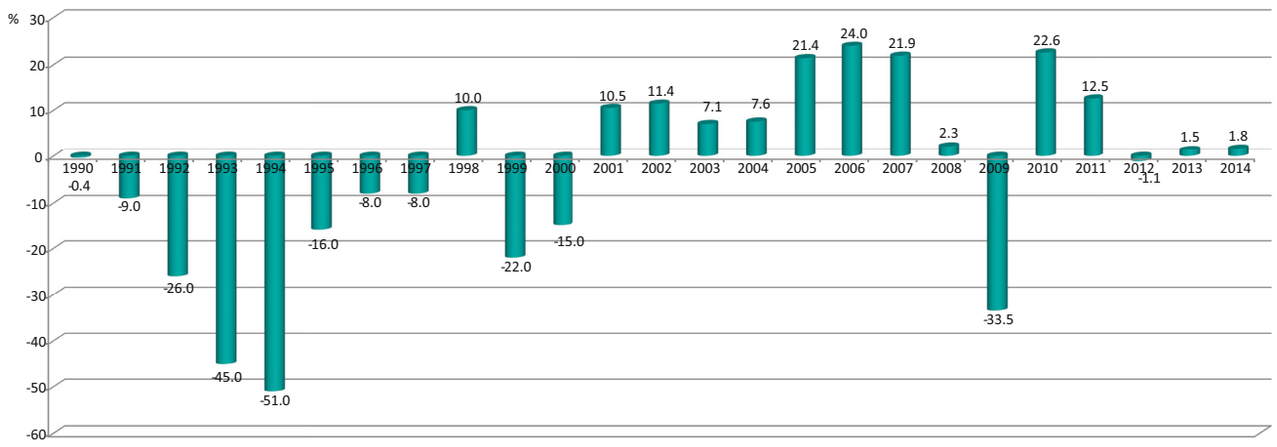


Figure 1-17: Capital Investments in the RM, 1991-2014 (% compared to the preceding year)

Table 1-53: Capital Investments in the RM, 1990-2013

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Investments, billion MDL	2.500	3.300	28.300	0.171	0.712	0.845	0.987	1.202	1.444	1.592	1.759	2.315
% compared to 1990		91.0	67.3	37.0	18.1	15.2	14.0	12.9	14.2	11.1	9.4	10.4
Investments, billion US$				0.128	0.175	0.188	0.215	0.260	0.269	0.152	0.142	0.180
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Investments, billion MDL	2.804	3.622	5.140	7.797	11.012	15.336	18.225	11.124	13.805	16.450	17.154	18.636
% compared to 1990	11.6	12.4	13.3	16.2	20.1	24.5	25.1	16.7	20.4	23.0	22.7	23.1
Investments, billion US$	0.207	0.260	0.417	0.619	0.839	1.264	1.754	1.001	1.116	1.402	1.417	1.480

Source: Ministry of Economy, Department of Macroeconomic Analysis and Forecasts (July 2015).

In 2014, capital investments totaled 20.353 billion MDL in current prices (of which 10.685 billion MDL – in construction-assembling works, a 4.4 per cent increase compared to the similar period of 2013; 8.672 billion MDL – in machinery and equipment, transportation vehicles, a 1.7 per cent increase compared to the previous year; respectively 0.996 billion MDL – other), which amounts to approximately 23.1 per cent of the 1990 level. Compared to 2013, in 2014 year the share of construction-assembling works increased by 1.7 per cent; while the investments in machinery, equipment, transportation vehicles and other decreased by 0.4 per cent and 1.3 per cent respectively.

The analysis of the investment structure by ownership revealed that increased investment activity was recorded mainly at the expense of the private sector of the economy. Economic agents and physical persons within that sector invested 8.251 billion MDL, representing 40.5 per cent of the total investments. Compared to 2013, the level of those investments decreased by 15.5 per cent (in comparable prices). Enterprises from the public sector ensured 44.1 per cent of total national investments, or 8.972 billion MDL, increasing by 36.3 per cent compared to the preceding year. Joint ventures and foreign-owned companies invested 14.4 per cent of the total national investments, or by 2.7 per cent less than in 2013.

In order to ensure the investment process in 2014 there were mainly used investments from the internal sources of companies and individuals, representing 11.194 billion MDL or 55.0 per cent of the total. In 2014, in order to ensure investment needs at the expense of budgetary resources 4.066 billion MDL were used or 20.0 per cent of the total investments, increasing by 78.7 per cent compared to 2013 (in comparable prices). The share of capital investments from foreign investors s-decreased by 3.1 per cent compared to the previous year, representing 4.4 per cent of total investment.

In terms of the structure of capital investments, most of the investments were channeled into the machinery, equipment and transportation vehicles sector – 42.6 per cent, compared to 43.0 per cent in 2013). The share of investments into the construction of buildings and structures represented 34.2 per cent of total investments (of which 11.6 per cent - housing and 22.6 per cent – other buildings and structures). Investments in the construction of housing decreased by 1.1 per cent compared to 2013, while for other buildings and structures an increase by 1.1 per cent was recorded.

1.6.7. Forestry Management

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, recovering to 372.8 thousand ha in 2013 or circa 11.1 per cent of the country's territory[12] (Figure 1-18).

[12] 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.

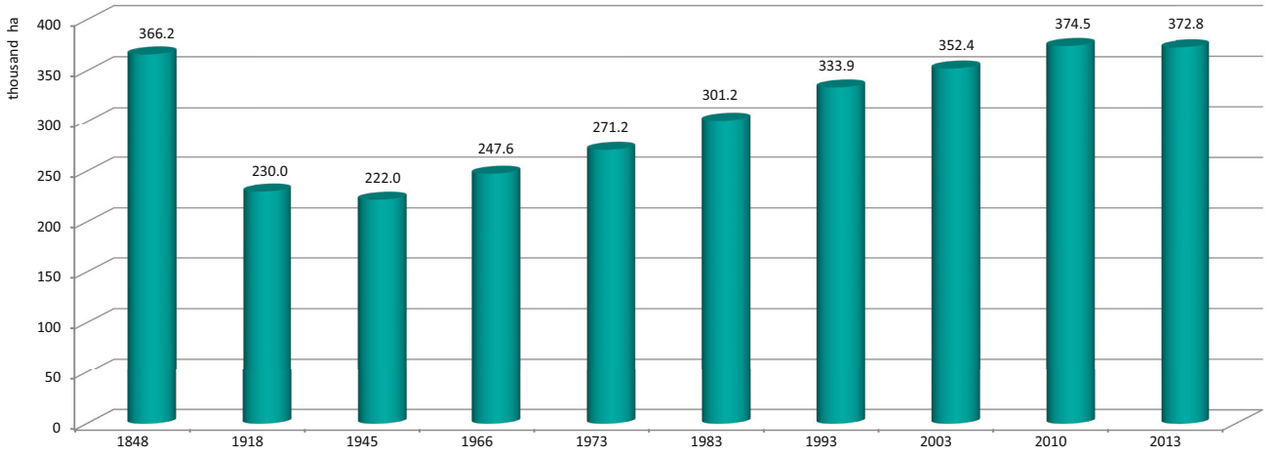


Figure 1-18: Evolution of Areas Covered with Forests in the RM, 1848-2013, thousand ha

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 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 47 million m^3, on average 124 m^3 per hectare. The average forest increment is 3.3 m^3/ha/year, and the total average increment is circa 1240 thousand m^3/year. The average production class is 2.3. The structure by age in all forest species is misbalanced, in particular in those of low productivity.

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 2007, a catastrophic drought was reported in the RM, affecting over 80 per cent of the country territory. This phenomenon has substantially damaged the national forests over an area of circa 19 thousand ha or 5.5 per cent of the forests, in particular in the southern and central regions of the country.

The drought affected about 20 forest species, both indigenous and non-native, such as: *Quercus robur L., Quercus petraea (Matt) Liebl., Quercus pubescens Willd, Fraxinus exelsior L., Acer platanoides L., Acer pseudoplatanus L., Robinia pseudoacacia L., Betula verrucosa Ehrh., Pinus sylvestris L., Pinus pallasiana [Lamb] Holmboe*. The most affected species was *Robinia spp,* representing 71.3 percent (13 thousand ha) of the total. The 2007 year drought has long-lasting consequences, and these are visible over several years. According to air-visual forest pathology research data, in 2009 year the total area of damaged and dried rammels represented 17.9 thousand ha, in 2010 year – 13.1 thousand ha, in 2011 – 8.9 thousand ha, while in2012 – 9.0 thousand ha.

Table 1-54 reveals the diversity of forest species growing in the forests of the RM, forming 11 group of species.

Table 1-54: 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	ST
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	PA
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	TE
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	PL
10.	*Robinia spp.*	Acacia	Acacia, Honey locust, Sofora	SC
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.	AS

In order to estimate biomass increments in forests and implicitly, resulting in 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 2013, available into the National Report on Forestry Resources of the Republic of Moldova (2011) and General Land Cadasters of the Republic of Moldova (Table 1-55).

Table 1-55: Forest Land Areas in the Republic of Moldova within 1990-2013 periods, thousand ha

Year	Total	Forest Land Areas by Species										
		ST	CA	FR	PA	UL	TE	SA	PI	PL	SC	AS
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	6.5
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

Year	Total	Forest Land Areas by Species										
		ST	CA	FR	PA	UL	TE	SA	PI	PL	SC	AS
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

Source: National Report on Forestry Resources of the Republic of Moldova (2011), General Land Cadasters for 1990-2013 periods; Statistical Records and Reports of „Moldsilva" Agency on afforestation over the 1998-2013 periods.

At the same time, beginning with 2013, information on the distribution of predominant forest species were taken from Forestry Research and Management Institute database. Final data on species distribution over the period of time under review was obtained by modelling using the primary data set obtained from the 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.

The volume of commercial timber, as well as the quantity of fuel wood gathered in the Republic of Moldova, there were identified based on statistical data and reports on commercial fellings 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 State Ecological Inspectorate, on authorized fellings 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 1-56).

Table 1-56: Trends in Fuel Wood Harvests in the Republic of Moldova, 1990-2013

	1990	1991	1992	1993	1994	1995	1996	1997
Commercial fellings, thousand m^3	39.4	27.0	27.4	31.5	39.8	68.5	51.7	52.7
Fuel wood gathering, thousand m^3	184.2	260.7	314.7	402.9	347.7	420.0	402.4	280.2
Illegal fuel wood logging, thousand m^3	0.6	140.8	213.4	328.2	210.7	205.7	187.5	21.4
Total fuel wood harvested, thousand m^3	184.8	401.5	528.1	731.1	558.4	625.7	589.9	301.6
	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Commercial fellings, thousand m^3	38.0	38.8	39.7	37.3	50.4	47.0	43.5	39.0
Fuel wood gathering, thousand m^3	332.4	326.1	330.5	307.1	343.9	372.4	371.7	352.2
Illegal fuel wood logging, thousand m^3	64.2	22.0	7.5	6.0	5.4	5.9	4.4	4.2
Total fuel wood harvested, thousand m^3	396.6	348.1	338.0	313.1	349.3	378.3	376.1	356.4
	2006	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Commercial fellings, thousand m^3	46.5	44.4	42.8	37.3	40.6	33.9	31.7	29.9
Fuel wood gathering, thousand m^3	419.8	388.7	400.3	394.8	415.4	471.3	524.2	567.4
Illegal fuel wood logging, thousand m^3	7.2	2.2	2.7	3.6	20.5	5.7	4.8	3.9
Total fuel wood harvested, thousand m^3	427.0	390.9	403.0	398.4	435.9	477.0	529.0	571.3

Source: Statistical Records/Reports of "Moldsilva" Agency and of the State Ecological Inspectorate for the 1990-2013 time series; D. Galupa, I. Talmaci, L. Spitoc, Study for the RM "Ensuring sustainability of forests and livelihoods through improving governance and control of illegal logging". Chisinau, Centrul editorial al UASM, 2005, 116 pages; Statistical Yearbooks of the ATULBD (2013); 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

Between 1990 and 2013, through different types of forest fellings a total wood mass of circa 11 million m^3 was harvested, including commercial wood – circa 980 thousand m^3 and fuel wood – circa 10 million m^3. 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 percent).

Distribution by species of wood suitable for industrial processing and fuel wood is presented in Tables 1-57 and 1-58 and refers to the 1990-2013 time series.

Table 1-57: Trends in Commercial Fellings Harvest in the RM, 1990-2013, thousand m^3

Species	1990	1991	1992	1993	1994	1995	1996	1997
Quercus spp.	7.16	4.32	4.09	4.41	6.88	9.59	10.05	10.26
Carpinus spp.	1.05	0.71	0.72	0.83	1.04	1.79	1.35	1.39
Fraxinus spp.	3.65	2.99	3.24	3.94	4.03	8.56	4.47	4.47
Acer spp.	0.31	0.23	0.23	0.27	0.34	0.58	0.45	0.44
Ulmus spp.	0.17	0.10	0.10	0.12	0.15	0.26	0.19	0.21
Tilia spp.	3.78	2.48	2.52	2.90	3.66	6.31	4.70	4.91
Salix spp.	0.26	0.19	0.19	0.22	0.28	0.48	0.37	0.36
Pinus spp.	0.28	0.17	0.18	0.20	0.26	0.44	0.32	0.35
Populus spp.	4.87	3.20	3.26	3.74	4.73	8.14	6.07	6.33
Robinia spp.	16.74	12.02	12.26	14.18	17.54	30.83	22.66	22.70
Other species	1.15	0.59	0.60	0.69	0.89	1.51	1.06	1.28
Total	39.40	27.00	27.40	31.50	39.80	68.50	51.70	52.70

Species	1998	1999	2000	2001	2002	2003	2004	2005
Quercus spp.	7.40	7.51	7.77	5.18	10.12	10.31	9.34	7.63
Carpinus spp.	1.00	0.99	1.07	1.09	1.85	1.00	0.92	1.05
Fraxinus spp.	3.23	3.49	3.17	2.96	4.45	3.41	3.03	3.12
Acer spp.	0.32	0.37	0.28	0.30	0.42	0.26	0.19	0.28
Ulmus spp.	0.15	0.13	0.18	0.19	0.24	0.22	0.22	0.18
Tilia spp.	3.54	3.34	3.97	4.86	4.82	4.22	4.47	3.90
Salix spp.	0.26	0.30	0.24	0.32	0.29	0.20	0.21	0.24
Pinus spp.	0.25	0.22	0.30	0.33	0.00	0.00	1.10	0.30
Populus spp.	4.56	4.32	5.11	2.89	5.82	8.28	6.62	5.02
Robinia spp.	16.37	17.67	16.13	18.19	19.94	16.43	15.93	15.85
Other species	0.92	0.45	1.46	0.97	2.46	2.66	1.44	1.44
Total	38.00	38.80	39.70	37.30	50.40	47.00	43.50	39.00
Species	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Quercus spp.	9.26	7.49	7.17	5.84	7.16	5.68	4.77	6.28
Carpinus spp.	1.28	0.92	1.13	0.77	0.87	0.74	0.49	0.52
Fraxinus spp.	5.57	5.94	6.02	5.70	5.83	4.03	4.52	4.76
Acer spp.	0.28	0.28	0.25	0.15	0.20	0.14	0.11	0.15
Ulmus spp.	0.27	0.31	0.20	0.17	0.19	0.24	0.12	0.17
Tilia spp.	4.06	3.45	3.84	3.24	3.42	3.17	2.67	2.21
Salix spp.	0.31	0.42	0.38	0.38	0.14	0.19	0.24	0.25
Pinus spp.	0.79	1.60	0.60	0.89	1.19	1.95	1.35	0.73
Populus spp.	7.81	6.44	6.09	4.87	6.32	5.61	5.26	5.06
Robinia spp.	15.68	16.58	16.01	14.34	14.41	11.47	11.69	9.43
Other species	1.22	1.01	1.10	0.98	0.89	0.69	0.47	0.36
Total	46.50	44.40	42.80	37.30	40.60	33.90	31.70	29.90

Source: Statistical Records/Reports of "Moldsilva" Agency and of the State Ecological Inspectorate for the 1990-2013 time-series.

Table 1-58: Trends in Fuel Wood Harvest in the Republic of Moldova,1990-2013, thousand m^3

Species	1990	1991	1992	1993	1994	1995	1996	1997
Quercus spp.	30.10	50.35	49.29	51.15	39.07	63.60	58.99	49.12
Carpinus spp.	12.50	17.96	13.24	13.15	10.05	11.30	15.45	20.41
Fraxinus spp.	15.80	38.99	56.52	73.07	55.81	71.97	73.74	25.80
Acer spp.	8.70	11.39	6.65	6.19	4.73	5.30	5.00	14.12
Ulmus spp.	3.50	6.19	6.54	10.23	7.81	8.76	2.26	5.72
Tilia spp.	10.60	18.97	20.40	29.23	22.32	20.10	19.50	17.29
Salix spp.	3.40	6.68	7.95	12.42	9.49	10.64	4.14	5.57
Pinus spp.	0.40	2.10	4.09	6.58	5.02	5.63	3.80	0.70
Populus spp.	11.80	34.34	55.04	73.07	55.81	74.35	70.09	19.21
Robinia spp.	76.80	197.60	294.55	439.88	335.98	340.30	323.90	125.34
Other species	11.20	16.91	13.82	16.08	12.28	13.77	12.98	18.32
Total	184.80	401.50	528.10	731.04	558.36	625.72	589.84	301.60
Species	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Quercus spp.	64.60	55.32	53.71	48.34	56.93	65.45	64.16	56.64
Carpinus spp.	26.84	24.10	23.40	22.46	23.41	23.07	25.30	24.68
Fraxinus spp.	33.93	30.09	29.22	28.35	28.91	32.38	30.63	30.81
Acer spp.	18.57	16.64	16.16	14.17	17.49	16.50	17.13	17.04
Ulmus spp.	7.52	6.38	6.19	5.78	6.36	8.32	7.07	6.53
Tilia spp.	22.73	19.59	19.02	18.93	18.35	21.63	23.40	20.06
Salix spp.	7.33	6.32	6.13	5.48	6.55	6.28	8.22	6.47
Pinus spp.	0.92	0.74	0.72	1.41	0.00	0.00	2.09	0.76
Populus spp.	25.26	20.32	19.73	17.37	21.29	28.96	28.19	20.80
Robinia spp.	164.81	148.24	143.93	132.86	149.22	148.22	147.77	151.77
Other species	24.09	20.38	19.78	17.98	20.79	27.52	22.09	20.86
Total	396.60	348.10	338.00	313.11	349.30	378.34	376.05	356.40
Species	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Quercus spp.	71.56	57.00	59.84	59.35	65.69	79.79	83.11	98.48
Carpinus spp.	27.49	23.70	27.73	26.27	30.17	34.93	40.30	43.30
Fraxinus spp.	48.42	47.74	49.05	52.75	62.33	51.65	63.42	71.72
Acer spp.	23.05	21.44	23.48	23.33	23.79	22.10	13.00	21.92
Ulmus spp.	10.45	10.47	8.55	9.90	12.74	20.60	21.51	20.27
Tilia spp.	27.66	24.71	25.19	22.43	22.98	22.22	28.75	29.88
Salix spp.	9.95	8.43	7.85	4.75	5.42	7.80	9.25	10.72
Pinus spp.	3.06	2.80	2.74	3.91	4.78	10.29	8.94	10.88
Populus spp.	27.11	23.26	25.04	23.82	26.00	30.97	33.76	39.41
Robinia spp.	161.18	155.21	154.83	149.54	162.77	173.10	188.06	192.53
Other species	17.08	16.17	18.74	22.32	19.20	23.55	38.90	32.19
Total	427.00	390.94	403.03	398.36	435.86	477.00	529.00	571.30

Source: Statistical Records/Reports of "Moldsilva" Agency and of the State Ecological Inspectorate for the 1990-2013 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 2000-2014.

Data on the volume of fuel wood gathered also include the volume of twigs, boughs, branches, etc., which are used as fuel as well. Taking into account 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.

Activity data on forest land affected by fires are available in Statistical Yearbooks of the Republic of Moldova and those of the ATULBD (Table 1-59).

Table 1-59: Forest Land Areas Affected by Fires in the Republic of Moldova,1990-2013

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

Source: Statistical Yearbooks of the RM for 1994 (page 38), 1999 (page 20), 2007 (page 22), 2011 (page 22), 2014 (page 22); Statistical Yearbooks of the ATULBD for 2000 (page 88), 2002 (page 91), 2007 (page 81), 2009 (page 80), 2011 (page 82), 2014 (page78).

1.6.8. Waste Management

Current situation with the management of 'Municipal Solid Waste' (MSW) 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 and more in urban areas. These data were taking into consideration during the development of the Republic of Moldova's Waste Management Strategy for 2013-2027.

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 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 waste management systems at regional level. 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 and district centers 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 2013 – Environment Protection in the Republic of Moldova, the total area of SWDS in urban areas represent circa 1100 ha. In 2013, the area of authorized SWDS represented only 169.5 ha (NBS, 2014), therefore, circa 930 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 1110 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 2014 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 2013-2014 in Nisporeni, Telenesti and Hincesti. Within 2000-2013 time periods, through urban sanitation services, about 1144 and 2647 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 30-35 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 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, Anenii Noi district 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. In fact, this landfill could still be used, but this is not possible due to repeated actions of blocking the access to the landfill by the residents of the nearby villages as a result of public opinion manipulation and the politicization of environment protection issues. Road blocking to the Cretoaia landfill is considered by the specialists as a populist action, without any relevant supporting arguments for stopping its use.

Meanwhile, starting with 2011 Chisinau municipality stores its waste near the waste transshipment station, located in the outskirts. The new location, though a temporary solution, is already a serious environmental problem since waste is disposed on an unmanaged land, lacking environment protection measures such as sealing foundation, rainwater deviation, etc.

The impact of waste on the environment increased significantly in recent years, and inappropriate management entails soil and phreatic water contamination, as well as CH_4, CO_2 emissions and other toxic gases, directly affecting the human health and the environment.

Between 1986 and 2012, several waste morphologic composition studies were performed in the Republic of Moldova. Figure 1-19 illustrates the shares of biodegradable fractions in the waste stream in the Republic of Moldova, indicating a decrease from circa 71 per cent in 1993 to 56 per cent in 2001 with a further increase to 72 per cent in 2005.

In 2012, a technical team within the State Environmental Laboratory conducted a study on solid waste morphologic composition thud determining the morphology of household waste generated in Chisinau, and respectively in Balti, Leova and Causeni municipalities (Table 1-60).

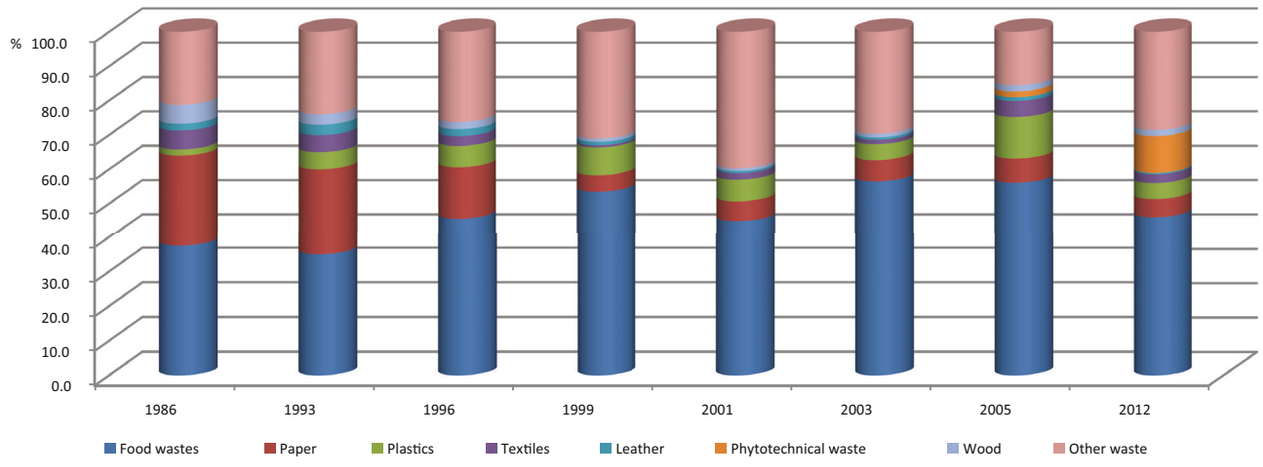


Figure 1-19: Biodegradable Waste in the Major Waste Streams in the Republic of Moldova.

Table 1-60: Average annual WDS Morphological Composition in 2012 year

Waste Type		Morphological Composition of Municipal Waste, %			
		Chisinau	Balti	Average Leova/Causeni	Average
Recyclable Waste	Paper	7.98	2.83	5.02	5.28
	Glass	8.06	5.17	5.13	6.12
	Plastics	7.30	3.76	2.92	4.66
	Metals and non-metals	1.98	1.99	1.04	1.67
Organic Waste	Food waste	46.24	63.14	28.79	46.06
	Phytotechnical Waste	4.30	5.01	23.00	10.77
	Fabrics	3.28	2.66	1.84	2.59
	Leather products and shoes	0.57	0.20	0.29	0.35
Bulky Waste	Furniture	1.39	3.88	0.59	1.95
	Electronic and Electrical Equipment	1.66	1.01	0.97	1.21
Construction and Demolition Waste	Wood	1.87	1.85	1.55	1.76
	Other (construction waste)	15.37	8.50	28.86	17.58

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, which enabled further development of feasibility studies.

As for the statistical sources on waste management records examined, 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. The performed analyzes 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 1-61 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.

Table 1-61: Activity Data on the Amount of Solid Waste Disposed on Land in the Republic of Moldova within 1985-2013 periods[13], thousand m^3

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Managed SWDS	963.30	1012.25	1037.18	1061.65	1110.90	1126.00	1127.40	879.40	869.30	830.00
Unmanaged SWDS	1945.00	2094.03	2043.30	2143.75	2243.00	2273.30	2317.30	2714.40	699.60	641.20
Total	2908.30	3106.28	3080.48	3205.40	3353.90	3399.30	3444.70	3593.80	1568.90	1471.20
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**
Managed SWDS	833.10	806.90	822.90	815.80	780.50	734.20	691.00	741.00	745.80	766.70
Unmanaged SWDS	540.40	592.80	482.90	490.40	430.90	410.40	410.90	407.40	397.70	433.30
Total	1373.50	1399.70	1305.80	1306.20	1211.40	1144.60	1101.90	1148.40	1143.50	1200.00
	2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**%**
Managed SWDS	785.50	819.00	1175.90	1487.10	1478.60	1494.00	1556.90	1591.30	1633.20	69.5
Unmanaged SWDS	483.00	534.60	614.70	643.70	731.60	808.60	793.10	829.80	1014.20	-47.9
Total	1268.50	1353.60	1790.60	2130.80	2210.20	2302.60	2350.00	2421.10	2647.40	-9.0

[13] Since1993, the information refers only to the Right Bank of the Dniester River.

During the previous years, there were several attempts to estimate GHG emissions from the SWDS from the left bank of the Dniester River (ATULBD). In this region, the situation in the field is similar with the rest of the country; household and industrial waste being disposed together to the SWDS. According to „The State Programme on Household and Industrial Waste Management Development", in 2006 year about 448.6 thousand m^3 of solid waste (a conversion coefficient of 0.25 tons/1m^3 of SWD is used in the region, due to the fact that the transportation services imply the use of old soviet trucks with a lower capacity) were disposed in the ATULBD to 8 authorized and about 90 unauthorized landfills. At the same time, in the last few years an increasing trend of waste generation and disposal was recorded in the region, with a total of 643.2 thousand m^3 of disposed waste in 2014 (Table 1-62).

Table 1-62: AD on the Amount of Solid Waste Disposed on Land in the ATULBD within 1993-2014, thousand m^3

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total MSW	367.4	328.1	331.1	367.4	362.7	385.8	384.8	263.8	138.9	250.8	362.7
	2004	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Total MSW	381.7	380.4	448.6	524.5	600.5	644.9	594.8	606.3	598.0	621.0	643.2

To be noted that all active landfills were built between 1960 and 1990, do not comply with sanitary and environment protection requirements and should be considered landfills. Within the current inventory cycle, AD refer to the amount of solid waste disposed on land in Tiraspol, Bender as well as in other 5 district centers – Camenca, Rabnita, Dubasari, Grigoriopol and Slobozia. The main sources of information were the Annual Activity Reports of the Ministry of Agriculture and Natural Resources of the ATULBD[14], Annual Activity Reports of the Local Public Administrations on the left bank of the Dniester River[15]; as well as the sectoral statistical publications[16].

As for the industrial waste, statistical data reveal that the waste generation process is unstable in time and the uncertainty is quite high. At the same time, following the GPG recommendations, AD must be consistent over time. Therefore, in order to estimate the amount of industrial waste for the right bank of Dniester river, after consulting the field experts, it was decided to use a share of 80 per cent of the biodegradable organic waste disposed to landfills between 1985 and 1989; 70 per cent for 1990; 60 per cent for 1991; 50 per cent of the biodegradable organic waste disposed to landfills between 1992 and 1999, a share of 60 per cent for the 2000-2008 time series, and a 40 per cent share for 2009-2013, based on the fact that the economic crisis strongly affected in 2009 year the industrial sector of the Republic of Moldova, reducing the amount of industrial waste generated. As for the left bank of the Dniester River, different sources reveal AD for 2002 and 2007-2010 time series. For the 1993-2001 time periods, respectively for 2003-2006 and 2010-2013, AD were generated using the extrapolation method. Table 1-63 refers to AD on total industrial waste disposed on land in the Republic of Moldova within 1985-2013 time series.

[14] <http://ecology-pmr.org/inform/inform_otchet.shtml>

[15] <http://rybnitsa.org/content/otchet-o-prodelannoy-rabote-gosadministracii-rybnickogo-rayona-i-g-rybnica-za-2013-god>; <http://grig-rsnd.idknet.com/news/informaciya-o-prodelannoj-rabote-go-sudarstvennoj-administracii-grigoriopolskogo-rajona-i-g-grigoriopol-za-2012-god-po-vypolneniyu-re-shenij-grigoriopolskogo-rajonnogo-soveta-narodnyx-deputatov.html>; <http://parcani.at.ua/news/otchet_gosudarstvennoj_administracii_slobodzejskogo_rajona_i_goroda_slobodzeja/2013-04-02-537>; <http://www.dubossary.ru/news.php?extend.3958; http://www.oblshkola.ru/obls/tverdih-bitovih-othodov-v-g-benderi/>;

[16] <http://mepmr.org/gosudarstvennaya-statistika/informacziya/77-sostoyanie-zhkx>.

Table 1-63: Activity Data on the Amount of Industrial Waste Disposed on Land in the Republic of Moldova within 1985-2013, thousand tons

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Right bank of Dniester River	930.66	994.01	985.75	1025.73	1073.25	951.80	826.73	718.76	313.78	294.24
Left bank of Dniester River	NA	NA	NA	NA	NA	NA	NA	NA	246.12	196.90
Republic of Moldova, total	930.66	994.01	985.75	1025.73	1073.25	951.80	826.73	718.76	559.90	491.14
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**
Right bank of Dniester River	274.70	279.94	261.16	261.24	242.28	274.70	264.46	275.62	274.44	288.00
Left bank of Dniester River	164.08	142.68	129.71	123.53	124.78	126.04	127.31	128.60	153.28	177.96
Republic of Moldova, total	438.78	422.62	390.87	384.77	367.06	400.74	391.77	404.22	427.72	465.96
	2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**%**
Right bank of Dniester River	304.44	324.86	429.74	511.39	353.63	368.42	376.00	387.38	423.58	-54.5
Left bank of Dniester River	202.64	227.32	252.00	245.60	184.00	88.10	86.70	85.51	88.80	-63.9
Republic of Moldova, total	507.08	552.18	681.74	756.99	537.63	456.52	462.70	472.89	512.39	-44.9

Table 1-64 provide AD on the total amount of solid municipal and industrial waste disposed at the landfills between 1985 and 2013; including AD on the disposal of solid municipal waste within the managed solid waste disposal sites (Chisinau municipality), the unmanaged solid waste disposal sites (the urban areas on both the right and left bank of the Dniester River were sanitation services exist and report the information to the regional and central statistical authorities), as well as AD on industrial waste disposal (for both the right and left bank of the Dniester River).

Table 1-64: Activity Data on the Amount of Solid Municipal and Industrial Waste Disposed at SWDS in the Republic of Moldova within 1985-2013 periods, thousand tons

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Managed SWDS	385.3	404.9	414.9	424.7	444.4	450.4	451.0	351.8	347.7	332.0
Unmanaged SWDS	778.0	837.6	817.3	857.5	897.2	909.3	926.9	1085.8	371.7	338.5
Industrial SWDS	930.7	994.0	985.8	1025.7	1073.2	951.8	826.7	718.8	559.9	491.1
Total	2094.0	2236.5	2217.9	2307.9	2414.8	2311.5	2204.6	2156.3	1279.3	1161.7
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**
Managed SWDS	333.2	322.8	329.2	326.3	312.2	293.7	276.4	296.4	298.3	306.7
Unmanaged SWDS	298.9	329.0	283.8	292.6	268.5	230.1	199.1	225.7	249.8	268.8
Industrial SWDS	438.8	422.6	390.9	384.8	367.1	400.7	391.8	404.2	427.7	466.0
Total	1071.0	1074.3	1003.9	1003.7	947.8	924.5	867.3	926.3	975.8	1041.4
	2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**%**
Managed SWDS	314.2	327.6	470.4	594.8	591.4	597.6	622.8	636.5	653.3	69.5
Unmanaged SWDS	288.3	326.0	377.0	408.6	522.8	477.5	468.8	481.4	560.9	-27.9
Industrial SWDS	507.1	552.2	681.7	757.0	537.6	456.5	462.7	472.9	512.4	-44.9
Total	1109.6	1205.8	1529.1	1760.4	1651.9	1531.6	1554.3	1590.8	1726.6	-17.5

Between 1985 and 2013, the amount of waste collected and disposed in urban landfills significantly decreased, in particular in 1992 and 1993 years.

The above mentioned allow assert:

- in 1985-1992 time period, the statistical system covered the entire territory of the country, while since 1993, it refers only to the right bank of the Dniester River (without ATULBD);
- data on the amount of solid waste disposed in the ATULBD became available only in recent years and are collected through multiple sources including the Annual Activity Reports of the Ministry of Agriculture and Natural Resources of the ATULBD and the Annual Activity Reports of the Local Public Administrations from the left bank of the Dniester River; the official statistical information became available starting with 2011[17];
- following the breakup of the Soviet Union, the country's economy was affected by a severe economic decline which continued till 2001; since the industry was one of the most affected sector of the national economy, as a result the amount of solid waste and industrial waste decreased dramatically;
- during the soviet period, raw material processing was extremely inefficient, therefore enormous amount of waste was generated, in particular industrial waste; another widespread phenomenon during the soviet era was „inflating figures"; since the statistical form „Special auto transport" reflected fuel consumption, respectively the distance traveled, the number of routes with the purpose of transporting solid waste was often increased thus explaining a larger amount of fuel used;
- the decrease in the amount of industrial waste after 2009 is the result of the severe economic decline that affected the Republic of Moldova, as well as other countries in the region; it should be noted that some sectors of the national economy such as food industry are extremely dependent of the geo-political regional context; therefore the Russian embargo on Moldovan food and agricultural products, specifically starting with 2006 year, had an impact on the decreasing trend of the industrial waste disposed. At the same time, since 2010, the agriculture sector of the Republic of Moldova attracted increasingly more investment in modernizing the technological processes; waste from food and agricultural industry are often subjected to biological treatment and biomass is widely used for energy generation.

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 90s of the twentieth century. In 1990 year just 20 per cent of the waste was generated in Chisinau city, while in the last five years the share of Chisinau city represents about 40 per cent of the total amount of waste disposed in landfills.

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 is not subject to statistical evidence, as no sanitation services exist there. Also, although waste processing enterprises operate in the Republic of Moldova, information on the amount of recycled waste is not always subjected to 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 recultured and their number – drastically reduced.

[17] <http://mepmr.org/gosudarstvennaya-statistika/informacziya/77-sostoyanie-zhkx>.

CHAPTER 2: NATIONAL GREENHOUSE GASES INVENTORY

2.1. Introduction

2.1.1. Convention, Kyoto Protocol and Party's Commitments

The United Nations Framework Convention on Climate Change (UNFCCC) was adopted on May 9, 1992 at the UN Conference on Environment and Sustainable Environment in Rio de Janeiro and was considered as a response of the international community to global warming, a phenomenon caused by atmosphere pollution and increasing atmospheric concentration of greenhouse gases.

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 a new Guideline on national communications for non-Annex I Parties (Decision 17/CP 8).

In conformity with these Guidelines, during 2005-2009 time period, under the *UNEP-GEF Project "Enabling Activities for the preparation of the Second National Communication under the UNFCCC",* Republic of Moldova developed its SNC under the UNFCCC; within 2010-2013 – the Third National Communication (3rdNC), while from 2014 to 2017, the Fourth National Communication (4thNC) is under preparation.

With reference to UNFCCC implementation instruments it should be noted that the COP 3 (Kyoto, 1997) adopted the Kyoto[18] Protocol, representing an instrument setting binding targets for the Parties under Convention, by committing industrialized countries and economies in transition (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 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 (2007), developing countries agreed for the first time to develop and implement *National Appropriate Mitigation Actions* 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.

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

[18] 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.

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

The draft LEDS 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.

Draft 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 country office of the United Nations Development Programme.

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.

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* every four years and *Biennial Update Reports* (BUR) every two years.

The inventory section of the BUR should consist of a national inventory report as a summary or as an update of the information contained in Decision 17/CP.8, Annex, Chapter III (National greenhouse gas inventories). The inventory 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 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.

Simultaneously, 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 will be conducted by a team of technical experts (TTE) and will be initiated within six months of BUR submission to the Secretariat.

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 21st, 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. As of 21st December 2015[19], 59 countries have ratified the Doha Amendment, most of which are non-Annex I Parties.

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 adopted by the COP 21 in Paris (2015)[20]. It is expected that the new climate agreement will establish 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 including those for estimating and accounting for anthropogenic

[19] <http://unfccc.int/kyoto_protocol/doha_amendment/items/7362.php>.
[20] <http://unfccc.int/resource/docs/2015/cop21/eng/l09r01.pdf>.

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 1st of October 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 is fully committed to the UNFCCC negotiation process towards adopting at COP 21 the Paris Agreement – an agreed outcome with legal force under the Convention, applicable to all Parties, in line with keeping global warming below 2ºC.

Following this statement, at 25th of September 2015, the Republic of Moldova communicated its Intended Nationally Determined Contribution (INDC)[21] 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.

The emission reduction targets will be developed into an emission budget covering the period 1st January 2021 to 31st December 2030.

[21] <http://www4.unfccc.int/submissions/INDC/Published%20Documents/Republic%20of%20Moldova/1/INDC_Republic_of_Moldova_25.09.2015.pdf>.

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, buthane 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 2013, the concentration of CO_2 increased by 41 per cent, concentration of CH_4– by 162 per cent, while N_2O concentration – by circa 21 per cent[22] (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.

[22] <http://cdiac.ornl.gov/pns/current_ghg.html>.

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

Greenhouse Gases	Preindustrial tropospheric concentration (1850-1900)	Recent tropospheric concentration (end of 2013)	GWP (100-yr time horizon) (IPCC, 2014)	Tropospheric lifetime (years)	Increased radiative forcing[23] (W/m^2)
Concentration in parts per million (ppm)					
Carbon dioxide (CO_2)	280	395.4	1	~ 100	1.88
Concentration in parts per billion (ppb)					
Methane (CH_4)	722	1893	28	12.4	0.49
Nitrous oxide (N_2O)	270	326	265	121	0.17
Tropospheric ozone (O_3)	237	337	n.a.	hours-days	0.40
Concentration in parts per trillion (ppt)					
CFC-11 (CCl_3F)	zero	236	4660	45	0.061
CFC-12 (CCl_2F_2)	zero	527	10200	100	0.169
CF-113 (CCl_2CClF_2)	zero	74	5820	85	0.022
HCFC-22 ($CHClF_2$)	zero	231	1760	11.9	0.046
HCFC-141b (CH_3CCl_2F)	zero	24	782	9.2	0.0036
HCFC-142b (CH_3CClF_2)	zero	23	1980	17.2	0.0042
Halon 1211 ($CBrClF_2$)	zero	4.1	1750	16	0.0012
Halon 1301 ($CBrClF_3$)	zero	3.3	6290	65	0.0010
HFC-134a (CH_2FCF_3)	zero	75	1300	13.4	0.0108
Carbon tetrachloride (CCl_4)	zero	85	1730	26	0.0143
Sulphur hexafluoride (SF_6)	zero	7.79	23500	3200	0.0043

[23] 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).

By the end of 2013, globally, the amount of annual emissions of carbon dioxide represented circa 35.3 Gigatons (Gt)[24], 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 is, on average, 100 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 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[25]).

It has been stated that circa 40 per cent of the atmospheric N_2O is of anthropogenic origin[26], 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[27].

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 aluminium 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 takes into account 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 relate to the GWP for a period of 100 years recommended by the IPCC SAR (1996) for use in GHG emissions inventory under UNFCCC and adopted at COP 3 (Table 2-2).

[24] <http://edgar.jrc.ec.europa.eu/news_docs/jrc-2014-trends-in-global-co2-emissions-2014-report-93171.pdf>.
[25] <https://www.globalmethane.org/documents/analysis_fs_en.pdf>.
[26] <https://www.wmo.int/pages/mediacentre/press_releases/pr_1002_en.html>.
[27] <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 [28]

GHG	Chemical formula	Lifetime	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
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
Perfluorocarbons (PFC)						
Perfluoromethane	CF_4	50000	6500	5700	7390	6630
Perfluoroethane	C_2F_6	10000	9200	11900	12200	11100

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

GHG	Chemical formula	Lifetime	SAR	TAR	AR4	AR5
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) AR4 – Fourth Assessment Report (IPCC, 2007) and AR5 – Fifth Assessment Report (IPCC, 2013).

2.1.4. Republic of Moldova's Contribution to Global Warming

The Republic of Moldova historic contribution to global warming is low. In 2013, the country contributed with circa 12.8 Mt CO_2 equivalent (without LULUCF) and 12.7 Mt CO_2 equivalent (with LULUCF) (Table 2-3), representing less than 0.03 per cent of total global GHG emissions.

Total and net emissions per capita, respectively, were less than half of the global average (3.2 t CO_2 equivalent/per capita compared to 6.4 t CO_2 equivalent/per capita, respectively, 3.1 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).

Between 1990 and 2013, the total national GHG emissions (without LULUCF) decreased by 70.4 per cent, which is much more than in some industrialized countries and economies in transition included in Annex I to Convention (Figure 2-1).

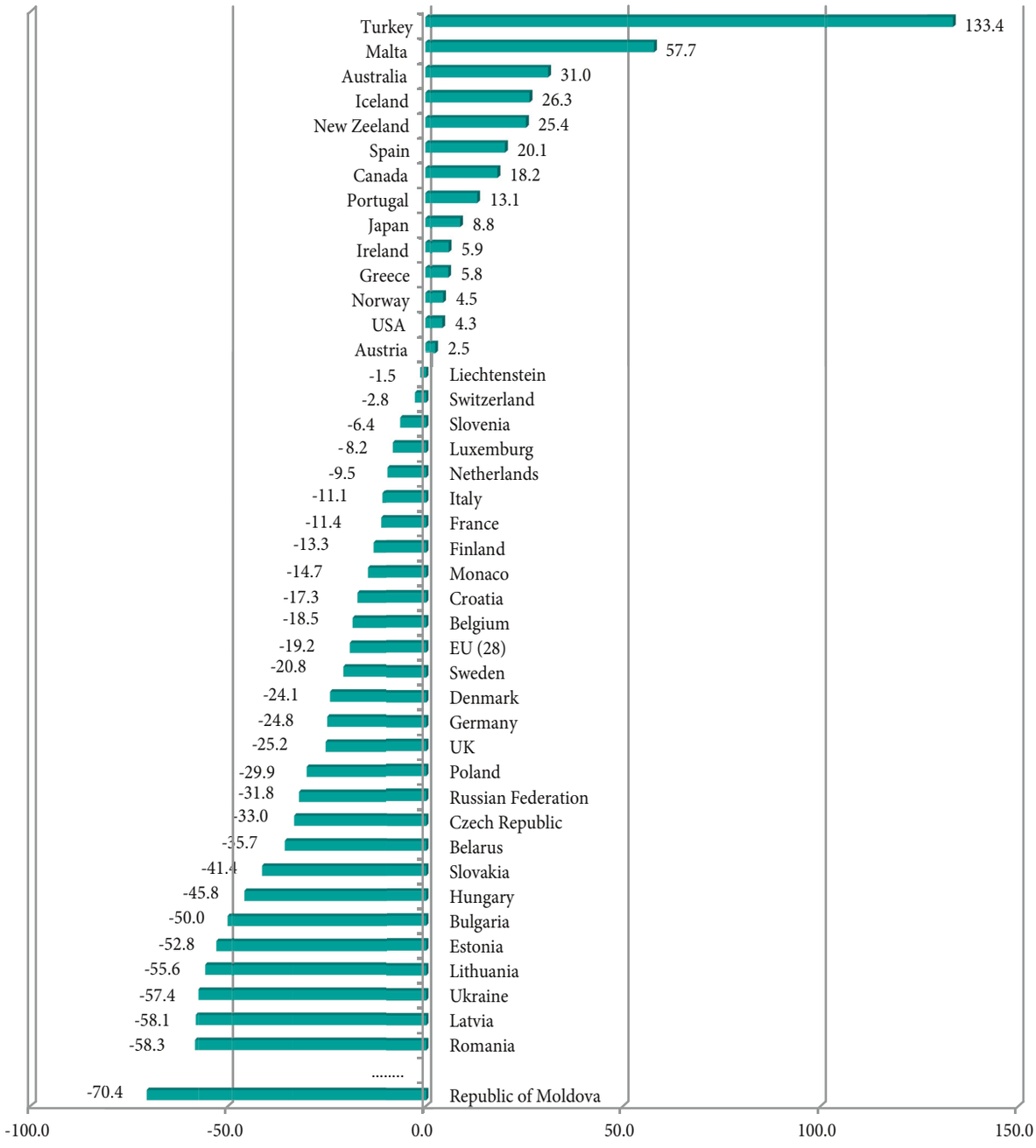


Figure 2-1: Total GHG Emissions from the Republic of Moldova (2013) and Annex I Parties to the Convention (2012) (% compared to 1990)

Table 2-3: Republic of Moldova's Direct GHG Emissions within 1990-2013 periods, Mt CO_2 equivalent

Categories of emissions and stocks	1990	1995	2000	2005	2006	2007	2008	2009	2010	2011	2012	2013
Total	**43.4188**	**17.4240**	**10.7307**	**12.7530**	**11.9433**	**11.6586**	**13.0587**	**13.1368**	**13.9394**	**14.1417**	**13.3642**	**12.8363**
Total net emission	**37.5322**	**16.3946**	**9.3385**	**12.3776**	**11.3042**	**8.5926**	**12.9992**	**11.8519**	**13.2823**	**13.7120**	**10.8939**	**12.7387**
1. Energy	**34.5213**	**11.7222**	**6.6728**	**8.4684**	**7.6334**	**7.7455**	**8.3514**	**9.0709**	**9.6473**	**9.8255**	**9.4690**	**8.4046**
A. Fuel Combustion Activities	33.8384	11.1663	6.1693	7.8081	7.0582	7.1338	7.7426	8.5666	9.1586	9.2689	8.9205	7.8818
1. Energy Industries	19.3933	6.9318	3.1524	3.2361	2.4941	2.8955	3.2951	4.4605	4.5950	4.1855	4.1908	3.3139
2. Manufacturing Industries and Construction	2.1959	0.4530	0.5318	0.5919	0.6517	0.8179	0.9131	0.5086	0.5407	0.6061	0.5632	0.6098
3. Transport	4.0566	1.3384	0.8635	1.6567	1.5821	1.6514	1.7425	1.6591	1.9057	2.0202	1.7634	1.8772
4. Other Sectors	8.0378	2.2616	1.5594	2.2558	2.2504	1.6986	1.7062	1.8885	2.0597	2.3903	2.3616	2.0505
5. Other (Other Works and Needs in Energy Sector)	0.1548	0.1815	0.0623	0.0676	0.0798	0.0704	0.0857	0.0500	0.0574	0.0667	0.0415	0.0304
B. Fugitive Emissions	0.6829	0.5560	0.5034	0.6603	0.5752	0.6117	0.6088	0.5043	0.4888	0.5566	0.5485	0.5228
1. Solid Fuels	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2. Oil and Natural Gas	0.6829	0.5560	0.5034	0.6603	0.5752	0.6117	0.6088	0.5043	0.4888	0.5566	0.5485	0.5228
2. Industrial Processes	**1.8420**	**0.4784**	**0.2702**	**0.5605**	**0.6563**	**0.9385**	**1.0150**	**0.5137**	**0.5594**	**0.6011**	**0.6227**	**0.6726**
A. Mineral Products	1.8303	0.4656	0.2418	0.5037	0.5977	0.8619	0.9236	0.4190	0.4524	0.4828	0.4908	0.5266
B. Chemical Industry	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
C. Metal Production	0.0117	0.0109	0.0150	0.0173	0.0112	0.0160	0.0146	0.0070	0.0040	0.0053	0.0052	0.0031
D. Other Production	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
E. Production of Halocarbons and SF_6	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
F. Consumption of Halocarbons and SF_6	NO, NE	0.0019	0.0134	0.0395	0.0474	0.0607	0.0768	0.0876	0.1030	0.1130	0.1267	0.1429
3. Solvents and Other Products Use	**0.1261**	**0.0346**	**0.0288**	**0.0675**	**0.0772**	**0.0981**	**0.1328**	**0.1197**	**0.0612**	**0.0689**	**0.0759**	**0.0666**
4. Agriculture	**5.0639**	**3.2844**	**2.2899**	**2.3588**	**2.2656**	**1.5124**	**2.1006**	**1.9181**	**2.1007**	**2.0865**	**1.6400**	**2.1267**
A. Enteric Fermentation	1.8402	1.3612	0.9119	0.7785	0.7534	0.6087	0.5795	0.6029	0.5986	0.5639	0.5327	0.5413
B. Manure Management	1.6906	0.9957	0.5759	0.5987	0.6208	0.4671	0.4665	0.5318	0.5592	0.5328	0.4818	0.4501
C. Rice Cultivation	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
D. Agricultural Soils	1.5331	0.9275	0.8021	0.9816	0.8913	0.4366	1.0545	0.7834	0.9429	0.9898	0.6256	1.1354
E. Prescribed Burning of Savannas	NO	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	IE
5. LULUCF	**-5.8866**	**-1.0294**	**-1.3922**	**-0.3754**	**-0.6391**	**-3.0660**	**-0.0595**	**-1.2849**	**-0.6571**	**-0.4296**	**-2.4704**	**-0.0976**
A. Forest Land	-2.1972	-1.6208	-2.1403	-2.2462	-2.0876	-2.1895	-2.2228	-2.2513	-2.1931	-2.0828	-2.0056	-1.8860
B. Cropland	-2.2132	1.9211	2.3051	3.4183	2.9786	0.6367	3.6586	2.4478	2.9877	3.1147	0.9973	3.2456
C. Grassland	-1.4762	-1.3297	-1.5570	-1.5475	-1.5302	-1.5131	-1.4953	-1.4814	-1.4517	-1.4616	-1.4621	-1.4572
D. Wetlands	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE
E. Settlements	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE
F. Other Land	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE
6. Waste	**1.8655**	**1.9044**	**1.4690**	**1.2978**	**1.3109**	**1.3640**	**1.4589**	**1.5145**	**1.5707**	**1.5597**	**1.5567**	**1.5658**
A. Solid Waste Disposal on Land	1.5442	1.6952	1.3093	1.0955	1.1126	1.1742	1.2630	1.3279	1.3714	1.3534	1.3414	1.3439
B. Wastewater Handling	0.3212	0.2092	0.1597	0.2024	0.1983	0.1897	0.1959	0.1866	0.1993	0.2064	0.2152	0.2219
C. Waste Incineration	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
7. Other	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
Memo Items	**0.2204**	**0.0425**	**0.0670**	**0.0685**	**0.0769**	**0.0808**	**0.0903**	**0.0836**	**0.0836**	**0.0965**	**0.1083**	**0.1167**
International Bunkers	0.2204	0.0425	0.0670	0.0685	0.0769	0.0808	0.0903	0.0836	0.0836	0.0965	0.1083	0.1167
CO_2 Emissions from Biomass	0.2108	0.6456	0.3679	0.2950	0.3237	0.2932	0.3367	0.3212	0.8280	1.0169	1.0536	1.2462

Abbreviations: IE – Included Elsewhere; NE – Not Estimates; NO – Not Occurring

2.2. Institutional Arrangements, Process for Inventory Preparation

2.2.1. Institutional Arrangements for Inventory Preparation

The Ministry of Environment (MoEN) of the Republic of Moldova (RM) is the state authority responsible for development and promotion of policies and strategies addressing environment protection, rational use of natural resources and biodiversity conservation. On behalf of the Government of Republic of Moldova, MoEN is in charge for implementation of international environment treaties to which the Republic of Moldova is a Part (including UNFCCC). Minister of Environment also acts as 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 into Ministry of Environment and Natural Resources based on Government Decision No. 357 dated 23 April 2005*).

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 biologic 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.

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 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 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 process, as well as reporting this information (National Inventory Reports, Biennial Update Reports and National Communications) on the national and international level. This process implies preliminary planning and preparation activities such as for example, defining specific responsibilities within the inventory preparation process. The respective responsibilities are shortly described in section 2.2.2 'Institutional and Legal Arrangements' as well as in more thoroughly in the "*Report on National GHG Inventory System in the RM*" (<http://clima.md/doc.php?l=en&idc=82&id=3839>), 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 MoEN, 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 „National Greenhouse Gases Inventory" from Biennial Update Reports and National Communications;
- The national experts are responsible for estimating emissions by individual categories of sources and removals by individual categories of sinks at sectoral level (Energy, Industrial Processes, Solvents and Other Products Use, Agriculture, LULUCF and Waste); for development the NIR's sectoral chapters; and also 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[29] of the National Bureau of Statistics (NBS) of the Republic of Moldova. The activity data provided by the NBS of the RM are available for the period until 1992 for the whole territory of the Republic of the Moldova, while since 1993 only for the right bank of Dniester (without Transnistrian Region, further referred as Administrative Territorial Units on the Left Bank of Dniester). The statistical data for the left bank of Dniester are collected from the Statistical Yearbooks of the ATULBD[30] and other periodic statistical publications available on the website of the Ministry of Economy of the ATULBD[31].

[29] National Bureau of Statistics, on-line database: <http://statbank.statistica.md/pxweb/Database/RO/data-basetree.asp>.
[30] Climate Change Office of the Ministry of Environment has copies of all Statistical Yearbooks of ATULBD for the 2000-2014, covering the years of 1990 and 1995-2013.
[31] Ministry of Economy of Transnistrian Region: <http://www.mepmr.org/gosudarstvennaya-statistika/informacziya>.

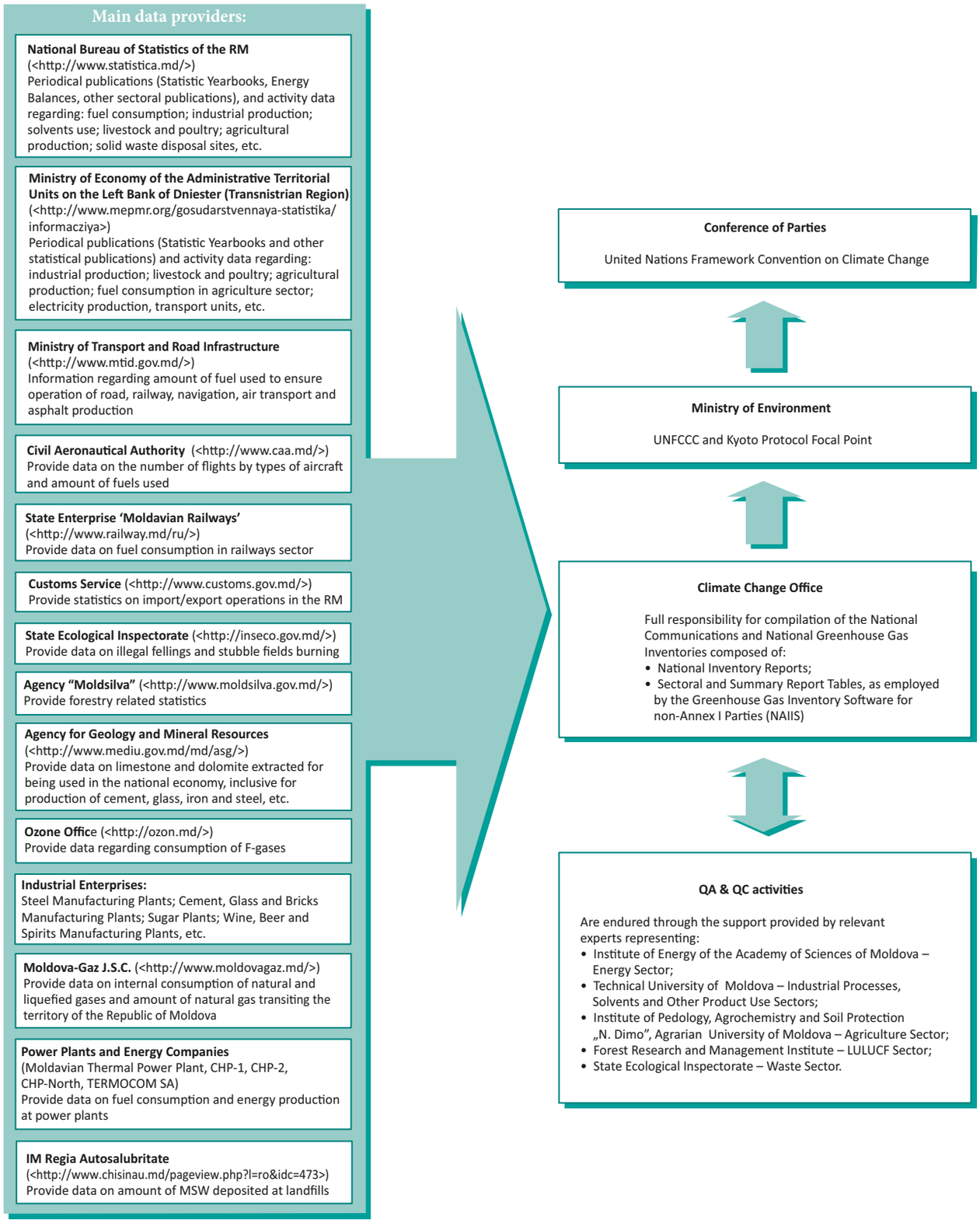


Figure 2-2: Institutional arrangements under the National Inventory System of the Republic Moldova

Additional statistical data (unpublished) may be provided at request, in conformity with provisions of the Law No. 412 as of 09.12.2004 on 'Official Statistics', Article 9 (2), item a) and b), according to which "*the official statistics authorities must disseminate statistical data to users in the amount, manner and terms specified in the statistical works programme*", as well as to "*to ensure access of all users to non-confidential statistic on equal conditions in terms of amount and terms of dissemination*".

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, other relevant activity data is collected from various state institutions and enterprises:

- from Ministry of Transports and Roads Infrastructure is collected information on the amount of fuel used to ensure operation of road, railway, naval transport and asphalt production;

- from State Enterprise 'Moldavian Railways" – information of fuel used for rail transport;
- from Civil Aeronautical Authority – information on the number of flights by type of aircrafts and amount of fuels used in air transportation;
- from Ministry of Information Technology and Communications – information on transport units registered, ages of fleet and/or production year and other relevant characteristics;
- from the Ministry of Defense – information on fuel used by the National Army;
- from the Ministry of Health – information on use of medicines which contains aerosols (specifically on HFCs), as well as on use of N_2O for anesthesia purposes;
- from Agency "Moldsilva" – information on forestry related statistics;
- from Land Relations and Cadaster Agency – information on land use by categories type;
- from Customs Service – statistics on import/export operations in the Republic of Moldova;
- from State Ecological Inspectorate – information on illegal felling and stubble fields burning;
- from Agency for Geology and Mineral Resources – information on extraction of mineral resources, inclusive of limestone and dolomite use (for cement, glass, iron and steel production, etc.);
- from Ozone Office – information on import/export of freons in bulk and type of freons used in the imported refrigeration and air-conditioning equipment;
- from „IPROCOM" Institute: information on the features of solid waste landfills existing in the Republic of Moldova;
- from Municipal Enterprise "Regia Autosalubritate" in Chisinau – information on the amount of municipal solid waste generated in Chisinau municipality;
- from "Moldova-Gaz" J.S.C. – information on the amount of natural gas transited through the territory of the Republic of Moldova, as well as on the consumption of natural gas in the national economy;
- from Power Plants („TERMOELECTRICA" S.A. in Chisinau [former CHP-1 S.A., CHP-2 S.A. and "TERMOCOM" S.A.],CHP-North S.A. in Balti – information on the amount of fuel used for electricity and heat production;
- from enterprises specialized in transportation and distribution of electricity (Î.S. „Moldelectrica", Î.C.S. „Red Union Fenosa", S.A. „Red-North", S.A. „Red North-West") – information on the amount of PFCs and SF_6 used in electrical equipment;
- from a range of industrial enterprises representing mainly the manufacture of non-metallic mineral products ("Lafarge Cement Moldova" S.A., "Macon" S.A., Glass Factory No. 1 in Chisinau, "Glass-Container" Company in Chisinau, etc.) – information on industrial output, amount of mineral resources used, amount of fuel used, etc.

It should be mentioned that the Article 1 of the Law on Access to Information regulates the relationships between information providers and individual / legal entities 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 standard estimation and reporting tables. The National Inventory preparation process is outlined in Figure 2-3.

The Coordinator 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, task group leads and 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 produced 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.

The Coordinator 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', Chapter 5 'Solvents and Other Products Use', Chapter 6 'Agriculture', Chapter 7 'LULUCF' and Chapter 8 'Waste'). He is also responsible for drafting other chapters (Executive Summary, Chapter 1 'Introduction', Chapter 2 'Trends in National GHG Emissions', Chapter 9 'Recalculations', 'Bibliography' and 'Annexes'), as well as for checking the correctness of the key category analysis, compatible with Good Practice Guidance - GPG (IPCC, 2000) and GPG for Land Use, Change in Land Use and Forestry Sector (IPCC, 2003) requirements.

National Inventory Report should be seen as a summary or an update of the information included in the Biennial Update Reports and/or the National Communications, produced in compliance with UNFCCC reporting guidelines. With reference to last available inventory cycle, in addition to the "*National Inventory Report: 1990-2013. Greenhouse Gas Sources and Sinks in the Republic of Moldova*", developed as a technical annex of the BUR1, standard reporting tables have been produced as well (*see in **Annex 1** the Table 1 "National greenhouse gas inventory of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol and greenhouse gas precursors" and Table 2 "National greenhouse gas inventory of anthropogenic emissions of HFCs, PFCs and SF_6", as per decision 17/CP.8, annex, chapter III "National greenhouse gas inventories"*).

The Coordinator of the National GHG Inventory has the task to monitor the process of producing standard Sectoral and Summary Reporting Tables, to ensure the consistency of results. National experts are responsible to produce the uncertainties analysis, as well as verification and QA/QC activities, in close cooperation with the Coordinator of the National GHG Inventory.

The first QA/QC Plan was produced in 2005 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 GPG (IPCC, 2000) 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 CCO prepares the MS Word final version of the National Inventory Report, which is then sent for approval to the MoEN. When the Report is approved, the final version is electronically processed, printed and published. Once published, the National Inventory Reports and the Reports on National GHG Inventory System in the Republic of Moldova are submitted by the MoEN to the COP as technical annexes of the Biennial Update Reports and/or the National Communications, 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 six main sectors: (1) Energy, (2) Industrial Processes, (3) Solvents and Other Products Use, (4) Agriculture, (5) Land Use, Land-Use Change and Forestry and (6) Waste. Each of these sectors is further subdivided by sources and sinks categories (Table 2-4).

Emissions of direct (CO_2, CH_4, N_2O, HFCs, PFCs and SF_6) and indirect (NO_x, CO, NMVOC, SO_2) greenhouse gases were estimated based on methodologies contained in the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories (IPCC, 1997). Further, the National Inventory Team used methodologies available in Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories (IPCC, 2000), GPG for LULUCF (IPCC, 2003), Air Pollutant Emission Inventory Guidebook (CORINAIR, 2013) and 2006 IPCC Guidelines for National Greenhouse Gas Inventories (IPCC, 2006).

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.

RM's national inventory is prepared using a "top-down" approach, providing estimates at a sectoral level of segregation without attribution to individual emitters. 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".

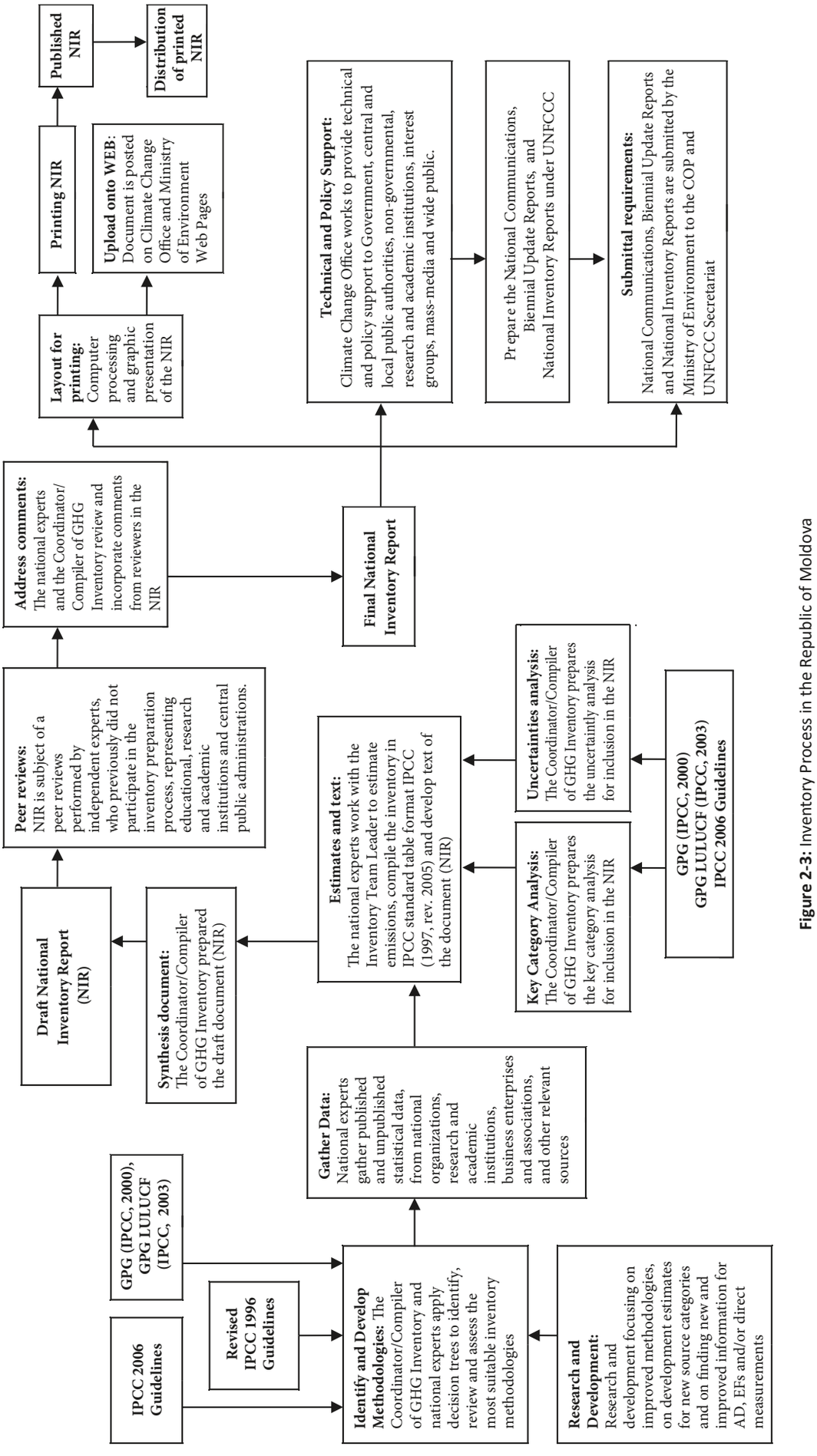


Figure 2-3: Inventory Process in the Republic of Moldova

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	T1	D, CS	T1	D	T1	D						
A. Fuel Combustion Activities	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 (other works and needs in energy sector)	T1	D, CS	T1	D	T1	D						
B. Fugitive Emissions	T1	D, CS	T1	D	T1	D						
1. Solid Fuels	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE						
2. Oil and Natural Gas	T1	D, CS	T1	D	T1	D						
2. Industrial Processes	T2, T1	D, CS	T1	D	T1	D	T2, T1	D	NO, NE	NO, NE	T2, T1	D
A. Mineral Products	T2, T1	D, CS	NA	NA	NA	NA						
B. Chemical Industries	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE						
C. Metal Production	T1	D	T1	D	T1	D						
D. Other Production	T1	D, CS	NA	NA	NA	NA						
E. Production of halocarbons and SF_6							NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
F. Consumption of halocarbons and SF_6							T2, T1	D	NO, NE	NO, NE	T2, T1	D
3. Solvents and Other Products Use	C	D	NA	NA	C	D						
A. Paint application	C	D	NA	NA	NA	NA						
B. Degreasing and dry cleaning	C	D	NA	NA	NA	NA						
C. Chemical Products, Manufacture and Processing	C	D	NA	NA	NA	NA						
D. Other	C	D	NA	NA	C	D						
4. Agriculture			T2, T1	D, CS	T2, T1	D, CS						
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	D, CS						
E. Prescribed burning of savannas			NO	NO	NA	NA						
F. Field burning of agricultural residues			IE	IE	IE	IE						
5. LULUCF	T2, T1	D, CS	T1	D	T1	D						
A. Forest lands	T2, T1	D, CS	T1	D	T1	D						
B. Croplands	T2, T1	D, CS	T1	D	T1	D						
C. Grasslands	T2, T1	D, CS	NE	NE	NE	NE						
D. Wetlands	T2, T1	D, CS	NE	NE	NE	NE						
E. Settlements	T2, T1	D, CS	NE	NE	NE	NE						
6. Waste			T2, T1	D, CS	T1	D						
A. Solid Waste Disposal on Land			T2, T1	D, CS	NA	NA						
B. Wastewater Handling			T1	D, CS	T1	D						
C. Waste Incineration			NO, NE	NO, NE	NO, NE	NO, NE						
7. Other	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE						
Memo Items	T2, T1	D, CS	T1	D	T1	D						
International bunkers	T1	D, CS										

Abbreviations: T1 – Tier 1 Method; T2 – Tier 2 Method; C – CORINAIR; CS – Country Specific; D – Default; IE – Included Elsewhere; NA – Not Applicable; NE – Not Estimates; NO – Not Occurring.

The CCO 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 detailed 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 (Transnistrian Region), Energy Balances, etc.) and international statistical publications (International Statistic Yearbook of Iron and Steel, UN FAO on-line database), publications of academic, research and development institutions (Institute of Pedology, Agrochemistry and Soil Protection "N. 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 (MITC, MAFI, MD, MH, MTRI, CAA, MF, Customs Service, MoEN; Agency „Moldsilva", SEI, SHS, Agency for Geology and Mineral Resources, Ozon Office) and central administrative authorities (National Bureau of Statistics, Agency for Land Relations and Cadaster), 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.), legislation acts (*National Complex Program of Enhancing Soil Fertility in 2001-2020*, approved by the Government Decree No. 591 as of 20.06.2000; *Complex Program for Reclamation of Degraded Lands and Enhancing Soils Fertility. Part I Reclamation of degraded lands*, approved by the Government Decree No. 636 as of 26.05.2003 and *Complex Program for Reclamation of Degraded Lands and Enhancing Soils Fertility, Part II Enhancing Soils Fertility*, approved by the Government Decree No. 841 as of 26.07.2004, etc.).

2.4.2. Key Categories

According to the GPG (IPCC, 2000, 2003) 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 presents the key categories for the Republic of Moldova inventory based on the Tier 1 methodological approach [with LULUCF: 17 key categories by level (L) and 17 key categories by trend (T); without LULUCF: 17 key categories by level (L) and 13 key categories by trend (T)] using emissions data in this report for the 1990-2013 period.

Following the recommendations set in the GPG (IPCC, 2000, 2003), the inventory was first disaggregated by source and sink categories which further were used to identify key categories. Source categories were defined in conformity with the following guidelines: (1) IPCC categories should be used with emissions specified in CO_2 equivalent units according to standard GWP; (2) a category should be identified for each gas emitted by the sources, since the methods, emission factors, and related uncertainties differ for each gas; (3) source categories that use the same emission factors based on common assumptions should be aggregated before analysis.

Key categories were identified from two perspectives:

- the first analysis the emission contribution that each category makes to the national total (with and without LULUCF); and
- 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 (with and without LULUCF categories).

The per cent contributions to both levels and trends in emissions are calculated and sorted from greatest to least (see details in Annex 1 of the NIR: 1990-2013[32]). The 95 per cent cumulative contribution threshold has been used in this analysis to define an upper boundary for the key category identification.

[32] <http://clima.md/doc.php?l=en&idc=82&id=3829>.

Table 2-5: Summary Overview of the RM's Key Categories for 1990-2013, Based on a Tier 1 Approach

IPCC classification	Key Categories	Gas	Tier 1 Approach				2013 GHG Emissions (Gg CO_2 eq.)
			With LULUCF		Without LULUCF		
			L	T	L	T	
5B	Cropland	CO_2	X	X			3245.4858
1A1	Energy Industries - Gas	CO_2	X	X	X	X	2753.2020
5A	Forest Lands	CO_2	X	X			-1887.6165
1A3b	Road Transportation	CO_2	X		X	X	1759.1150
5C	Grasslands	CO_2	X	X			-1461.3867
6A	Solid Waste Disposal on Land	CH_4	X	X	X	X	1343.8942
1A4b	Other: Residential	CO_2	X	X	X		1309.0059
4D	Direct Emissions from Agricultural Soils	N_2O	X	X	X	X	908.0039
1A2	Manufacturing Industries and Construction	CO_2	X	X	X		607.6708
4A	Enteric Fermentation	CH_4	X	X	X		541.2669
1B2	Fugitive Emissions from Oil and Natural Gas	CH_4	X		X	X	520.6450
2A1	Cement Production	CO_2	X	X	X	X	476.9147
1A4a	Other: Commercial/Institutional	CO_2	X	X	X		471.6212
1A1	Energy Industries - Coal	CO_2	X	X	X	X	470.1322
4B	Direct Emissions from Manure Management	N_2O	X	X	X		328.6530
4D	Indirect Emissions from Agricultural Soils	N_2O	X	X	X	X	227.3876
1A4c	Other: Agriculture/Forestry/Fishing	CO_2	X	X	X	X	164.9499
6B	Waste water treatment	CH_4			X	X	136.4857
2F1	HFC Emissions from Refrigeration and Air Conditioning Equipment	HFCs			X		96.9365
6B	Wastewater Handling	N_2O			X		85.4174
1A1	Energy Industries – Residual Fuel Oil	CO_2		X		X	84.8480
1A3c	Railways	CO_2		X		X	62.3858
2A3	Limestone and Dolomite Use	CO_2				X	14.3708

Sub-total without LULUCF	**12362.9064**
Total National Emissions without LULUCF	12836.3270
Per cent of National Emissions without LULUCF	96.31%
Sub-total with LULUCF	**11926.1787**
Total National Emissions with LULUCF	12738.7123
Per cent of Total National Emissions with LULUCF	93.62%

Abbreviations: L – Level Assessment; T – Trend Assessment

The Key Category Analysis (KCA) was carried out using the Key Category Calculation Tool developed by the United States Environment Protection Agency (US EPA).

2.4.3. Quality Assurance and Quality Control

Following the GPG recommendations (IPCC, 2000), national inventories have to be transparent, well documented, consistent, complete, comparable, assessed for uncertainties, subject to verification and QA/QC.

Good Practice Guidance (IPCC, 2000) 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 Tier 1 (general procedures) and Tier 2 (source-specific procedures) detailed specific procedures (Figure 2-4) and standard verification and quality control forms and checklists, that serve to standardize the process of implementing quality assurance and quality control activities meant to ensure the quality of the national inventory; also, peer review carried out by experts not directly involved in the national inventory development process (see some Peer Review Reports realized by international experts published on Climate Change Office website[33]); 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.

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 Revised 1996 IPCC Guidelines (IPCC, 1997) and GPG (IPCC, 2000) recommendations is 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 (3-8), as well as in the Chapter 9 'Recalculations and Improvements' of the NIR.

Individual source 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 categories; (6) annexes; (7) references (see more details in the "*Report on National Greenhouse Gas Inventory System in the Republic of Moldova*")[34].

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 CCO 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 categories. It is obvious that in comparison with the previous inventory cycles, by continuous integration of QA/QC activities, the RM ensured a better quality inventory.

2.4.4. Recalculations

The national inventory team revised and recalculated GHG emissions and removals for each calendar year covered by the GHG Inventory for the period from 1990 through 2010, a component part of the 3rdNC of the RM under the UNFCCC (2014). These activities were carried out during the on-going process of improving the quality of the National GHG Inventory (including, by taking into account the updated activity data, new methodological approaches and emission factors used, and identified errors correcting actions).

Under the current inventory cycle, improvements were made in all sectors (using higher tier methodologies, revision of previously used methodological approaches and emission factors, activity data etc.), entailing the need to make recalculations of national GHG emissions for the 1990-2010 time series, reflected in the Chapter 2 'National GHG Inventory' of the 3rdNC.

In comparison with the results reported under the 3rdNC of the RM under the UNFCCC, the changes performed during the development of the current inventory, resulted in insignificant increased values of total direct GHG emissions for 1990, 1992-1995, 1998, 2007, 2009-2010, respectively, revealed a decreasing trend in the following years: 1991, 1996-1997, 1999-2006, 2008 (Table 2-6).

[33] <http://clima.md/doc.php?l=en&idc=82&id=3852> and <http://clima.md/doc.php?l=ro&idc=82&id=3853>.

[34] <http://clima.md/doc.php?l=en&idc=82&id=3839>

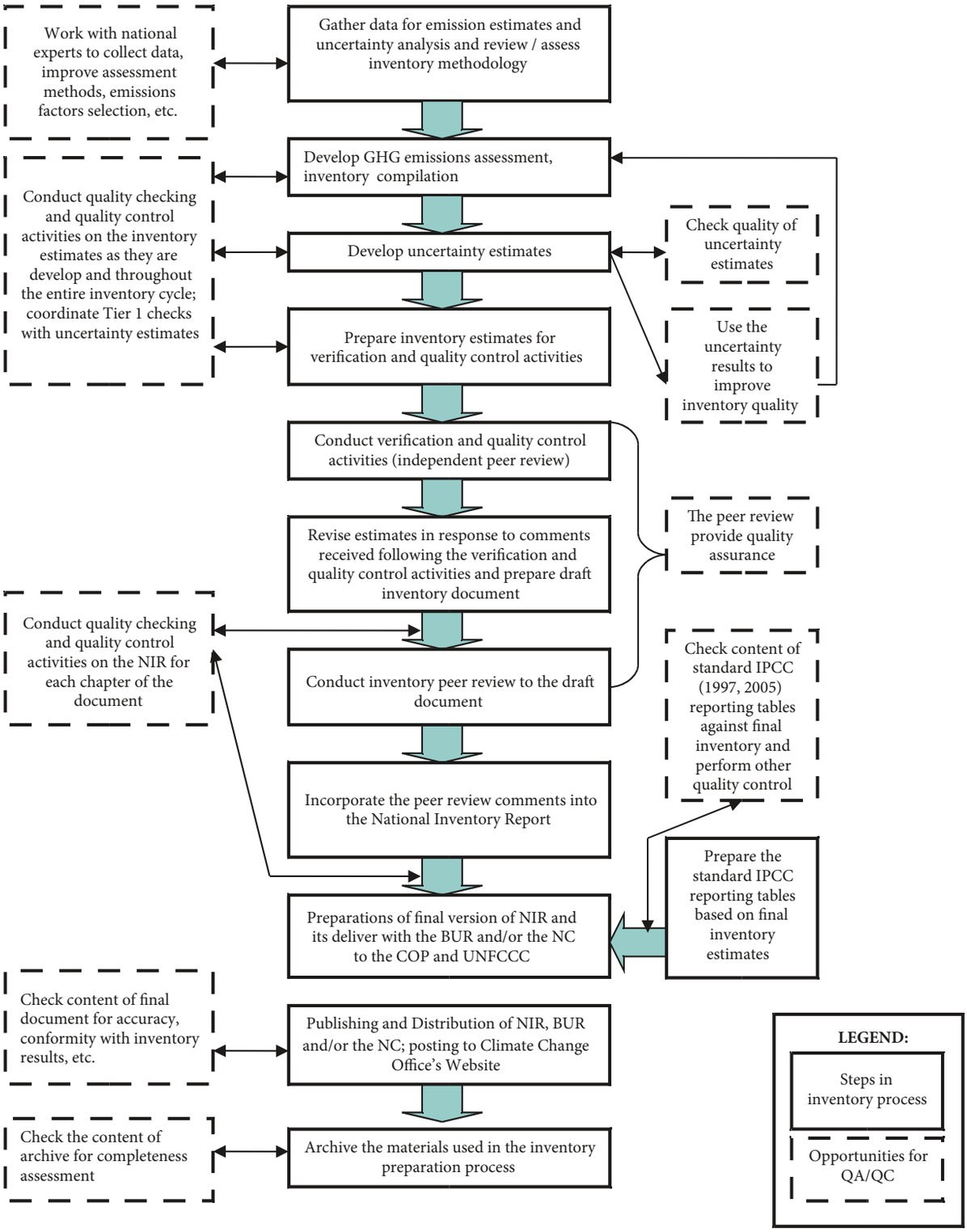


Figure 2-4: The Role of QA/QC Activities in the Inventory Preparing Process

Table 2-6: Recalculations of Total Direct GHG Emissions included into the 3rdNC of the Republic of Moldova under the UNFCCC, Mt CO_2 equivalent.

	1990	1991	1992	1993	1994	1995	1996
3rdNC	43.2598	38.8643	28.6479	23.1660	20.9036	17.3809	17.2985
BUR1	43.4188	38.7474	28.7545	23.2180	20.9914	17.4240	17.2640
Difference, %	0.4	-0.3	0.4	0.2	0.4	0.2	-0.2
	1997	1998	1999	2000	2001	2002	2003
3rdNC	16.0263	14.0435	11.9511	10.9108	11.5891	11.3244	11.8425
BUR1	16.0256	14.0442	11.7718	10.7307	11.4210	11.1419	11.6173
Difference, %	0.0	0.0	-1.5	-1.7	-1.5	-1.6	-1.9

	2004	2005	2006	2007	2008	2009	2010
3rdNC	12.5511	12.9399	12.1180	11.3894	13.1216	13.1243	13.2761
BUR1	12.3044	12.7530	11.9433	11.6586	13.0587	13.1368	13.9394
Difference, %	-2.0	-1.4	-1.4	2.4	-0.5	0.1	5.0

Abbreviations: 3rdNC – Third National Communication; BUR1 – First Biennial Update Report.

With reference to the net GHG emissions included into the 3rdNC of the RM under the UNFCCC, changes made in the development of the current inventory, resulted in an increasing trend in GHG emissions in 1990 and during the 1992-1995 time periods, varying from a minimum of 1.1 per cent in 1995, up to 4.6 per cent in 1993, respectively in a decreasing trend in GHG emissions in 1991 and during the 1996-2010 time periods, varying from a minimum of 0.2 per cent in 2010 to 7.8 per cent in 2000 (Table 2-7).

Table 2-7: Recalculations of the Total Net Direct GHG Emissions included into the 3rdNC of the Republic of Moldova under the UNFCCC, Mt CO_2 equivalent.

	1990	1991	1992	1993	1994	1995	1996
3rdNC	36.0828	33.7870	23.5389	20.7527	18.5263	16.2228	16.2919
BUR1	37.5322	33.4510	24.3701	21.7173	18.8274	16.3946	16.0973
Difference, %	4.0	-1.0	3.5	4.6	1.6	1.1	-1.2
	1997	1998	1999	2000	2001	2002	2003
3rdNC	16.2026	13.8565	11.3935	10.1287	11.3099	11.2530	10.7960
BUR1	15.8886	13.3216	10.6370	9.3385	10.6710	10.6092	10.0626
Difference, %	-1.9	-3.9	-6.6	-7.8	-5.6	-5.7	-6.8
	2004	2005	2006	2007	2008	2009	2010
3rdNC	12.8611	12.8357	11.7152	8.7796	13.2525	12.2528	13.3025
BUR1	12.2012	12.3776	11.3042	8.5926	12.9992	11.8519	13.2823
Difference, %	-5.1	-3.6	-3.5	-2.1	-1.9	-3.3	-0.2

Abbreviations: 3rdNC – Third National Communication; BUR1 – First 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 fuel combustion and cement processing, 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 Republic of Moldova's Inventory:

- *Incorporating excluded emission sources.* Quantitative estimates for some of the sources and sinks of GHG emissions are not available at this time. In particular, emissions from a number of categories in Land Use, Land-Use Changes and Forestry sector are not included in the inventory because data are incomplete.
- *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 use, indirect N_2O emissions from waste 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 (for example, the ability to estimate emissions of F-gases (HFCs, PFCs and SF_6) from Industrial Processes sector is limited).

The overall inventory uncertainty was estimated using a Tier 1 methodological approach (IPCC, 2000). An estimate of the overall quantitative uncertainty, ±7.55 per cent level uncertainty and, respectively ±3.11 per cent trend uncertainty, are shown in Table 2-8, as well as in the Annex 5 of the NIR: 1990-2013.

Emissions evaluated under the RM's 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.

Table 2-8: Estimated Overall National Inventory Quantitative Uncertainty within the National Inventory of the Republic of Moldova

	CO_2	CH_4	N_2O	Total
Level Uncertainty	±10.09	±11.24	±22.43	±7.55
Trend Uncertainty	±3.63	±6.43	±8.85	±3.11

2.4.6. Completeness Assessment

RM's National GHG Inventory is, mostly, a complete inventory of the following direct GHG – CO_2, CH_4, N_2O, HFCs, PFCs and SF_6, using 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 F-gases (HFCs, PFCs and SF_6) from 2F3 'Fire Extinguishers', 2F5 'Solvents' and 2F6 'Other Applications with ODS'; CO_2 emissions and removals from 5D 'Wetlands' and; GHG emissions from 6C 'Waste Incineration' (in particular, from medical 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.

2.5. Reporting Greenhouse Gas Emissions

2.5.1. Summary of Direct GHG Emission Trends

Between 1990 and 2013, the total direct greenhouse gas emissions dynamic expressed in CO_2 equivalent, revealed a decreasing trend in the Republic of Moldova, reducing by circa 70.4 per cent: from 43.4188 in 1990 to 12.8363 Mt CO_2 equivalent in 2013 (Figure 2-5).

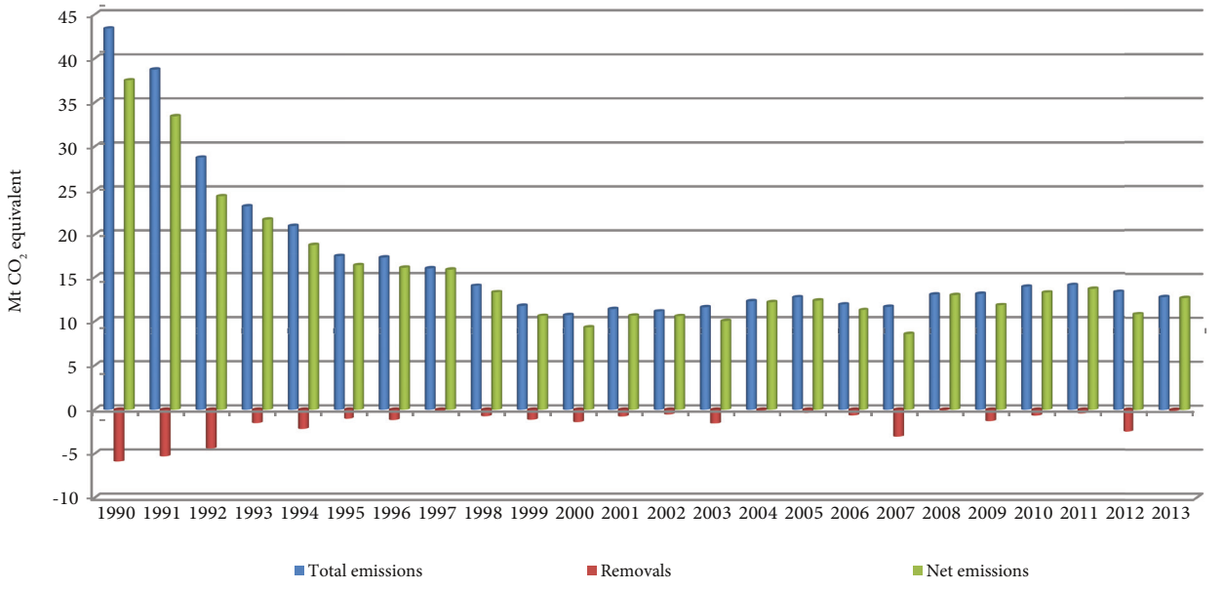


Figure 2-5: Greenhouse Gas Emission and Removals Trends in the Republic of Moldova within 1990-2013 time series

The most significant GHG emissions reductions have been registered under the following source categories: 1A1 'Energy Industries' (-82.9 per cent), 1A4 'Other Sectors' (-74.5 per cent), 4B 'Manure Management' (-73.4 per cent), 2C 'Metal Production' (-73.2 per cent), 1A2 'Manufacturing Industries and Constructions' (-72.2 per cent), 2A 'Mineral Products' (-71.2 per cent), 4A 'Enteric Fermentation' (-70.6 per cent) and1A3 'Transport' (-53.7 per cent).

Between 2012 and 2013, total direct GHG emissions decreased in the Republic of Moldova by circa 4.0 per cent. At the same time, emissions from certain source categories increased, in particular from: 4D 'Agricultural Soil' (+81.5 per cent), 2F 'Consumption of HFCs and SF_6' (+12.8 per cent), 1A2 'Manufacturing Industries and Constructions' (+8.3 per cent), 2A 'Mineral Products' (+7.3 per cent), 1A3 'Transport' (+6.5 per cent) and 4A 'Enteric Fermentation' (+1.6 per cent).

2.5.2. Direct GHG Emission Trends by Gas

In the time periods from 1990 through 2013, the total CO_2 emissions (without LULUCF) decreased by circa 76.4 per cent (from 35.3337 to 8.3255 Mt). CH_4 and N_2O emissions (without LULUCF) decreased by circa 44.7 per cent (from 4.8724 to 2.6937 Mt CO_2 equivalent), respectively by 47.9 per cent (from 3.2128 to 1.6743 Mt CO_2 equivalent) (Table 2-9).

Table 2-9: Direct GHG Emissions in the RM within 1990-2013, Mt CO_2 equivalent

	1990	1991	1992	1993	1994	1995	1996	1997
CO_2 (without LULUCF)	35.3337	31.0500	21.8049	16.5695	14.9980	11.5527	11.6556	10.6885
CO_2 (with LULUCF)	29.4438	25.7222	17.4179	15.0653	12.8319	10.5207	10.4871	10.5485
CH_4 (without LULUCF)	4.8724	4.7236	4.5852	4.3179	4.1921	3.9534	3.8140	3.4065
CH_4 (with LULUCF)	4.8747	4.7256	4.5871	4.3204	4.1935	3.9553	3.8153	3.4088
N_2O (without LULUCF)	3.2128	2.9738	2.3644	2.3306	1.8014	1.9159	1.7903	1.9239
N_2O (with LULUCF)	3.2138	3.0032	2.3651	2.3316	1.8020	1.9166	1.7908	1.9248
HFCs	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	0.0019	0.0041	0.0066
PFCs	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO
SF_6	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO
Total (without LULUCF)	43.4188	38.7474	28.7545	23.2180	20.9914	17.4240	17.2640	16.0256
Total (with LULUCF)	37.5322	33.4510	24.3701	21.7173	18.8274	16.3946	16.0973	15.8886
	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
CO_2 (without LULUCF)	9.0630	7.1544	6.3884	6.9920	6.6679	7.4392	7.9122	8.3103
CO_2 (with LULUCF)	8.3375	6.0167	4.9951	6.2404	6.1349	5.8844	7.8086	7.9346
CH_4 (without LULUCF)	3.2493	3.0418	2.9138	2.8462	2.8444	2.7640	2.7233	2.7555
CH_4 (with LULUCF)	3.2513	3.0439	2.9146	2.8473	2.8447	2.7641	2.7235	2.7557
N_2O (without LULUCF)	1.7225	1.5641	1.4151	1.5663	1.6100	1.3882	1.6369	1.6477
N_2O (with LULUCF)	1.7233	1.5649	1.4154	1.5668	1.6101	1.3883	1.6371	1.6478
HFCs	0.0095	0.0115	0.0134	0.0165	0.0195	0.0259	0.0320	0.0394
PFCs	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO
SF_6	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	0.0000	0.0000	0.0000
Total (without LULUCF)	14.0442	11.7718	10.7307	11.4210	11.1419	11.6173	12.3044	12.7530
Total (with LULUCF)	13.3216	10.6370	9.3385	10.6710	10.6092	10.0626	12.2012	12.3776

	2006	2007	2008	2009	2010	2011	2012	2013
CO_2 (without LULUCF)	7.6519	8.0283	8.7278	9.0304	9.5523	9.6871	9.3542	8.3255
CO_2 (with LULUCF)	7.0124	4.9594	8.6673	7.7449	8.8950	9.2572	6.8814	8.2261
CH_4 (without LULUCF)	2.6644	2.5860	2.6488	2.6332	2.7027	2.7335	2.6933	2.6937
CH_4 (with LULUCF)	2.6646	2.5877	2.6495	2.6335	2.7029	2.7337	2.6946	2.6947
N_2O (without LULUCF)	1.5797	0.9835	1.6053	1.3856	1.5814	1.6080	1.1901	1.6743
N_2O (with LULUCF)	1.5799	0.9848	1.6056	1.3859	1.5815	1.6081	1.1912	1.6750
HFCs	0.0471	0.0604	0.0763	0.0871	0.1024	0.1124	0.1260	0.1422
PFCs	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SF_6	0.0003	0.0004	0.0004	0.0005	0.0006	0.0006	0.0006	0.0007
Total (without LULUCF)	11.9433	11.6586	13.0587	13.1368	13.9394	14.1417	13.3642	12.8363
Total (with LULUCF)	11.3042	8.5926	12.9992	11.8519	13.2823	13.7120	10.8939	12.7387

Abbreviations: NE – Not Estimated; NO – Not Occurring.

Halocarbons emissions (HFCs, PFCs) and sulphur hexafluoride (SF_6) emissions have been recorded beginning with 1995, considered as a starting year for monitoring F-gases (HFCs, PFCs and SF_6) 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 2013.

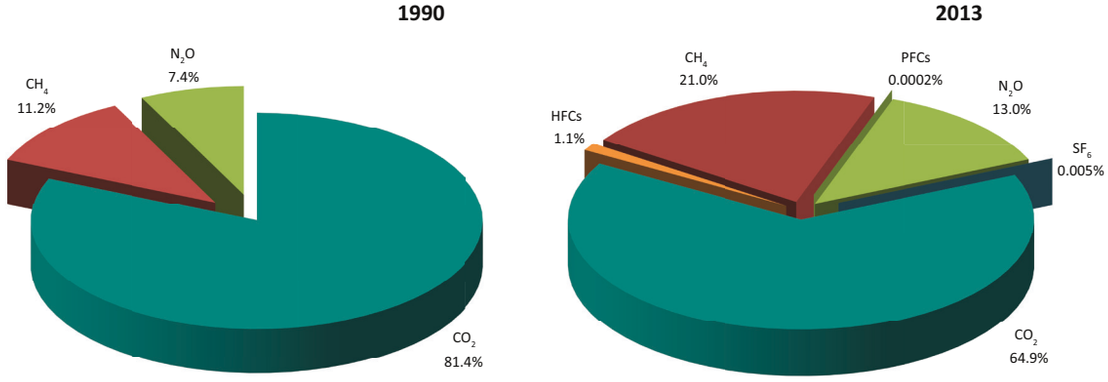


Figure 2-6: Direct GHGs share in the structure of total GHG emissions in the Republic of Moldova in 1990 and 2013 years

In 2013, the source categories having the biggest share in the total dioxide of carbon emissions in the Republic of Moldova were: 1A1 'Energy Industries' (3.3082 Mt or 39.7 per cent of the total), 1A4 'Other Sectors' (1.9456 Mt or 23.4 per cent of the total), 1A3'Transport' (1.8353 Mt or 22.0 per cent of the total), 1A2 'Manufacturing Industries and Constructions' (0.6077 Mt or 7.3 per cent of the total) and 2A 'Mineral Production' (0.5266 Mt or 6.3 per cent of the total) (Figure 2-7).

In 2013, the source categories having the biggest share in the total methane emissions in the Republic of Moldova were: 6A 'Solid Waste Disposal on Land' (1.3439 Mt CO_2 equivalent or 49.9 per cent of the total), 4A 'Enteric Fermentation' (0.5413 Mt CO_2 equivalent or 20.1 per cent of the total), 1B2 'Fugitive Emissions From Oil and Natural Gas' (0.5206 Mt CO_2 equivalent or 19.3 per cent of the total), 6B 'Wastewater Handling' (0.1365 Mt CO_2 equivalent or 5.1 per cent of the total), 1A4 'Other sectors' (0.0882 Mt CO_2 equivalent or 3.3 per cent of the total) and 4B 'Manure Management' (0.0545 Mt CO_2 equivalent or 2.0 per cent of the total) (Figure 2-8).

In 2013, the source categories having the biggest share in the total nitrous oxide emissions in the Republic of Moldova were: 4D 'Agricultural Soils' (1.1354 Mt CO_2 equivalent or 67.8 per cent of the total), 4B 'Manure Management' (0.3956 Mt CO_2 equivalent or 23.6 per cent of the total), 6B 'Wastewater Handling' (0.0854 Mt CO_2 equivalent or 5.1 per cent of the total), 1A3 'Transport' (0.0352 Mt CO_2 equivalent or 2.1 per cent of the total) and 1A4 'Other sectors' (0.0168 Mt or 1.0 per cent of the total) (Figure 2-9).

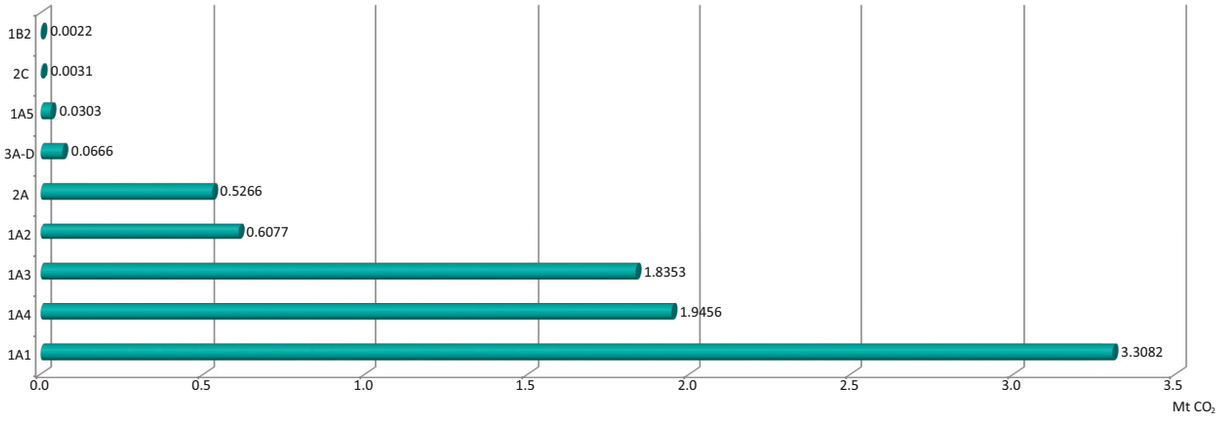


Figure 2-7: Source Categories of CO_2 in the Republic of Moldova in 2013

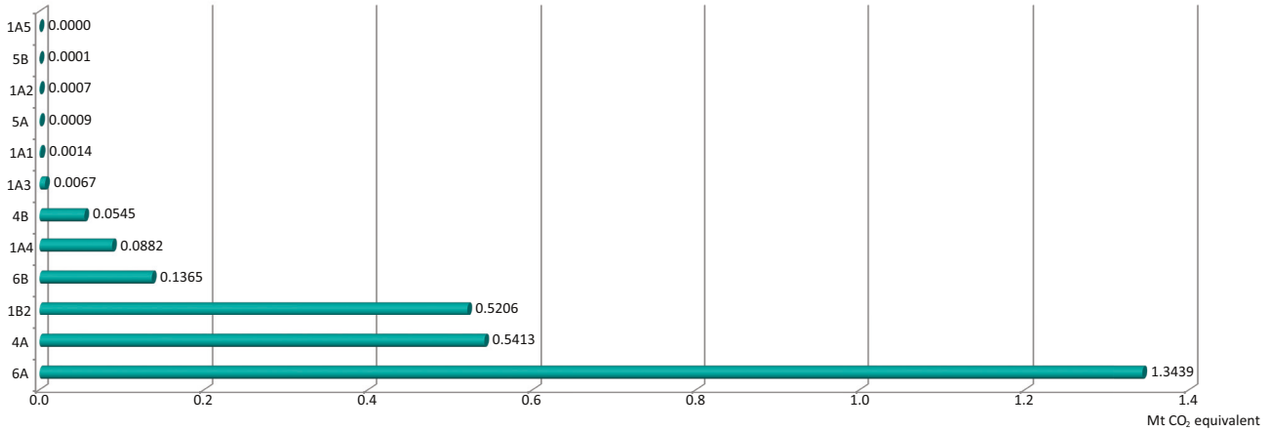


Figure 2-8: Source Categories of CH_4 in the Republic of Moldova in 2013

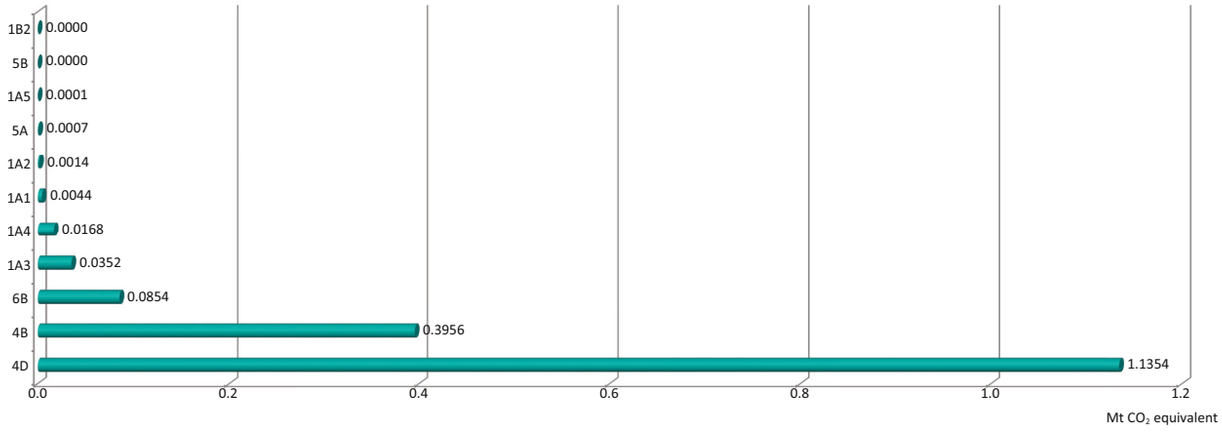


Figure 2-9: Source Categories of N_2O in the Republic of Moldova in 2013

2.5.3. Emission Trends by Sources

According to the UNFCCC Reporting Guidelines (IPCC), emissions estimates are grouped into six large categories: Energy, Industrial Processes (IP), Solvents and Other Products Use (SOPU), Agriculture, Land Use, Land-Use Change and Forestry (LULUCF) and Waste Sectors. Interpretation of GHG emissions inventory results under Land Use, Land-Use Change and Forestry Sector is somewhat 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.

In the time series 1990 through 2013, total GHG emissions in the Republic of Moldova tended to decrease, thus emissions under Energy Sector decreased by circa 75.7 per cent, Industrial Processes Sector – by circa 63.5 per cent, Solvents and Other Products Use Sector – by circa 47.2 per cent, Agriculture Sector – by 58.0 per cent, Land Use, Land-Use Change and Forestry Sector – by 98.3 per cent, while from Waste Sector – by 16.1 per cent (Table 2-10).

Table 2-10: Direct Greenhouse Gas Emissions in the Republic of Moldova by Sector within 1990-2013, Mt CO_2 equivalent

	1990	1991	1992	1993	1994	1995	1996	1997
1. Energy	34.5213	30.2217	21.3789	16.4721	15.0185	11.7222	11.9472	10.7884
2. Industrial Processes	1.8420	1.7560	1.1472	0.7394	0.6077	0.4784	0.4256	0.4778
3. SOPU	0.1261	0.1009	0.0764	0.0576	0.0438	0.0346	0.0300	0.0258
4. Agriculture	5.0639	4.6906	4.0899	3.9268	3.3627	3.2844	3.0403	2.9853
5. LULUCF	-5.8866	-5.2964	-4.3844	-1.5008	-2.1641	-1.0294	-1.1666	-0.1369
6. Waste	1.8655	1.9782	2.0621	2.0221	1.9587	1.9044	1.8209	1.7483
	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
1. Energy	9.2725	7.3732	6.6728	7.2688	6.9519	7.7253	8.1841	8.4684
2. Industrial Processes	0.3321	0.2971	0.2702	0.2620	0.3204	0.3715	0.4201	0.5605
3. SOPU	0.0195	0.0268	0.0288	0.0426	0.0363	0.0329	0.0417	0.0675
4. Agriculture	2.7514	2.5192	2.2899	2.4549	2.5085	2.1956	2.3790	2.3588
5. LULUCF	-0.7226	-1.1349	-1.3922	-0.7500	-0.5327	-1.5547	-0.1032	-0.3754
6. Waste	1.6686	1.5555	1.4690	1.3927	1.3247	1.2920	1.2795	1.2978

	2006	2007	2008	2009	2010	2011	2012	2013
1. Energy	7.6334	7.7455	8.3514	9.0709	9.6473	9.8255	9.4690	8.4046
2. Industrial Processes	0.6563	0.9385	1.0150	0.5137	0.5594	0.6011	0.6227	0.6726
3. SOPU	0.0772	0.0981	0.1328	0.1197	0.0612	0.0689	0.0759	0.0666
4. Agriculture	2.2656	1.5124	2.1006	1.9181	2.1007	2.0865	1.6400	2.1267
5. LULUCF	-0.6391	-3.0660	-0.0595	-1.2849	-0.6571	-0.4296	-2.4704	-0.0976
6. Waste	1.3109	1.3640	1.4589	1.5145	1.5707	1.5597	1.5567	1.5658

Energy Sector is the most important source of total national direct GHG emissions, its share varying over the time series from 1990 through 2013 from 79.6 per cent to 65.5 per cent. Other relevant sources are represented by Agriculture, Waste, and Industrial Processes Sectors (Figure 2-10).

Energy Sector

In the Republic of Moldova, the Energy Sector is by far the largest source of GHG emissions. The respective includes emissions of all GHGs from fuel combustion for the primary purpose of delivering energy (93.8 per of total emissions per sector in 2013), 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 (6.2 per cent of total emissions per sector in 2013) (Figure 2-11, Table 2-11).

Overall, these emissions accounted, in 2013 circa 65.5 per cent of total national direct GHG emissions. Between 1990 and 2013, total direct GHG emissions from Energy Sector decreased by circa 75.7 per cent: from 34.5204 to 8.9465 Mt CO_2 equivalent.

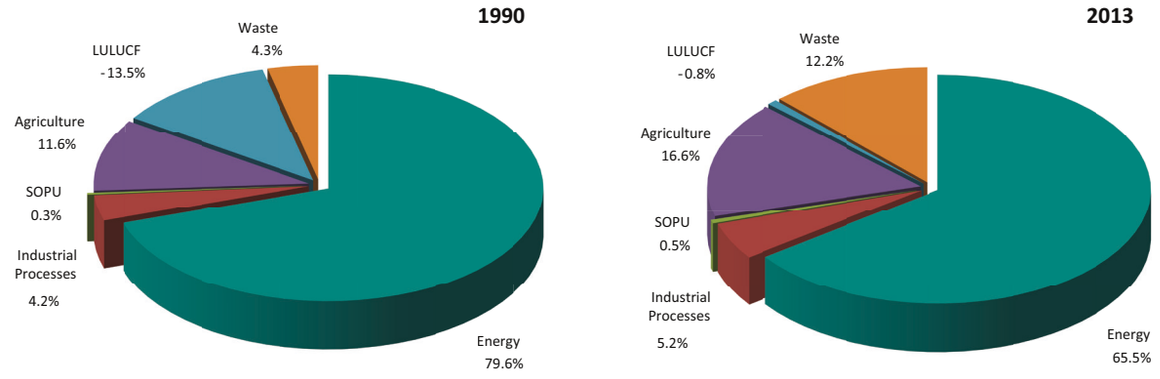


Figure 2-10: Sectoral Breakdown of the RM's total GHG Emissions within 1990-2013

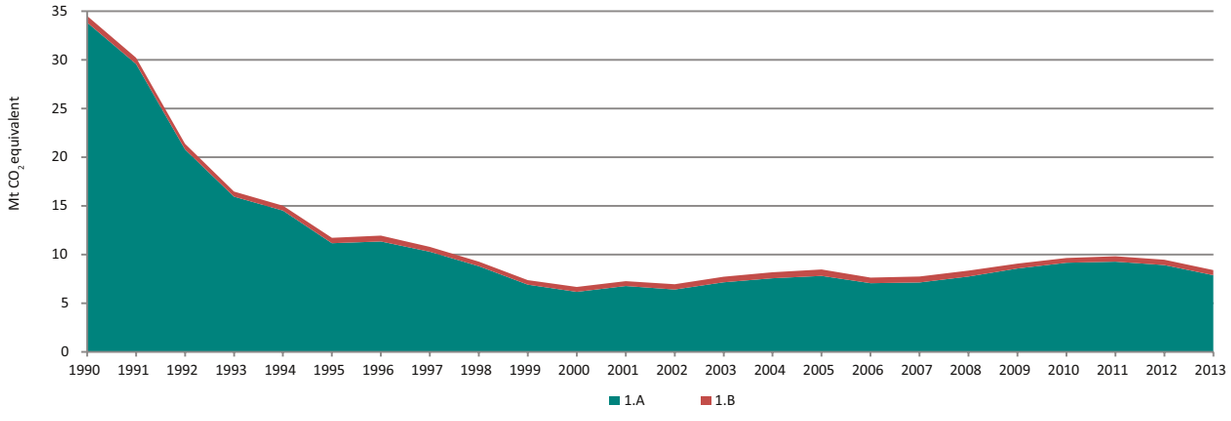


Figure 2-11: GHG Emissions from Energy Sector in the Republic of Moldova within 1990-2013

Table 2-11: GHG Emissions from Energy Sector within 1990-2013, Mt CO_2 equivalent

Source Categories	1990	1995	2000	2005	2010	2011	2012	2013
1. Energy	**34.5213**	**11.7222**	**6.6728**	**8.4684**	**9.6473**	**9.8255**	**9.4690**	**8.4046**
A. Fuel Combustion	33.8384	11.1663	6.1693	7.8081	9.1586	9.2689	8.9205	7.8818
A.1. Energy Industries	19.3933	6.9318	3.1524	3.2361	4.5950	4.1855	4.1908	3.3139
A.2. Manufacturing industries and constructions	2.1959	0.4530	0.5318	0.5919	0.5407	0.6061	0.5632	0.6098
A.3. Transport	4.0566	1.3384	0.8635	1.6567	1.9057	2.0202	1.7634	1.8772
A.4. Other sectors	8.0378	2.2616	1.5594	2.2558	2.0597	2.3903	2.3616	2.0505
A.5. Other works and needs in energy	0.1548	0.1815	0.0623	0.0676	0.0574	0.0667	0.0415	0.0304
B. Fugitive Emissions	0.6829	0.5560	0.5034	0.6603	0.4888	0.5566	0.5485	0.5228
1B.2. Oil and Natural Gas	0.6829	0.5560	0.5034	0.6603	0.4888	0.5566	0.5485	0.5228

The 1A1 'Energy Industries' contribute more than any other category to the Republic of Moldova's emissions under Energy Sector, accounting for circa 39.4 per cent of the total per sector in 2013 (56.2 per cent in 1990). Other relevant categories are represented by 1A4 'Other Sectors', accounting for circa 24.4 per cent of the total (23.3 per cent in 1990) and 1A3 'Transport', accounting for 22.3 per cent of the total per sector (11.8 per cent in 1990) (Figure 2-12).

Industrial Processes Sector

The Industrial Processes Sector represents an important GHG emission source in the Republic of Moldova that includes emissions generated by non-energy industrial activities. In 2013, this sector accounted for 5.2 per cent of the total national GHG emissions (4.2 per cent in 1990). During 1990-2013 time periods, total sectoral GHG emissions decreased by circa 63.5 per cent: from 1.8420 in 1990 to 0.6726 Mt CO_2 eq. in 2013 (Figure 2-13).

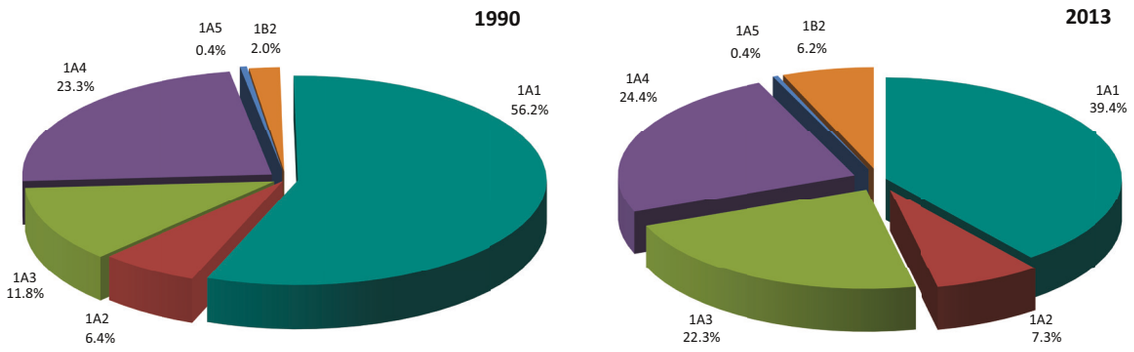


Figure 2-12: Energy Sector Greenhouse Gas Sources in the Republic of Moldova in 1990 and 2013

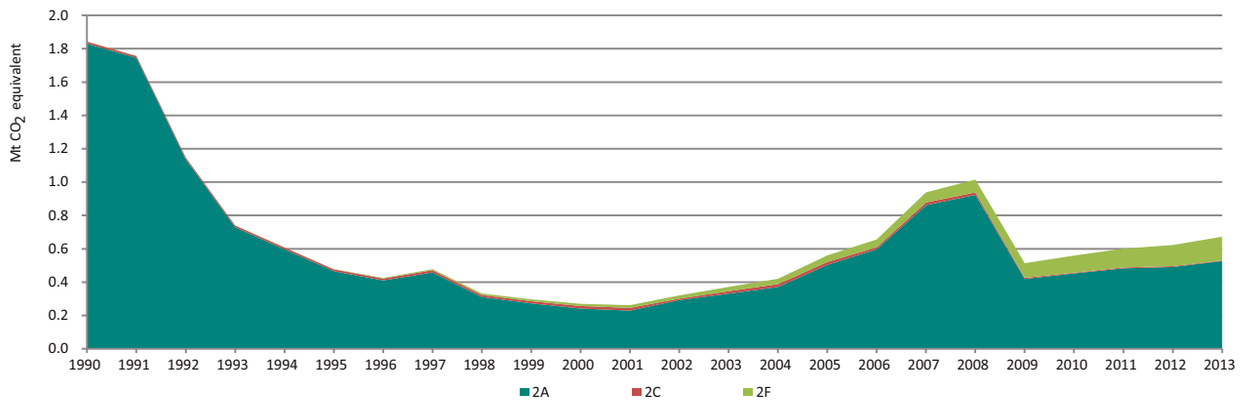


Figure 2-13: GHG Emissions from Industrial Processes in the Republic of Moldova within 1990-2013

Between 2008 and 2009, the respective emissions decreased by 49.4 per cent as a consequence of the global and regional economic crises that significantly affected the industrial sector in the Republic of Moldova. At the same time, between 2012 and 2013, the sectoral GHG emissions increased by 8.0 per cent, in particular as a result of cement production growth, widespread use of soda ash (Na_2CO_3), as well as due to the increased use of halocarbons and SF_6 (Table 2-12).

Table 2-12: GHG Emissions from Industrial Processes within 1990-2013, Mt CO_2 equivalent

Source Categories	1990	1995	2000	2005	2010	2011	2012	2013
2. Industrial Processes	**1.8420**	**0.4784**	**0.2702**	**0.5605**	**0.5594**	**0.6011**	**0.6227**	**0.6726**
A. Mineral Products	1.8303	0.4656	0.2418	0.5037	0.4524	0.4828	0.4908	0.5266
A1. Cement Production	0.9717	0.2485	0.1728	0.3651	0.3498	0.4273	0.4422	0.4769
A2. Lime Production	0.1487	0.0282	0.0110	0.0066	0.0023	0.0055	0.0051	0.0041
A3. Limestone and Dolomite Use	0.6195	0.1625	0.0322	0.0988	0.0745	0.0178	0.0201	0.0144
A4. Soda Ash Use	0.0330	0.0146	0.0140	0.0182	0.0120	0.0154	0.0093	0.0155
A7. Other Mineral Products	0.0575	0.0118	0.0119	0.0151	0.0138	0.0168	0.0140	0.0157
B. Chemical Industry	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
C. Metal Production	0.0117	0.0109	0.0150	0.0173	0.0040	0.0053	0.0052	0.0031
C1. Iron and Steel Production	0.0117	0.0109	0.0150	0.0173	0.0040	0.0053	0.0052	0.0031
D. Other	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
E. Production of Halocarbons and SF_6	NO	NO	NO	NO	NO	NO	NO	NO
F. Consumption of Halocarbons and SF_6	NO, NE	0.0019	0.0134	0.0395	0.1030	0.1130	0.1267	0.1429
F1. Refrigeration and Air Conditioning Equipment	NO, NE	0.0002	0.0081	0.0235	0.0654	0.0722	0.0831	0.0969
F2. Foam Blowing	NO, NE	0.0017	0.0053	0.0159	0.0370	0.0402	0.0429	0.0452
F4. Aerosols	NO, NE	NO, NE	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001
F8. Electrical Equipment	NO, NE	NO, NE	NO, NE	0.0000	0.0006	0.0006	0.0007	0.0007

Abbreviations: NE – Not Estimated; NO – Not Occurring.

The most important source of emission in this sector is represented by 2A1 „Cement Production", with a share of circa 70.9 per cent of the total sectoral emissions in 2013 (52.8 per cent in 1990). Other relevant sources in 2013 were represented by 2F1 'Refrigeration and Air Conditioning Equipment' – accounting for circa 14.4 per cent of the total, 2F2 'Foam Blowing' - 6.7 per cent of the total, 2A4 'Soda Ash Use' - 2.3 per cent of the total (1.8 per cent in 1990), 2A7 'Other Mineral Products' (Mineral Wool Production, Brick Production, Expanded Clay Production) accounting for 2.3 per cent of the total (3.1 per cent in 1990) and 2A3'Limestone and Dolomite Use' accounting for 2.1% of the total (33.6 per cent in 1990) (Figure 2-14).

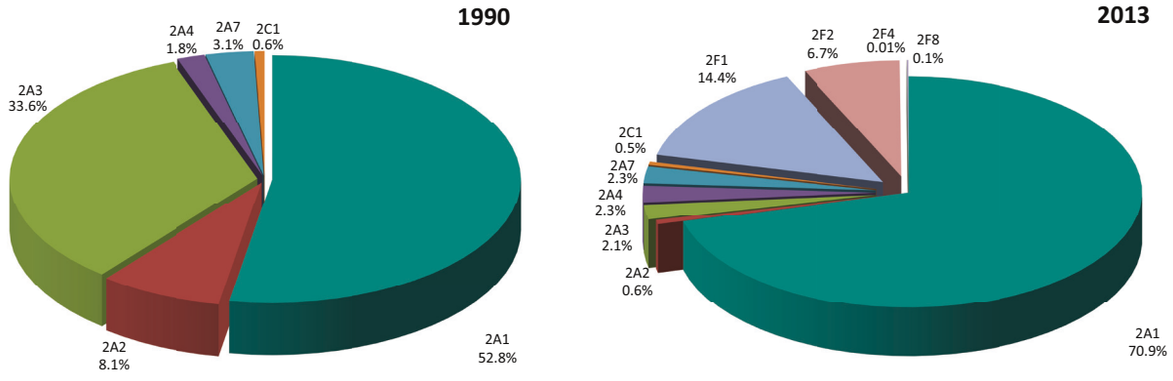


Figure 2-14: Breakdown of Industrial Processes' GHG Emissions by Category in the Republic of Moldova in 1990 and 2013

Solvents and Other Products Use Sector

In the Republic of Moldova the Solvents and Other Products Use Sector is a modest source and includes emissions of non-methane volatile organic compounds (NMVOC), also considered as a CO_2 emissions source - as the majority of solvents are obtained from fossil fuels, as well as N_2O emissions from use of N_2O for anesthesia.

In 2013, the respective sector accounted for as little as circa 0.5 per cent of the total national GHG emissions (0.3 per cent in 1990). Between 1990 and 2013 the total GHG emissions covered by this sector decreased by 47.2 per cent: from 0.1261 in 1990, to 0.0666 Mt CO_2 equivalents in 2013 (Table 2-13). From 2012 to 2013, the respective emissions decreased by 12.2 per cent.

Table 2-13: GHG Emissions from Solvents and Other Product Use Sector within 1990-2013, Mt CO_2 equivalent

Source Categories	1990	1995	2000	2005	2010	2011	2012	2013
3. Solvents and Other Products Use	**0.1261**	**0.0346**	**0.0288**	**0.0675**	**0.0612**	**0.0689**	**0.0759**	**0.0666**
A. Paint Application	0.0416	0.0037	0.0060	0.0308	0.0227	0.0278	0.0273	0.0205
B. Degreasing and Dry Cleaning	0.0628	0.0197	0.0121	0.0221	0.0234	0.0253	0.0329	0.0300
C. Chemical Products, Manufacture and Processing	0.0077	0.0012	0.0008	0.0019	0.0029	0.0035	0.0038	0.0046
D. Other	0.0140	0.0100	0.0100	0.0126	0.0122	0.0123	0.0119	0.0115
D1. Printing	0.0007	0.0001	0.0001	0.0004	0.0004	0.0004	0.0003	0.0004
D2. Domestic Solvents Use	0.0092	0.0091	0.0090	0.0087	0.0086	0.0086	0.0086	0.0085
D3. Other Products Use	0.0041	0.0007	0.0009	0.0035	0.0033	0.0033	0.0029	0.0025

Abbreviations: NE – Not Estimated; NO – Not Occurring.

In the SOPU Sector, the largest source of emissions is represented by 3B 'Degreasing and Dry Cleaning' accounting for circa 45.0 per cent of the total sectoral emissions (49.8 per cent in 1990). Other relevant source categories are represented by 3A 'Paint Application' accounting for 30.7 per cent of the total sectoral emissions in 2013 (33.0 per cent in 1990), 3D 'Other' accounting for 17.3 per cent of the total (11.1 per cent in 1990) and 3C 'Chemical Products, Manufacture and Processing' with a share of 7.0 per cent of the total (6.1 per cent in 1990) (Figure 2-15).

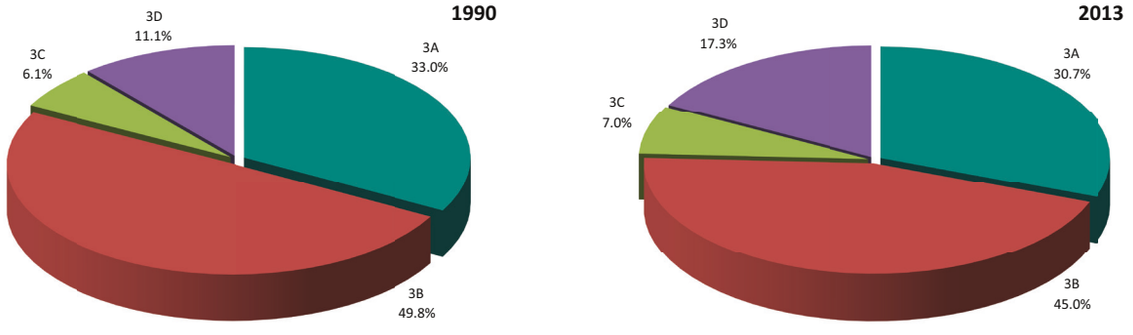


Figure 2-15: Breakdown of Solvents and Other Product Use Sector GHG Emissions by Category in the Republic of Moldova in 1990 and 2013

Agriculture Sector

The Agriculture Sector represents an important source of GHG emissions in the Republic of Moldova: CH_4 emissions, in particular from 4A 'Enteric Fermentation', 4B 'Manure Management'; N_2O emissions from 4B 'Manure Management' and 4D 'Agricultural Soils'. In the Republic of Moldova there are no registered emissions from 4C 'Rice Cultivation' and 4E 'Prescribed Burning of Savannas', as for the emissions from 4F Field Burning of Agricultural Residues, these are monitored in the LULUCF Sector, under the category 5B 'Cropland'.

In 2013, Agriculture Sector accounted for circa 16.6 per cent of the total national direct GHG emissions (11.6 per cent in 1990).

Between 1990 and 2013 total GHG emissions originated from this sector decreased by 58.0 per cent: from 5.0639 in 1990 to 2.1267 Mt CO_2 eq. in 2013 (Table 2-14), in particular, due to a sharp drop in such indicators as: domestic livestock and poultry population, amounts of synthetic N and organic fertilizers applied to soils, amounts of agricultural crop residues returned to soils, carbon losses from mineral soils and changes of tillage practices.

Between 2012 and 2013, direct GHG emissions from Agriculture Sector increased by 29.7 per cent, in particular as a result of increase of N_2O emissions from 4D 'Agricultural Soils' (Figure 2-16).

Table 2-14: Emissions from Agriculture Sector within 1990-2013, Mt CO_2 equivalent

Source Categories	1990	1995	2000	2005	2010	2011	2012	2013
4. Agriculture	**5.0639**	**3.2844**	**2.2899**	**2.3588**	**2.1007**	**2.0865**	**1.6400**	**2.1267**
A. Enteric Fermentation	1.8402	1.3612	0.9119	0.7785	0.5986	0.5639	0.5327	0.5413
B. Manure Management	1.6906	0.9957	0.5759	0.5987	0.5592	0.5328	0.4818	0.4501
C. Rice Cultivation	NO	NO	NO	NO	NO	NO	NO	NO
D. Agricultural Soils	1.5331	0.9275	0.8021	0.9816	0.9429	0.9898	0.6256	1.1354
E. Prescribed Burning of Savannas	NO	NO	NO	NO	NO	NO	NO	NO
F. Field Burning of Agricultural Residues	IE	IE	IE	IE	IE	IE	IE	IE

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

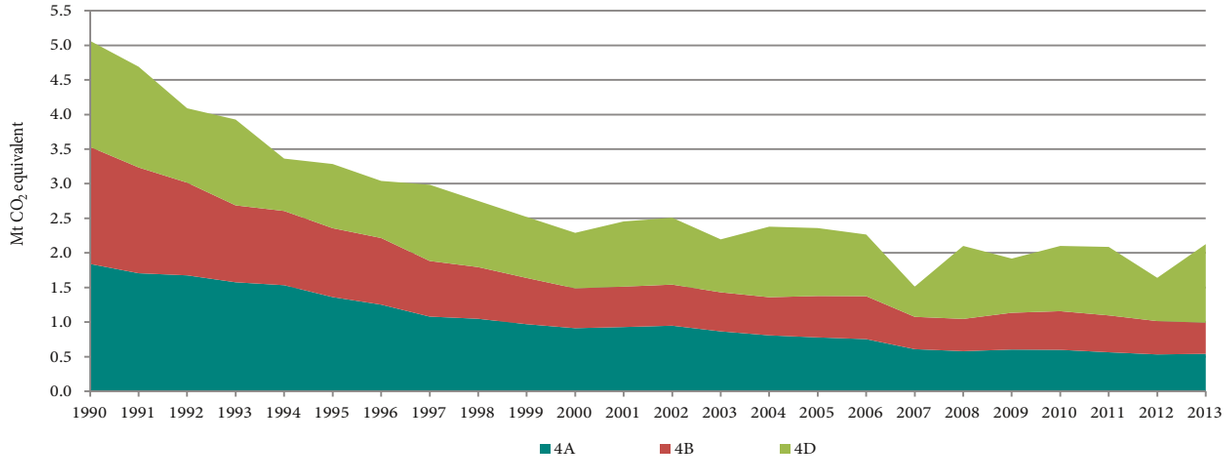


Figure 2-16: GHG Emissions from Agriculture Sector in the RM within 1990-2013

In 2013, the largest source of emission was 4D 'Agricultural Soils', accounting for 53.4 per cent of the total sectoral emissions (30.3 per cent in 1990). Other relevant sources are represented by 4A 'Enteric Fermentation', accounting for 25.5 per cent of the total (36.3 per cent in 1990) and 4B 'Manure Management', accounting for circa 21.2 per cent of the total (33.4 per cent in 1990) (Figure 2-17).

Land Use, Land-Use Change and Forestry Sector

Between 1990 and 2013, the LULUCF Sector represented a sink of CO_2. However, within the respective period, net CO_2 removals registered a decreasing trend, reducing by 98.3 per cent, from -5.8866 Mt recorded in 1990 to -0.0976 Mt in 2013 (Table 2-15, Figure 2-18).

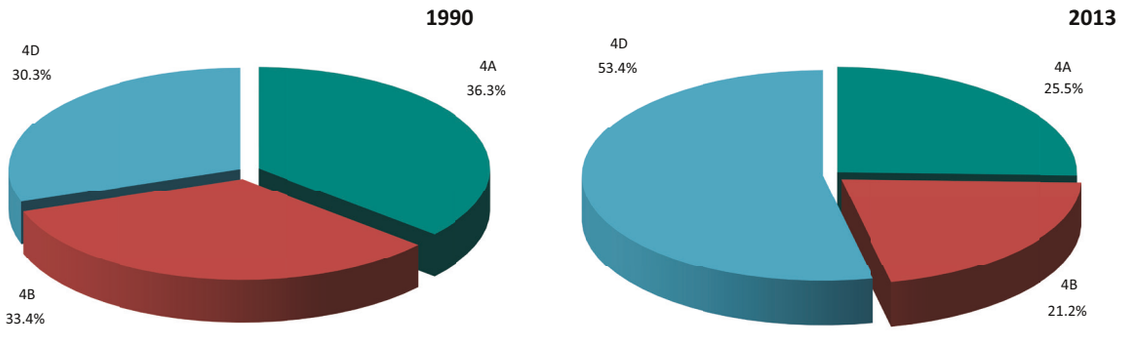


Figure 2-17: Breakdown of Agriculture Sector GHG Emissions by Category in the Republic of Moldova in 1990 and 2013

Table 2-15: Emissions and Removals in LULUCF Sector within 1990–2013, Mt CO_2 equivalent

Categories	1990	1995	2000	2005	2010	2011	2012	2013
5. LULUCF	**-5.8866**	**-1.0294**	**-1.3922**	**-0.3754**	**-0.6571**	**-0.4296**	**-2.4704**	**-0.0976**
A. Forest Land	-2.1972	-1.6208	-2.1403	-2.2462	-2.1931	-2.0828	-2.0056	-1.8860
B. Cropland	-2.2132	1.9211	2.3051	3.4183	2.9877	3.1147	0.9973	3.2456
C. Grassland	-1.4762	-1.3297	-1.5570	-1.5475	-1.4517	-1.4616	-1.4621	-1.4572
D. Wetlands	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE
E. Settlements	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE
F. Other Land	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE

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

This situation can be explained, in particular, due to changes in the use and management of agricultural soils (5B 'Cropland'), that contributed to the substantial decrease of organic carbon from the agricultural soils, changing the humus balance from a positive one like in 1990-1992 years, to a relatively neutral balance, specific to 1993-1994 years, respectively to a profoundly negative balance, like in 1995-2013 time periods.

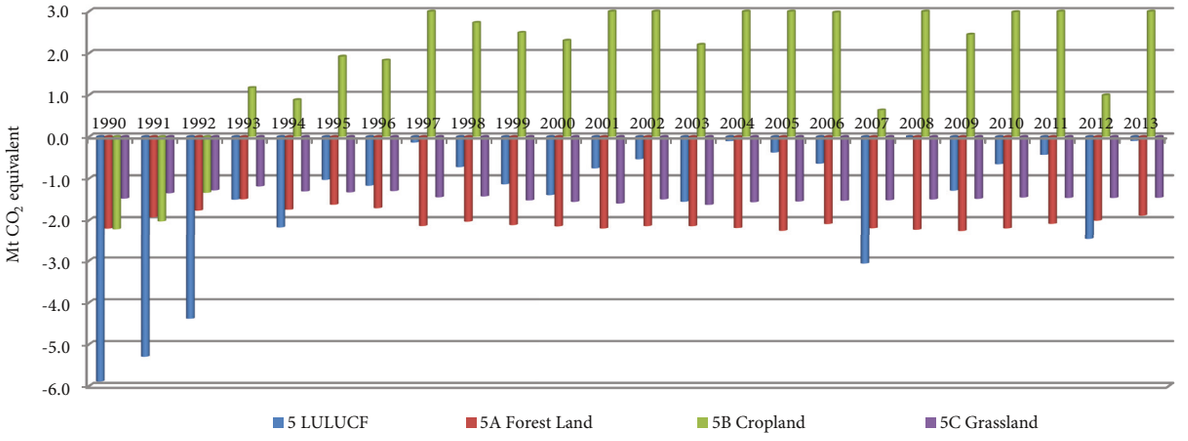


Figure 2-18: Net Emissions/Removals in LULUCF Sector by Source/Sink Categories within 1990-2013

This process was also influenced by some changes in the maintenance and use of forests (5A 'Forest Land'), authorized increased amounts of harvested wood, substantial increase of illegal fellings, increased conversion of forest lands into croplands etc.

In 1990, the largest source of carbon removals under LULUCF Sector was 5B 'Cropland' (lands covered with woody vegetation – multiannual plantations as well as the agricultural soils) accounting for37.6per cent of the total, followed by 5A 'Forest Land' (forests, protective forests, etc.) accounting for 37.3 per cent, respectively by 5C 'Grassland', accounting for 25.1 per cent (Figure 2-19). The contribution of land areas occupied by forest ecosystems (5A'Forest Land') in the process of carbon removals is continuously growing since 1995, especially due to the expansion of areas covered with forest vegetation. In future, the respective growth could be extended at the expense of increasing productivity of existing forests by applying broader reconstruction of damaged trees and with low productivity. Starting with 1993, the 5B 'Cropland' category became a source of CO_2 emissions, as a result of profoundly negative carbon balance in agricultural soils, as well as due to reduction of multiannual plantation areas.

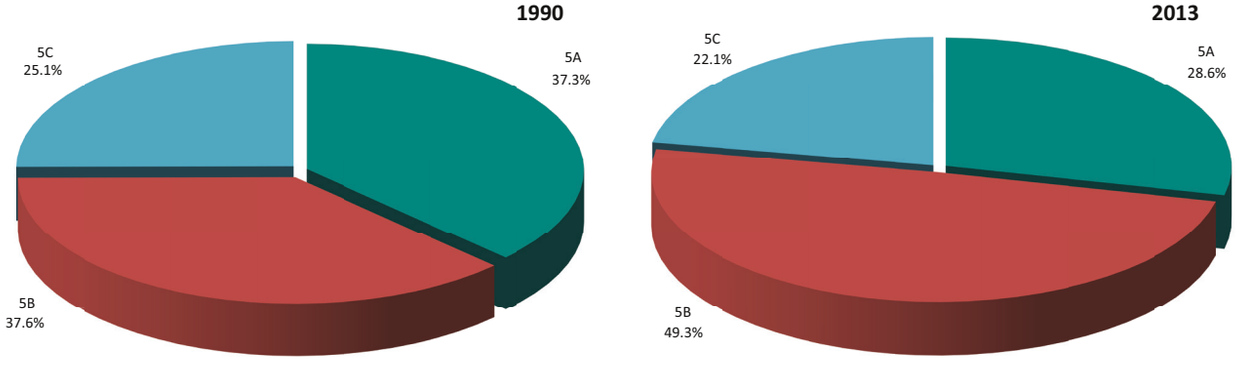


Figure 2-19: Breakdown of Net GHG Emissions and Removals by Source and Sink Categories in LULUCF Sector in 1990 and 2013

In the RM the emissions/removals from 5F 'Other Land' were not estimated, while the emissions/removals from 5E 'Settlements' were partly taken into account in 5B 'Cropland' category, especially CO_2 removals from land covered with wood vegetation, including terrestrial and underground biomass of orchards, vineyards, and trees in individual gardens. The emissions/removals from 5D 'Wetlands' were considered partially within the 5C 'Grassland' category, in particular CO_2 removals from grasslands located in wet zones.

Waste Sector

Waste Sector is an important source of GHG emissions: CH_4 emissions from 'Solid Waste Disposal on Land' (Category 6A) and 'Wastewater Handling' (Category 6B), as well as N_2O emissions

from 'Human Sewage' (Category 6B). At the moment, in RM there are no emissions registered in 6C 'Waste Incineration' category.

In 2013, Waste Sector accounted for circa 12.2 per cent of the total national direct GHG emissions (4.3 per cent in 1990). In the time series from 1990 through 2013, total GHG emissions from this sector decreased by circa 16.1 per cent: from 1.8655 in 1990 to 1.5658 Mt CO_2 equivalents in 2013 (Table 2-16, Figure 2-20). Between 2012 and 2013, GHG emissions from Waste Sector increased by 0.6 per cent.

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, the capacity to generate wastes. At the same time, starting with 2006, there has been a clear growing trend of direct GHG emissions from the 'Waste Sector' In 2013,the largest source of GHG emissions within the Waste Sector was 6A 'SWDL', accounting for 85.8 per cent of the total sectoral emissions (82.8 per cent in 1990) (Figure 2-21).

Table 2-16: GHG Emissions from Waste Sector within 1990-2013, Mt CO_2 equivalent

Source Categories	1990	1995	2000	2005	2010	2011	2012	2013
6. Waste	**1.8655**	**1.9044**	**1.4690**	**1.2978**	**1.5707**	**1.5597**	**1.5567**	**1.5658**
A. Solid Waste Disposal on Land	1.5442	1.6952	1.3093	1.0955	1.3714	1.3534	1.3414	1.3439
B. Wastewater Handling	0.3212	0.2092	0.1597	0.2024	0.1993	0.2064	0.2152	0.2219
C. Waste Incineration	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE

Abbreviations: NE – Not Estimated; NO – Not Occurring.

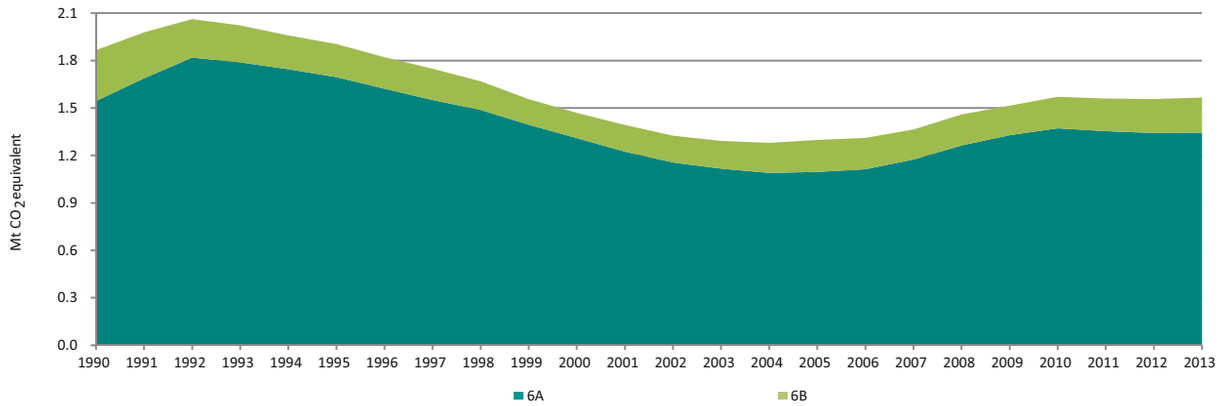


Figure 2-20: Total Waste Sector GHG Emissions Trends in the RM within 1990-2013

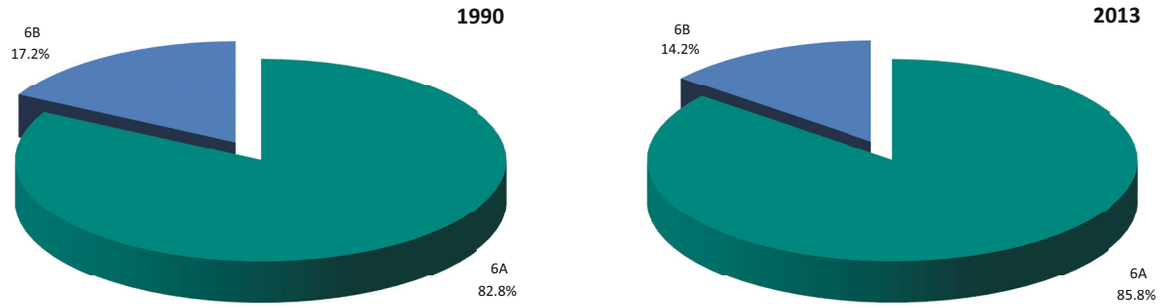


Figure 2-21: Breakdown of Waste GHG Emissions by Category in the RM in 1990 and 2013

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.

In the time series from 1990 through 2013, nitrogen oxides emissions decreased by 71.6 per cent: from 137.4740 to 36.3703 kt, total carbon monoxide emissions decreased by 68.3 per cent: from 433.8751 to 146.9860 kt, non-methane volatile organic compounds emissions decreased by 80.4 per cent: from 517.8048 kt to 128.2985 kt, while sulphur dioxide emissions decreased by 93.2 per cent: from 294.7812 kt to 21.8608 kt (Table 2-17).

Table 2-17: Ozone and Aerosol Precursors Emission Trends in the RM within 1990-2013, kt

	1990	1991	1992	1993	1994	1995	1996	1997
NO_x	137.4740	118.1256	78.5301	63.2389	56.8169	47.8562	45.0918	41.8912
CO	433.8751	375.0938	194.1732	157.3955	142.4926	140.5712	137.7967	132.6081
NMVOC	517.8048	432.5641	339.5211	269.2725	175.9493	161.5871	147.7475	73.8989
SO_2	294.7812	256.0414	170.0244	145.5388	102.5450	60.9425	58.8845	33.8644

	1998	1999	2000	2001	2002	2003	2004	2005
NO_x	35.1409	25.7394	24.4303	26.6523	27.3799	30.7111	32.1177	32.8714
CO	117.3456	80.7215	77.0622	79.4615	95.8651	112.8889	115.2139	117.7508
NMVOC	61.2282	38.2089	36.5216	44.6699	44.8823	47.1698	55.6361	67.1886
SO_2	26.9025	13.9042	9.8013	9.3216	10.4256	12.2190	11.1254	10.7556
	2006	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
NO_x	30.9001	32.4470	34.8352	35.0592	39.1098	39.9538	37.0639	36.3703
CO	112.1234	112.4844	116.8356	114.1050	137.6408	149.8077	139.7743	146.9860
NMVOC	75.5299	145.4701	114.0611	84.8130	101.6484	88.6763	108.2620	128.2985
SO_2	10.9519	9.0310	13.2886	17.6388	19.9704	19.6706	18.6718	21.8608

In 2013, the source categories having the biggest share in the total nitrogen oxides emissions in the Republic of Moldova were: 1A3 'Transport' (18.9230 kt or 52.0 per cent of the total), 1A1 'Energy Industries' (9.0957 kt or 25.0 per cent of the total), 1A4 'Other Sectors' (5.3637 kt or 14.7 per cent of the total), 1A2 'Manufacturing Industries and Constructions' (1.7193 kt or 4.7 per cent of the total) and 2A 'Mineral Products' (1.1294 kt or 3.1 per cent of the total) (Figure 2-22).

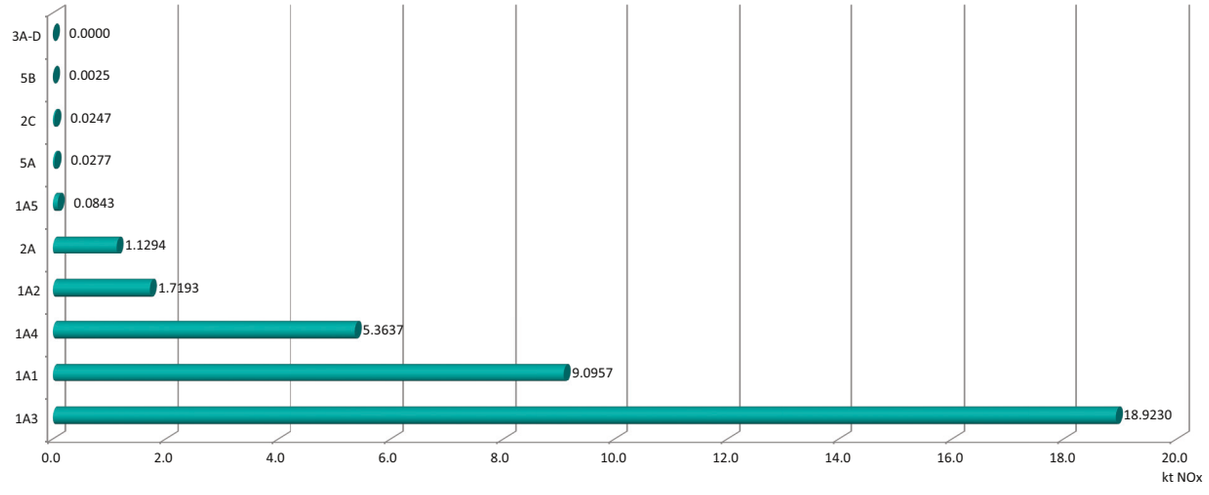


Figure 2-22: Source Categories of NO_x in the Republic of Moldova in 2013 year

In 2013, the source categories having the biggest share in the total carbon monoxide emissions in the Republic of Moldova were: 1A3 'Transport' (78.5783 kt or 53.5 per cent of the total), 1A4 'Other Sectors' (64.9480 kt or 44.2 per cent of the total), 1A1 'Energy Industries' (1.3662 kt or 0.9 per cent of the total), 5A 'Forest Land' (affected by fires) (0.9856 kt or 0.7 per cent of the total), 1A2 'Manufacturing Industries and Constructions' (0.6476 kt or 0.4 per cent of the total) and 2C 'Metal Production' (0.3233 kt or 0.2 per cent of the total) (Figure 2-23).

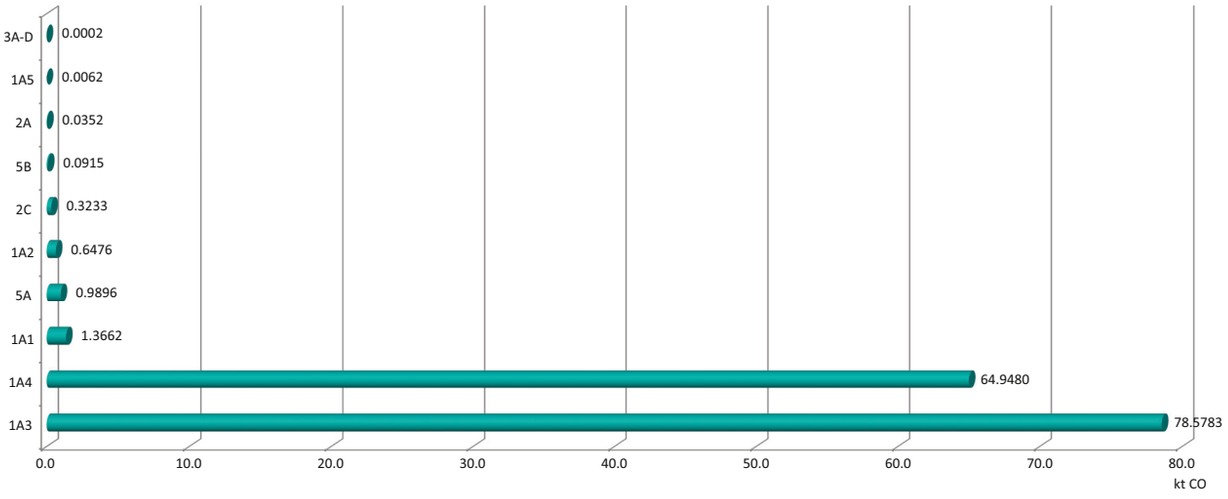


Figure 2-23: Source Categories of CO in the Republic of Moldova in 2013 year

In 2013, the source categories having the biggest share in the total non-methane volatile organic compounds emissions in the RM were: 2A 'Mineral Products' (76.7637 kt or 59.8 per cent of the total), 3A-D 'Solvents and Other Products Use' (22.7398 kt or 17.7 per cent of the total), 1A3 'Transport' (14.9469 kt or 11.7 per cent of the total), 1A4 'Other Sectors' (7.8002 kt or 6.1 per cent of the total), 2D 'Other Production' (foods and beverages) (4.7530 kt or 3.7 per cent of the total) and 1B2 'Fugitive Emissions From Oil and Natural Gas' (0.8712 kt or 0.7 per cent of the total) (Figure 2-24).

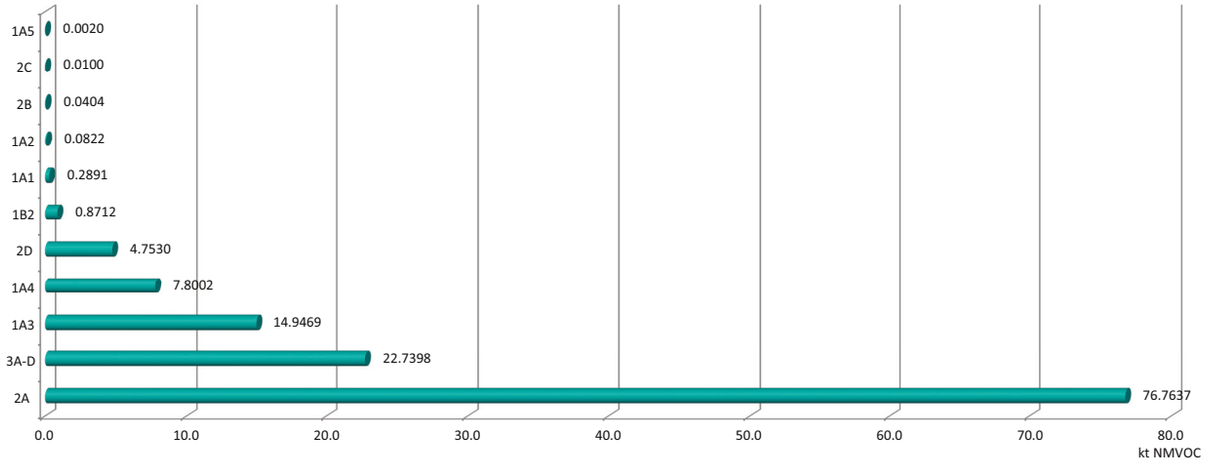


Figure 2-24: Source Categories of NMVOC in the Republic of Moldova in 2013 year

In 2013, the source categories having the biggest share in the total sulphur dioxide emissions in the Republic of Moldova were: 1A4 'Other Sectors' (8.2087 kt or 37.5 per cent of the total), 1A1 'Energy Industries' (7.2092 kt or 33.0 per cent of the total), 1A3 'Transport' (2.8612 kt or13.1 per cent of the total), 1A2 'Manufacturing Industries and Constructions' (2.7863 kt or 12.7 per cent of the total) and 2A 'Mineral Products' (0.6862 kt or 3.1 per cent of the total) (Figure 2-25).

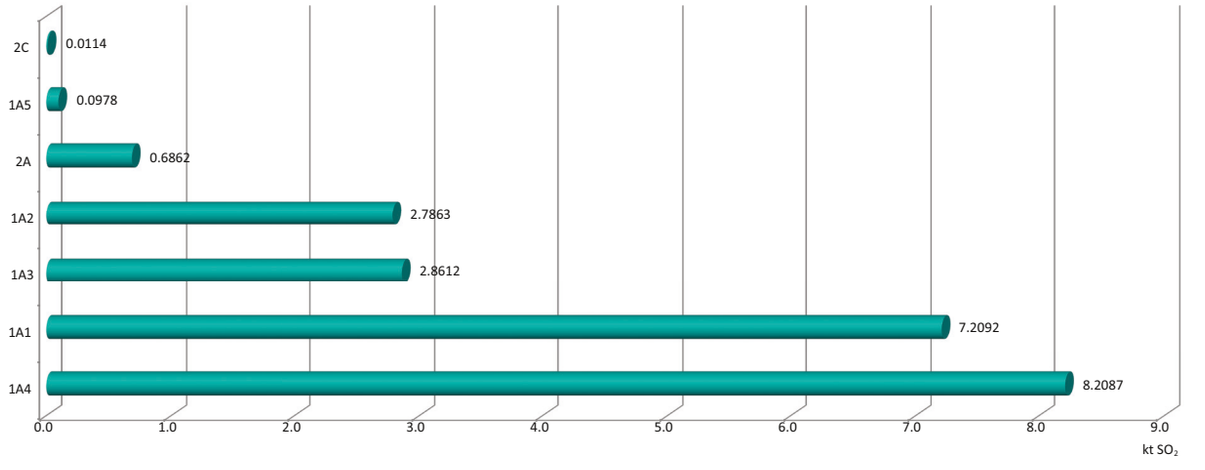


Figure 2-25: Source Categories of SO_2 in the Republic of Moldova in 2013 year

CHAPTER 3: INFORMATION ON MITIGATION ACTIONS AND THEIR EFFECTS

3.1. Quantified Economy-Wide Emissions Targets

Republic of Moldova has associated itself with the Copenhagen Accord and set an emissions reduction target which is specified in Annex II to this Agreement "*Nationally appropriate mitigation actions of developing country Parties*":

> "*A reduction by not less than 25% versus the base year (1990) of total national GHG emissions by 2020 through implementation of economic mechanisms focused on climate change mitigation globally, according with the principles and provisions of the Convention*".

This target was proposed without indication of identified and quantified specific nationally appropriate mitigation actions and without further clarification regarding the needed support to accomplish it. At the same time, it is understood that accomplishment of their target will require financial, technological and capacity building support that can be offered through the UNFCCC mechanisms.

At present, the only document aimed at climate change challenges is the Environmental Strategy of the Republic of Moldova for the years 2014-2023 and its implementation Action Plan[35], approved through a Governmental Decision on 24 of April 2014. The Strategy envisages creation of an integrated air quality management system, reducing emissions of pollutants into the atmosphere by 30% by 2023 and greenhouse gas emissions by 2020 by at least 20% compared to the BAU scenario, including:

- by 25% GHG emissions from the Energy Sector;
- by 20% GHG emissions from the Buildings, Industry and Agriculture Sectors;
- by 15% GHG emissions from Transport and Waste Sector;
- by 25% carbon dioxide removal capacity in the LULUCF Sector.

Alongside the Environmental Strategy of the Republic of Moldova for the years 2014-2023 and its implementation Action Plan, the Government is finalizing the Low Emissions Development Strategy (LEDS) of the Republic of Moldova until 2030, which will be approved by the end of 2016. This paper enables the Republic of Moldova to adjust its development path towards a low-carbon emissions economy and achieve a sustainable green development and based on socio-economic development priorities of the country. The 20% by 2020 GHG emissions reduction target set in LEDS will be maintained, while targets by sector will be amended, following the revision of development policies of the sectors concerned. The paper will also set targets for reducing GHG emissions for 2030.

[35] GD no. 301 of 24.04.2014

3.2. National Climate Change Policies and Mitigation Measures

The Ministry of Environment, through its Policies Analysis, Monitoring and Evaluation Directorate, coordinates the climate change related policies in the Republic of Moldova at the official level. Some policies impacting on climate change are the responsibility of other ministries: Ministry of Economy, Ministry of Transport and Roads Infrastructure, Ministry of Agriculture and Food Industry, etc.

3.2.1. Clean Development Mechanism of the Kyoto Protocol

The RM is on track to meet the commitments made by the country by adhering to Copenhagen Accord. The country recognizes that the Clean Development Mechanism (CDM) of the Kyoto Protocol contributes and could further play an important role for accomplishing the undertaken goals. In view of capitalizing on the GHG emissions reduction potential through the CDM of the Kyoto Protocol, institutions and the necessary regulatory and information framework were created in the Republic of Moldova. Thus, the Designated National Authority for the Clean Development Mechanism of the Kyoto Protocol was established within the Ministry of Environment, the task of which is the implementation and achievement of UNFCCC provisions, as well as the mechanisms and provisions of the Kyoto Protocol.

Two institutions are effectively engaged in promoting the CDM Projects in the RM:

- Climate Change Office, which operates under the Ministry of Environment and is the knowledge canter in policy analysis and national GHG emissions assessment;
- Carbon Finance Unit, which operates under the Ministry of Environment and is currently overseeing the implementation of several CDM Projects.

For now, 11 requests for launching CDM projects have been registered, of which eight were approved and are being implemented. RM doesn't have a carbon trading market and specially designated budget for carbon reductions. However, this idea is being assessed.

3.2.2. Activities Related to Nationally Appropriate Mitigation Actions

RM is starting to promote NAMA implementation mechanism. The key to achieving success in this initiative is seen primarily in proper strengthening of national capacities capable to implement NAMA projects, sufficiently justified to obtain financial support

from external donors. In this regard, with the international donors support (UNDP, EU, the Governments of Australia and the Federal Republic of Germany), the 'Low Emission Capacity Building Program' (LECB) project is being implemented within April 2014 - December 2016, being focused on preparation 2-4 NAMA projects in line with the UNFCCC requirements. During the preparation phase, the national experts are trained to be able to independently identify, develop, submit, and obtain funding, and to implement mitigation measures at national level (NAMA projects). For now, from the multitude of 136 NAMA type project proposals 11 were considered to be of higher priority (**Annex 2**), selected upon application of the Multi-Criteria Decisions Analysis (MCDA) Method. Of those 11, 4 were selected (**Annex 3**) for being developed as full supported NAMA project proposals, based both on the MCDA and the conclusions of the National Commission for implementation of UNFCCC provisions and the Kyoto Protocol.

3.2.3. Economic Instruments

Taxes and other economic instruments can play a leading role towards achieving the goals of combating climate change. These can provide incentives for conduct that protects or improves the environment and also discourage negative environmental impact actions.

We have to admit that to date, few levers of this kind, namely those to reduce CO_2 emissions, have been used in the Republic of Moldova. The Law on Environmental Pollution, updated over time, including in 2008, sets the pollution fees in a way that does not cause an obvious interest towards reducing GHG emissions. In conformity with the law, fees for atmospheric emissions of pollutants from petrol (leaded, non-ethylated) fuelled mobile sources; jet engines fuels (aviation gasoline, kerosene) and diesel fuel are imposed on businesses and individuals importing the fuel. The fee for the polluting emissions from mobile sources are calculated as 1% of cost in customs of the leaded petrol, of the aircraft engines fuel and of diesel, and as 0.5% - for non-ethylated petrol. For emissions from stationary combustion, the fee is set per tonne, with an increase for exceeding the norm, without specifying if it also applies to direct GHG emissions.

Environmental pollution tax for vehicles was aimed at reducing of carbon monoxide (CO), rather than carbon dioxide (CO_2) emissions. However, aiming at reducing the import of second hand vehicles, which are considered a source of greater emissions, the Parliament has introduced a car age limit on import of vehicles.

Aiming at strengthening the economic instruments to meet the national and global environmental priorities, in 2012 the Global Environment Facility (GEF) has launched a project aimed at environmental fiscal reforms capacity building. The amount of support is US$ 475,000, with a US$ 610,000 co-financing.

The project aims at establishing a solid foundation to institutionalize an environmental fiscal reform at the national level, with support of relevant government institutions, including the Ministry of Environment, Ministry of Finance and other ministries, by establishing the National Environmental Fiscal Reform Commission (EFRC) which initially will act as the project's board of directors, later evolving into the EFRC.

3.3. Climate Change Mitigation Policies and Measures by Sector

3.3.1. Energy Sector

Most policies in this sector set forth in the Third National Communication of the Republic of Moldova to the UNFCCC (2014) are topical now as well.

Given the 87.1%[36] energy dependence on imported energy, the energy policies of the state are geared at increasing energy security in two ways: in terms of energy production - by attracting the renewable energy sources into the energy balance, and in terms of energy demand - by promoting energy efficiency. Thus, by 2020 energy demand is expected to be reduced by 533 ktoe compared to the baseline scenario (20% reduction), and energy demand for by this year is expected to be covered by 430 ktoe of energy from renewable sources (20% of demand). Achieving these targets will obviously cause imminent corresponding reduction of GHG emissions. The currently existing legal framework aimed at achieving the set objectives mostly covers the whole range of regulations needed in this respect, from laws to action plans. The most important of these are listed below.

Energy Roadmap for 2015-2030, GD no. 409/2015

The objective of the Roadmap is to create the regulatory, institutional and organizational framework in electricity and gas sector, and to ensure security of electricity and gas supply, following the achievement of specific objectives set out in the Energy Strategy until 2030 of the Republic of Moldova. The roadmap identifies the work packages, tasks and specific actions, assign responsibilities among major stakeholders, estimate the terms associated with the proposed actions, evaluates the type of costs and quantifies the indicative costs of the major investment projects. The energy sector roadmap underlies the evaluation and reporting process and progress monitoring mechanisms during the implementation of the set actions.

GHG concerned: CO_2, CH_4, N_2O
Category of the measure: Regulatory and economic
Status: effective since 2015
Included in: With Measures (WM) Scenario

Renewable Energy Law, no. 160/2007

Sets out the principles and objectives of the state policy in the field of renewable energy sources use. Identifies the financial resources and economic-financial mechanism to support the process of using the renewable energy sources. Lays down the economic and organizational measures aimed at boosting production and use of renewable energy. According to the Renewable Energy Law, by 2020, about 20% of energy demand is to be covered from renewable energy sources, including 20% bioethanol and biodiesel of the total fuels sold.

GHG concerned: CO_2, CH_4, N_2O
Category of the measure: Regulatory and economic
Status: effective since 2007
Included in: Business-As-Usual (BAU) Scenario

Energy Efficiency Law, no. 142/2010

The Law is aimed at creating energy efficiency improvement prerequisites, including by establishing and supporting the structures involved in developing and implementing programs, plans, energy services, other energy consumption efficiency measures.

[36] Energy Balance of the Republic of Moldova. Statistical compilation 2014. National Bureau of Statistics of the Republic of Moldova. Chisinau. - 2015. <http://www.statistica.md/public/files/publicatii_electronice/balanta_energetica/BE_2015_rom.pdf>.

GHG concerned: CO_2, CH_4, N_2O
Category of the measure: Regulatory
Status: effective since 2010
Included in: With Measures (WM) Scenario

National Energy Efficiency Program for 2011-2020, GD no. 833/2011

The program establishes policies and priority actions to be implemented during the 2011-2020 period to meet the challenges of rising energy prices, dependence on imported energy resources and energy sector impact on climate change. The program will be supported by national energy efficiency action plans, adopted every three years. The program's objectives match the objectives of the Renewable Energy Law.

GHG concerned: CO_2, CH_4, N_2O
Category of the measure: Regulatory
Status: effective since 2011
Included in: With Measures (WM) Scenario

National Development Strategy "Moldova 2020": 8 solutions for economic growth and poverty reduction. Law no. 166/2012, amended by Law no. 121/2014

One of the 8 solutions of the Strategy concerns the energy sector: "Energy: secure supply, efficient use". The strategic vision for the energy sector development is based on the following pillars: (i) energy security of the country and (ii) increasing energy efficiency. For the latter, mainly the following goals are provided to be achieved by 2020: reducing energy intensity by 10%; 20% of energy demand to come from renewable energy sources; reduction of greenhouse gas emissions by 25% (compared to 1990).

GHG concerned: CO_2, CH_4, N_2O
Category of the measure: regulatory and economic
Status: effective since 2012, amended in 2014
Included in: With Measures (WM) Scenario

Moldova Energy Strategy 2030, GD no. 102/2013

The document provides concrete benchmarks for energy sector development in the Republic of Moldova, including in the field of energy efficiency and development of renewable energy sources, and its objectives match the objectives of the National Development Strategy "Moldova 2020".

GHG concerned: CO_2, CH_4, N_2O
Category of the measure: regulatory and economic
Status: effective since 2013
Included in: With Measures (WM) Scenario

The National Action Plan on Renewable Energy Sources for 2013-2020, GD no. 1073/2013

The National Action Plan on Renewable Energy Sources for 2013-2020 defines the sector target of 20% of energy demand to be covered from renewable sources by 2020 and sets out legislative, regulatory and administrative actions needed to achieve these objectives.

GHG concerned: CO_2, CH_4, N_2O
Category of the measure: regulatory
Status: effective since 2013
Included in: With Measures (WM) Scenario

National Energy Efficiency Action Plan for 2013-2015, GD no. 113/2013

The objective of the National Action Plan for Energy Efficiency for 2013-2015 is to reduce final energy consumption in all sectors of national economy by 428 ktoe, and reducing C_2O emissions by 962,848 tons in 2013-2015. The plan proposes a set of measures the implementation of which will result in energy savings in various sectors of national economy, decrease the import of natural gas, liquid fuels (petrol, diesel and liquefied gas), as well as electricity.

GHG concerned: CO_2, CH_4, N_2O
Category of the measure: regulatory and economic
Status: effective since 2013
Included in: With Measures (WM) Scenario

The Law on Heat and Promotion of Cogeneration, no. 92/2014

The Law on Heat and Promotion of Cogeneration regulates: the principles and objectives of the state policy in district heating systems: management of the heating sector by the state; cogeneration and co-generation technologies promotion; setting up and approval of regulated tariffs for heat; licensing of activities in the heat sector; rights and obligations of heat facilities, etc.

GHG concerned: CO_2, CH_4, N_2O
Category of the measure: regulatory and economic
Status: effective since 2014
Included in: With Measures (WM) Scenario

The Law on Energy Performance in Buildings, no. 128/2014

The Law promotes improving the energy performance of buildings and establishes the requirements on: the general methodology for calculating the energy performance of buildings and units thereof; application of minimum energy performance requirements for buildings; energy certification of buildings; regular inspection of heating and air conditioning system in buildings; respective monitoring systems, etc.

GHG concerned: CO_2, CH_4, N_2O
Category of the measure: regulatory
Status: effective since 2015
Included in: With Additional Measures (WAM) Scenario

The Law on Energy Labelling, no. 44/2014

The Law on Energy Labelling sets the regulatory framework for some national measures on energy labelling and standard product information for end-users, especially regarding energy consumption and, where appropriate, other essential resources use and additional energy-related information about products.

GHG affected policy: CO_2, CH_4 and N_2O
Category measure: regulatory
Status: effective 2014
Included in: With Additional Measures (WAM) Scenario

Establishment of the Energy Efficiency Fund, GD no. 401/2012

The Government Decision no. 401/2012 sets up the Regulation on organization and operation of the Energy Efficiency Fund. The Fund's objective is to attract and manage resources to finance and implement projects in the field of energy efficiency and the renewable energy in line with strategies and programs developed by the Government. During 2012-2015 about 590 million MDL, or about 32 million EUR have been earmarked by the Government for the Energy Efficiency Fund.

GHG concerned: CO_2, CH_4, N_2O
Category of the measure: economic
Status: effective since 2012
Included in: With Measures (WM) Scenario

3.3.2. Industrial Processes Sector

Currently the Republic of Moldova does not have any approved policy paper geared specifically towards reducing GHG emissions from industrial sector. The main documents and programs which indirectly entail emission reductions are listed below.

Industry Development Strategy up to year 2015, GD no. 1149/2006

The Strategy sets out the main principles, objectives and priorities aiming at development and improving the efficiency and competitiveness of the industrial sector, as well as the mechanisms and instruments to achieve it.

GHG concerned: CO_2, HFCs, PFCs, SF_6
Category of the measure: economic and regulatory
Status: effective since 2006
Included in: Business-As-Usual (BAU) Scenario

The Innovative Strategy for the Republic of Moldova for the period 2013-2020 "Innovation for Competitiveness" GD no. 952/2013

The strategy focuses on three specific objectives: technological development of businesses, including small and medium enterprises, development of support infrastructure for innovation activities and ensuring the conditions for building a knowledge-based economy.

GHG concerned: CO_2, HFCs, PFCs, SF_6
Category of the measure: regulatory
Status: effective since 2013
Included in: With Measures (WM) Scenario

3.3.3. Agriculture Sector

In 2014 the only approved policy in the Republic of Moldova geared specifically towards reducing greenhouse gas emissions from agriculture sector was the following:

The Environmental Strategy for 2014-2023 and its Action Plan, GD no. 301/2014

The overall objective of the Strategy is to create an efficient environmental management system, including (Specific Objective 7) "Development of an integrated air quality management system, reducing emissions of pollutants into the atmosphere by 30% by 2023 and greenhouse gas emissions by 2020 by at least 20% compared to the baseline scenario". Agriculture is expected to achieve a reduction of about 20% of GHG emissions by the year 2020 compared to the baseline scenario, through such actions as: creating a carbon balance in soil as favourable as possible and maintaining soil fertility in the long term so that the secondary crop production (straw and other crop residues) is predominantly incorporated in the soil, rather than used as an energy source; through effective manure management; use of sidereal fertilizers and soil conservation cultivation technologies.

GHG concerned: CO_2, CH_4, N_2O
Category of the policy: regulatory
Status: effective during 2014-2023
Included in: With Measures (WM) Scenario

Livestock Sector

The legal framework regulating the animal husbandry in the Republic of Moldova is formed of a number of organic laws, including:

The Law on Livestock Selection Breeding, no. 371/1995

The Law was adopted to create economic grounds for improving the quality and increasing overall livestock production through improving the existing breeds, development and implementation of new breeds, types, lines, two crossbreeds and hybrids of animals with highly productive and adaptable potential, etc.

The Law on Livestock, no. 412/1999, in force since 2001

The Law establishes the basis of legal and economic organization of the livestock sector; regulates the relations between the state and livestock owners. The Law was adopted to create conditions for improving the quality and increasing the livestock production.

The Law on Veterinary, no. 221/2007, in force since 2008

The Law was adopted to ensure animal health, safety and quality of feed etc.

GHG concerned: CH_4, N_2O
Category of the policy: regulatory
Included in: Business-As-Usual (BAU) Scenario

Enteric Fermentation

The basic animal husbandry policies, with direct or indirect impact on the prevailing trends in greenhouse gas emissions from the source category 4A "Enteric Fermentation" are reflected in the following strategies, programs and action plans:

Some measures for regeneration of swine genetic pool, GD no. 1095/2003

Aiming at regeneration, conservation and rational use of swine genetic pool, the state enterprise for selection research and swine hybridization "Moldsuinhibrid" was created.

GHG concerned: CH_4 and N_2O
Policy type: regulatory and economic
Status: effective since 2003
Included in: Business-As-Usual (BAU) Scenario

The National Development Strategy for 2008-2011, approved by the Law no. 295/2007 and Action Plan, approved by the GD no. 191/2008

With reference to the livestock sector, the National Development Strategy for 2008-2011 and the Action Plan on implementation of the National Development Strategy for 2008-2011 provided for reorganization of services / sanitary veterinary and phyto-sanitary systems aiming at harmonization with EU requirements.

GHG affected policy: CH_4 and N_2O
Policy type: economic regulator
Status: effective during the period 2008-2011
Included in: Business-As-Usual (BAU) Scenario

The Activity Programme of the Government of the Republic of Moldova "European Integration: Freedom, Democracy, Wellbeing" (2011-2014)

The program provides a governing policies framework for the Republic of Moldova for 2011-2014. Regarding the livestock sector, the Government Programme of the Republic of Moldova "European Integration: Freedom, Democracy, Wellbeing" (2011-2014) stipulates institutional reorganization of the sanitary and veterinary sector by aligning to the general development concept of food safety systems, and EU norms etc.

GHG concerned: CH_4 and N_2O
Policy type: regulatory
Status: effective during 2011-2014
Included: With Measures (WM) Scenario

National Strategy for Agricultural and Rural Development for 2014-2020, GD no. 409/2014

Regarding the livestock sector, the overall objective 1 of the National Strategy for Agricultural and Rural Development for 2014-2020 stipulates provision of support for the modernization and restructuring of farms specialized in production of traditional agricultural products (milk and meat) and other competitive agricultural products.

GHG concerned: CH_4 and N_2O
Policy type: regulatory and economic
Status: effective during 2014-2020
Included in: With Measures (WM) Scenario

Manure Management

The normative acts of the Republic of Moldova do not cover policies specifically geared towards reducing GHG emissions by source category 4B "Manure Management". However, policies aimed at stimulating use of conservation tillage technologies contribute to manure becoming increasingly valuable as organic fertilizer for croplands, obtained by storing manure on properly equipped special platforms and / or by composting.

The Soil Conservation and Fertility Improvement Program for 2011-2020, GD no. 626/2011 and the Action Plan for Soil Conservation and Soil Fertility Improvement Program for 2014-2016, GD no. 138/2014

Regarding manure management, the Soil Conservation and Fertility Improvement Program for 2011-2020 provides for conservation and of soil fertility improvement measures by offsetting humus losses in soil by complex fertilization with organic fertilizers (manure and composts).

GHG concerned: CH_4 and N_2O
Policy type: regulatory
Status: effective during 2011-2020
Included in: With Measures (WM) Scenario

Waste Management Strategy of the Republic of Moldova for 2013-2027, GD no. 248/2013

With the Waste Management Strategy of the Republic of Moldova for 2013-2027 the Government commits to develop a new legal and institutional framework governing the waste management sector at international standards.

GHG concerned: CH_4 and N_2O
Policy type: regulatory and economic
Status: effective during 2013-2027
Included in: With Measures (WM) Scenario

In the above context, the policies aiming at boosting the country's use of renewable energy sources, providing for *generation of biogas from manure* with the possibility of its future use as fuel for electricity and heat production, should be mentioned. These policies are reflected in the energy section.

Crops Cultivation and Soil Resources Sector

The legal framework for the *crop cultivation and soil resources* of the RM is formed by a number of organic laws, including:

- the Land Code, no. 828/1991, effective since 2001
- the Law on Horticulture, no. 728/1996
- the Law on Normative Price and Sale-Purchase of Land, no. 1308/1997, effective since 2001
- the Law on Nut Crops no. 658/1999, effective since 2001
- the Law on Foodstuffs, no. 78/2004, effective since 2005
- the Law on Plant Protection Products and Fertilizers, no. 119/2004
- the Law on Viticulture and Wine, no. 57/2006
- the Law on Tobacco and Tobacco Products, no. 278/2007, effective since 2008
- the Law on Plant Varieties Protection, no. 39/2008

Basic policies in crop husbandry and soil resources, impacting the prevailing trends in greenhouse gas emissions in source category 4D "Agricultural Soils" are reflected in a number of strategies, programs and action plans:

Land Consolidation Program, GD no. 554/2006

Land Consolidation Program is one of the implementation mechanisms of the National Program "Moldovan Village" (2005-2015). The purpose of the Programme is sustainable rural development of the Republic of Moldova by promoting consolidation of agricultural lands - a set of economic, legal, technical, organizational and environmental measures.

GHG concerned: CO_2, CH_4 and N_2O
Policy type: regulatory and economic
Status: effective since 2006
Included: Business-As-Usual (BAU) Scenario

National Development Strategy for 2008-2011, approved by Law no. 295/2007 and its Action Plan approved by the GD no. 191/2008

The improvement of agricultural performance and competitiveness of agricultural products was to be achieved by improving agricultural land management and complex soil protection, creation and implementation of an integrated soil fertility enhancement and reproduction system, rehabilitation of irrigation systems, improvement of soil fertility by promoting erosion control and soil improvement measures etc.

GHG concerned: CO_2 and N_2O
Policy type: regulatory and economic
Status: effective during 2008-2011
Included in: Business-As-Usual (BAU) Scenario

The Soil Conservation and Soil Fertility Improvement Program for 2011-2020, GD no. 626/2011 and the Action Plan on implementation of the Soil Conservation and Soil Fertility Improvement Program, GD no. 138/2014

The objective of the papers is long-term preservation of the means soils quality and production capacity aimed at ensuring the food security of the country. The quality of soils largely determines the crops productivity, livestock sector development, export of food products, the wellbeing of population and the ecological situation in the country.

GHG concerned: CO_2 and N_2O
Policy type: regulatory and economic
Status: effective during 2011-2020
Included in: With Measures (WM) Scenario

Programme of the Government of the Republic of Moldova "European Integration: Freedom, Democracy, Wellbeing" (2011-2014)

Regarding the crop cultivation and soil resources sector, the program includes: support and boosting the soil conservation activities, stimulation of high added value and organic crops for capitalizing the lands productive potential; stimulation of modern irrigation technologies implementation; harmonization with European regulations etc.

GHG concerned: CO_2 and N_2O
Policy type: regulatory and economic
Status: effective during 2011-2014
Included: With Measures (WM) Scenario

National Development Strategy "Moldova 2020", Law no. 166/2012, as amended in 2014

The "Moldova 2020" Strategy focuses on eight priorities, including *increasing agricultural and food products competitiveness and sustainable rural development*. The policies implemented in the food sector

will have the following strategic goals: food security and safety; conservation of natural resources and land; ensuring a sustainable foundation for rural economy and boosting employment in rural areas.

GHG concerned: CO_2, CH_4 and N_2O
Policy type: economic and regulatory
Status: in force during the period 2012-2020
Included in: With Measures (WM) Scenario

National Strategy for Agricultural and Rural Development for 2014-2020, GD no. 409/2014

Regarding the crop cultivation and soil resources sector, the strategy looks at employment of modern agricultural land and water management practices; afforestation of poor quality or unproductive agricultural lands to increase biodiversity, reduce soil erosion and conserve water resources etc.

GHG concerned: CO_2, CH_4 and N_2O
Policy type: regulatory and economic
Status: effective during 2014-2020
Included in: With Measures (WM) Scenario

3.3.4. Forestry Sector

Most policies with reference to forestry sector described in the Third National Communication of the Republic of Moldova to the UNFCCC (2014) are relevant today. Meanwhile, two other important documents have been approved: the Environmental Strategy for 2014-2023 and its Action Plan, and the National Plan on Expansion of Wooded Areas for 2014-2018.

The Policies of the forestry sector are reflected in the following documents:

National Strategy and Action Plan for Biodiversity Conservation, Parliament Decision no. 112/2001, amended in 2007

The main goal of the National Strategy and Action Plan for Biodiversity Conservation is the conservation, rehabilitation, reconstruction and sustainable use of biological and landscape diversity, including by expanding the forests up to 15% through afforestation of river protection zones, waters and degraded lands by creating ecological connection corridors, etc.

GHG concerned: CO_2
Type of measure: regulatory
Status: effective since 2001
Included in: Business-As-Usual (BAU) Scenario

Sustainable Development Strategy of the Forestry Sector, PD no. 350/2001 and GD no. 739/2003 "On the implementation of The Strategy for Sustainable Development of National Forestry Sector"

The documents provide for improvement of policies, legislation and institutional framework; forest regeneration and afforestation on the surface of 95.1 thousand ha; ecological reconstruction of 24.5 thousand ha of forests; expanding areas covered with forest vegetation by 128 thousand ha.

GHG concerned: CO_2
Type of measure: regulatory
Status: effective since 2001, respectively since 2003
Included in: Business-As-Usual (BAU) Scenario

The Lands Use and Soil Fertility Improvement Program, GD no. 636/2003

According to the program, approximately 56.4% of agricultural lands are affected by different degradation processes. The program provides for a set of anti-erosion works and measures in 2003-2010, including planting of new and reconstruction of the existing protective forest belts; afforestation of degraded areas on 133.1 thousand ha.

GHG concerned: CO_2
Type of measure: regulatory
Status: effective since 2003
Included: Business-As-Usual (BAU) Scenario

The State Program for Regeneration and Afforestation of Forest Lands for 2003-2020, GD no. 737/2003

By 2020 regeneration and afforestation works in the forest areas will be carried out on a total area of 95.118 thousand hectares.

GHG concerned: CO_2
Type of measure: regulatory
Status: effective since 2003
Included: Business-As-Usual (BAU) Scenario

Possibilities to harvest timber during the main products cutting in 2006-2010, GD no. 1337/2005; respectively in 2011-2015, GD no. 1184/2010

It provides for harvesting 1359.3 thousand m^3 of timber or 272 thousand m^3 annually during 2006-2010, respectively, 1940.0 thousand m^3 or 388 thousand m^3 annually in 2011-2015.

GHG concerned: CO_2
Type of measure: regulatory
Status: effective during 2006-2010, and respectively during 2011-2015
Included in: Business-As-Usual (BAU) Scenario and in With Measures (WM) Scenario

National Strategy for Sustainable Development of Agribusiness in the Republic of Moldova for 2008-2015, GD no. 282/2008

The Strategy provides for the creation of protective forest belts, planting vineyards, etc.

GHG concerned: CO_2
Type of measure: regulatory
Status: in force during the period 2008-2015
Included in: With Measures (WM) Scenario

The National Program on the establishment of National Ecological Network, GD no. 593/2011

The program envisages afforestation of water protection zones and strips of rivers and water basins on 30.4 ha by the end of 2018.

GHG concerned: CO_2
Type of measure: regulatory
Status: effective during 2011-2018
Included: With Measures (WM) Scenario

Soil Conservation and Soil Fertility Improvement Program for 2011-2020, GD no. 626/2011

Among the objectives of the Programme are: stopping the active forms of soil cover degradation on 877 thousand hectares of arable land by the end of 2020.

GHG concerned: CO_2
Type of measure: regulatory
Status: effective during 2011-2020
Included: With Measures (WM) Scenario

Action Plan for Implementation of the Soil Conservation and Soil Fertility Improvement Program for 2014-2016, GD no. 138/2014

One of the actions included in the Action Plan for implementation of the Soil Fertility Conservation and Improvement Program for 2014-2016 provides for land clearance of degraded perennial plantations (in 2014 – 200 ha, in 2015 – 200 ha, in 2016 – 400 ha).

GHG concerned: CO_2
Type of measure: regulatory
Statute: effective since 2014
Included: With Measures (WM) Scenario

Environmental Strategy for 2014-2023 and the Action Plan, GD no. 301/2014

One of the specific objectives of the Environmental Strategy for 2014-2023 and the Action Plan, GD no. 301/2014, is expansion of forest areas up to 15% of the country's territory, and state protected natural areas to 8.1% of the country's territory, as well as the effective and sustainable management of natural ecosystems.

GHG concerned: CO_2
Type of measure: regulatory
Status: effective since 2014
Included in: With Measures (WM) Scenario

National Wooded Areas Expansion Plan for 2014-2018, GD no. 101/2014

The plan provides for the expansion of forest vegetation on 13.041 thousand hectares and provision of seedlings needed for the expansion works.

GHG concerned: CO_2
Type of measure: regulatory
Status: effective since 2014
Included: With Measures (WM) Scenario

National Strategy for Agricultural and Rural Development for 2014-2020, GD no. 409/2014

Regarding the forestry sector, the National Strategy for Agricultural and Rural Development for 2014-2020 provides for afforestation of poor farmlands quality to increase biodiversity and reduce soil erosion, also to contribute to water resources conservation.

GHG concerned: CO_2, CH_4 and N_2O
Type of measure: regulatory
Status: effective since 2014
Included in: With Measures (WM) Scenario

3.3.5. Waste Sector

The current Moldovan legal framework related to environmental protection regulates the reduction of GHG emissions in the Waste Sector only in general terms. It lacks stipulations on equipping the solid waste disposal sites and wastewater treatment plants with biogas recovery systems. Indirectly, policies aimed at reducing the GHG emissions in Waste Sector are reflected in a number of regulations set forth in the Third National Communication of the Republic of Moldova to the UNFCCC (2014). They are supplemented with new ones recently approved which specify the aspects of reducing emissions in this sector in a more obvious way. They include:

The Environmental Strategy for 2014-2023 and its Action Plan, GD no. 301/2014

The overall objective lies in creating an efficient environmental management, including (Benchmark 7) "Creating integrated management system of air quality, reducing by 30% the emission of pollutants into the atmosphere by 2023 and at least 20% of greenhouse gases by 2020 compared to the BAU scenario". For the Waste Sector, by 2020 it is expected to achieve about 15% reduction in GHG emissions compared to the baseline scenario.

GHG concerned: CH_4 and N_2O
Policy Category: regulatory
Status: in force during the period 2014-2023
Included in: With Measures (WM) Scenario

Waste Management Strategy of the Republic of Moldova for 2013-2027, GD no. 248/2013

The Waste Management Strategy of the Republic of Moldova for 2013-2027 provides for the development of integrated solid waste management systems by harmonizing relevant regulations; territorial division of the country into eight waste management regions; increasing the quantity of recycled and recovered waste by 20-30% by 2025; reducing the amount of landfilled biodegradable waste; development of regional waste disposal infrastructure through the construction of seven SWD platforms and two mechanical-biological treatment plants (MBT) in Chisinau and Balti; re-cultivation of at least 50% of non-complying landfills until 2027.

GHG concerned: CH_4 and N_2O
Policy type: regulatory
Status: effective during 2013-2027
Included in: With Additional Measures (WAM) Scenario

CHAPTER 4: PROJECTIONS

4.1. Assumptions and Tools Used

4.1.1. Introduction

The climate change mitigation analysis for the first Biennial Updated Report (BUR1) of the Republic of Moldova (RM) is a continuation of the respective analysis carried out under the Third National Communication of the Republic of Moldova to the UNFCCC (2014).

In the Biennial Updated Report of the Republic of Moldova to the UNFCCC the GHG projections were made for three scenarios: (1) Business-As-Usual (BAU) Scenario; (2) With Measures (WM) Scenario; and (3) With Additional Measures (WAM) Scenario.

The scenarios were generated for the following sectors: energy, industrial processes, agriculture, land use, land-use change and forestry and waste sectors, respectively. The respective scenarios considered the following direct GHGs: CO_2, CH_4, N_2O and F-gases. The GHG emissions projections are provided in aggregate form (as CO_2 equivalent) as well.

Projections considered 2010 year as a reference year for all scenarios, while for WM and WAM scenarios it is also a starting point year (despite the fact that for this year historical GHG emissions already reported to UNFCCC are available). Emissions from fuel combustion in international transport are also provided in this chapter, although they have been not considered in the total national emissions.

4.1.2. Scenarios Considered

As already said above, the GHG projections were developed for the years 2010, 2015, 2020, 2025 and 2030 for the following scenarios:

- Business-As-Usual (BAU) Scenario – defines the level of GHG emissions, given that it considers the mitigation policies approved within 01.01.2000 – 01.01.2010 only. The policies considered for the BAU are described in Chapter 3.
- With Measures (WM) Scenario – reflects the projections made with consideration of appropriate policies and measures implemented or adopted after 01.01.2010.
- With Additional Measures (WAM) Scenario – reflects policies and measures planned to be adopted and implemented starting with 2016 year.

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 to the Convention (Decision 2 / CP.17, Annex III, Chapter 4)[37].

The direct GHG emissions projections were made based on methodological approaches set out in the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories (IPCC, 1997), IPCC 2000 Good Practices Guidance (IPCC, 2000), IPCC 2006 Guidelines for National Greenhouse Gas Inventories (IPCC, 2006), and on the basis of country specific methodologies and emission factors.

To assess GHG emissions / removals in the LULUCF sector the GPG for LULUCF (IPCC, 2003) was used.

Other calculation tools used are: WASP, LEAP (in Energy Sector), IPCC standard calculation and reporting tools and, partially regression analysis method, based on the information available in the *"National Inventory Report: 1990-2013. GHG Sources and Sinks in the Republic of Moldova"*.

4.1.4. Key Parameters and Assumptions

Table 4-1 features key parameters projected for the national economy and Table 4-2 features specific parameters used for projection in some sectors.

[37] UNFCCC biennial update reporting guidelines for Annex I parties not included in the Convention (Decision 2 / CP.17, Annex 3, Chapter 4).

Table 4-1: Key parameters used for scenarios development

Parameters	UM	2000	2005	2010	2015	2020	2025	2030
Real GDP	mil. USD	1289	2988	5813	7948	10621	14130	18,939
Annual GDP growth	%	2.2	18.3	14.2	6.5	6.0	5.9	6.0
Population	thousand	3640	3595	3562	3547	3504	3431	3331
Population growth	%	0.2	0.0 - 0.2	0.0 - 0.2	0.1	0.0 - 0.2	0.4	<0.6
The price of imported natural gas	$ / 1000 m^3		67	273.	445	468	492	517
The price of imported electricity	$ cents / kWh		2.39	5.83	6.90	7.25	7.62	8.01
The price of imported coal	$ / ton		80	100	120	126	133	139

Table 4-2: Parameters used for making projections in relevant sectors

Parameters	UM	2000	2005	2010	2015	2020	2025	2030
Gross added value, including	billion MDL	14.0	31.6	59.9	99.1	147.7	213.3	299.6
Industry	billion MDL	2.6	5.9	27.1	17.0	27.1	39.3	56.2
Agriculture	billion MDL	4.1	6.2	8.7	14.4	18.8	24.3	31.2
Services - total, including	billion MDL	7.7	20.3	43.2	69.8	104.7	153.9	217.9
Wholesale and Retail Trade	billion MDL	2.0	3.9	9.2	16.3	25.9	38.5	55.5
Transport and Communications	billion MDL	1.5	4.6	8.1	11.9	18.3	27.1	39.0
Constructions	billion MDL	0.4	1.3	2.4	4.1	6.9	10.9	16.7
Electricity sub-sector								
Electricity demand under BAU and WM	billion kWh	5.3	6.6	6.0	6.8	8.5	10.5	12.6
Annual growth of electricity demand under BAU and WM	%		4.8	2.1	2.6	4.8	4.3	3.7
Electricity demand under WAM	billion kWh	5.3	6.6	6.0	5.8	6.5	7.2	8.1
Annual growth of electricity demand under WAM	%		4.8	2.1	0.6	2.2	2.3	2.4
Transport sector								
Total mileage for passenger transport	mil. pass.*km	2876	3948	4534	5204	5658	6133	6635
Freight road transport	mil. tons*km	2693	5712	4320	6421	8500	10969	13910
Buildings (residential, commercial or tertiary sector)								
Surface of buildings	mil. m^2	88.0	89.6	92.2	93.7	94.9	95.3	95.5

4.2. Projections of Aggregate Direct GHG Emissions

The impacts of the promoted GHG emissions mitigation policies and measures described in Chapter 3 and underlining the concept of the Business-As-Usual Scenario (BAU), With Measures (WM) Scenario and With Additional Measures (WAM) Scenario were calculated for sectors defined by the IPCC, being expressed in CO_2 equivalent.

The results apply to the entire country, including separatist Transnistrian Region on the left bank of Dniester River are set forth in Table 4-3 and Figure 4-1.

Table 4-3: Projections of aggregate GHG emissions in the RM, Gg CO_2 equivalent

	1990	1995	2000	2005	2010	2015	2020	2025	2030
BAU									
Energy	34521	11722	6673	8468	8868	8749	9378	10532	12084
Industrial Processes	1842	478	270	560	559	745	990	1255	1551
Solvents and other products use	126	35	29	67	61	61	61	61	61
Agriculture	5064	3284	2290	2359	2098	2574	2834	3140	3520
LULUCF	-5887	-1029	1392	375	38	33	366	1796	-2659
Waste	1865	1904	1469	1298	1571	1568	1705	1861	1990
Total (with LULUCF)	**37532**	**16395**	**9338**	**12378**	**13196**	**13664**	**14601**	**15054**	**16548**
Total (without LULUCF)	**43419**	**17424**	**10731**	**12753**	**13158**	**13697**	**14968**	**16850**	**19207**
WM									
Energy	34521	11722	6673	8468	8868	8295	8796	9500	10469
Industrial Processes	1842	478	270	560	559	669	782	894	1005
Solvents and other products use	126	35	29	67	61	61	61	61	61
Agriculture	5064	3284	2290	2359	2098	2367	2613	2876	3189
LULUCF	-5887	-1029	1392	375	38	117	712	-2537	-3653
Waste	1865	1904	1469	1298	1571	1588	1437	1015	1153
Total (with LULUCF)	**37532**	**16395**	**9338**	**12378**	**13196**	**12862**	**12978**	**11809**	**12225**
Total (without LULUCF)	**43419**	**17424**	**10731**	**12753**	**13158**	**12979**	**13690**	**14346**	**15878**
WAM									
Energy	34,521	11722	6673	8468	8868	7937	7461	7584	8036
Industrial Processes	1842	478	270	560	559	636	697	757	815
Solvents and other products use	126	35	29	67	61	61	61	61	61
Agriculture	5064	3284	2290	2359	2098	2286	2534	2776	3003
LULUCF	-5887	-1029	1392	375	38	230	-1088	-3177	-4491
Waste	1865	1904	1469	1298	1571	1588	1383	916	988
Total (with LULUCF)	**37532**	**16395**	**9338**	**12378**	**13196**	**12277**	**11048**	**8917**	**8411**
Total (without LULUCF)	**43419**	**17424**	**10731**	**12753**	**13158**	**12507**	**12136**	**12095**	**12902**

As shown in Figure 4-1, the GHG emissions in all scenarios are consistent with the commitments made by the Republic of Moldova under the Copenhagen Accord.

The level of net emissions in 2020 compared to 1990 is within 29% (WAM), 35% (WM) and 39% (BAU) versus the 75% prescribed in the document (see Copenhagen Accord Target in Figure 4-1).

The respective commitment remains relevant for 2030 as well, the year when the emissions level remains relatively low compared to the 1990 level, featuring 22% (WAM), 33% (WM) and 44% (BAU).

The most significant contribution towards achieving these objectives comes from the Energy and LULUCF sectors, as shown in Figure 4-2 which reflects the GHG emissions in the considered sectors.

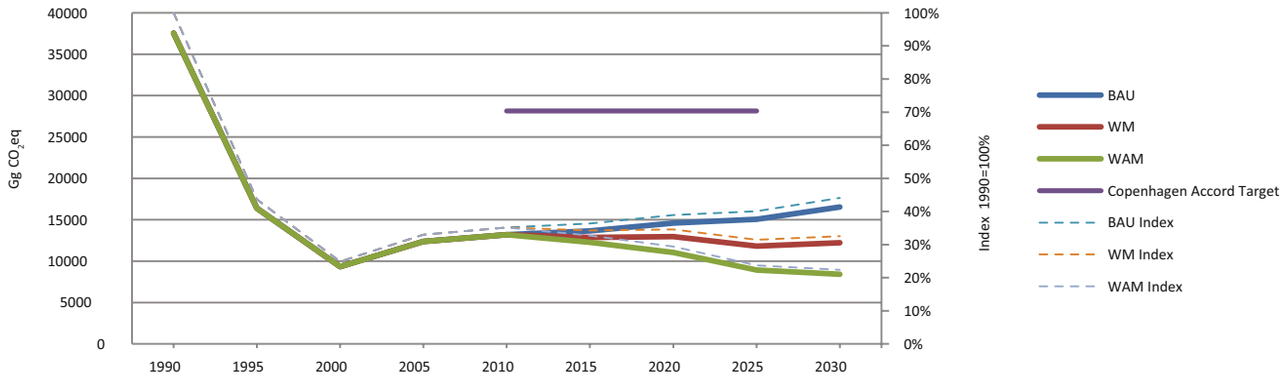
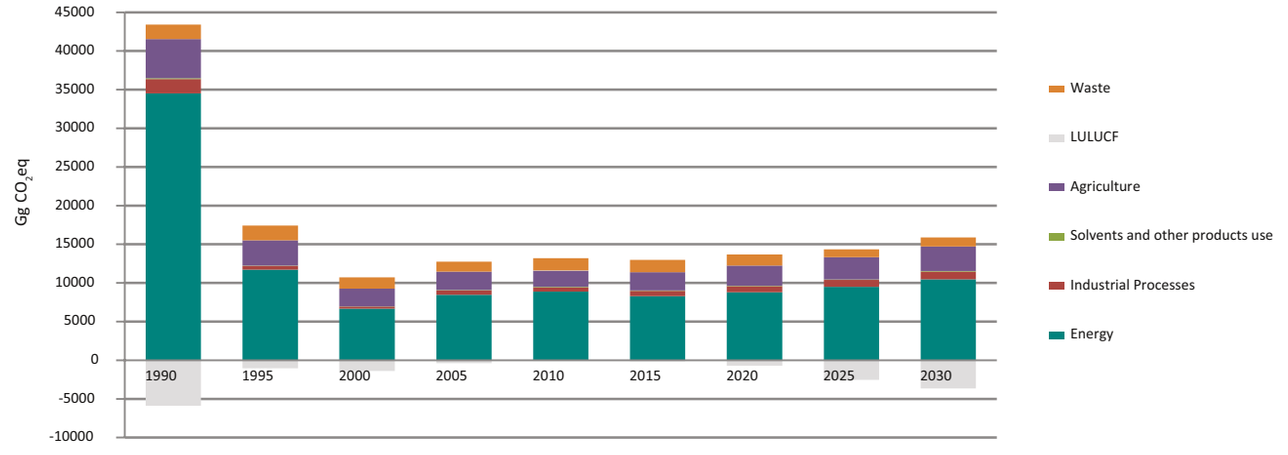
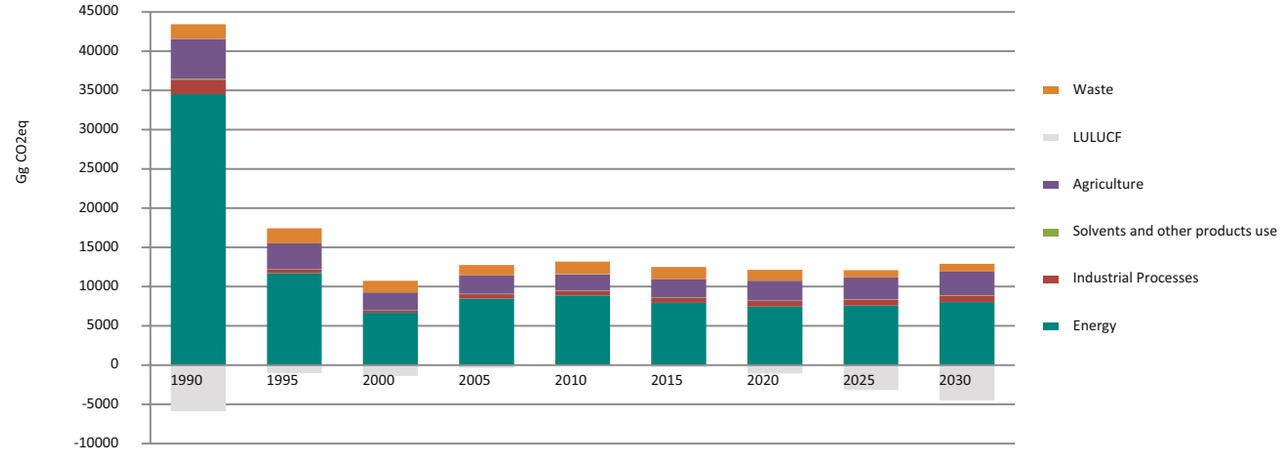


Figure 4-1: Projections of total net GHG emissions under considered scenarios



a) WM



b) WAM

Figure 4-2: Sectors share in total GHG emissions according to WM (a) and WAM (b) scenarios

Due to promoting energy efficiency and including renewable energy sources into the energy balance, the GHG emissions from the energy sector tend to slightly increase in WM or even decrease under the WAM, while the real GDP of the country is expected to increase by 83% by 2020 and by 226% in 2030, as compared with 2010. On the other hand, expansion of forest areas and implementation of sustainable agriculture practices in LULUCF sector will entail a gradual increase of the amount of removed GHG emissions. Table 4-4 and Figure 4-3 come to support these finding, featuring the GHG emission reductions anticipated for 2020 and 2030 years, compared to the base year (1990), according to WM and WAM scenarios.

Table 4-4: Expected GHG emission reductions by 2020 and 2030 as compared to 1990, according to WM and WAM, Gg CO_2 equivalent

	WM-2020	WM-2030	WAM-2020	WAM-2030
Energy	-25725	-24052	-27060	-26485
Industrial Processes	1060	-837	-1145	-1027
Solvents and Other Products Use	65	65	65	65
Agriculture	-2451	1874	-2530	-2061
LULUCF	5175	2233	4798	1396
Waste	428	712	482	878
Total (with LULUCF)	**-29729**	**-27541**	**-31283**	**-30517**
Total (without LULUCF)	**-24554**	**-25308**	**-26485**	**-29121**

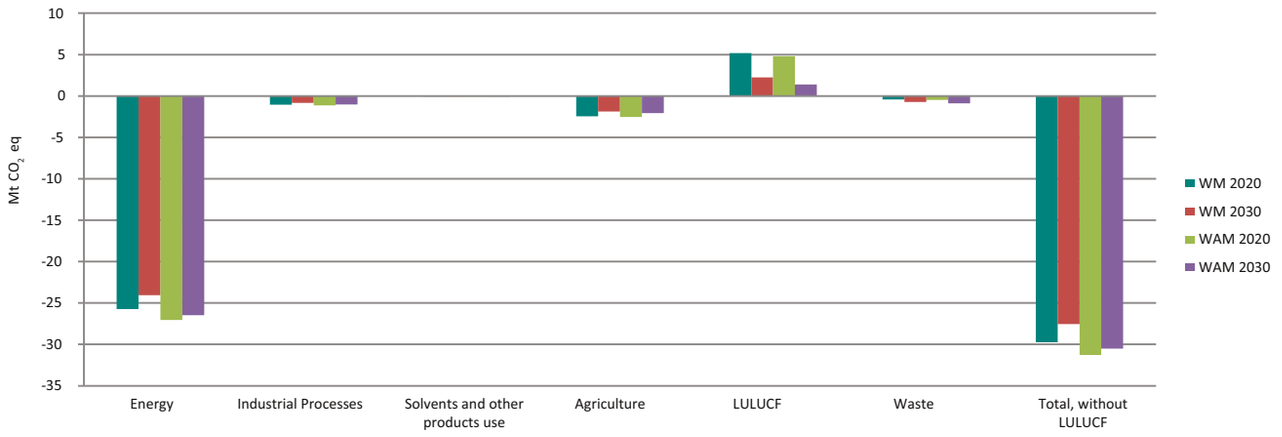


Figure 4-3: Expected GHG emission reductions by 2020 and 2030, as compared with 1990, according to WM and WAM, in Mt CO_2 equivalent

Figure 4-4 reveals the change in individual GHG emissions, according to WM and WAM, as compared to 1990.

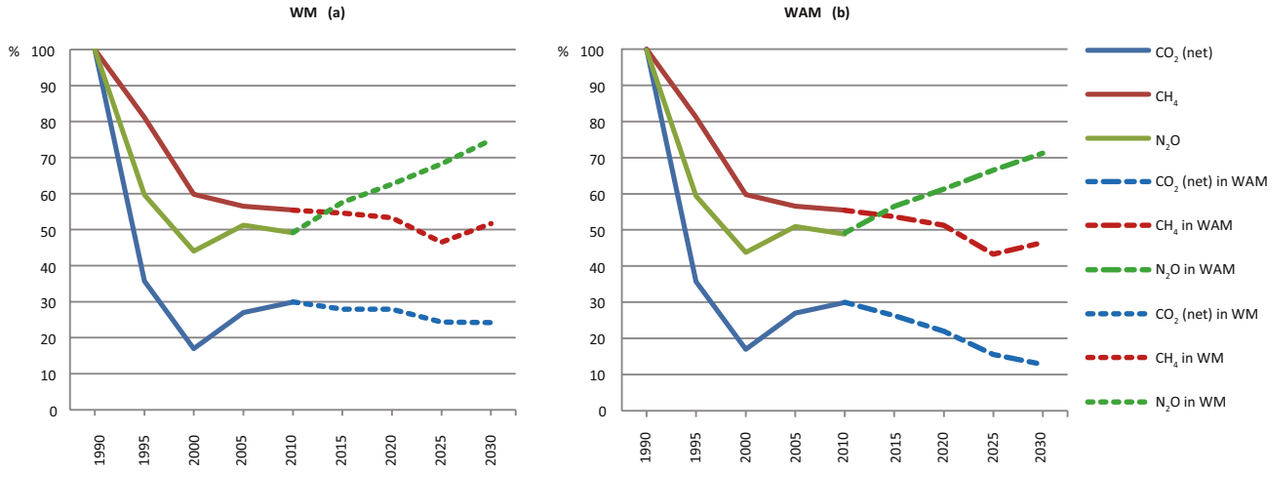


Figure 4-4: GHG emissions according to WM (a) and WAM (b), by GHGs as compared to 1990, %

The absolute values of GHG output for years under review are shown in Table 4-5. As with reference to F-gases, their share in the total national emissions are not expected exceeding 1.5% of the total during the period under review (until 2030) for all examined scenarios.

As revealed in Figure 4-4, the amount of CO_2 and CH_4 emissions tend to decrease, while the N_2O emissions tend to increase throughout the period under review. The phenomenon can be explained by the gradual increase of livestock and poultry heads numbers by 2030, higher rates of fertilizers application under the agriculture soils and loss of carbon through the process of mineralization due to changes in agricultural land use and soil management practices. It should be noted also that the share of N_2O in total direct GHG emissions during 2020-2030 will be around 15% under the WM, and circa 16-18% under the WAM scenarios.

Table 4-5: Projections of direct GHG emissions in the Republic of Moldova within the considered scenarios for the period up to 2030, Gg CO_2 equivalent

	1990	1995	2000	2005	2010	2015	2020	2025	2030
BAU									
Total emissions CO_2 (without LULUCF)	35334	11553	6388	8310	8774	8833	9642	10996	12776
Total emissions CH_4 (without LULUCF)	4872	3953	2914	2756	2701	2770	3038	3331	3636
Total emissions N_2O (without LULUCF)	3213	1916	1415	1648	1580	1957	2105	2295	2523
Total emissions of F-gases	NO, NE	2	13	39	103	138	183	228	273
Total national emissions (without LULUCF)	**43419**	**17424**	**10731**	**12753**	**13158**	**13697**	**14968**	**16850**	**19207**
WM									
Total emissions CO_2 (without LULUCF)	35334	11553	6388	8310	8774	8337	8930	9717	10767
Total emissions CH_4 (without LULUCF)	4872	3953	2914	2756	2701	2662	2599	2268	2518
Total emissions N_2O (without LULUCF)	3213	1916	1415	1648	1580	1852	2013	2194	2407
Total emissions of F-gases	NO, NE	2	13	39	103	129	148	167	186
Total national emissions (without LULUCF)	**43419**	**17424**	**10731**	**12753**	**13158**	**12979**	**13690**	**14346**	**15878**
WAM									
Total emissions CO_2 (without LULUCF)	35334	11553	6388	8310	8774	7968	7566	7754	8261
Total emissions CH_4 (without LULUCF)	4872	3953	2914	2756	2701	2615	2501	2111	2268
Total emissions N_2O (without LULUCF)	3213	1916	1415	1648	1580	1816	1970	2139	2290
Total emissions of F-gases	NO, NE	2	13	39	103	107	99	91	83
Total national emissions (without LULUCF)	**43419**	**17424**	**10731**	**12753**	**13158**	**12507**	**12136**	**12095**	**12902**

4.3. Projections of Direct GHG Emissions Trends by Sector

4.3.1. Energy Sector

Energy Sector generates GHG emissions by burning and transformation of fossil fuels. Methane fugitive emissions are generated during extraction, transportation and processing of natural gas.

WASP and LEAP calculation tools were used for the energy sector development scenarios, and GHG emissions from the Energy Sector were calculated with application of emission factors mentioned in the "*National Inventory Report: 1990-2013. GHG Sources and Sinks in the Republic of Moldova*". IPCC Standard calculation and reporting tool was used for other sectors.

BAU, WM and WAM scenarios include measures set out in Chapter 3.3.1. Additionally, the WAM scenario includes measures comprised in draft documents and studies, including:

1. Draft Low Emission Development Strategy of the RM until 2030;
2. Draft Law on Renewable Energy, which will replace the actual Law in force;
3. World Bank Study "Moldova: Sector Study on Electricity Market Options. March 25, 2015", commissioned by the Government of the Republic of Moldova.

GHG emissions mitigation measures primarily include energy efficiency, advanced technologies for electricity and heat production, as well as generation of energy from renewable energy sources.

Projections of CO_2 emissions

Within the Energy Sector, the share of CO_2 in total GHG emissions was 93.2% (2010). The results of CO_2 calculations for the sector are revealed in Table 4-6 and Figure 4-5.

As noticeable, in BAU and WM, CO_2 emissions tendency show an increasing trend over the years due to GDP growth or energy demand. In WAM, even if there has been a slight increase in CO_2 emissions after 2020, their level is below the 2010 levels. The main reason for such evolution is considering an energy demand projection lower than in BAU and WM, as determined by latest studies in the field.

Table 4-6: Projections of CO_2 emissions from the Energy Sector until 2030, Gg

	2010	2015	2020	2025	2030
BAU					
1. Energy	**8256.1**	**8164.1**	**8773.6**	**9907.0**	**11436.3**
1A Fuel Combustion	**8254.2**	**8162.2**	**8771.8**	**9905.1**	**11434.5**
1A1. Energy	3633.0	2830.9	3200.1	3904.2	4776.3
1A2. Manufacturing industries and construction	539.3	1007.2	1035.5	1061.1	1063.9
1A3. Transport	2037.8	2199.0	2341.4	2762.8	3235.8
1A4. Other sectors	1987.0	2067.7	2137.3	2119.6	2301.0
1A5. Other works and needs in energy	57.2	57.4	57.4	57.4	57.4
1B Fugitive emissions	**1.8**	**1.8**	**1.8**	**1.8**	**1.8**
1B2. Oil and natural gas	1.8	1.8	1.8	1.8	1.8
WM					
1. Energy	**8256.1**	**7735.2**	**8235.2**	**8929.1**	**9886.5**
1A Fuel Combustion	**8254.2**	**7733.3**	**8233.4**	**8927.3**	**9884.6**
1A1. Energy	3633.1	2856.8	3690.9	4150.8	4573.1
1A2. Manufacturing industries and construction	539.3	927.7	827.7	850.7	853.3
1A3. Transport	2037.8	2117.2	1945.7	2272.5	2662.5
1A4. Other sectors	1987.0	1774.4	1711.8	1596.1	1738.5
1A5. Other works and needs in energy	57.2	57.2	57.2	57.2	57.2
1B Fugitive emissions	**1.8**	**1.8**	**1.8**	**1.8**	**1.8**
1B2. Oil and natural gas	1.8	1.8	1.8	1.8	1.8
WAM					
1. Energy	**8256.1**	**7378.7**	**6906.9**	**7026.6**	**7468.1**
1A Fuel Combustion	**8254.2**	**7376.9**	**6905.1**	**7024.8**	**7466.3**
1A1. Energy	3633.1	2720.2	2757.3	2796.5	2829.5
1A2. Manufacturing industries and construction	539.3	920.1	778.4	774.8	750.9
1A3. Transport	2037.8	1929.6	1688.1	1961.6	2300.1
1A4. Other sectors	1987.0	1749.8	1624.1	1434.6	1528.6
1A5. Other works and needs in energy	57.2	57.2	57.2	57.2	57.2
1B Fugitive emissions	1.8	1.8	1.8	1.8	1.8
1B2. Oil and gas	1.8	1.8	1.8	1.8	1.8

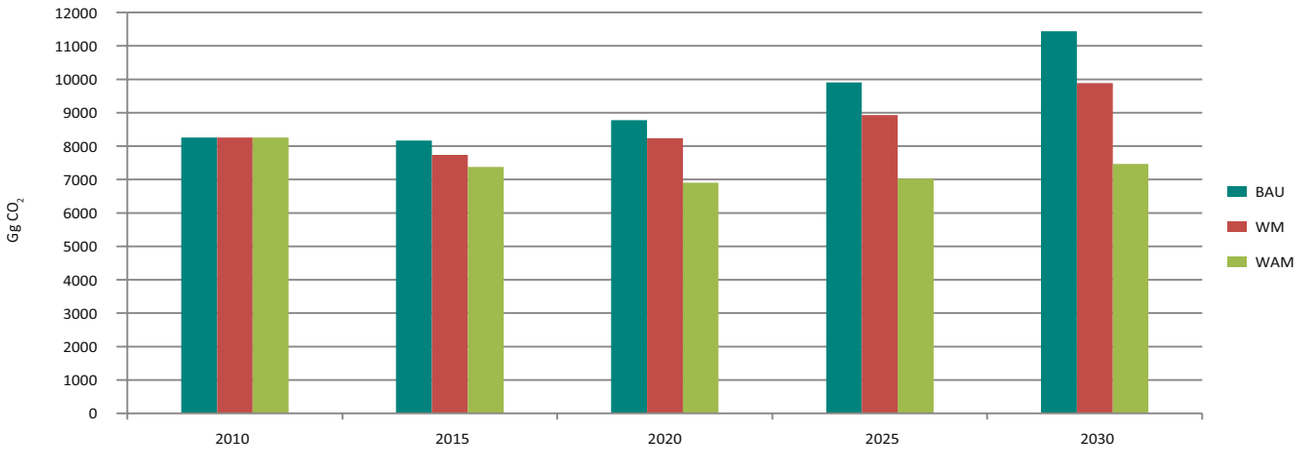


Figure 4-5: Projections of CO_2 emissions from the Energy Sector until 2030, Gg

Projections of CH_4 emissions

In the Energy Sector the share of CH_4 emissions in the total GHG emissions at the sector level in 2010 was 6.3%, of which 87% were fugitive emissions from oil and gas operations. The absolute level of fugitive emissions was considered constant throughout the period under review in all considered scenarios, assuming that the likely increase of CH_4 emissions resulting from increased demand will be offset by the emissions mitigation measures. Projections of CH_4 emissions from combustion and transformation of fossil fuels were prepared based on assumptions of fossil fuel consumption and methods available in the 2006 IPCC Guidelines, as well as on the emission factors available in the *"National Inventory Report: 1990-2013. GHG Sources and Sinks in the Republic of Moldova"*. The calculation results are revealed in Table 4-7.

Table 4-7: Projections of CH_4 emissions from the Energy Sector until 2030, Gg CO_2 equivalent

	2010	2015	2020	2025	2030
BAU					
1. Energy	**559.5**	**531.3**	**540.3**	**549.4**	**559.1**
1A Fuel Combustion	**72.6**	**44.4**	**53.4**	**62.5**	**72.1**
1A1. Energy	1.4	1.1	1.2	1.5	1.8
1A2. Manufacturing industries and construction	0.5	0.7	0.7	0.7	0.7
1A3. Transport	9.7	12.1	13.9	15.8	17.9
1A4. Other sectors	61.0	30.6	37.6	44.5	51.8
1A5. Other works and needs in energy	0.0	0.0	0.0	0.0	0.0
1B Fugitive emissions	**486.9**	**486.9**	**486.9**	**486.9**	**486.9**
1B2. Oil and natural gas	486.9	486.9	486.9	486.9	486.9
WM					
1. Energy	**559.5**	**513.1**	**512.8**	**514.1**	**516.0**
1A Fuel Combustion	**72.6**	**26.1**	**25.8**	**27.1**	**29.1**
1A1. Energy	1.4	1.1	1.4	1.6	1.7
1A2. Manufacturing industries and construction	0.5	0.6	0.6	0.6	0.6
1A3. Transport	9.7	10.6	10.2	11.5	13.1
1A4. Other sectors	61.0	13.8	13.6	13.4	13.7
1A5. Other works and needs in energy	0.0	0.0	0.0	0.0	0.0
1B Fugitive emissions	**486.9**	**486.9**	**486.9**	**486.9**	**486.9**
1B2. Oil and natural gas	486.9	486.9	486.9	486.9	486.9
WAM					
1. Energy	**559.5**	**512.0**	**507.5**	**503.8**	**504.6**
1A Fuel Combustion	**72.6**	**25.1**	**20.5**	**16.9**	**17.6**
1A1. Energy	1.4	1.0	1.0	1.0	1.1
1A2. Manufacturing industries and construction	0.5	0.6	0.5	0.5	0.5
1A3. Transport	9.7	10.6	10.1	11.4	12.9
1A4. Other sectors	61.0	12.9	8.9	3.9	3.2
1A5. Other works and needs in energy	0.0	0.0	0.0	0.0	0.0
1B Fugitive emissions	**486.9**	**486.9**	**486.9**	**486.9**	**486.9**
1B2. Oil and natural gas	486.9	486.9	486.9	486.9	486.9

Projections of N_2O emissions

The share of N_2O emission in the total GHG emissions of the Energy sector is modest, accounting for only 0.6% of the total, of which approximately 71.5% refer to the transport sector, caused by burning fuel in motor vehicles. As in the case of determining CH_4 emissions; N_2O emissions from burning and transformation of fossil fuels were calculated based on assumed consumption of fossil fuels, using methods available in 2006 IPCC Guidelines. The calculation results are revealed in Table 4-8.

Table 4.8: Projections of N_2O emissions from the Energy Sector until 2030, Gg CO_2 equivalent

	2010	2015	2020	2025	2030
BAU					
1. Energy	**52.7**	**53.2**	**63.7**	**75.6**	**89.1**
1A Fuel Combustion	**52.7**	**53.2**	**63.7**	**75.6**	**89.1**
1A1. Energy	2.1	1.7	1.9	2.3	2.8.
1A2. Manufacturing industries and construction	1.0	1.3	1.3	1.3	1.3
1A3. Transport	37.7	47.2	57.0	68.0	80.5
1A4. Other sectors	11.7	2.9	3.4	3.9	4.5
WM					
1. Energy	**52.7**	**46.8**	**48.5**	**56.7**	**66.6**
1A Fuel Combustion	**52.7**	**46.8**	**48.5**	**56.7**	**66.6**
1A1. Energy	2.1	1.7	2.1	2.4	2.6
1A2. Manufacturing industries and construction	1.0	1.2	1.2	1.2	1.2
1A3. Transport	37.7	42.2	43.5	51.5	61.1
1A4. Other sectors	11.7	1.7	1.6	1.6	1.7
WAM					
1. Energy	**52.7**	**46.6**	**46.6**	**53.9**	**63.3**
1A Fuel Combustion	**52.7**	**46.6**	**46.6**	**53.9**	**63.3**
1A1. Energy	2.1	1.6	1.6	1.6	1.6
1A2. Manufacturing industries and construction	1.0	1.2	0.9	1.0	1.0
1A3. Transport	37.7	42.1	42.7	50.5	59.9
1A4. Other sectors	11.7	1.6	1.3	0.9	0.9

Projections of aggregate total GHG emissions

Table 4-9 and Figure 4-6 feature the projections of aggregate GHG emissions in the Energy Sector, including Transport, where emissions can be compared with emissions recorded in the reference year (1990).

Table 4.9: Projections of aggregate GHG emissions for the Energy Sector, Gg CO_2 equivalent

	1990	2010	2015	2020	2025	2030
BAU						
1. Energy	**34521.3**	**8868.0**	**8749.0**	**9378.0**	**10532.0**	**12084.0**
1A Fuel Combustion	**33838.4**	**8379.5**	**8259.8**	**8888.9**	**10043.2**	**11595.7**
1A1. Energy	19393.3	3636.5	2833.7	3203.3	3908.0	4781.0
1A2. Manufacturing industries and construction	2195.9	540.7	1009.1	1037.4	1063.1	1065.9
1A3. Transport	4056.6	2085.1	2258.2	2412.3	2846.6	3334.2
1A4. Other sectors	8037.8	2059.7	2101.3	2178.4	2168.0	2357.3
1A5. Other works and needs in energy	154.8	57.4	57.4	57.4	57.4	57.4
1B Fugitive emissions	**682.9**	**488.8**	**488.8**	**488.8**	**488.8**	**488.8**
1B2. Oil and natural gas	682.9	488.8	488.8	488.8	488.8	488.8
WM						
1. Energy	**34521.3**	**8868.0**	**8295.0**	**8796.0**	**9500.0**	**10469.0**
1A Fuels Combustion	**33838.4**	**8379.5**	**7806.3**	**8307.7**	**9011.1**	**9980.3**
1A1. Energy	19393.3	3636.5	2859.5	3694.4	4154.8	4577.4
1A2. Manufacturing industries and construction	2195.9	540.7	929.5	829.4	852.5	855.2
1A3. Transport	4056.6	2085.1	2170.0	1999.5	2335.6	2736.6
1A4. Other sectors	8037.8	2059.7	1790.0	1727.1	1611.0	1753.8
1A5. Other works and needs in energy	154.8	57.4	57.2	57.2	57.2	57.2
1B Fugitive emissions	**682.9**	**488.8**	**488.8**	**488.8**	**488.8**	**488.8**
1B2. Oil and natural gas	682.9	488.8	488.8	488.8	488.8	488.8
WAM						
1. Energy	**34521.3**	**8868.0**	**7937.0**	**7461.0**	**7584.0**	**8036.0**
1A Fuels Combustion	**33838.4**	**8379.5**	**7448.5**	**6972.2**	**7095.6**	**7547.3**
1A1. Energy	19393.3	3636.5	2722.8	2760.0	2799.2	2832.2
1A2. Manufacturing industries and construction	2195.9	540.7	921.9	779.9	776.3	752.4
1A3. Transport	4056.6	2085.1	1982.3	1740.9	2023.4	2372.8
1A4. Other sectors	8037.8	2059.7	1764.3	1634.2	1439.4	1532.6
1A5. Other works and needs in energy	154.8	57.4	57.2	57.2	57.2	57.2
1B Fugitive emissions	**682.9**	**488.8**	**488.8**	**488.8**	**488.8**	**488.8**
1B2. Oil and natural gas	682.9	488.8	488.8	488.8	488.8	488.8

Analysis of the respective data allow to ascertain that the Energy Sector, which has the most important contribution to GHG emissions in the Republic of Moldova (67% in 2010) will substantially contribute to achieving the country's commitments to reduce GHG emissions. For example, in 2020 the GHG emissions under the BAU, WM and WAM as compared to 1990, will be as much as 27.6%, 25.5% and 21.6% respectively, while in 2030, 35.0%, 30.3% and 23.3%, accordingly.

Figure 4-6: Projections of aggregate GHG emissions for the Energy Sector, Gg CO_2 equivalent

4.3.2. Industrial Processes Sector

In 2010, the Industrial Processes Sector contributed with circa 4.3% of the total GHG emissions, of which CO_2 emissions accounted for 81.6%, while F-gases, respectively for 22.8%. The GHG emissions mitigation measures undertaken in the sector are reflected in Chapter 3.3.2 and under the WAM the country's GDP growth optimistic scenario was considered.

CO_2 emissions projections

In the Industrial Processes Sector CO_2 emissions are generated only in the categories 2A "Mineral products" and 2C "Metal production"; category 2A contributing 99% of total emissions, of them 90% are generated from cement production.

For BAU scenario, it was assumed that the rate of increase in the amount of clinker and of the emission factor will be similar to those of 2000-2005 periods. In assuming this period, a high correlation between the amount of cement produced and projected industry GDP by 2030 was found. Under the WM scenario, the projections were made on the basis of information available in the Industry Development Strategy of the Republic of Moldova for the period until 2015; it has been assumed that clinker production will fall by 5% by 2030. At the same time it has been assumed that cement production will correlate to the one considered under the BAU scenario, with a slight increase of 7%, which is in line with the macroeconomic development forecast. There are two cement plants in the country with a capacity of about 1 million tons/year each, and extension is not expected for neither in the nearest future. Under the WAM scenario a correlation with the optimistic macroeconomic indices was attempted, taking into account the assumption that cement plants in the Republic of Moldova intend to change the product range so as to lower the amount of clinker used up to 40% by 2030. The CO_2 calculation results are shown in Table 4-10.

Table 4-10: Projections of CO_2 emissions in Industrial Processes Sector until 2030, Gg

	2010	2015	2020	2025	2030
BAU					
2. Industrial Processes	**456.4**	**607.7**	**807.1**	**1027.7**	**1278.0**
A. Mineral Products	452.4	587.8	782.8	999.1	1245.1
C. Metal Production	4.0	19.9	24.2	28.6	32.9
WM					
2. Industrial Processes	**456.4**	**540.1**	**633.8**	**726.6**	**818.8**
A. Mineral Products	452.4	521.8	611.3	700.7	790.1
C. Metal Production	4.0	18.3	22.6	26.0	28.7
WAM					
2. Industrial processes	**456.4**	**528.5**	**597.8**	**666.4**	**732.1**
A. Mineral Products	452.4	510.9	576.2	641.6	706.9
C. Metal Production	4.0	17.6	21.5	24.8	25.2

Projections of F- gas emissions

In the RM the most important sources of HFCs emissions are the refrigeration equipment (refrigerators, freezers) and air conditioners (stationary and mobile air conditioners). The country does not produce HFCs, PFCs and SF_6. Measures to mitigate GHG emissions from category 2F "Consumption of halocarbons and SF_6" are mainly geared to the gradual substitution of refrigerants with less polluting substitutes. The calculation results are shown in Table 4-11.

Table 4-11: Projections of F-gas emissions in the Industrial Processes Sector until 2030, Gg CO_2 equivalent

	2010	2015	2020	2025	2030
BAU					
2F consumption of halocarbons and sulphur hexafluoride	103.0	137.6	182.7	227.8	272.9
WM					
2F consumption of halocarbons and sulphur hexafluoride	103.0	128.9	147.9	167.0	186.1
WAM					
2F consumption of halocarbons and sulphur hexafluoride	103.0	107.2	99.0	90.8	82.6

Projections of aggregate GHG emissions

Table 4-12 and Figure 4-7 feature projections of aggregate GHG emissions in the Industrial Processes Sector which may be investigated as compared to GHG emissions from this sector recorded in 1990.

Table 4-12: Projections of aggregate GHG emissions for the Industrial Processes Sector until 2030, Gg CO_2 equivalent

	1990	2010	2015	2020	2025	2030
BAU						
2. Industrial processes	**1842.0**	**559.4**	**745.3**	**989.8**	**1255.5**	**1550.9**
A. Mineral Products	1830.3	452.4	587.8	782.8	999.1	1245.1
C. Metal Production	11.7	4.0	19.9	24.2	28.6	32.9
F. Consumption of halocarbons and SF_6	NO, NE	103.0	137.6	182.7	227.8	272.9
WM						
2. Industrial processes	1842.0	559.4	669.0	781.8	893.7	1004.9
A. Mineral Products	1830.3	452.4	521.8	611.3	700.7	790.1
C. Metal Production	11.7	4.0	18.3	22.6	26.0	28.7
F. Consumption of halocarbons and SF_6	NO, NE	103.0	128.9	147.9	167.0	186.1

WAM						
2. Industrial processes	**1842.0**	**559.4**	**635.7**	**696.8**	**757.1**	**814.6**
A. Mineral Products	1830.3	452.4	510.9	576.2	641.6	706.9
C. Metal Production	11.7	4.0	17.6	21.5	24.8	25.2
F. Consumption of halocarbons and SF_6	NO, NE	103.0	107.2	99.0	90.8	82.6

Unlike the Energy Sector, the level of GHG emissions related to Industrial Processes Sector in 2020 is relatively higher and accounts for 54%, 42% and 38%, for BAU, WM and WAM scenarios, respectively.

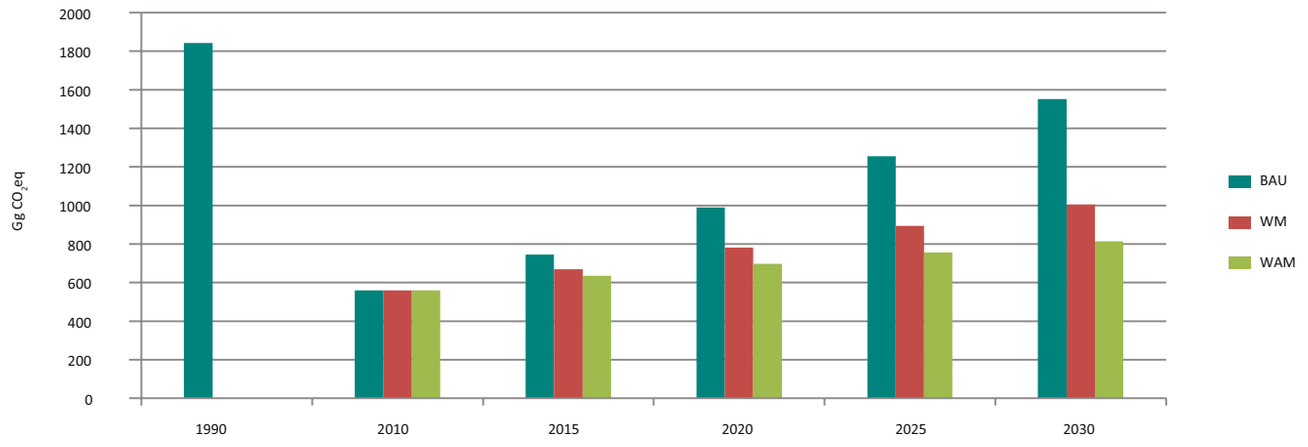


Figure 4-7: Projections of aggregate GHG emissions from Industrial Processes Sector until 2030, Gg CO_2 equivalent

4.3.3. Solvents and Other Products Use Sector

In the RM, the Solvents and Other Products Use Sector is a modest source and it includes emissions of non-methane volatile organic compounds (NMVOCs), while it is also considered a source of indirect CO_2 emissions (as most solvents are derived from fossil fuels); also N_2O emissions from the use of respective gas for anesthesia. In 2010, this sector accounted for only about 0.4% of the total national GHG emissions (0.2% in 1990). Within the projections of GHG emissions in this sector, their level is kept constant and equal to that of 2010 (about 61 Gg CO_2 eq., throughout the period under review).

4.3.4. Agriculture Sector

Within the Agriculture Sector, CH_4 emissions from the livestock sector are monitored, in particular emissions from the source categories 4A "Enteric Fermentation" and 4B "Manure Management", as well as N_2O emissions from the source categories 4B "Manure Management" and 4D "Agricultural Soils". Policies used for development of mitigation scenarios in the agriculture sector (BAU, WM and WAM scenarios) are the same as described in Chapter 3.3.3.

In the livestock sector (enteric fermentation and manure management) mitigation of GHG emissions is based both on improving the structure of livestock and poultry, as well as gradual increase of the share of large farms similar to the ones that existed in the earlier 1990's, where liquid manure management systems allowed for reducing CH_4 emissions at a more significant rate than the currently used manure management practices (mainly solid storage and pasture range/paddock) applied at the small farms prevailing in the country. At the same time, the share of solid storage manure management systems, less responsible for generating CH_4 emissions, will increase. Table 4-13 features livestock and poultry heads number projections until 2030.

Regarding the mitigation measures for category 4D "Agricultural Soils", the aim is to reduce mineralization of nitrogen from soils, namely to promote sustainable agriculture, including the use of green manure in parallel with the implementation of the conservation agriculture techniques, based on "No-till" and "Mini-till" technologies, increasing the share of organic fertilizers in the soil, leaving the main crops residues in the field to form mulch, etc. As it is well known, carbon of organic origin and nitrogen are closely related to the content of organic matter (humus) in the soil. Carbon loss through mineralization process due to changes in agricultural land use and soil management practices is accompanied by simultaneous biochemical breakdown of nitrogen in humus. In case of soil carbon loss, the mineralized nitrogen is considered an additional source of nitrogen available to turn into N_2O emissions.

Table 4-13: Projections of livestock and poultry heads numbers during 1990-2030, thousand heads

	1990	1995	2000	2005	2010	2011	2012	2015	2020	2025	2030
	BAU										
Total cattle	1061	729	445	340	236	224	211	300	360	420	500
Dairy cows	395	381	299	233	166	156	145	200	230	260	300
Other cattle	665	349	147	107	70	68	65	100	130	160	200
Sheep	1245	1328	851	833	801	722	706	780	840	900	960
Goat	37	95	111	122	119	124	130	135	140	145	150
Horses	47	62	76	72	54	51	47	50	60	70	80
Asses	2	3	4	4	3	3	2	3	3	2	2
Swine	1850	1015	493	493	512	472	438	480	520	560	600
Rabbit	283	209	161	279	277	277	267	300	305	310	315
Poultry	24625	13745	13625	22774	23811	34530	39937	25150	25800	26450	27100

	1990	1995	2000	2005	2010	2011	2012	2015	2020	2025	2030
	WM										
Total cattle	1061	729	445	340	236	224	211	240	290	340	395
Dairy cows	395	381	299	233	166	156	145	160	185	205	235
Other cattle	665	349	147	107	70	68	65	80	105	135	160
Sheep	1245	1328	851	833	801	722	706	740	770	800	830
Goat	37	95	111	122	119	124	130	130	125	120	115
Horses	47	62	76	72	54	51	47	47	46	45	44
Asses	2	3	4	4	3	3	2	3	2	2	2
Swine	1850	1015	493	493	512	472	438	460	485	525	550
Rabbit	283	209	161	279	277	277	267	297	302	307	312
Poultry	24625	13745	13625	22774	23811	34530	39937	24500	25150	25800	26450
	WAM										
Total cattle	1061	729	445	340	236	224	211	220	260.	300	340
Dairy cows	395	381	299	233	166	156	145	150	170	190	210
Other cattle	665	349	147	107	70	68	65	70	90	110	130
Sheep	1245	1328	851	833	801	722	706	720	740	760	780
Goat	37	95	111	122	119	124	130	125	120	115	110
Horses	47	62	76	72	54	51	47	47	46	45	44
Asses	2	3	4	4	3	3	2	2	2	2	2
Swine	1850	1015	493	493	512	472	438	450	470	490	520
Rabbit	283	209	161	279	277	277	267	295	300	305	310
Poultry	24625	13745	13625	22774	23811	34530	39937	23850	24500	25150	25800

For BAU scenario, projections were made based on the information available in the Agriculture and Food Sector Strategy for 2006-2015, in particular the draft version of the document which was run through public consultations and includes a set of more detailed data, compared to the approved version of the Strategy. In BAU scenario changes were taken into consideration in the livestock sector over the period since the adoption of the policy and up to date, especially the on-going trend of reducing the number of livestock. Thus, it was considered appropriate to transfer to 2030 the targets originally envisaged in the policy document for 2015.

For WM scenario, the projections were made based on information available in the National Strategy for Agricultural and Rural Development for the years 2014-2020, which envisages a lower growth rate of livestock numbers, the focus being on increasing livestock productivity. In addition, the projection is based also on the Waste Management Strategy of the Republic of Moldova for 2013-2027 and Environmental Strategy of the Republic of Moldova for 2014-2023.

For WAM scenario, projections were made based on the information available in the draft version of the Low Emission Development Strategy of the Republic of Moldova until 2030 that places special emphasis on implementing the most effective mitigation measures at sector level. The WM and WAM scenarios anticipate reverting to manure management practices specifically used in the 1990's not earlier than by 2030.

With reference to the category 4A "Enteric Fermentation", the higher livestock productivity growth rate characteristic for WM and WAM scenario will contribute to increase of the value of country-specific emission factors, calculated according to the Tier 2 methodology (IPCC, 2006) used to assess CH_4 emissions from the respective category. According to WAM scenario, it is anticipated that in 2030 productivity level in the livestock sector will be similar to the current productivity in Western Europe countries, respectively emission factors will have similar values as emission factors used by default for assessing CH_4 emissions from the category 4A "Enteric Fermentation" specific for the Western European countries (109 kg of CH_4/ capita / year - for dairy cows; 57 kg of CH_4/ capita / year - other cattle; 8 kg of CH_4/ capita / year - for sheep).

In the case of the source category 4B "Manure Management", it is expected that by 2030, according to the WM and WAM scenarios, the emission factors will have similar values as emission factors used by default for assessment of methane emissions from the respective category, specific for the Eastern European countries (11 kg of CH_4/ capita / year - for dairy cows; 4 kg of CH_4/ capita / year - other cattle; 3 kg of CH_4/ capita / year - for pigs), respectively close to values achieved by the country in the 1990's.

For the source category 4D "Agricultural Soils" the projections for the BAU scenario were made based on the information available in the Program of new lands revaluation and increasing soil fertility (Part II Increasing soil fertility). For the WM scenario the projections were made on the basis of the "Programme for soil conservation and improvement of soil fertility 2011-2020", the National Development Strategy "Moldova 2020" and the National Strategy for Agricultural and Rural Development for the 2014-2020, all focusing especially on optimizing the application of mineral and organic fertilizers, incorporation of crop residues into the soil, use of green manure and wider introduction of conservation agriculture system.

Measures envisaged under the WM scenario were considered for the WAM scenario as well, however at a wider extent and based on best practice recommendations on sustainable development of agricultural sector and the most efficient mitigation measures for the agricultural sector, included in the draft version of the Low Emission Development Strategy of the RM until 2030.

Despite the effort to be made in implementing sustainable agriculture practices set forth in sectoral policies approved in recent years, it is unlikely that by 2030 a low level of nitrogen mineralization will be achieved from agricultural soils of the RM. Thus, by 2030 only in WAM a slightly positive carbon balance (+0.03 t / ha) and humus balance (+0.05 t / ha) of arable soils of the country may be reached; however, these values will be well below those recorded in 1990 (+0.24 t / ha and, respectively, +0.41 t / ha).

Projections of CH_4 emissions

The projections of CH_4 emissions from the agriculture are revealed in Table 4-14. CH_4 emissions from category 4A "Enteric fermentation" exceed about 10 times those from category 4B

"Manure management", which would draw a far more important attention to measures for optimizing the structure of livestock and poultry heads number to be promoted for GHG emission mitigation in the sector. However, manure management also cause N_2O emissions, which are at the same level as the emissions from enteric fermentation (Table 4-15). Thus, the effort to mitigate GHG emissions in the livestock sector needs to be divided almost equally between these two categories.

Table 4-14: Projections of CH_4 emissions for Agriculture Sector until 2030, Gg CO_2 equivalent

	2010	2015	2020	2025	2030
BAU					
4. Agriculture	**656.0**	**767.7**	**898.1**	**1033.6**	**1208.6**
4A Enteric fermentation	598.6	698.9	813.2	930.9	1085.6
4B Manure management	57.4	68.8	84.8	102.7	123.0
WM					
4. Agriculture	**656.0**	**660.4**	**757.8**	**865.1**	**995.0**
4A Enteric fermentation	598.6	598.6	680.8	772.8	885.8
4B Manure management	57.4	61.8	77.1	92.4	109.2
WAM					
4. Agriculture	**656.0**	**614.4**	**703.1**	**798.0**	**900.5**
4A Enteric fermentation	598.6	552.6	628.8	708.8	797.3
4B Manure management	57.4	61.8	74.3	89.2	103.2

Projections of N_2O emissions

Projections of N_2O emissions from Agriculture Sector are revealed in Table 4-15. N_2O emissions from category 4D "Agricultural Soils" exceed virtually twice the N_2O emissions from category 4B "Manure Management".

Table 4-15: Projections of N_2O emissions for Agriculture Sector until 2030, Gg CO_2 equivalent

	2010	2015	2020	2025	2030
BAU					
4. Agriculture	**1441.8**	**1806.0**	**1936.3**	**2106.1**	**2311.6**
4B Manure Management	498.9	570.7	636.3	700.0	778.9
4D Agricultural Soils	942.9	1235.3	1300.0	1406.1	1532.7
WM					
4. Agriculture	**1441.8**	**1706.2**	**1855.5**	**2011.0**	**2194.5**
4B Manure Management	498.9	533.6	590.9	643.9	706.4
4D Agricultural Soils	942.9	1172.5	1264.7	1367.1	1488.1
WAM					
4. Agriculture	**1441.8**	**1671.2**	**1830.6**	**1977.8**	**2102.1**
4B Manure Management	498.9	533.6	568.8	625.1	674.9
4D Agricultural Soils	942.9	1137.5	1261.8	1352.7	1427.3

Projections of total aggregate GHG emissions

Table 4-16 and Figure 4-8 feature the projections of aggregate GHG emissions in the Agriculture Sector, presented in comparison with emissions recorded in 1990.

Table 4-16: Projections of aggregate GHG emissions for Agriculture Sector, Gg CO_2 equivalent

	1990	2010	2015	2020	2025	2030
BAU						
4. Agriculture	**5063.9**	**2097.9**	**2573.6**	**2834.4**	**3139.7**	**3520.2**
4A Enteric Fermentation	1840.2	598.6	698.9	813.2	930.9	1085.6
4B Manure Management	1690.6	556.4	639.5	721.1	802.8	901.9
4D Agricultural Soils	1533.1	942.9	1235.3	1300.0	1406.1	1532.7
WM						
4. Agriculture	**5063.9**	**2097.9**	**2366.5**	**2613.4**	**2876.1**	**3189.5**
4A Enteric Fermentation	1840.2	598.6	598.6	680.8	772.8	885.8
4B Manure Management	1690.6	556.4	595.4	667.9	736.3	815.6
4D Agricultural Soils	1533.1	942.9	1172.5	1264.7	1367.1	1488.1
WAM						
4. Agriculture	**5063.9**	**2097.9**	**2285.6**	**2533.7**	**2775.9**	**3002.7**
4A Enteric Fermentation	1840.2	598.6	552.6	628.8	708.8	797.3
4B Manure Management	1690.6	556.4	595.4	643.1	714.3	778.1
4D Agricultural Soils	1533.1	942.9	1137.5	1261.8	1352.7	1427.3

Compared to the reference year (1990), in 2020 the level of GHG emissions under the BAU, WM and WAM scenarios will be respectively 56%, 52% and 50%; under the 75% threshold of the Copenhagen Accord commitments (2010).

4.3.5. Land Use, Land-Use Change and Forestry Sector

Within the LULUCF sector CO_2 sequestration / CO_2 emissions are monitored from categories 5A "Forest Land", 5B "Cropland (inclusive from 5B1 "Cropland covered with forest vegetation", 5B2 "Annual changes in carbon stocks in mineral soils") and 5C "Grassland". CH_4 and N_2O emissions related to LULUCF sector are not considered in the analysis because their values are outside the accuracy levels of GHG emission calculations, while the areas burned in forest fires and burnt stubble are steadily declining.

Policies used for development of mitigation scenarios (BAU, WM, WAM) for the LULUCF Sector are the same as the ones described in Chapter 3.3.4, geared towards increasing afforested areas, with the subsequent increase in wood mass remaining after its harvesting; diminishing areas covered by fires; gradually increasing protective

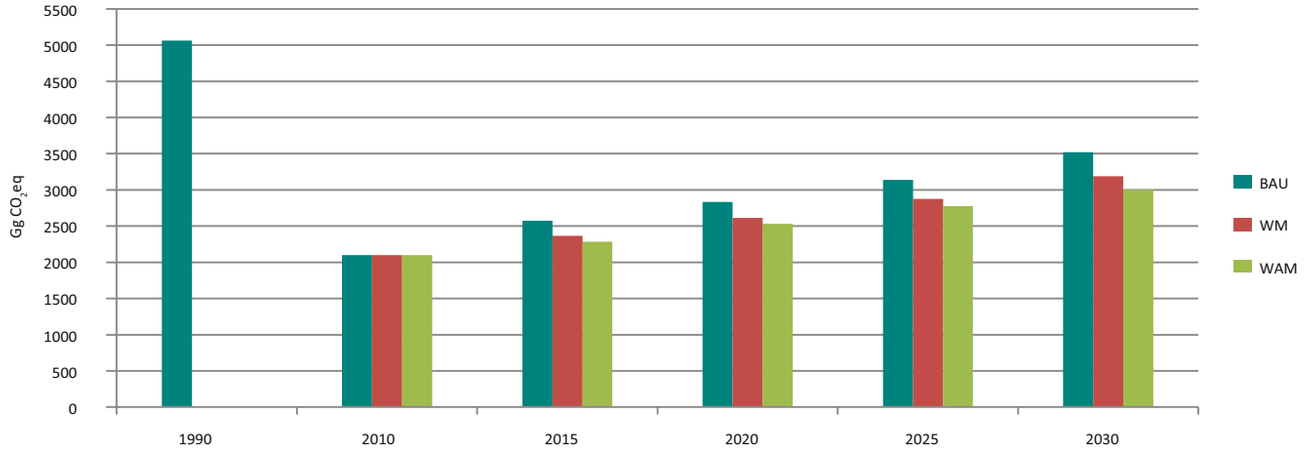


Figure 4-8: Projections of aggregate GHG emissions for Agriculture Sector, Gg CO_2 equivalent

forest belts area, plantations of trees and shrubs, orchards and vineyards, improving the quality of plantations. However, the expansion of category grassland areas is not expected. Moreover, they grassland will show a decreasing trend, as the number of livestock is steadily declining. In the subcategory 5B2 "Annual changes in carbon stocks in mineral soils", promotion of conservation agriculture is foreseen, as described in the chapter on agriculture sector.

The scenarios considered for the LULUCF sector are the following:

- BAU scenario covers the implemented policies provisions and measures officially adopted by the Government of the Republic of Moldova during the period 01.01.2000-01.01.2010 (see Section 3.3.4).
- WM scenario considers policies and measures implemented or adopted over the period since 01.01.2010 till 31.12.2014, including the National Strategy for Sustainable Development of the Agro-Industrial Complex of the Republic of Moldova for 2008-2015, the National Program on Establishment of the National Ecological Network and Program for Soil Conservation and Enhancing Soil Fertility for 2011-2020, the Action Plan for Implementation of Soil Conservation and Enhancing Soil Fertility for 2014-2016, the Environmental Strategy for 2014-2023 and its Action Plan, the National Plan for expansion of areas for 2014-2018, the National Strategy for Agricultural and Rural Development for 2014-2020, the National Development Strategy "Moldova 2020".
- In WAM, projections reflect the policies and measures planned to be adopted and implemented 01.01.2015 (including those specified in the draft version of the Low Emission Development Strategy of the RM till 2030). For indicators that are not mentioned in the draft documents, projections are based on a 20% increase of the indicators used in WM, starting 2015 year.

Figure 4-9 and Table 4-17 feature projections of aggregate CO_2 removals from the LULUCF Sector compared to removals accounted in the reference year (1990).

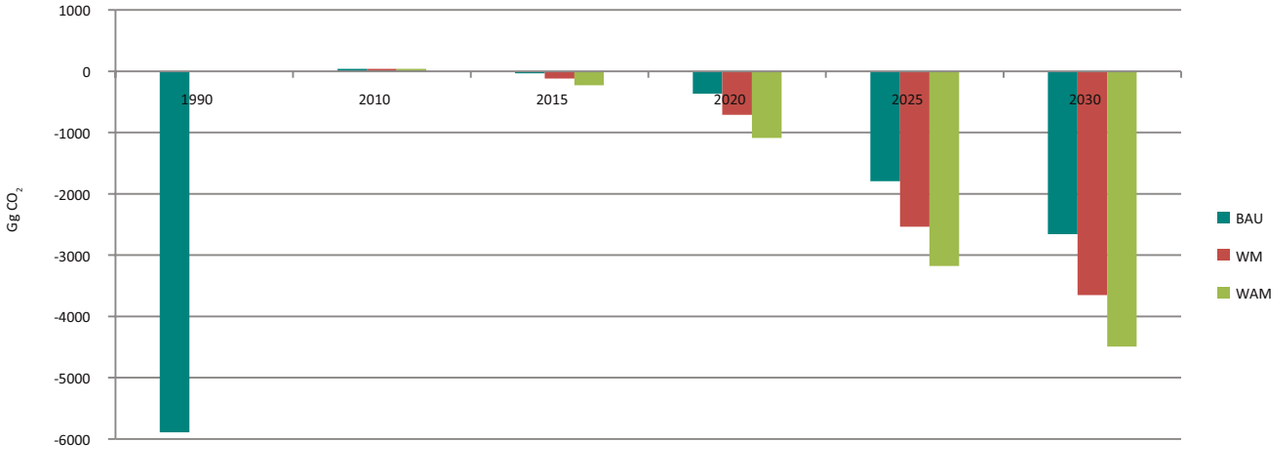


Figure 4-9: Projections of CO_2 emissions/removals for the LULUCF Sector, Gg

Significant changes are expected for the sub-category 5B2"Annual changes in mineral soils carbon stocks". Given the level of CO_2 removals of 1490.4 Gg in 1990, this sub-category became a source of C_2O emissions after 1992, with a contribution of 3458.2 Gg in 2010, there is no perspective for this subcategory to revert to its status of a CO_2 sink by 2030. According to the BAU scenario LULUCF Sector will clearly become a CO_2 sink not earlier than by 2025. In 2020, the level of CO_2 removals under the BAU, WM and WAM scenarios, as compared to 1990, will be 6%, 12% and 18%, accordingly.

Table 4-17: Projections of CO_2 emissions/removals for the LULUCF Sector, Gg

	1990	2010	2015	2020	2025	2030
BAU						
5. LULUCF	**-5,889.9**	**37.8**	**-32.7**	**-366.3**	**-1,795.9**	**-2,658.9**
5A. Forest land	**-2,197.6**	**-2,193.3**	**-2,258.5**	**-2,343.7**	**-2,431.9**	**-2,517.5**
5B. Cropland	-2,216.0	2,987.7	2,988.5	2,715.8	1,350.2	548.6
5C. Grassland	-1,476.2	-756.6	-762.6	-738.4	-714.2	-690.0
WM						
5. LULUCF	**-5,889.9**	**37.8**	**-117.3**	**-711.9**	**-2,536.6**	**-3,653.2**
5A. Forest land	-2,197.6	-2,193.3	-2,197.1	-2,324.7	-2,475.9	-2,628.5
5B. Cropland	-2,216.0	2,987.7	2,844.8	2,365.8	680.1	-296.0
5C. Grassland	-1,476.2	-756.6	-765.1	-753.0	-740.9	-728.8
WAM						
5. LULUCF	**-5,889.9**	**37.8**	**-230.24**	**-1,088.44**	**-3,177.2**	**-4,491.04**
5A. Forest land	-2,197.6	-2,193.3	-2,168.35	-2,426.19	-2,679.1	-2,931.61
5B. Cropland	-2,216.0	2,987.7	2,705.58	2,105.22	269.37	-791.96
5C. Grassland	-1,476.2	-756.6	-767.5	-767.5	-767.5	-767.5

4.3.6. Waste Sector

In the Waste Sector CH_4 emissions from the source categories 6A "Solid Waste Deposits" and 6B "Wastewater treatment", and N_2O emissions from the source category 6B "Wastewater treatment" (sewage sludge) are monitored.

The policies used for development of mitigation scenarios in the Waste Sector (BAU, WM, WAM) are the same as those described in Chapter 3.3.5.

Measures to mitigate GHG emissions from the Waste Sector include: developing regional waste disposal infrastructure by building regional solid waste disposal sites (authorized landfills) and transfer stations in accordance with the Waste Management Strategy of the Republic of Moldova for 2013-2027 and implementation of the EU and national standards; extending the current primary waste collection and storage system from urban to rural areas; improving water supply and sanitation infrastructure.

The three GHG emission mitigation scenarios in the Waste Sector include:

- BAU scenario developed for 2010-2030, by assuming that no technological measures will be undertaken and no significant changes will occur in the Waste Management Sector during this period, based on GHG emission trends over 2005-2012 for projecting purposes. The trend of annual increase storage capacity by 5% in district centers and in Chisinau municipality was assumed 3% and will be maintained in the coming years

(2013-2020), while afterwards, for the years 2021 to 2030, 1% growth will be maintained for both urban locality categories. The annual growth in industrial waste generation and disposal will amount to 3% over 2013-2020, as associated to the GDP growth index, and it will equal 1% for the years 2021-2030. Projections of CH_4 and N_2O emissions in BAU scenario for category 6B "Wastewater treatment" were determined based on the trends of development of sewerage systems during the years 2008-2012.

– WM scenario was developed based on the trends in solid waste generation, as referred in the Waste Management Strategy of the Republic of Moldova for the period 2013-2027. The calculation had also taken into consideration that, in spite of population number decline, the volumes of solid wastes will keep increasing, both in the urban and rural areas. These increases are explained by improved activity of sanitation services in communities, including in district centers and increased consumption over the last decade. The trends of emission reduction will be minimal in the early years of the deposits, as biogas recovery systems will be operational within 3-5 years after the establishment of regional landfills. For WM scenario, projections of methane and nitrous oxide emissions from category 6B "Wastewater treatment" were calculated based on the Strategy for Water Supply and Sanitation (2014-2028), as well as based on information for on-going investment projects for the period prior until 2020

– WAM scenario was developed on the basis of draft Waste Law, which provides for the reduction of biodegradable fractions of waste deposited at solid waste disposal sites, otherwise speaking biodegradable waste will be collected separately and transported to composting plants or individual composting platforms. The WAM scenario related to category 6B "Wastewater treatment" provides for upgrading the wastewater treatment plants in Chisinau and Balti, with anaerobic sludge treatment starting in 2020.

Projections of CH_4 emissions

Projections of CH_4 emissions for the Waste Sector for all scenarios (BAU, WM and WAM), are revealed in Table 4-18. The respective emissions originate from municipal solid waste deposits, and from domestic and industrial wastewater treatment.

Table 4-18: Projections for CH_4 emissions from the Waste Sector, Gg CO_2 equivalent

	1990	2010	2015	2020	2025	2030
BAU						
6. Waste	**1759.8**	**1485.5**	**1470.6**	**1599.6**	**1748.1**	**1868.3**
6A. Solid waste disposal on land	1544.2	1371.4	1341.3	1468.3	1614.9	1733.1
6B. Wastewater treatment	215.6	114.1	129.3	131.2	133.2	135.2
WM						
6. Waste	**1759.8**	**1485.5**	**1489.0**	**1328.4**	**888.8**	**1007.0**
6A. Solid waste disposal on land	1544.2	1371.4	1359.9	1185.8	723.5	815.4
6B. Wastewater treatment	215.6	114.1	129.1	142.6	165.3	191.6
WAM						
6. Waste	**1759.8**	**1485.5**	**1489.0**	**1290.9**	**808.8**	**863.3**
6A. Solid waste disposal on land	1544.2	1371.4	1359.9	1169.7	668.3	700.5
6B. Wastewater treatment	215.6	114.1	129.1	121.2	140.5	162.9

Projections of N_2O emissions

Projections of N_2O emissions from the Waste Sector for all three scenarios (BAU, WM WAM) are revealed in Table 4-19. The respective emissions originate from wastewater treatment (human sludge).

Table 4-19: Projections for N_2O emissions from the Waste Sector, Gg CO_2 equivalent

	1990	2010	2015	2020	2025	2030
BAU						
6B. Wastewater treatment	105.6	85.2	97.6	105.2	113.3	122.0
WM						
6B. Wastewater treatment	105.6	85.2	98.6	108.8	126.2	146.3
WAM						
6B. Wastewater treatment	105.6	85.2	98.6	92.5	107.2	124.3

Projections of aggregate GHG emissions

Table 4-20 and Figure 4-10 feature aggregate GHG emission projections for the Waste Sector compared to GHG emissions from the same sector in 1990. In comparison with the reference year emissions, in 2020 the Waste Sector related GHG emissions will account for 91.4% under the BAU, 77% under the WM and 74% under the WAM scenarios.

Table 4-20: Projections for aggregate GHG emissions from the Waste Sector, Gg CO_2 equivalent

	1990	2010	2015	2020	2025	2030
BAU						
6. Waste	**1865.5**	**1570.7**	**1568.2**	**1704.7**	**1861.4**	**1990.3**
6A. Solid waste disposal on land	1544.2	1371.4	1341.3	1468.3	1614.9	1733.1
6B. Wastewater treatment	321.2	199.3	226.9	236.4	246.5	257.2
WM						
6. Waste	**1865.5**	**1570.7**	**1587.6**	**1437.2**	**1015.0**	**1153.3**
6A. Solid waste disposal on land	1544.2	1371.4	1359.9	1185.8	723.5	815.4
6B. Wastewater treatment	321.2	199.3	227.7	251.4	291.4	337.9
WAM						
6. Waste	**1865.5**	**1570.7**	**1587.6**	**1383.4**	**916.0**	**987.6**
6A. Solid waste disposal on land	1544.2	1371.4	1359.9	1169.7	668.3	700.5
6B. Wastewater treatment	321.2	199.3	227.7	213.7	247.7	287.2

4.3.7. International Bunkers

Of the two types of international bunkers (navigation and aviation), for the RM only aviation is applicable, as the fuel consumption recorded in the international navigation is inexistent according to the national statistical system.

The below projections for the international aviation are not considered in the total national aggregate GHG emissions.

These projections were developed on the basis of information on international aviation provided by the Civil Aeronautical Authority of the Republic of Moldova for the period until 2010. This information was analyzed by means of regression analysis for the period 2000-2009. Emissions were calculated using emissions factors available in the 2006 IPCC Guidelines for National GHG emission Inventories. Regression analysis revealed an R^2 correlation coefficient of 0.7747; which was considered sufficient to develop projections for 2010-2030.

It was estimated that compared to 2010 emissions from international air transport will increase by 38% to 2020 and by 69% to 2030 (Table 4-21).

Table 4-21: Projections for the GHG emissions from international aviation until 2030, in Gg CO_2 equivalent

GHG	2010	2015	2020	2025	2030
CO_2	85.4	98.3	111.1	123.9	136.8
CH_4	0.01	0.01	0.02	0.02	0.02
N_2O	0.7	0.9	1.0	1.1	1.2
TOTAL	**86.2**	**99.1**	**112.1**	**125.0**	**138.0**

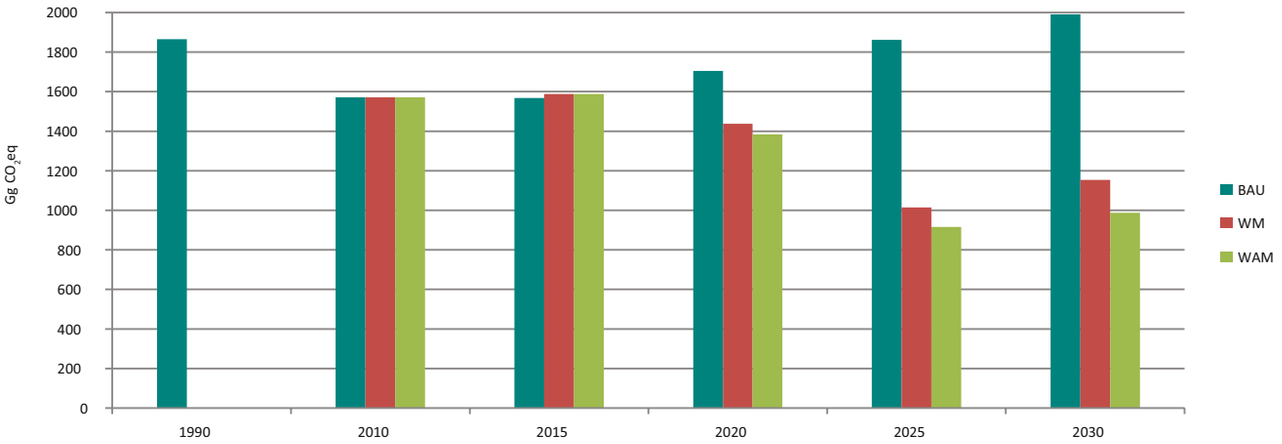


Figure 4-10: Projections for aggregate GHG emissions from the Waste Sector, Gg CO_2 equivalent

CHAPTER 5: FINANCE, TECHNOLOGY AND CAPACITY BUILDING NEEDS AND SUPPORT RECEIVED

5.1. Capacity Needs in the Area of GHG Inventory

For future inventory cycles, a series of improvements are planned. Thus, the estimation process of anthropogenic GHG emissions and carbon dioxide removals could be enhanced through the following institutional and procedural improvements:

- Strengthening institutional arrangements in order to ensure the constant development of GHG national inventories, through a legislative/regulatory framework to be considered and approved by the Government of the Republic of Moldova in 2016;
- Reinforcing the main elements of the National Reporting Systems under the United Nations Framework Convention on Climate Change (NRS-UNFCCC) by using the United States Environment Protection Agency Template Workbook "Developing a National Greenhouse Gas Inventory System" (<www.epa.gov/climatechange/emissions/ghginventorycapacitybuilding>), in order to develop/update by the end of each inventory cycle a *„Report on the National GHG Inventory System of the Republic of Moldova"*, which will contain information according to six templates: (1) a description of institutional arrangements for National Inventory Systems; (2) methods and data documentation; (3) a description of quality assurance and quality control procedures; (4) a description of archiving system; (5) a description of key category analysis; and (6) a description of the National Inventory Improvement Plan;
- Enhancing the level of knowledge of national experts and institutions involved in developing the national GHG emission inventory, in particular within the energy sector, as well as for the LULUCF sector (i.e., the employees of the Institute of Power Engineering of the Academy of Sciences of Moldova, the Technical University of Moldova, National Bureau of Statistics, etc.; respectively, the employees of the Forest Research and Management Institute, Agency „Moldsilva", Institute of Pedology, Agrochemistry and Soil Protection „Nicolae Dimo", Agrarian University of Moldova, etc.), by organizing a series of seminars and thematic trainings by the end of the latest inventory cycle;
- Developing a data management system for tracking and archiving the inventory information used in each inventory cycle by the end of 2016 year;
- Gradual transition to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories in all sectors and enhancing the professional capacities of national experts involved in the inventory process, as well as transitioning from default EFs and Tier 1 methodologies to country specific emission factors and Tier 2 and 3 methodologies, particularly focusing on key categories.

5.2. Climate Change Mitigation Constraints and Needs

Financial, technological and institutional constraints to low-carbon economic development in the key sectors of national economy are described in the draft Low Emissions Development Strategy of the Republic of Moldova until 2030, to be approved by the Moldovan Government by the end of 2016. The most relevant constraints are listed below for each sector.

5.2.1. Energy Sector

The country lacks an appropriate regulatory framework and the reduced payment capacity and a relatively high cost of capital investments in the Republic of Moldova make investing difficult, or unaffordable expensive.

Thus, lack of funding and adequate technology transfer are among the barriers that limit the enhancement of electric and thermal energy plants efficiency. However, most of the measures aimed at reducing GHG emissions require investments that entail increased energy prices, which do not ensure the sustainability of economy.

The investment risks of the RM are determined mainly by Transnistrian separatism and the low political and economic stability, which does not favour access to foreign loans.

Lack of interest for the rehabilitation or construction of new power plants in a free electricity generation market is another relevant barrier. The availability of electricity generation sources at lower prices (for example from Ukraine and from the Moldovan Thermal Power Plant in Dnestrovsk, Transnistrian Region) than the price of electricity produced by a new plant, limits the investors interest for construction of new power plants in the country.

Apparently, a favourable legal framework for the development of Renewable Energy Sources (RES) has been created. However, investors are reluctant to invest in RES; since tariffs for electricity produced from such sources are not known in advance ("Feed-in" type tariffs are missing). As a result, accomplishment of the state's strategic documents objectives related to RES promotion becomes problematic. On the other hand, lack of own traditional electricity sources (70-75% of electricity is imported) makes balancing of energy demand over time problematic as a result of dependence of renewable energy production (solar and wind) on weather conditions. However, climate change conditions pose greater risks of drought and as a consequence, smaller production of biomass for energy purposes.

5.2.2. Transport Sector

Currently transport remains a source of considerable pollution in the RM. Mostly obsolete vehicles due to wear but also poor performance are a relevant source of GHG emissions. In recent years the number of vehicles in the RM significantly increased, second-hand vehicles accounting for the biggest share as a result of weak purchasing power of the population who cannot afford to purchase new vehicles.

The problem worsens even more in large cities where inadequate infrastructure and heavy traffic causes intense GHG emissions, mainly due to congestion, inefficient public transport and underdeveloped "pro-environment" culture.

The new Project of the Ministry of Environment called "Rattletrap" developed in conformity with the Environmental Strategy of the Republic of Moldova for 2014-2023 and its Action Plan could be a tool to improve the situation. The project is to start soon, aiming at upgrading the fleet by replacing older vehicles with the new ones. So far, the authorities have not yet estimated the total cost of the project, which can be impressive and this could lead to reconsideration of its implementation in favour of other priority projects[38].

Another barrier related to energy efficiency improvements in vehicles is the perceived commercial risk of investments in development of efficient technologies, which partially results from the lack of clear regulatory signals in the form of vehicles efficiency standards.

In terms of demand for high-performance vehicles, pre-operating costs for electric and hybrid vehicles are high. Lack of infrastructure for charging electric vehicles is also a barrier.

The use of biofuels, given the demand for arable land and water resources for irrigation, is competing with the food security related priority objectives of the national policy.

A major challenge faced by public transport infrastructure projects relates to very high pre-operational capital costs.

Other issues include poor urban planning and inadequate institutional mechanisms for managing transport demand in urban areas.

5.2.3. Buildings Sector

Many energy efficiency projects in buildings are too small to attract the attention of investors and financial institutions. The small size of the projects, with disproportionately high transaction costs prevents some energy efficiency investments.

Thermal insulation of apartments in multi-storey buildings face the difficulties mainly related to:

- Investments aimed at improving the thermal protection is not considered a profitable investment, given its high value and long duration of investment return;
- The income and financial reserves of the majority population, as well as the available financial resources of the state are very tight;
- In the case of apartment buildings, insulation cannot be done for a separate apartment, but for at least one block or porch. Typically, only about 50% of the tenants in the building have the capacity to invest;
- State does not have the capacity to invest in buildings at present, especially given the fact that the housing stock to be modernized requires huge funding[39];
- Tenants of apartments connected to the district heating system have no interest to insulate exterior walls, since the economic gain is minor, given the heat consumed is not measured for each apartment separately, but for the entire building;
- Insulation of external walls of apartment blocks entails a decrease in heat load from the CHPs in Chisinau and Balti and heat plants in other cities, resulting in overall reduction of efficiency of these sources of electrical capacity delivered over the network and as a result, freezing of investments spent for construction of these objectives, namely to increase the price for heating.

Typically, residents resort to thermal insulation of external walls of apartment buildings only if they have installed individual heating systems, mostly due to low quality of services provided by district heating facilities. To discourage switching to individual heating systems, the Government issued a Decision stipulating the binding requirement for the owners of individual heating systems to pay for 20% of the heat that they would have received if they did not have individual heating systems. Also, the Law on Heat and Promotion of Cogeneration impose certain requirements that make it difficult to disconnect apartments from the centralized heat supply.

5.2.4. Industrial Sector

The main barriers to low carbon development in the industrial sector are associated with:

- Legislative instability, particularly in fiscal and budgetary policy;
- Increasing scarcity of technical-engineering personnel and skilled workers in the industry;
- Reduced possibilities of the state for financial support to restructuring of industrial enterprises;
- Out-dated standards (GOST type) that do not allow for the product range diversification and contribute to maintaining the high level of emissions.

Overcoming these barriers and achieving GHG emission reductions calls for essential amendment of legislative framework to fully support the implementation of new technologies in cement plants and halocarbons and sulphur hexafluoride consumption.

Another important constraint is the lack of energy service companies (ESCOs) that would undertake to help the SMEs to find and finance their effectiveness. Establishment of energy service companies is constrained by the unavailability of initial capital from financial institutions, which are not familiar with the business model of these organizations. Recently a project funded by the Global Environment Facility (GEF) was initiated to create a functional and reliable market for service companies in the energy sector in the RM.

5.2.5. Agriculture Sector

In the Republic of Moldova agriculture still remains a volatile activity and very vulnerable to risks, such as, for example, climatic factors (droughts, frosts, floods, hail, different types of erosion, etc.).

The main barriers to low carbon development in agriculture sector are associated with:

- small budgetary allocations, especially for inventory upgrading, as well as lack of capital investments for assets renovation;
- insufficient financial coverage of the Fund subsidizing agricultural producers;

[38] <http://trm.md/ro/social/programul-rabla-va-fi-lansat-si-la-chisinau/>.
[39] <http://www.chisinauprojects.eu/media/publication/Eficienta%20energetica%20a%20cladirilor%20in mun.%20Chisinau.pdf.>

- insufficient development of the agricultural insurance market;
- insufficient monitoring and control of the farmlands and lack of measures for rational and efficient use;
- excessive fragmentation of agricultural lands, what contributes to decreased effectiveness of agricultural production due to non-employment of soil cultivation technologies and erosion protection measures;
- underdevelopment of conservation agriculture based on no-till and mini-till technologies with sub-soiling tillage and maintaining a positive balance of humus, nitrogen and carbon in soil by systemic use of green manure;
- inadequate and disproportionate fertilization of crops with chemical fertilizers (45-55 kg/ha of active substance, of which 75-85% is chemical nitrogen fertilizers), gradual exhaustion of the phosphorus and potassium reserves o from the soil with negative effect on the volume and quality agricultural products;
- failure to use organic fertilizers on croplands leading to decreased efficiency of chemical fertilizers, generation of a deeply negative balance of humus and carbon in soil, increased GHG emissions, destruction and strong compacting of the arable layer and increased risk of soil drought with serious consequences for the quality status and production capacity of agricultural soils;
- lack of investment for livestock sector recovery and the implementation of sustainable manure management systems;
- reduced opportunities for procurement of breeding stock and high-tech equipment, consequently, inefficient pricing policy for raw material purchase in the livestock sector; and
- lack of integrated and comprehensive approach on effective use of renewable energy sources (agricultural waste, manure).

Unfortunately, along with some positive changes (privatization, multitude of production process organization forms, creating an enabling environment for competition, initiative, entrepreneurship, etc.) these structural changes have caused the emergence of obvious disproportion between branches entailing job losses, reduced investment, high share of subsistence farms mostly using out-dated farming technologies; low labour productivity and high production costs, excessive simplification of crop rotation, reduced range and insufficient quality of agricultural production, reduced use of mineral and organic fertilizers, respectively, a deep negative balance of humus and soil fertility, etc.

Livestock production has decreased significantly due to the fact that small-scale livestock production is predominant in individual households mostly practicing extensive production technologies. As a result, the sector's productivity has reduced while environmental pollution has intensified, since the generated manure is not deposited on fields as organic fertilizer, but is stocked within rural communities, aggravating the ecological situation and sanitary status of the countryside.

In the past 20 years, Moldovan agriculture was based mainly on the exploitation of natural fertility of soils (the available soils humus accumulated over millennia). As a result, any increase in yield due to climatic factors not followed by compensation for loss of soil organic matter used for growing has led to increased GHG emissions. So, intense dehumification process as a result of subsistence agriculture has led to decreased removed carbon stocks in soil, increased CO_2 emissions and worsening the quality and fertility of agricultural soils.

To overcome this situation, the government has recently approved the Soil Conservation and Fertility Improvement Program for 2011-2020. Unfortunately, its financial coverage is absolutely insufficient (as much as about 18 million lei annually) and it cannot provide for radical changes in the existing situation.

Speaking about the livestock sector it should be noted that its development has been particularly problematic in the past 20 years, being hampered by competitiveness and marketing bottlenecks. The sector faces internal resources constraints and hard pressure due to imports of cheaper animals and animal products, in particular from the EU and CIS countries because of local production high costs, low productivity of the sector and non-competitive breeds. All of this, along with unstable livestock sector support system substantially retains the growth of production and creates difficult competing conditions for local livestock products versus the subsidized cheaper imported meat/dairy products. As a result, now the country became a net importer of animal products.

5.2.6. Forestry Sector

The biggest problems identified in this sector relate to inadequate forest management, low bio-productive potential and inadequate guarding and protection of forests. The actions undertaken by relevant authorities are still insufficient to halt the considerable losses caused by illegal felling, estimated at about 400-600 thousand m^3 annually.

The sector is also facing serious problems related to institutional framework and management deficiencies regarding complex natural areas protected by the state and lack of funding sources needed to ensure sustainable management, insufficient size of the surfaces of natural areas protected by state (only 5.5% of territory), and of areas covered with forests (only about 11.1% of the country), poor provision and development of sustainable forest management, green spaces, grasslands, wetlands, continuous degradation of protection belts by rivers and water basins, what causes loss of habitats and ecosystems[40].

The current production processes monitoring and control system in the forestry sector is only applied to forest areas managed by "Moldsilva" Agency, so that a wide range of efforts to monitor practical application and forest management are needed to address the level of deforestation recorded now in the country.

5.2.7. Waste Sector

Waste Management Sector in the Republic of Moldova is still underdeveloped, requiring a restructuring of both legal and institutional framework and development of an integrated recycling and waste recovery system. Still a significant deficiency is the precarious infrastructure for waste collection, transportation and disposal, especially in rural areas. However, lack of clearly defined responsibilities for each actor currently involved in waste and wastewater management at the level of state agencies, associations, NGOs, private sector, civil society, associated with insufficient financing of the waste management sector at the state and private sector level, hinders the implementation of comprehensive measures for waste and wastewater management.

A serious problem is lack of capacities for hazardous waste treatment, including medical waste, which if deposited together with the solid waste pose a higher risk to the environment, as well

[40] See Appendix 1 to the Environmental Strategy for 2014-2023, approved by Government Decision no. 301 of 04/24/2014.

as construction and demolition waste, animal waste, street waste, technical oils, tires, etc. There are also difficulties in implementation of relevant legislative and regulatory framework, relative passiveness and indifference of environmental bodies being noticed. Also, application of minor penalties encourages non-compliance.

In the Republic of Moldova waste sector faces mainly the following problems:

a) lack of regulation (legislative, normative and technical) in waste management sector, appropriate to current situation and EU legislation requirements;

b) lack of planning, organization and implementation infrastructure of an integrated waste management system at all levels (national and regional);

c) lack of adequate capacities for waste disposal and only partial coverage for collection and transportation of waste in urban areas (60-80%), and lack of such services in rural areas (10-20%);

d) lack of final waste storage capacities, built and operated in accordance with environmental standards;

e) lack of management infrastructure for other categories of waste, such as construction and demolition waste, animal waste, street waste, etc.;

f) insufficient financing of waste and wastewater management at the state and private sector level;

g) obsolete technical capacities of wastewater treatment plants; and

h) scarcity of modern plants for processing sludge formed during wastewater treatment.

One of the significant issues continues to be low awareness of the population and businesses, including about the importance of integrated waste management measures and active involvement in their implementation, without which the effective waste management is impossible.

5.3. Capacity Building Needs in Climate Change Mitigation

The GHG emissions mitigation capacity should be understood as the ability of individuals, groups they represent, organizations and institutions concerned to solve the problems associated with climate change, this activity being considered as an integral part of a series of efforts towards sustainable development.

The GHG emissions mitigation capacity 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 internationally, primarily to attract financing.[41]

5.3.1. Capacity to Carry Out Climate Studies, Research and Assessments

The Republic of Moldova has a wide network of research institutions in various areas. However, it has no entities strictly oriented towards studies on mitigation of GHG emissions. The ground for this is that the country has no sectors with significant GHG emissions, while the existing legal framework so far has not set emission mitigation as a top priority of the country.

However, the abovementioned institutions continue to hold research structures which carry out research related to climate change and they have qualified staffs in the areas, which enables them to carry out studies related to climate change, including for development of National Communications, Biennial Update Reports and National Reports on Inventory to UNFCCC.

It is true, however, that regarding the available and in-use calculation models, as well as information availability for them, the situation is different. In the energy sector calculation models WASP and IMPACT from ENPEP software package of models are successfully used. Calculation models MARCAL and LEAP were also learnt. However, the application of the latter faces lack of input data, while data preparation by independent experts requires significant time and financial resources. In other words, the national statistical system is far from satisfying the requirements for performing studies to assess the reserves for energy efficiency and for the development of an energy demand based on a "bottom up" approach.

Currently, the Republic of Moldova receives support from USAID and UNDP to identify the restructuring needed in the statistical system of the country so that it corresponds to the one applied in the EU. That is, we can expect to have official statistics in compliance with requirements for studies and researches related to GHG emissions mitigation not earlier than in 5-7 years.

5.3.2. Capacity to Formulate Climate Strategies and Policies

The only official document approved in the RM, which sets concrete goals for environmental protection, including GHG emission reduction is the Environmental Strategy and Action Plan for 2014-2023. The goals related to climate change mitigation are taken over from the draft Low Emissions Development Strategy (LEDS) of the Republic of Moldova until 2030, to be approved by the end of 2016.

The first draft of the LEDS has been developed by international consultants with financial support from the Regional Bureau for Europe and CIS (RBEC Bratislava) of the United Nations Development Programme (UNDP) and the UNDP Country Office. Subsequently, numerous national consultants, who contributed with important changes, were involved in this process.

There is a wide range of other national and sector already approved strategies related to direct GHG emissions mitigation. Some of these have been developed, to a large extent, due to external donor support. In this respect, the energy strategies of the RM are relevant. Three energy strategies were developed and approved during 2000-2013, the recent being approved in 2013 for the period until 2030. Unlike the first two, the last strategy was developed largely by external consultants, with the EU financial support. All these strategies have encountered and still do encounter significant difficulties towards implementation.

The strategies developed for other sectors had a similar fate. The fundamental reason that determines such state of affairs, when the most important sector development documents remain without impact for the country, is the lack of studies to substantiate the objectives defined in the policy documents. In other words, the targets are more like wishes, as they are not supported by financial and organizational justification in terms of social, technical and

[41] Sagar, A. Capacity development for the environment: A view from the south, the view from the north, in: Annual Review of Energy and Environment 25, 2000, pages 377-439.

economic impacts, the capacity to invest, etc. To a large extent, national consultants (i.e. national relevant institutions) have the capacity to carry out such studies. The problem is, however, the ability to formulate these studies and compiling them into a credible strategic document. Donor assistance is much welcomed in this respect. Such assistance would finalize with a draft policy document that would pragmatically specify the need for such studies and how to finance them.

5.3.3. Capacity to Implement Climate Strategies and Policies

As already mentioned above, the first policy document of the RM which expressly reflects the climate change mitigation targets is the Environmental Strategy of the Republic of Moldova for 2014-2023 and Action Plan for its implementation, adopted in April 2014. So, its implementation capacities are just being consolidated. The first step in this direction is the development of the Low Emission Development Strategy (LEDS) of the Republic of Moldova until 2030. Compilation of sector policies with an impact on GHG emissions mitigation in one policy document, significant raises the likelihood of their implementation, given the importance of the issue of combating climate change globally, and as a result, availability of international support to overcome it.

Highlighting low emission development priorities in the country's political agenda can be achieved by means of a high-level advisory body, fully able to address cross-sector issues in response to combined challenges of climate change and green economic development. Such a body is the "National Commission for the Implementation of the UNFCCC, as well as mechanisms and provisions of the Kyoto Protocol" (National Commission), established by the Government Decision no. 1574 of 26.12.2003.

Technical tasks related to the implementation of potential actions supported by donors and creditable in the energy, industry, buildings and transport sectors are to be assigned to the Energy Efficiency Agency (EEA) of the Ministry of Economy (MEC); mitigation aspects in the agricultural sector to the Ministry of Agriculture and Food Industry (MAFI); mitigation aspects in the forestry sector to "Moldsilva" Agency of the Ministry of Environment (MoEN); and aspects related to waste and industrial sectors (refrigeration and air conditioning industry) to certain offices of the Ministry of Environment (Environmental Pollution Prevention Office and Ozone Office, respectively).

5.3.4. Capacities to Negotiate Climate Issues Internationally

It should be noted that the capacity to negotiate funding for reducing GHG emissions in the RM is limited, even at the early stage of consolidation. Consequently, significant efforts are required to overcome this constraint.

It is expected that these capacities will be well developed under the "Low Emission Capacity Building Program", implemented by the UNDP in 25 countries around the world with financial support of the European Union, the governments of Australia and the Federative Republic of Germany, which is being implemented in the RM until the end of 2016. The Program is aimed at strengthening national capacities for: (1) institutionalization of the national GHG inventory system; (2) formulation of nationally appropriate mitigation actions (NAMAs) and the Low-Emission Development Strategy (LEDS); and (3) establishing national MRV systems aimed at supporting the implementation and development of LEDS and NAMAs.

5.4. Financing Needs and Access to Financial Resources

According to calculations set forth in **Annex 4** for WM and WAM scenarios, the following investments additional to BAU scenario are needed:

For WM: US$ 1,371 million for the period 2016-2020;
US$ 3,741 million for the period 2016-2030

For WAM: US $ 4,022 million for the period 2016-2020;
US $ 8,642 million for the period 2016-2030

In order to strengthen the country's capacity to solve low emissions development related problems, about US$ 1.9124 million would be needed over the next five years, of which annually about $US 0.21 million for climate studies, research and assessments, other resources being a onetime involvement in the form of aid, principally from international donors (see Tables A4-3 and A4-4).

5.5. Technology Transfer and Access to Technology

IPCC identifies three major dimensions needed to ensure efficient technology transfer: capacity building; enabling business environment; technology transfer mechanisms.

5.5.1. Capacity Building for Technology Transfer

Up-to-date in the RM a number of actions were undertaken towards capacity building for innovation and technology transfer, the ones geared strictly toward reducing GHG emissions having emerged only over the last decade.

Thus, in 2004, the Agency for Innovation and Technology Transfer (AITT) was established under the auspices of the Academy of Sciences of Moldova (ASM). AITT is still subordinated to ASM and it is a specialist organization that provides technological extension. It aims to coordinate, promote and implement mechanisms for innovation and technology transfer. In 2014, AITT has funded 3 projects for technology transfer in energy efficiency and exploitation of renewable energy resources:

- "Implementing innovation technology to establish energy plantations and biomass use", implementing entity – Botanical Garden (Institute) of the ASM.
- "Designing and building an innovation biogas plant", implementing entity – "MolFarmGrup" Ltd.
- "Develop and implement pellets based dryers for fruits and vegetables", implementing entity – Technical University of Moldova (TUM).

AITT has created three scientific-technological parks and 7 innovation incubators.

The Organization for Development of Small and Medium Enterprises (ODIMM), active in the RM runs the program co-financing energy efficiency projects, aimed at providing financial support to SMEs developing energy efficiency activities. The program's purpose is

to contribute with 60-70% of the cost of energy efficiency projects approved for funding, the cost of which, however, shall not exceed EUR 10,000.

Establishment of industrial parks is in full swing in the country. During 2010-2014, based on the Government decision, seven enterprises were awarded the title of industrial parks, including "Bioenergagro Industrial Park" created in Tarigrad, Drochia, with the purpose to capitalize the first private investment in biogas production by the "Bioenergagro" SRL.

Since 2011, the Republic of Moldova has become a partner of Enterprise Europe Network (EEN), by creating a consortium between the Chamber of Commerce and Industry of Moldova, the Agency for Innovation and Technology Transfer and the Organisation for Development of Small and Medium Enterprises. These partners pursued the establishment of a Centre to provide a wide range of services to businesses to facilitate access to the European market and implementation of innovative technologies in operations.

Acknowledging the contribution of the aforementioned structures to the country's capacity building for technology transfer, it should be noted that their contribution to the promotion of technologies leading to mitigation of GHG emissions is actually modest[42]. A more significant impact geared towards environmentally friendly technology transfer was produced due to the establishment of Energy Efficiency Agency (EEA)[43] in 2010 and of the Energy Efficiency Fund (EEF)[44] in 2012.

The RM participates in the Eastern Europe Energy Efficiency and Environmental Partnership Fund (E5P). E5P is a multi-donor fund established in 2009 to promote energy efficiency investments in Eastern European countries.

The EBRD credit lines MoSEFF[45] and MoREFF[46], the bilateral Programme Moldova - EU for 2011-2016, namely the energy package launched by the World Bank[47] also contribute to capacity building (see more details on these initiatives in **Annex 5** "Summary of Mitigation and Adaptation Related Work Undertaken to Date in the Republic of Moldova").

The experience gained in the field of technology transfer in the RM showed that technology transfer promotion is hampered by two basic impediments: (a) low capacity of potential beneficiaries to submit feasible projects for implementation and (b) limited financial capacity to implement the proposed projects on their own. For this reason, further external support is needed, to overcome the first problem and ease the investment burden for who intend to implement advanced environmentally friendly technologies.

5.5.2. Enabling Business Environment

In general, the current business environment in the RM, including with reference to transfer of technologies focused on mitigating GHG emissions, is described in the draft National Development Strategy "Moldova 2020", being identified as the country's priority for the next years. According to the strategy, the business environment is characterized by unjustified financial costs that essentially exceed the costs level in developed countries, which discourage productivity and innovation -oriented fair competition.

The 2014 World Bank's "Doing Business" international ranking ranked the RM 78th of 189 countries, though significantly improving the results of previous years - the 35th of the 50 countries that achieved the results in reducing the gap to the first top ranked.

In the global competitiveness ranking the RM also climbed several positions, ranking 82nd of 144 countries, surpassed by such countries as Ukraine (76), Georgia (69), Romania (59), Russian Federation (53). The country is much better positioned regarding technological availability, macroeconomic environment and labour efficiency. The main problems faced by the RM are corruption, political instability, government bureaucracy and governmental instability, with innovation, market size and the business environment development level also in poor condition.

Another benchmark for international comparison is the Economic Freedom Index developed by "The Heritage Foundation" and "The Wall Street Journal". This indicator assesses the extent of the state's intervention in economic activity. In 2014, RM was ranked 110th out of 178 countries, which qualifies it as a country with predominantly unfree (mostly unfree) economy.

5.5.3. Technology Transfer Mechanisms

According to the IPCC Report "Methodological and Technological Issues in Technology Transfer", the technology transfer mechanisms include: national innovation system, official development assistance, GEF, multilateral development banks, the Kyoto Protocol mechanisms, etc.

National Innovation System

The research and innovation system in the country is a centralized one, the decision-making authority and management tools for research being concentrated in the Academy of Sciences of Moldova (ASM). Since 2008 the R&D funding has been steadily decreasing from 0.63% of GDP in 2008 to 0.39% of GDP in 2014, with corresponding impact on reaching the ASM[48] goals.

The national innovation system of the RM includes research institutions, the Agency for Innovation and Technology Transfer (AITT), the State Agency for Intellectual Property (AGEPI), 3 parks for science and technology (including, "Academic", "INAGRO", etc.), 7 innovation incubators, universities, the Organization for SME development (OSME). However, the system is still at an early stage of development, lacking the essential elements of a modern innovation system. The innovation capacity of companies of the country is low, while the links between innovation companies, especially SMEs, are practically non-existent. Because of this, the impact of innovation on the national economy is low, while the RM registers a very low level of staff employed in manufacturing with high technological intensity, such employment existing mainly in terms of export. In 2014, a number of 17 technology transfer projects were funded in total amounting to 19.96 million lei (1.1 million euros), of which 8.62 million MDL were provided from the state budget and 11.35 million MDL from co-financing.

Official Development Assistance

The RM has consolidated its attempts to refocus the assistance from subsistence to sustainable development. In this regard, in 2012 the Parliament of the RM approved the National Development Strategy "Moldova 2020", updated in 2014, based on a diagnostic study of economic development constraints. The biggest constraint in

[42] <http://www.mrda.md/step/?cont=catalog2&m=2>.
[43] Government Decision no. 1173 of 21.12.2010 "On Energy Efficiency Agency"
[44] Government Decision no. 401 of 12.06.2012, Official Gazette 126-129 / 448 of 22.06.2012
[45] <http://www.moseff.org/>.
[46] <http://moreeff.info/statistica-moreeff/>.
[47] <http://www.mepiu.md/>.

[48] See, item 18 of the Partnership Agreement between the Government and ASM for 2014, available at: <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=354646>

implementing the National Development Strategy "Moldova 2020" is still lacking cost estimates for the proposed measures, which makes it difficult to assess the resources needed for their implementation.

The RM has no experience in developing long-term strategic planning documents or resources needed to ensure that the activities are effectively implemented, while unstable political context and lack of financial resources leaves the Government in a more vulnerable position and makes it further dependent on donor priorities. In terms of the latter, by 1 June 2015 donor commitments to the Republic of Moldova accounted for about 4.315 billion EUR, with total disbursements of 2.432 billion EUR for a total of 1,761 projects[49]. As regards financial resources in the context of low-emission development, the RM enjoyed the support provided by the GEF, World Bank, EBRD; EU etc.

Global Environmental Facility

Since joining GEF and applying for grants, the RM has received financial non-reimbursable support worth about US$ 36.6 million and US$74.7 million as co-financing for 22 projects, including eight projects related to combating climate change.

Among the recent projects are the following: UNEP-GEF project "Enabling Activities for the Preparation of Third National Communications under the UNFCCC" (US$ 500 thousand), the UNEP-GEF project "Support for preparation of the first Biennial Updated Report and the Fourth National Communication in accordance with the RM obligations to UNFCCC"(US$ 832 thousand), UNIDO-GEF project "Reducing GHG emissions through improved energy efficiency in the industrial sector of Moldova"[50] (US$ 960 thousand plus approximately US$ 3.364 million co-financing, including from the private sector), etc. (see more details in **Annex 5** "Summary of Mitigation and Adaptation Related Work Undertaken to Date in the Republic of Moldova").

In the last operational phase of applying for funding from the GEF (GEF-6), Moldova has received an offer to develop and implement projects amounting to US$ 1.5 million in biodiversity protection, US$ 2.0 million for climate change and about US$ 5.49 million for combating soil degradation.

The Republic of Moldova has recently joined the Small Grants Programme (SGP) promoted by the Global Environment Facility.[51] Launched in 1992, the GEF SGP started in the RM in late 2012. By the end of July 2015, GEF SGP has funded 11 projects in the country, totalling over US$ 500,000. GEF SGP supports activities that contribute to achieving global environmental benefits in the areas of biodiversity conservation, climate change, sustainable land management and persistent organic pollutants, with the involvement of local communities, and generate positive effects for them. The maximum amount of a grant is US$ 50,000. The project should ensure a co-financing of at least 50% of the total project value.

World Bank (WB)

From 1992 to 2014, the World Bank financed implementation of 49 projects in the RM with over US$1 billion (see more details in **Annex 5**). The current Partnership Strategy of the World Bank Group with the RM includes financial commitments totalling to US$ 570 million for fiscal years 2014-2017. The strategy will assist the RM on three main pillars, including "Promoting green, clean and resilient Moldova" by: (i) strengthening adaptation and resilience to climate change; (ii) improving natural resource management and (iii) increasing energy efficiency and security[52].

European Bank for Reconstruction and Development (ERBD)

The assistance provided to the Republic of Moldova since August 2014 includes: a total of 106 projects worth 886.5 million EUR, of which 477.1 million EUR are gross disbursements, while the private sector portfolio accounts for 36%. By opening the MoREFF and MoSEFF credit lines, the ERBD continue to contribute to increasing energy efficiency in the economy, with major impacts on reducing GHG emissions[53] (see more details in **Annex 5**).

The United Nations Environment Programme (UNEP)

UNEP continues to substantially contribute to GHG emissions mitigation and adaptation to climate change. Among the most recent and relevant UNEP-funded projects in Moldova is the Project "Technology Needs Assessment for Climate Change Adaptation and Mitigation"[54] (US$ 120 thousand) (see more details in **Annex 5**).

United Nations Development Programme (UNDP)

UNDP is also quite active in promoting activities to mitigate GHG emissions. Among the relevant projects financed by UNDP Moldova is the project "Low Emission Capacity Building Program"[55] (US$ 642 thousand) (see more details in **Annex 5**).

European Union

During 2011-2014 the EU and UNDP have funded the project "Moldova Energy and Biomass". EU provided 14 million EUR and UNDP Moldova 560 000 EUR. The "Moldova Energy and Biomass" project was extended for 2015-2017, with a budget of 9.41 million euro[56] (see more details in **Annex 5**).

Bilateral agreements

Recently, the Government of Japan provided a US$ 14 million grant for manufacturing 25 biomass based heating plants, which will be installed in 25 schools and kindergartens in the country.[57]

CDM of Kyoto Protocol

The information with reference to the implementation of the Clean Development Mechanism of the Kyoto Protocol in the Republic of Moldova corresponds to the content of the relevant section of Chapter 6.1.3 of the Republic of Moldova Third National Communication to the UNFCCC (2014)[58]. More detailed information on CDM Projects in the Republic of Moldova can be viewed on the website of the Climate Change Office[59] of the Ministry of Environment.

[49] <www.amp.gov.md>.
[50] <http://energyeficiency.clima.md/pageview.php?l=en&idc=231>
[51] <http://www.thegef.org/gef/sites/thegef.org/files/documents/gef6-star.pdf>
[52] <http://bancamea.md/news/grupul-bancii-mondiale-cinci-parteneri-de-dezvoltare-ai-republicii-moldova>
[53] <http://www.ebrd.com/downloads/research/factsheets/moldova.pdf>
[54] <http://www.tech-action.org/Participating-Countries/Phase-1---Asia-and-CIS/Republic-of-Moldova>
[55] <http://www.lowemissiondevelopment.org>
[56] <http://www.biomasa.md/project-background-ro/ ; http://www.biomasa.md/who-can-apply-biomass-projects-ro/>
[57] <http://www.eco.md/index.php/economie/energetica/item/2433-japonia-ofer%C4%83-un-grant-pentru-dotarea-a-25-de-%C5%9Fcoli-%C5%9Fi-gr%C4%83dini%C5%A3e-moldovene%C5%9Fti-cu-%C3%AEnc%C4%83lzire-pe-biomas%C4%83>
[58] <Http://unfccc.int/resource/docs/natc/mdanc3.pdf> <http://clima.md/doc.php?l=ro&idc=81&id=3506>
[59] <http://clima.md/lib.php?l=ro&idc=242>

CHAPTER 6: DOMESTIC MEASUREMENTS, REPORTING AND VERIFICATION ARRANGEMENTS

6.1. Domestic MRV System

Regarding the mitigation activities impact, the key elements of the National Measurement, Reporting and Verification System (MRV) manifest themselves through the UNFCCC mechanisms for reporting the effective and projected emissions produced by the country, and through a number of energy efficiency activities and promotion of renewable energy sources, as well as through CDM Projects of the Kyoto Protocol.

In the above context, it is necessary to mention that national GHG emissions and trends are regularly reported by the Republic of Moldova in the National Communications under the UNFCCC[60] (since 2000) and in the National Inventory Reports[61] (since 2010). These documents are developed on the basis of studies, researches, reports and surveys undertaken by national consultants of the highest qualification, inclusively experts with international experience in the area of GHG Inventory, Climate Change Mitigation, Climate Modelling, Vulnerability and Adaptation Assessments; national experts selected for making calculations and realizing analysis of retroactive information, with responsibilities for development short- and medium-term GHG emissions projection scenarios for each individual gas, category and sector, based on macroeconomic development scenarios of the country.

Additionally, aiming at enhancing transparency, consistency, comparability, completeness and accuracy of the national inventory of anthropogenic greenhouse gas emissions from sources or removals of carbon dioxide non-regulated by the Montreal Protocol, the Republic of Moldova has recently developed the *"Report on National Greenhouse Gas Inventory System in the Republic of Moldova"* using the six templates developed by the Environmental Protection Agency of the United States of America (US EPA)[62] as a starting point (institutional arrangements; assessment methodologies and data documentation; quality assurance (QA) and quality control (QC) procedures; archiving system; key categories analysis, and national inventory improvement plan).

As part of the on-going effort to develop a high quality, transparent and credible inventory, in 2005 the Republic of Moldova developed, and is regularly updating the Quality Assurance and Quality Control Plan. The key specifics of the QA/QC Plan comprises detailed procedures for Tier 1 (general procedures) and Tier 2 (specific procedures), as well as templates and standard checklists for quality control that serve to standardize the process of implementing the activities for quality insurance and quality control, to ensure the quality of the inventory at national level; also external technical review (audit) carried out by experts who are not directly involved in drafting and development of the national inventory (both national consultants, as well as the international consultants[63] included in the UNFCCC Roster of expert[64]); activity data quality verification, including by comparing sets of data from various sources; planning and coordination of the inventory process at the inter-institutional level; as well as on-going documentation of the national inventory development process.

Regarding the activities focused on reducing GHG emissions, comprising elements of measurement, reporting and verification, the most relevant are:

- CDM projects – to-date eight CDM projects were registered in the RM;
- MoSEFF[65] program - is one of the largest funded projects in energy efficiency in the country, supported by the EBRD. The eligible projects receive up to 20% of funds as grants, and the outputs are measured, inclusively, in GHG emissions reductions;
- MoREEFF[66] – an EBRD project supported by the EU and the Swedish government in the buildings sector (similar to MoSEFF);
- Energy and Biomass Program[67], funded by the EU and UNDP, focuses on installing boilers for heat production in schools, kindergartens and hospitals; UNDP appoints a third party evaluator;
- The National Action Plan for 2013-2020[68] on energy from renewable sources 2013-2020 sets forth specific figures for substitution of fossil fuels with renewable energy and ways for assessing the objectives to be achieved up to 2020;
- The National Action Plan for Energy Efficiency for 2013-2015[69] sets forth specific figures regarding reducing power consumption as compared to the baseline scenario for each sector and ways for assessing the objectives to be achieved.

Current MRV Legal and Institutional Framework

The Ministry of Environment (MoEN) is the state authority responsible for the development and promotion of policies and strategies that address environmental protection, rational use of natural resources and biodiversity conservation. The MoEN is

[60] <http://clima.md/lib.php?l=ro&idc=81&>
[61] <http://clima.md/lib.php?l=ro&idc=82&>
[62] <www.epa.gov/climatechange/emissions/ghginventorycapacitybuilding>
[63] <http://clima.md/doc.php?l=ro&idc=82&id=3853> <http://clima.md/doc.php?l=en&idc=82&id=3852>
[64] <http://unfccc.int/parties_and_observers/roster_of_experts/items/534.php>
[65] <www.moseff.org>
[66] <www.moreeff.org>
[67] <www.biomasa.md>
[68] HG nr. 1073 din 27.12.2013
[69] HG nr.113 din 07.02.2013

responsible for implementing international environmental treaties to which the Republic of Moldova is a Party (including the Rio Conventions). Under MoEN, Climate Change Office (CCO) is responsible for development of National Communications, Biennial Update Reports and the National Inventory Reports. The National Inventory Team of the CCO is responsible for estimating emissions by source and removals by categories of sinks, key sources analysis, quality assurance and quality control activities, uncertainty assessment, documentation and archiving of the information related to GHG inventory preparation process.

The monitoring of pollution, including air pollution, is conducted by the State Environmental Inspectorate (SEI). SEI checks enterprises and installations with potential for environmental pollution, records and intervenes in cases of exceeding the maximum allowable concentration of pollutants, including exhaust gas emissions, but is not including so far the GHGs, which are not yet covered by the national legislation.

In the RM, the National Commission for the Implementation of the United Nations Framework Convention on Climate Change, as well as mechanisms and provisions of the Kyoto Protocol (National Commission) is operational, which was established by Government Decision no. 1574 of 26.12.2003, and has a mandate to communicate with UNFCCC and assess CDM projects. The National Commission has no mandate yet to prioritize, evaluate, approve / reject and monitor NAMA related projects and associated MRV systems.

Currently there is no accreditation system yet for monitoring and verification of environmental impact for experts and authorities responsible for monitoring and verification.

6.2. Establishing the Institutional Framework for NAMA's MRV System

Following the Bali Action Plan (2007) on implementation of Nationally Appropriate Mitigation Actions (NAMA) in the context of sustainable development, supported and secured on the basis of technology, financing and capacity-building, in a Measurable, Reportable and Verifiable (MRV) manner, the RM has committed to establish an adequate National MRV System, in compliance with subsequent decisions adopted at COP 16 (Cancun, 2010), COP 17 (Durban, 2011) and COP 19 (Warsaw, 2013).

To achieve this goal, the country received UNDP support through UNDP Project "Low-Emission Capacity Building Project - Republic of Moldova". With the support of international experts selected by UNDP, the MRV concept associated with NAMA[70] projects was developed, to be effectively implemented over the coming years.

The administrative structure for national MRV - NAMA system is shown in Figure 6-1. It comprises the Ministry of Environment, the National Commission, the Technical Committee and the MRV – NAMA team.

[70] <http://clima.md/doc.php?l=ro&id=3640&idc=267> <http://clima.md/doc.php?l=en&id=3640&idc=267>

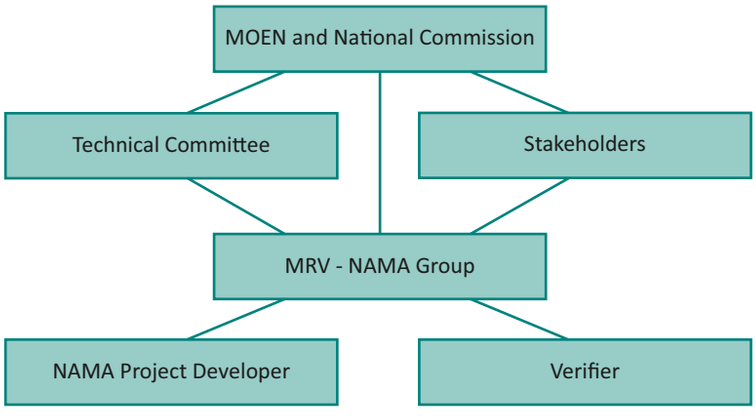


Figure 6-1: The administrative structure for the National MRV – NAMA System

MoEN will hold overall responsibility for the MRV system, while the National Commission will have the mandate to prioritize, evaluate, approve / reject and monitor NAMA projects are related to MRV systems. The Technical Committee will provide technical support to the National Commission. It will evaluate specific NAMAs, including their MRV component integrated in all phases of the project cycle. The Technical Committee will submit evaluation reports to the National Commission. The Working Group will support the Technical Committee on MRV and NAMA with informal consultations as needed. According to its competencies, the Working Group MRV - NAMA will cover all areas of expertise needed to develop NAMA, being made up of national experts, who will get involved at the request of NAMA beneficiaries, while consultancy relationships will be determined upon free negotiations between the parties. Initially the Working Group MRV-NAMA will be posted in the MoEN, having the support of the Climate Change Office. Later, when Environmental Protection Agency (EPA) is established in the Republic of Moldova, the Working Group MRV-NAMA might be taken over by EPA.

6.3. Domestic MRV System Use

The National MRV System will be focused on the three types of MRV:

1. MRV of GHG emissions;
2. MRV of NAMA projects and activities focused on reducing GHG emissions;
3. MRV of the support obtained from external donors for supported NAMA projects.

MRV for GHG emissions include identifying and/or defining institutional roles and responsibilities clearly spelled out to ensure smooth movement and standardization of information for all entities which develops; reports; and verifies GHG estimates. It is expected the current MRV system of GHG emissions will be further developed and improved by establishing an appropriate regulatory framework.

MRV for NAMA projects and activities focused on reducing GHG emissions will be developed for three types of measures:

a) Unilateral NAMA - reducing GHG emissions through nationally appropriate mitigation actions implemented with domestic financial support;

b) NAMA developed with donor support - reducing GHG emissions through nationally appropriate mitigation actions implemented with external financial support;

c) CDM Projects - reducing GHG emissions through carbon financing mechanisms.

To reduce costs and the time of the staff involved in the implementation of the MRV system, NAMA projects will be monitored using templates. In this respect, the regulatory framework will also require periodic filling in of said templates, with updated information about the proposed or on-going NAMAs, which shall be submitted to the Climate Change Office for processing. When the Environmental Protection Agency (EPA) is established, the MRV authorities for unilateral NAMAs will pertain to it. The templates will serve for monitoring of emission reductions for NAMA projects of all categories. However, the NAMA projects of type (b) and (c) will have their own MRV systems, while in the NAMA projects of type (b) the MRV system will be set up by donors. In case of NAMA projects of type (c), the MRV system will comply with UNFCCC requirements. The templates for NAMA projects of type (a) and (b) shall include: data on support obtained for the specific NAMA, such as: financial flows and their impact; transfer of technology and its impact; capacity building and associated impact, etc.

Regarding the process of NAMA approval, whether it has the support of donors, or it of CDM type, it shall be submitted to the National Commission in two stages. First, a concept note on the NAMA project will be sent and in the second stage – the NAMA as such. Both documents will have a chapter on the MRV system. During preparation of the Concept Note of the NAMA project, the beneficiaries will apply to the Working Group MRV-NAMA for advice if needed.

The National Commission, upon evaluation of the NAMA Project Concept Note or of the NAMA project itself, will issue a decision approving or rejecting the document submitted for approval. Schematically, the processing of a NAMA project proposal by the National Commission is shown in Figure 6-2.

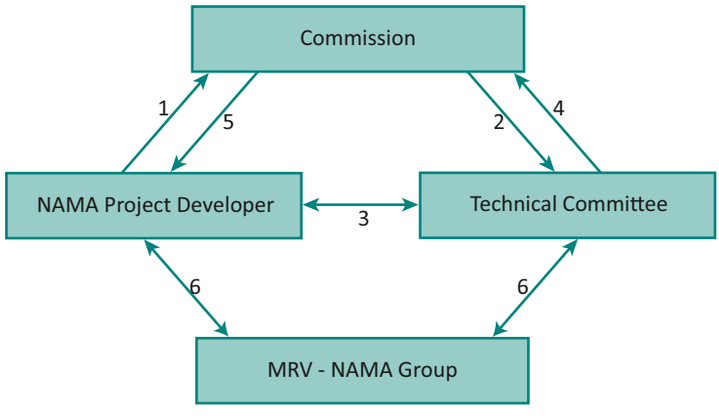


Figure 6.2: Processing of a NAMA Project Proposal by the National Commission (figures show sequence of actions)

At the time of the NAMA Project Concept Note approval, it will be decided who will maintain communication with the UNFCCC in order to record the NAMA project.

The regulatory framework for the implementation of the National Concept for NAMA MRV mentioned above is being developed under the UNDP Low Emission Capacity Building Project which will be over in December 2016.

Within the same project, of a total number of 136 NAMA proposals, 2 priority NAMAs were selected for each of the seven sectors (power generation, transport, buildings, industry, agriculture, forestry and waste) by applying the Multiple-Criteria Decision Analysis. Respectively, of the total of 14 priority NAMAs identified at the first stage four NAMAs have been selected to be developed in detail as full project proposals to be submitted to donors for seeking financial support, and for being registered in the UNFCCC NAMA Register.

BIBLIOGRAPHY

1. **Agenția "Moldsilva" (Moldsilva Agency),** *Evidențe statistice, rapoarte pentru perioada (Statistical data, reports for period) 1990-2013(formularele 1 g.s., 2 g.s., 3 g.s., etc.).*
2. **Agenția Națională pentru Reglementare în Energetică (National Regulatory Agency in Energy) (2010),** *Raport despre activitatea Agenției Naționale pentru Reglementare în Energetică în anul 2009 (Activity Report of the National Regulatory Agency in Energy, 2009)* . Chișinău, 2010. – 55 p.
3. **Agenția Națională pentru Reglementare în Energetică (National Regulatory Agency in Energy) (2011),** *Raport despre activitatea Agenției Naționale pentru Reglementare în Energetică în anul 2010. (Activity Report of the National Regulatory Agency in Energy, 2010.)* Chișinău, 2011. – 70 p.
4. **Agenția Națională pentru Reglementare în Energetică (National Regulatory Agency in Energy) (2011),** *Raport despre activitatea Agenției Naționale pentru Reglementare în Energetică în anul 2011. (Activity Report of the National Regulatory Agency in Energy, 2011).* Chișinău, 2011. – 57 p.
5. **Agenția Națională pentru Reglementare în Energetică (National Regulatory Agency in Energy) (2012),** *Raport despre activitatea Agenției Naționale pentru Reglementare în Energetică în anul 2012. (Activity Report of the National Regulatory Agency in Energy, 2012).* Chișinău, 2012. – 70 p.
6. **Agenția Națională pentru Reglementare în Energetică (National Regulatory Agency in Energy) (2013),** *Raport despre activitatea Agenției Naționale pentru Reglementare în Energetică în anul 2013. (Activity Report of the National Regulatory Agency in Energy, 2013).* Chișinău, 2013. – 65 p.
7. **Agenția Națională pentru Reglementare în Energetică (National Regulatory Agency in Energy) (2014),** *Raport despre activitatea Agenției Naționale pentru Reglementare în Energetică în anul 2014. (Activity Report of the National Regulatory Agency in Energy, 2014).* Chișinău, 2014. – 85 p.
8. **Agenția Relații Funciare și Cadastru (Agency for Land Relations and Cadastre),** *Cadastrele funciare de stat pentru perioada 1979-2013. (State Land Cadastre for period 1979-2013).*
9. **Banaru, Anatol (2000),** *Metodica pentru determinarea emisiilor cu efect de seră din solurile arabile (Methodology for greenhouse gas emissions assessment from arable soils)* . În culegerea de lucrări „Schimbarea Climei. Cercetări, studii, soluții". Ministerul Mediului și Amenajării Teritoriului / PNUD Moldova (in „Climate Change: Research, studies, solutions" Ministry of Environment and territory Improvements /UNDP Moldova) . „Bons Offices" S.R.L. Chișinău, 2000. p. 115-123.
10. **Biroul Național de Statistică al Republicii Moldova (National Bureau for Statistics of the Republic of Moldova) (2005),** *Balanța Energetică în anul 2004 pe Republica Moldova (Energy Balance 2004 for the Republic of Moldova).* Mun. Chișinău.
11. **Biroul Național de Statistică al Republicii Moldova (National Bureau for Statistics of the Republic of Moldova) (2006),** *Balanța Energetică în anul 2005 pe Republica Moldova (Energy Balance 2005 for the Republic of Moldova).* Mun. Chișinău.
12. **Biroul Național de Statistică al Republicii Moldova (National Bureau for Statistics of the Republic of Moldova) (2006),** *Anuarul Statistic al Republicii Moldova, 2006 (Energy Balance 2006 for the Republic of Moldova).* Chișinău, Î.S. F.E.-P. „Tipografia Centrală" – Statistica Moldovei, 560 p.
13. **Biroul Național de Statistică al Republicii Moldova (National Bureau for Statistics of the Republic of Moldova) (2007),** *Balanța Energetică a Republicii Moldova 2006. Culegere statistică (Energy Balance 2006 for the Republic of Moldova. Statistical Report).* Chișinău: Statistica, 2007 (Combinatul Poligrafic), 121 p.
14. **Biroul Național de Statistică al Republicii Moldova (National Bureau for Statistics of the Republic of Moldova) (2007),** *Anuarul Statistic al Republicii Moldova (Annual Statistics of the Republic of Moldova), 2007.* Chișinău, 2007, 560 p.
15. **Biroul Național de Statistică al Republicii Moldova (National Bureau for Statistics of the Republic of Moldova) (2008),** *Balanța Energetică a Republicii Moldova 2007. Culegere statistică (Energy Balance 2007 for the Republic of Moldova. Statistical Report).* Chișinău: Statistica, 2008 (Combinatul Poligrafic), 129 p.
16. **Biroul Național de Statistică al Republicii Moldova (National Bureau for Statistics of the Republic of Moldova) (2008),** *Anuarul Statistic al Republicii Moldova (Annual Statistics of the Republic of Moldova), 2008.* Chișinău, 2008, (F.E.-P. „Tipografia Centrală"). - (Statistica Moldovei). 580 p.
17. **Biroul Național de Statistică al Republicii Moldova (National Bureau for Statistics of the Republic of Moldova) (2009),** *Balanța Energetică a Republicii Moldova 2008. Culegere statistică (Energy Balance 2008 for the Republic of Moldova. Statistical Report).* Chișinău: Statistica, 2009 (Combinatul Poligrafic), 129 p.
18. **Biroul Național de Statistică al Republicii Moldova (National Bureau for Statistics of the Republic of Moldova) (2009),** *Anuarul Statistic al Republicii Moldova (Annual*

Statistics of the Republic of Moldova), 2009. Ch.: Statistică, 2009 (F.E.-P. „Tipografia Centrală"). - (Statistica Moldovei). 576 p.

19. **Biroul Național de Statistică al Republicii Moldova (National Bureau for Statistics of the Republic of Moldova) (2010)**, *Balanța Energetică a Republicii Moldova 2009. Culegere statistică (Energy Balance 2009 for the Republic of Moldova. Statistical Report)*. Chișinău: Statistica, 2010 (Statistica Moldovei), 178 p.
20. **Biroul Național de Statistică al Republicii Moldova (National Bureau for Statistics of the Republic of Moldova) (2010),** *Anuarul Statistic al Republicii Moldova (Annual Statistics of the Republic of Moldova), 2010*. Ch.: Statistică, 2010 (F.E.-P. „Tipografia Centrală"). - (Statistica Moldovei). 572 p.
21. **Biroul Național de Statistică al Republicii Moldova (National Bureau for Statistics of the Republic of Moldova) (2011)**, *Balanța Energetică a Republicii Moldova 2010. Culegere statistică (Energy Balance 2010 for the Republic of Moldova. Statistical Report)*. Chișinău: Statistica, 2011 (Statistica Moldovei), 71 p.
22. **Biroul Național de Statistică al Republicii Moldova (National Bureau for Statistics of the Republic of Moldova) (2011),** *Anuarul Statistic al Republicii Moldova (Annual Statistics of the Republic of Moldova), 2011*. Ch.: Statistică, 2011 (S.C. „Europres" S.R.L.). - (Statistica Moldovei). 564 p.
23. **Biroul Național de Statistică al Republicii Moldova (National Bureau for Statistics of the Republic of Moldova) (2012)**, *Balanța Energetică a Republicii Moldova 2011. Culegere statistică (Energy Balance 2011 for the Republic of Moldova. Statistical Report)*. Chișinău: Statistica, 2012 (Statistica Moldovei), 73 p.
24. **Biroul Național de Statistică al Republicii Moldova (National Bureau for Statistics of the Republic of Moldova) (2012),** *Anuarul Statistic al Republicii Moldova (Annual Statistics of the Republic of Moldova), 2012*. Ch.: Statistică, 2012 (Î.S. F.E.-P. „Tipografia Centrală"). - (Statistica Moldovei). 560 p.
25. **Biroul Național de Statistică al Republicii Moldova (National Bureau for Statistics of the Republic of Moldova) (2013),** *Anuarul Statistic al Republicii Moldova (Annual Statistics of the Republic of Moldova), 2013*. Ch.: Statistică, 2013 (S.C. Î.S. F.E.-P. „Tipografia Centrală"). - (Statistica Moldovei). 556 p.
26. **National Bureau of Statistics of the Republic of Moldova (2013)** Statistical Database <http://statbank.statistica.md/pxweb/Dialog/varval.asp?ma=IND0301&ti=Productia principalelor produse industriale%2C 1997-2013&path=../Database / EN / 14% 20IND / IND03 / & lang = 1>.
27. **Biroul Național de Statistică al Republicii Moldova (National Bureau for Statistics of the Republic of Moldova) (2013),** Baza de date statistice. Indicatorii Revizuiți ai Obiectivelor Dezvoltării Mileniului (Statistical database. Reviewed Indicators of the Millenium Development Goals), 2000- 2013<http://statbank.statistica.md/pxweb/Dialog/varval.asp?ma=ODM0101&ti=Indicatorii revizuiti ai Obiectivelor Dezvoltarii Mileniului%2C 2000-2013&path=../Database / E / ODM / & lang = 1>.
28. **Biroul Național de Statistică (National Bureau for Statistics) (1990-2014),** *Raport Statistic (anual) nr. 24-agr „Starea sectorului zootehnic". Efectivul animalelor și păsărilor în gospodăriile de toate categoriile la 1 ianuarie (rapoarte anuale pentru perioada 1990-2013) (Annual Statistical Report No. 24-agr „Condition of the Livestock Sector". Number of livestock and poultry in all categories of farms as of January 01 for period 1990-2013)*.
29. **Biroul Național de Statistică (National Bureau for Statistics) (1990-2014),** *Raport Statistic (anual) nr. 24-agr „Starea sectorului zootehnic". Indicatorii de bază a dezvoltării sectorului zootehnic în gospodăriile de toate categoriile pe Republica Moldova (rapoarte anuale pentru 1990-2013) (Annual Statistical Report No. 24-agr „Condition of the Livestock Sector". Basic indicators of the livestock sector development in all categories of farms of the Republic of Moldova, annual reports for period 1990-2013)*.
30. **Biroul Național de Statistică al Republicii Moldova (National Bureau for Statistics of the Republic of Moldova) (2014),** *Anuarul Statistic al Republicii Moldova (Annual Statistics of the Republic of Moldova), 2014*. Ch.: Statistică, 2014 (S.C. Î.S. F.E.-P. „Tipografia Centrală"). - (Statistica Moldovei). 558 p.
31. **Capcelea Arcadie, Lozan Aurel, Lupu Ion, et al. (2011),** *Studiul analitic privind consumul de masă lemnoasă în Republica Moldova (Analytical study on wood consumption in the Republic of Moldova)*. Agenția "Moldsilva", Ch., 48 p.
32. **Departamentul de Stat pentru Statistică al Republicii Moldova (State Department for Statistics of the Republic of Moldova) (1992)**, *Economia Națională a Republicii Moldova, 1991. Anuar Statistic (National Economy of the Republic of Moldova 1991. Annual Statistics)*. Ch.: Tipografia C.P.C., 406 p.
33. **Departamentul de Stat pentru Statistică al Republicii Moldova (State Department for Statistics of the Republic of Moldova) (1994)**, *Anuarul Statistic al Republicii Moldova (Annual Statistics of the Republic of Moldova), 1992*. Ch.: Universitas, 1994, 372 p.
34. **Departamentul Statisticii al Republicii Moldova (State Department for Statistics of the Republic of Moldova) (1994)**, *Balanța Energetică în anul 1993 pe Republica Moldova (fără Transnistria) (Energy Balance 1993 for the Republic of Moldova without Transnistria)*. Mun. Chișinău.
35. **Departamentul Statisticii al Republicii Moldova (Statistical Department of the Republic of Moldova) (1994)**, *Anuarul Statistic al Republicii Moldova (Annual Statistics of the Republic of Moldova) , 1993*. Ch.: "Statistica", 1994, 448 p.
36. **Departamentul Statisticii al Republicii Moldova (Statistical Department of the Republic of Moldova) (1995)**, *Balanța Energetică în anul 1994 pe Republica Moldova (fără Transnistria) (Energy Balance 1994 for the Republic of Moldova without Transnistria)*. Mun. Chișinău.
37. **Departamentul Statisticii al Republicii Moldova (Statistical Department of the Republic of Moldova) (1995)**, *Anuarul Statistic al Republicii Moldova (Annual Statistics of the Republic of Moldova), 1994*. Chișinău: Combinatul Poligrafic, 1995, 420 p.
38. **Departamentul Statisticii al Republicii Moldova (Statistical Department of the Republic of Moldova) (1996)**, *Anuarul Statistic al Republicii Moldova (Annual Statistics of the Republic of Moldova), 1995*. Chișinău: Combinatul Poligrafic, 1996, 464 p.
39. **Departamentul Statisticii al Republicii Moldova, Centrul Principal de Calcul (Statistical Department of the**

Republic of Moldova. Main Computing Center) (1996), *Balanța Energetică în anul 1995 pe Republica Moldova (Energy Balance 1995 for the Republic of Moldova)*. Mun. Chișinău.

40. **Departamentul Statisticii al Republicii Moldova (Statistical Department of the Republic of Moldova) (1997)**, *Anuarul Statistic al Republicii Moldova (Annual Statistics of the Republic of Moldova), 1996.* Chișinău: Editura „Știința", 1997, 528 p.
41. **Departamentul Statisticii al Republicii Moldova (Statistical Department of the Republic of Moldova) (1997)**, *Balanța Energetică în anul 1996 pe Republica Moldova (Energy Balance 1996 for the Republic of Moldova)*. Mun. Chișinău.
42. **Departamentul Analize Statistice și Sociologie al Republicii Moldova, Centrul Principal de Calcul (Department for Statistical Analyses and Sociology of the Republic of Moldova, Main Computing Center) (1998)**, *Balanța Energetică în anul 1997 pe Republica Moldova (Energy Balance 1997 for the Republic of Moldova)*. Mun. Chișinău.
43. **Departamentul Analize Statistice și Sociologie al Republicii Moldova, Centrul Principal de Calcul (Department for Statistical Analyses and Sociology of the Republic of Moldova, Main Computing Center) (1999)**, *Balanța Energetică în anul 1998 pe Republica Moldova (Energy Balance 1998 for the Republic of Moldova)*. Mun. Chișinău.
44. **Departamentul Analize Statistice și Sociologie al Republicii Moldova, Centrul Principal de Calcul (Department for Statistical Analyses and Sociology of the Republic of Moldova, Main Computing Center) (2000)**, *Balanța Energetică în anul 1999 pe Republica Moldova (Energy Balance 1999 for the Republic of Moldova)*. Mun. Chișinău.
45. **Departamentul Analize Statistice și Sociologie al Republicii Moldova (Department for Statistical Analyses and Sociology of the Republic of Moldova) (2001)**, *Anuarul Statistic al Republicii Moldova (Annual Statistics of the Republic of Moldova), 1999.* Chișinău: Statistica, 526 p
46. **Departamentul Statistică și Sociologie al Republicii Moldova (Department for Statistical Analyses and Sociology of the Republic of Moldova) (2001)**, *Balanța Energetică în anul 2000 pe Republica Moldova (Energy Balance 2000 for the Republic of Moldova)*. Mun. Chișinău.
47. **Departamentul Statistică și Sociologie al Republicii Moldova (Department for Statistical Analyses and Sociology of the Republic of Moldova) (2002)**, *Balanța Energetică în anul 2001 pe Republica Moldova (Energy Balance 2001 for the Republic of Moldova)*. Mun. Chișinău.
48. **Departamentul Statistică și Sociologie al Republicii Moldova (Department for Statistical Analyses and Sociology of the Republic of Moldova) (2003)**, *Anuarul Statistic al Republicii Moldova (Annual Statistics of the Republic of Moldova), 2003.* Chișinău: Statistica, 704 p
49. **Departamentul Statistică și Sociologie al Republicii Moldova (Department for Statistical Analyses and Sociology of the Republic of Moldova) (2003)**, *Balanța Energetică în anul 2002 pe Republica Moldova (Energy Balance 2002 for the Republic of Moldova)*. Mun. Chișinău.
50. **Departamentul Statistică și Sociologie al Republicii Moldova (Department for Statistical Analyses and Sociology of the Republic of Moldova) (2004)**, *Anuarul Statistic al Republicii Moldova (Annual Statistics of the Republic of Moldova), 2004.* Chișinău: Statistica, 738 p
51. **Departamentul Statistică și Sociologie al Republicii Moldova (Department for Statistical Analyses and Sociology of the Republic of Moldova) (2004)**, *Balanța Energetică în anul 2003 pe Republica Moldova (Energy Balance 2003 for the Republic of Moldova)*. Mun. Chișinău.
52. **Departamentul Statistică și Sociologie al Republicii Moldova (Department for Statistical Analyses and Sociology of the Republic of Moldova) (2005)**, *Anuarul Statistic al Republicii Moldova (Annual Statistics of the Republic of Moldova), 2005.* Chișinău: Statistica, 555 p
53. **ECE Convention on Long-Range Transboundary Air Pollution and European Environment Agency EMEP/CORINAIR (2000),** *Atmospheric Emission Inventory Guidebook.* Second Edition from September 1999, Volumes 1, 2 and 3.
54. **EEA (2005),** *EMEP/CORINAIR Emission Inventory Guidebook – 2005,* European Environment Agency, Technical report No 30. Copenhagen, Denmark, December 2005. (available on: <http://reports.eea.eu.int/EMEPCORINAIR4/en>).
55. **EEA (2009),** *EMEP/EEA Air Pollution Emission Inventory Guidebook 2009, Technical guidance to prepare national emission inventories.* European Environment Agency, Technical report No 9/2009. Copenhagen, Denmark, (available on: <http://www.eea.europa.eu/publications/emep-eea-emission-inventory-guidebook-2009>).
56. **EEA (2013),** *EMEP/EEA Air Pollution Emission Inventory Guidebook 2013, Technical guidance to prepare national emission inventories.* European Environment Agency, Technical report No 12/2013. Copenhagen, Denmark, (available on: <http://www.eea.europa.eu//publications/emep-eea-guidebook-2013>).
57. **Food and Agriculture Organization of the United Nations (2013),** FAOSTAT / FAO Statistics Division, 15 February 2013: <http://faostat.fao.org/site/609/DesktopDefault.aspx?PageID=609#ancor>.
58. **Galupa D., Talmaci I., Șpitoc L. (2005),** *Studiul pentru Republica Moldova „Asigurarea durabilității pădurilor și mijloacelor de trai prin perfecționarea guvernării și controlului asupra tăierilor ilicite" (Study for the Republic of Moldova „Ensuring sustainability of forests and livelihoods through improved governance and control of illegal logging")* . Chișinău, Centrul editorial al UASM, 116 p.
59. **Galupa D., Talmaci I., Șpitoc L. (2006),** *Sectorul forestier din Republica Moldova – probleme, realizări, perspective (Forestry sector of the Republic of Moldova: problems, achivements, prospects)* . Chișinău, Centrul editorial al UASM, 27 p.
60. **Galupa Dumitru, Platon Ion et al. (2011),** *Raport privind starea sectorului forestier din Republica Moldova: perioada 2006-2010 (Report on the Condition of the Forestry Sector of the Republic of Moldova: 2006-2010 period)*. Agenția "Moldsilva"; Ch., 48 p.
61. **Galupa Dumitru, Ciobanu Anatol, Scobioală Marian et al. (2011),** *Tăierile ilicite ale vegetației forestiere în Republica Moldova. Studiu analitic (Illegal Logging of the Forestry Vegetation in the Republic of Moldova. Analytical Study)*, Ch., Agenția "Moldsilva", 38 p.
62. **Gil-Alana LA (2008),** *Time trend estimation with breaks in temperature lime series*. Clim Change 89: 325-337.
63. **Inspectoratul Ecologic de Stat (State Ecological Inspectorate) (2009),** *Anuarul IES – 2008 "Protecția mediului*

în Republica Moldova" (SEI Annual Report 2008: Protection of the Environment in the Republic of Moldova) / Iurie Stamatin, Alexandru Apostol, Mihai Mustea [et al.]. – Ch. : "A.V.i.T. Publ" SRL, 2009 (Tipogr. "Continental-Grup" SRL). – 288 p.

64. **Inspectoratul Ecologic de Stat (State Ecological Inspectorate) (2011),** *Anuarul IES – 2010 „Protecția mediului în Republica Moldova" (SEI Annual Report 2010 „Environmental Protection in the Republic of Moldova")* ; col. red.: Grigore Prisăcaru, Valentina Țapiș, Vadim Stîngaci [et al.]. – Ch.: S.n., 2011 (Tipogr. - "Sirius" SRL) – 232 p.

65. **Inspectoratul Ecologic de Stat (State Ecological Inspectorate) (2012),** *Anuarul IES – 2011 „Protecția mediului in Republica Moldova" (SEI Annual Report 2011 „Environmental Protection in the Republic of Moldova")*; col. red.: Gr. Prisăcaru, V. Țapiș, V. Stingaci [et al.]. – Ch. : Continental Grup, 2012. – 248 p.

66. **Inspectoratul Ecologic de Stat (State Ecological Inspectorate) (2013),** *Anuarul IES-2012 «Protecția mediului in Republica Moldova» (SEI Annual Report 2012 „Environmental Protection in the Republic of Moldova")* elab.: V. Untila [et al.]. - Ch.: Pontos, 2013 (Tipografia «Europres»).

67. **Inspectoratul Ecologic de Stat (State Ecological Inspectorate) (2014),** *Anuarul IES-2013 «Protecția mediului in Republica Moldova» (SEI Annual Report 2013 „Environmental Protection in the Republic of Moldova")* elab.: V. Curari [et al.]. - Ch.: Pontos, 2014 (Tipografia «Europres»).

68. **IPCC (1997)**, *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories Vol 1-3,* Intergovernmental Panel on Climate Change.

69. **IPCC/OECD/IEA (2000),** *IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories,* Intergovernmental Panel on Climate Change, Organization for Economic Co-operation and Development, and International Energy Agency, Tokyo.

70. **IPCC (2003),** *Good Practice Guidance for Land Use, Land-Use Change and Forestry*. [Internet] Intergovernmental Panel on Climate Change. Available from: <http://www.ipccnggip.iges.or.jp/lulucf/gpglulucf_unedit.html> [Accessed on December 2003].

71. **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>.

72. **IPCC (2007),** *Climate change 2007: The physical science basis. Contribution of Working Group I to the Fourth Assessment Report. Summary for policymakers* [Solomon S. Qin 0, Manning M, Chen Z, Marquis M. Averyl KB, Tignor M, Miller HL (eds)]. Cambridge University Press, Cambridge, p 1-18.

73. **IPCC (2013),** *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 1535 pp, doi: 10.1017/CBO9781107415324.

74. **IPCC (2014),** *Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland, 151 pp.

75. **Ministerul Agriculturii şi Industriei Prelucrătoare / Institutul de Cercetări pentru Pedologie, Agrochimie şi Hidrologie „N. Dimo" (Ministry of Agriculture and Processing Industry / Research Institute for Pedology, Agrochemistry and Hydrology „N. Dimo") (2001),** *Programul național complex de sporire a fertilității solului în 2001-2020 (National Complex Programme for Soil Fertility Improvement for 2001-2020).* Redactor responsabil membr. coresp. al AŞM dr.hab.șt.ag., S. Andrieș. Alcătuitor responsabil dr.hab.șt.ag., prof. V. Cerbari. Ch.: Pontos, 2001, (Tipografia Reclama). - 130 p.

76. **Ministerul Agriculturii şi Industriei Prelucrătoare / Agenția de Stat pentru Relații Funciare şi Cadastru / Institutul de Cercetări pentru Pedologie şi Agrochimie „N. Dimo" / Institutul de Proiectări pentru Organizarea Teritoriului (Ministry of Agriculture and Processing Industry / State Agency for Land Relations and Cadastre / Research Institute for Pedology, Agrochemistry and Hydrology „N. Dimo" / Institute for Projects in Territory Development) 2004,** *Programul complex de valorificare a terenurilor degradate şi sporirea fertilității solului. Partea I Ameliorarea terenurilor degradate (Complex Programme for Use of Degraded Land and Soil Fertility Improvement. Part I. Improvement of Degraded Land).* Redactor responsabil memb. cores. al AŞM dr.hab.șt.ag., S. Andrieș. Ch.: Pontos, 2004, (Tipografia Reclama). - 212 p.

77. **Ministerul Agriculturii şi Industriei Prelucrătoare / Agenția de Stat pentru Relații Funciare şi Cadastru / Institutul de Cercetări pentru Pedologie şi Agrochimie „N. Dimo" / Institutul de Proiectări pentru Organizarea Teritoriului (2004) (Ministry of Agriculture and Processing Industry / State Agency for Land Relations and Cadastre / Research Institute for Pedology, Agrochemistry and Hydrology „N. Dimo" / Institute for Projects in Territory Development),** *Programul complex de valorificare a terenurilor degradate şi sporirea fertilității solului. Partea II Sporirea fertilității solurilor (Complex Programme for Use of Degraded Land and Soil Fertility Improvement. Part II. Soil fertility Improvement).* Redactor responsabil membr. coresp. al AŞM dr.hab.șt.ag., S. Andrieș. Ch.: Pontos, 2004, (Tipografia Reclama). - 128 p.

78. **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.

79. **Ministerul Ecologiei, Construcțiilor şi Dezvoltării Teritoriului /PNUD Moldova (Ministry of Ecology, Construction and Territory Development / UNDP Moldova) (2002),** *Necesități tehnologice şi priorități de dezvoltare. Raport elaborat în cadrul Convenției Națiunilor Unite privind Schimbarea Climei (Technology Needs and Development Priorities. Report Developed within United Nations Framework Convention in Climate Change),* Chişinău: Cartdidact, 2002 (Tipografia „Reclama"), 176 p.

80. **Ministerul Ecologiei, Construcțiilor şi Dezvoltării Teritoriului / Institutul Național de Ecologie (Ministry of Ecology, Construction and Territory Development / National Institute for Ecology) (2003),** *Starea mediului în Republica Moldova în anul 2002 (Raport Național (State of*

the Environment in the Republic of Moldova in 2002. National Report). Chișinău, Mediul Ambiant, 2003, 144 p.

81. **Ministerul Ecologiei și Resurselor Naturale / Institutul Național de Ecologie (Ministry of Ecology and Natural Resources / National Institute for Ecology) (2004),** *Starea mediului în Republica Moldova în anul 2003 (Raport Național) (State of the Environment in the Republic of Moldova in 2003. National Report).* Chișinău, Institutul Național de Ecologie, 2004, 130 p.
82. **Ministerul Ecologiei și Resurselor Naturale / Institutul Național de Ecologie (Ministry of Ecology and Natural Resources / National Institute for Ecology) (2005),** *Starea mediului în Republica Moldova în anul 2004 (Raport Național) (State of the Environment in the Republic of Moldova in 2004. National Report).* Chișinău, Institutul Național de Ecologie, 2005, 123 p.
83. **Ministerul Ecologiei și Resurselor Naturale / Academia de Științe a Moldovei / Institutul de Ecologie și Geografie (Ministry of Ecology and Natural Resources / Academy of Sciences of Moldova / Institute for Ecology and Geography) (2006),** *Starea mediului în Republica Moldova în anul 2005 (Raport Național) (State of the Environment in the Republic of Moldova in 2005. National Report).* Chișinău, Institutul de Ecologie și Geografie, 2006, 116 p.
84. **Ministerul Ecologiei și Resurselor Naturale / Academia de Științe a Moldovei / Institutul de Ecologie și Geografie (Ministry of Ecology and Natural Resources / Academy of Sciences of Moldova / Institute for Ecology and Geography) (2007),** *Starea mediului în Republica Moldova în anul 2006 (Raport Național) (State of the Environment in the Republic of Moldova in 2006. National Report).* Ch.: S.n., 2007, 103 p.
85. **Ministerul Ecologiei și Resurselor Naturale al Republicii Moldova (Ministry of Ecology and Natural Resources of the Republic of Moldova (2008),** *Protecția mediului în Republica Moldova: (Raport Național pentru conferința ministerială de la Belgrad, Serbia) (Environmental Protection in the Republic of Moldova: National Report for Interministerial Conference, Belgrade, Serbia)* – Chișinău, 2008, - 64 p.
86. **Ministerul Ecologiei și Resurselor Naturale, Inspectoratul Ecologic de Stat (Ministry of Ecology and Natural Resources, State Ecological Inspectorate) (2008),** *Anuarul "Calitatea factorilor de mediu și activitatea Inspectoratului Ecologic de Stat – anul 2007"(Annual Report „Quality of Environmental Factors and Activity of the State Ecological Inspectorate in 2007)* – Chișinău, 2008 – 202 p.
87. **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.
88. **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.
89. **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.* Coordinators: Gheorghe Salaru, George Manful; Project Team: Vasile Scorpan, Aliona Solomon. Authors: Taranu, M., Bicova, E., Postolatii, V., Brega, V., Tarita, A., Cosman, S., Cremeneac, L., Cerbari, V., Bacean, I., Talmaci, I., Tugui, T., Guvir, T. – Ch.: "Imprint Plus" SRL, 2013. - 379 p.
90. **Ministry of Environment of Republic of Moldova / United Nations Environmental Programme (2013),** *Third National Communication of the Republic of Moldova under the United Nations Framework Convention on Climate Change.* Coordinators: Gheorghe Salaru, George Manful. Synthesis team: Taranu M., Comendant I., Taranu L., Druta A., Trescilo L., Voda D. – Ch.: "Imprint Plus" SRL, 2013. - 397 p.
91. **Ministry of Environment of Republic of Moldova / United Nations Development Programme (2015),** *Conceptual Framework for MRV of NAMAs in the Republic of Moldova.* Developed by: Morten Pedersen, Coordinator ApS, MRV of NAMAs International Expert (Denmark). - Chisinau, 12 January 2015. - 41 p. <http://clima.md/doc.php?l=en&idc=267&id=3640>.
92. **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>.
93. **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.
94. **Ministry of Environment of Republic of Moldova / United Nations Development Programme (2015),** *Report on the technical review of the National Greenhouse Gas (GHG) Inventories of the Republic of Moldova – LULUCF Sector.* Realized by: Viorel Nelu Blujdea (Romania). - Chisinau, 15 December 2015. - 14 p. <http://clima.md/doc.php?l=ro&idc=82&id=3853>.
95. **Ministry of Environment of Republic of Moldova / United Nations Development Programme (2015),** *Report on the technical review of the National Greenhouse Gas (GHG) Inventories of the Republic of Moldova – Energy Sector.* Realized by: Veronika Ginzburg (Russian Federation). - Chisinau, 17 December 2015. - 16 p. <http://clima.md/doc.php?l=en&idc=82&id=3852>.
96. **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.
97. **Ministerul Mediului / Programul Națiunilor Unite pentru Dezvoltare (Ministry of Environment / United Nations Development Programme) (2015),** *Dezvoltarea Sistemului național de inventariere a emisiilor de gaze cu efect de seră. Ghid practic pentru utilizatori (Development of the National*

System for Greenhouse Gas Emission Inventory. Practical Guidebook for Users). Autori: Marius Țăranu, Elena Bîcova, Vladimir Brega, Anatol Tărîță, Sergiu Coşman, Ion Talmaci, Tatiana Țugui. Coord.: Serghei Palihovici, Silvia Pană-Carp. Echipa proiectului: Vasile Scorpan, Aliona Solomon, Sergiu Ungureanu, Tatiana Tribolo. - Ch.: Tipografia Centrală, 2015 - 83 p. <http://clima.md/doc.php?l=ro&idc=267&id=3711>.

98. **Ministerul Mediului (Ministry of Environment) (2011),** *Starea mediului în Republica Moldova în anii 2007-2010. (Raport Național) (State of the Environment in the Republic of Moldova during 2007-2010. National Report).* – Ch.: S.n., (Tipografia „Nova-Imprim" SRL). – 2011. – 192 p.
99. **Monitorul Oficial al RM (Official Gazette of RM) Nr. 177-184 din 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 on Roadmap in the Energy Sector for 2015-2030).*
100. **Monitorul Oficial al RM (Official Gazette of RM) Nr. 178-184 din 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 on Heat and Cogeneration Promotion).*
101. **Monitorul Oficial al RM (Official Gazette of RM) Nr. 104-109 din 06.05.2014,** *Hotărârea Guvernului RM 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 (Government Decision on Approval of the Environmental Strategy for 2014-2023 and Action Plan for its Implementation).*
102. **Monitorul Oficial al RM (Official Gazette of RM) Nr. 152 din 10.06.2014,** *Hotărârea Guvernului RM Nr. 409 din 04.06.2014 cu privire la aprobarea Strategiei naționale de dezvoltare agricolă și rurală pentru anii 2014-2020 (Government Decision on Approval of the National Strategy for Agricultural and Rural Development for 2014-2020).*
103. **Monitorul Oficial al RM (Official Gazette of RM) Nr. 297-309 din 10.10.2014,** *Parlamentul RM. Legea Nr. 128 din 11.07.2014 privind performanța energetică a clădirilor (Parliament of the RM. Law on Energy Performance of Buildings).*
104. **Monitorul Oficial al RM (Official Gazette of RM) Nr. 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 on Approval of the National Plan for Extending Forest Areas for 2014-2018).*
105. **Monitorul Oficial al RM (Official Gazette of RM) Nr. 293-296 din 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 on Amending Law Approving National Development Strategy „Moldova – 2020") .*
106. **Monitorul Oficial al RM (Official Gazette of RM) Nr. 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 on Labelling Products with Energy Impact).*
107. **Monitorul Oficial al RM (Official Gazette of RM) Nr. 49-52 din 28.02.2014,** *Hotărârea Guvernului RM 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 (Government Decision on Approval of the Action Plan for Implementation of the Programme for Soil Conservation and Fertility Improvement for 2014-2016).*
108. **Monitorul Oficial al RM (Official Gazette of RM) Nr. 4-8 din 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 on Approval of the National Action Plan in Energy from Renewable Sources for 2013-2020).*
109. **Monitorul Oficial al RM (Official Gazette of RM) Nr. 284-289 din 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 on Approval of the Innovation Strategy of the Republic of Moldova „Innovation for Competitiveness" for 2013-2020).*
110. **Monitorul Oficial al RM (Official Gazette of RM) Nr. 82 din 12.04.2013,** *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 on Approval of the Strategy for Waste Management in the Republic of Moldova for 2013-2027).*
111. **Monitorul Oficial al RM (Official Gazette of RM) Nr. 31-35 din 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 on Approval of the National Action Plan in Energy Efficiency for 2013-2015).*
112. **Monitorul Oficial al RM (Official Gazette of RM) Nr. 64-68 din 29.03.2013,** *Parlamentul RM. Legea Nr. 57 din 10.03.2006 viei și vinului (Parliament of the RM, Law on Vineyards and Wine).*
113. **Monitorul Oficial al RM (Official Gazette of RM) Nr. 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 on Approval of the Energy Strategy of the Republic of Moldova till 2030).*
114. **Monitorul Oficial al RM (Official Gazette of RM) Nr. 245-247 din 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 on Approval of National Development Strategy „Moldova-2020").*
115. **Monitorul Oficial al RM (Official Gazette of RM) Nr. 126-129 din 22.06.2012,** *Hotărârea Guvernului RM Nr. 401 din 12.06.2012 cu privire la Fondul pentru Eficiență Energetică (Government Decision on Fund for Energy Efficiency).*
116. **Monitorul Oficial al RM (Official Gazette of RM) Nr. 197-202 din 18.11.2011,** *Hotărârea Guvernului RM Nr. 833 din 10.11.2011 cu privire la Programul național pentru eficiență energetică 2011-2020 (Government Decision on National Programme for Energy Efficiency for 2011-2020).*
117. **Monitorul Oficial al RM (Official Gazette of RM) Nr. 139-145din 26.08.2011,** *Hotărârea Guvernului RM Nr. 626 din 20.08.2011 cu privire la aprobarea Programului de conservare și sporire a fertilității solurilor pentru anii 2011-2020 (Government Decision on Approval of the Programme for Soil Conservation and Fertility Improvement for 2011-2020).*
118. **Monitorul Oficial al RM (Official Gazette of RM) Nr. 131-133 din 12.08.2011,** *Hotărârea Guvernului RM Nr. 593 din 01.08.2011 cu privire la aprobarea Programului național privind*

constituirea rețelei ecologice naționale pentru anii 2011-2018 (Government Decision on Approval of the National Programme on Establishment of the National Ecological Network for 2011-2018).

119. **Monitorul Oficial al RM (Official Gazette of RM) Nr. 155-158 din 03.09.2010,** *Parlamentul RM. Legea Nr. 142 din 02.07.2010 cu privire la eficiența energetică. (Parliament of the RM, Law on energy efficiency).*
120. **Monitorul Oficial al RM (Official Gazette of RM) Nr. 254-256 din 24.12.2010,** *Hotărârea Guvernului RM 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. (Government Decision on approval of possibilities for wood harvesting within main logging processes during 2011-2015).*
121. **Monitorul Oficial al RM (Official Gazette of RM) Nr. 254-256 din 24.12.2010,** *Hotărârea Guvernului RM Nr. 1173 din 21.12.2010 cu privire la Agenția pentru Eficiență Energetică. (Government Decision on Agency for Energy Efficiency).*
122. **Monitorul Oficial al RM (Official Gazette of RM) Nr. 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 on livestock selection and reproduction).*
123. **Monitorul Oficial al RM (Official Gazette of RM) Nr. 99-101 din 06.06.2008,** *Parlamentul RM. Legea Nr. 39 din 29.02.2008 privind protecția soiurilor de plante (Parliament of the RM, Law on protection plant species).*
124. **Monitorul Oficial al RM (Official Gazette of RM) Nr. 57-60 din 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 on Approval of National Strategy for Sustainable Development of the Agro-industrial complex of the Republic of Moldova).*
125. **Monitorul Oficial al RM (Official Gazette of RM) Nr. 51-54 din 14.03.2008,** *Parlamentul RM. Legea Nr. 221 din 19.10.2007 privind activitatea sanitar-veterinară (Parliament of the RM, Law on Sanitary-Veterinary Activity).*
126. **Monitorul Oficial al RM (Official Gazette of RM) Nr. 42-44 din 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 on Approval of Action Plan for Implementation of the National Development Strategy for 2008-2011).*
127. **Monitorul Oficial al RM (Official Gazette of RM) Nr. 18-20 din 29.01.2008,** *Parlamentul RM. Legea Nr. 295 din 21.12.2007 pentru aprobarea Strategiei naționale de dezvoltare pe anii 2008-2011 (Parliament of the RM, Law on Approval of the National Development Strategy for 2008-2011).*
128. **Monitorul Oficial al RM (Official Gazette of RM) Nr. 127-130 din 17.08.2007,** *Parlamentul RM. Legea Nr. 160 din 12.07.2007 energiei regenerabile (Parliament of the RM, Law on renewable energy).*
129. **Monitorul Oficial al RM (Official Gazette of RM) Nr. 164-167 din 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 on Strategy for Industry Development up to 2015).*
130. **Monitorul Oficial al RM (Official Gazette of RM) Nr. 83-86 din 02.06.2006,** *Hotărârea Guvernului RM Nr. 554 din 22.05.2006 privind aprobarea Programului de consolidare a terenurilor agricole. (Government Decision on approval of the Programme for land consolidation).*
131. **Monitorul Oficial al RM (Official Gazette of RM) Nr. 172-175 din 23.12.2005,** *Hotărârea Guvernului RM 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. (Government Decision on approval of possibilities for wood harvesting within main logging processes during 2006-2010).*
132. **Monitorul Oficial al RM (Official Gazette of RM) Nr. 83 din 28.05.2004,** *Parlamentul RM. Legea Nr. 78 din 18.03.2004 privind produsele alimentare (Parliament of the RM, Law on food products).*
133. **Monitorul Oficial al RM (Official Gazette of RM) Nr. 99-103 din 06.06.2003,** *Hotărârea Guvernului RM Nr. 636 din 26.05.2003 despre aprobarea Programului de valorificare a terenurilor noi și de sporire a fertilității solurilor. (Government Decision on approval of the Programme for use of new land plots and soil fertility enhancement).*
134. **Monitorul Oficial al RM (Official Gazette of RM) Nr. 200 din 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 on some actions for regeneration of swine genetic resources).*
135. **Monitorul Oficial al RM (Official Gazette of RM) Nr. 132-133 din 01.07.2003,** *Hotărârea Guvernului RM 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. (Government Decision on approval of the State Programme for regeneration and afforestation of forest areas for 2003-2020).*
136. **Monitorul Oficial al RM (Official Gazette of RM) Nr. 126-131 din 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 on implementation of the Strategy for sustainable development of the national forestry sector).*
137. **Monitorul Oficial al RM (Official Gazette of RM) Nr. 107 din 04.09.2001,** *Parlamentul RM. Legea Nr. 828 din 25.12.1991, Codul funciar (Parliament of the RM, Law on Land Code).*
138. **Monitorul Oficial al RM (Official Gazette of RM) Nr. 090 din 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, Law on Approval of the National Strategy and Action Plan for Biologic Diversity Conservation).*
139. **Monitorul Oficial al RM (Official Gazette of RM) Nr. 147-149 din 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 on regulatory price and methodology for purchase of land).*
140. **Monitorul Oficial al RM (Official Gazette of RM) Nr. 73-77 din 15.07.1999,** *Parlamentul RM. Legea Nr. 412 din 27.05.1999 zootehniei (Parliament of the RM, Law on livestock).*
141. **Monitorul Oficial al RM (Official Gazette of RM) Nr. 153-155 din 29.12.1999,** *Parlamentul RM. Legea Nr. 658 din*

29.10.1999 culturilor nucifere (Parliament of the RM, Law on walnut crops).

142. **Monitorul Oficial al RM (Official Gazette of RM) nr. 4-5/36 (16.01.1997),** *Codul silvic, nr. 887-XIII din 21.06.1996.*

143. **Monitorul Oficial al RM (Official Gazette of RM) Nr. 17-18 din 21.03.1996,** *Parlamentul RM. Legea Nr. 728 din 06.02.1996 cu privire la pomicultură (Parliament of the RM, Law on orchards).*

144. **National Agency for Energy Regulation (2009),** *Activity Report 2008 of the National Agency for Energy Regulation.* Chisinau, 2009. – 33 p.

145. **Sagar, A. (2000),** *Capacity development for the environment: A view from the south, a view from the north, in: Annual Review of Energy and Environment*. 2000, pages 377–439.

146. **Ţăranu, M. (2006),** *Development of the Republic of Moldova's Greenhouse Gas Inventory for 1990-2002*. Mediul Ambiant (Environment), Scientific Journal of Information and Ecological Culture, No. 4 (28), August 2006, ISSN: 1810-9551. Pag. 42-46.

147. **UNFCCC (2002),** *Decision 17/CP.8: Guidelines for the preparation of the national communications from Parties not included in Annex I to the Convention.* Conference of Parties (COP 8) of the United Nations Framework Convention on Climate Change (UNFCCC), held in October-November 2002.

148. **UNFCCC (2002),** *User Manual for guidelines on national communications from non-Annex I Parties.* Climate Change Secretariat (UNFCCC), Bonn, Germany.

149. **UNFCCC (2005),** Consultative Group of Experts on National Communications from Parties not Included in Annex I to the UNFCCC (2005), *Handbook on Industrial Processes Sector*. 26 p.

150. **UNFCCC (2005),** Consultative Group of Experts on National Communications from Parties not included in Annex I to the UNFCCC, *Handbook on Agriculture Sector*. 33 p.

151. **UNFCCC (2013),** GHG Locator (v3.4) containing the submission year 2013 inventory data.

152. **Государственный комитет по статистики Приднестровской Молдавской Республики (State Statistical Committee of Transnistria) (1998), Статистический ежегодник Приднестровской Молдавской Республики (Statistical Annual Report of Transnistria) – 1997:** *Статистический сборник (за 1990, 1995-1997 г.).* ПМР. – Тирасполь, 1998. – 254 с.

153. **Государственный комитет по статистики Приднестровской Молдавской Республики (State Statistical Committee of Transnistria) (2000),** *Статистический ежегодник Приднестровской Молдавской Республики (Statistical Annual Report of Transnistria) – 1999: Статистический сборник (за 1990, 1995-1999 г.).* ПМР. – Тирасполь, 2000. – 185 с.

154. **Государственная служба статистики Министерства Экономики Приднестровской Молдавской Республики (State Statistical Service of the Ministry of Economy of Transnistria) (2002),** *Статистический ежегодник Приднестровской Молдавской Республики (Statistical Annual Report of Transnistria) – 2001: Статистический сборник (за 1996-2001 г.).* ПМР. – Тирасполь, 2002. – 190 с.

155. **Государственная служба статистики Министерства Экономики Приднестровской Молдавской Республики (State Statistical Service of the Ministry of Economy of Transnistria) (2005),** *Статистический ежегодник Приднестровской Молдавской Республики (Statistical Annual Report of Transnistria) – 2004: Статистический сборник (за 2000-2004 г.).* ПМР. – Тирасполь, 2005. – 189 с.

156. **Государственная служба статистики Министерства Экономики Приднестровской Молдавской Республики (State Statistical Service of the Ministry of Economy of Transnistria) (2006),** *Статистический ежегодник Приднестровской Молдавской Республики (Statistical Annual Report of Transnistria) – 2005: Статистический сборник (за 2001-2005 г.).* ПМР. – Тирасполь, 2006. – 188 с.

157. **Государственная служба статистики Министерства экономики ПМР (State Statistical Service of the Ministry of Economy of Transnistria) (2009),** Экспресс-информация, Основные показатели работы промышленности, автомобильного транспорта, торговли и платных услуг за 2009 год (Special report: main activity data in industry, transport, trade and services in 2009). - Тирасполь, 2009 - 15с.

158. **Государственная служба статистики Министерства экономики ПМР (State Statistical Service of the Ministry of Economy of Transnistria) (2010),** *Статистический ежегодник Приднестровской Молдавской Республики (Statistical Annual Report of Transnistria) - 2009: Статистический сборник (за 2005–2009г.).* ПМР. – Тирасполь, 2010 - 181с.

159. **Государственная служба статистики Министерства экономики ПМР (State Statistical Service of the Ministry of Economy of Transnistria) (2010),** Экспресс-информация, Основные показатели работы промышленности республики за январь - декабрь 2010 г. (предварительные данные) (Special report: main activity data in industry of Transnistria for January-December 2010. Preliminary data). - Тирасполь, 2011 - 13с.

160. **Государственная служба статистики Приднестровской Молдавской Республики (State Statistical Service of Transnistria) (2010),** *Социально-экономическое развитие ПМР за 2009 год (Social and economic development of Transnistria in 2009),* Тирасполь, 2010. 75 с.

161. **Государственная служба статистики Министерства экономики ПМР (State Statistical Service of the Ministry of Economy of Transnistria) (2011),** *Статистический ежегодник Приднестровской Молдавской Республики (Statistical Annual Report of Transnistria) - 2010: Статистический сборник (за 2006–2010 г.).* ПМР - Тирасполь, 2011 – 184с.

162. **Государственная служба статистики Министерства экономики ПМР (State Statistical Service of the Ministry of Economy of Transnistria) (2011),** Экспресс-информация, Основные показатели работы промышленности республики за 2010 г. (Special report: main activity data in industry in 2010) - Тирасполь, 2011 - 13с.

163. **Государственная служба статистики Приднестровской Молдавской Республики (State Statistical Service of Transnistria) (2011),** *Социально-экономическое развитие ПМР за 2010 год (Social and economic development of Transnistria in 2010),* Тирасполь, 2011. 79 с.

164. **Государственная служба статистики Министерства экономики ПМР (State Statistical Service of the Ministry of Economy of Transnistria) (2012),** Статистический ежегодник Приднестровской Молдавской Республики *(Statistical Annual Report of Transnistria) - 2011:* Статистический сборник (за 2007–2011 г.). ПМР - Тирасполь, 2012 – 188с.

165. **Государственная служба статистики Министерства экономики ПМР (State Statistical Service of the Ministry of Economy of Transnistria) (2012),** Экспресс-информация, Основные показатели работы промышленности республики за 2011 г. (Special report: main activity data in industry in 2011) - Тирасполь, 2012 - 13с.

166. **Государственная служба статистики Приднестровской Молдавской Республики (State Statistical Service of Transnistria) (2012),** *Социально-экономическое развитие ПМР за 2011 год (Social and economic development of Transnistria in 2011),* Тирасполь, 2012. 85 с.

167. **Государственная служба статистики Министерства экономики ПМР (State Statistical Service of the Ministry of Economy of Transnistria) (2012),** ПРЕСС - ВЫПУСК «Состояние жилищно-коммунального хозяйства республики за 2011 год» (Press release: Condition of buildings and facilities of Transnistria over 2011). ПМР - Тирасполь, 2012 – 6с.

168. **Государственная служба статистики Министерства экономики ПМР (State Statistical Service of the Ministry of Economy of Transnistria) (2013),** Аналитическая записка «Экологическая обстановка в Приднестровской Молдавской Республике в 2012 году» (Analytical report: Condition of the environment in Transnistria in 2012). Тирасполь, 2013. С.4.

169. **Государственная служба статистики Министерства экономики ПМР (State Statistical Service of the Ministry of Economy of Transnistria) (2013),** Статистический ежегодник Приднестровской Молдавской Республики (Statistical Annual Report of Transnistria) - 2012: Статистический сборник (за 2008–2012 г.). ПМР - Тирасполь, 2013 – 190с.

170. **Государственная служба статистики Министерства экономики ПМР (State Statistical Service of the Ministry of Economy of Transnistria) (2013),** Экспресс-информация, Основные показатели работы промышленности республики за 2012 г (Special report: main activity data in industry in 2012). - Тирасполь, 2013 - 13с.

171. **Государственная служба статистики Приднестровской Молдавской Республики (State Statistical Service of the Ministry of Economy of Transnistria) (2013),** *Социально-экономическое развитие ПМР за 2012 год (Social and economic development of Transnistria in 2012),* Тирасполь, 2013. 85 с.

172. **Государственная служба статистики Министерства экономики ПМР (State Statistical Service of the Ministry of Economy of Transnistria) (2013),** ПРЕСС - ВЫПУСК «Состояние жилищно-коммунального хозяйства республики за 2012 год» (Press release: Condition of buildings and faciltiies of Transnistria over 2012). ПМР - Тирасполь, 2013 – 6с.

173. **Государственная служба статистики Министерства экономики ПМР (2014),** Аналитическая записка «Экологическая обстановка в Приднестровской Молдавской Республике в 2013 году» (Analytical report: Condition of the environment in Transnistria in 2013). Тирасполь, 2014. С.4.

174. **Государственная служба статистики Министерства экономики ПМР (State Statistical Service of the Ministry of Economy of Transnistria) (2014),** Статистический ежегодник Приднестровской Молдавской Республики (*Statistical Annual Report of Transnistria)* - 2013: Статистический сборник (за 2009–2013 г.). ПМР - Тирасполь, 2014 – 180с.

175. **Государственная служба статистики Министерства экономики ПМР (State Statistical Service of the Ministry of Economy of Transnistria) (2014),** Экспресс-информация, Основные показатели работы промышленности республики за 2013 г (Special report: main activity data in industry in 2013 without small entrepreneurs) (без субъектов малого предпринимательства). - Тирасполь, 2014 - 14с.

176. **Государственная служба статистики Приднестровской Молдавской Республики (State Statistical Service of Transnistria) (2014),** *Социально-экономическое развитие Приднестровской Молдавской Республики, 2013 (окончательные данные) (Social and economic development of Transnistria in 2013. Final data).* Тирасполь, 2014 - 88с.

177. **Государственная служба статистики Министерства экономики ПМР (State Statistical Service of the Ministry of Economy of Transnistria) (2014),** ПРЕСС - ВЫПУСК «Состояние жилищно-коммунального хозяйства республики за 2013 год» (Press release: Condition of buildings and faciltiies of Transnistria over 2013). ПМР - Тирасполь, 2014 – 6с.

178. **Государственная служба статистики Приднестровской Молдавской Республики (State Statistical Service of Transnistria) (2015),** *Социально-экономическое развитие Приднестровской Молдавской Республики, 2014 (окончательные данные) (Social and economic development of Transnistria in 2014. Final data).* Тирасполь, 2015 - 81с.

179. **Государственная служба статистики Министерства экономики ПМР (State Statistical Service of the Ministry of Economy of Transnistria) (2015),** ПРЕСС - ВЫПУСК «Состояние жилищно-коммунального хозяйства республики за 2014 год» *(Press release: Condition of buildings and faciltiies of Transnistria over 2014).* ПМР - Тирасполь, 2015 – 6с.

ANNEXES

Annex 1: Greenhouse Gas Inventory Summary Tables, 1990-2013

Annex 1-1: Inventory Year - 1990

GHG Source and Sink Categories	CO_2 Emissions (Gg)	CO_2 Removals (Gg)	CH_4 (Gg)	N_2O (Gg)	NO_x (Gg)	CO (Gg)	NMVOC (Gg)	SO_x (Gg)
Total emissions and removals	**35,333.6867**	**-5,889.8617**	**232.1268**	**10.3670**	**137.4740**	**433.8751**	**517.8048**	**294.7812**
1. Energy	**33,365.5535**		**45.8847**	**0.6200**	**134.9883**	**427.8225**	**72.8422**	**293.0068**
A. Fuel Combustion	33,364.9158		13.3945	0.6199	134.9883	427.8225	72.2605	293.0068
1. Energy Industries	19,332.7655		0.4423	0.1653	54.2987	4.9157	1.3281	203.2514
2. Manufacturing Industries and Construction	2,188.7285		0.0953	0.0167	5.8887	1.4012	0.1954	24.1072
3. Transport	3,926.6606		1.2119	0.3371	38.9861	294.3999	55.4240	4.3700
4. Other Sectors	7,762.4898		11.6427	0.0993	35.3755	127.0250	15.3004	60.5137
5. Other (other works and needs in energy sector)	154.2715		0.0023	0.0016	0.4393	0.0808	0.0126	0.7646
B. Fugitive Emissions from Fuels	0.6377		32.4902	0.0000	NO, NE	NO, NE	0.5817	NO, NE
1. Solid Fuels			NO		NO	NO	NO	NO
2. Oil and Natural Gas	0.6377		32.4902	0.0000	NO, NE	NO, NE	0.5817	NO, NE
2. Industrial Processes	**1,842.0368**		**NO, NE**	**NO, NE**	**2.3880**	**2.4634**	**402.0057**	**1.7744**
A. Mineral Products	1,830.3185		NO, NE	NO, NE	2.2958	1.2584	392.0868	1.7319
B. Chemical Industry	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	0.3657	NO, NE
C. Metal Production	11.7182		NO, NE	NO, NE	0.0921	1.2049	0.0369	0.0425
D. Other Production	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	9.5163	NO, NE
E. Production of Halocarbons and SF_6								
F. Consumption of Halocarbons and SF_6								
G. Other	NO		NO	NO	NO	NO	NO	NO
3. Solvent and Other Product Use	**126.0964**			**0.0001**	**0.0000**	**0.0009**	**42.9570**	
4. Agriculture			**102.3308**	**9.4031**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Enteric Fermentation			87.6290					
B. Manure Management			14.7018	4.4577			NO, NE	
C. Rice Cultivation			NO				NO	
D. Agricultural Soils				4.9454			NO, NE	
E. Prescribed Burning of Savannas			NO	NO	NO	NO	NO	
F. Field Burning of Agricultural Residues			IE	IE	IE	IE	IE	
G. Other			NO	NO	NO	NO	NO	
5. LULUCF		**-5,889.8617**	**0.1090**	**0.0032**	**0.0977**	**3.5884**	**NO, NE**	**NO, NE**
A. Forest Land		-2,197.5790	0.0112	0.0006	0.0071	0.2544		
B. Cropland		-2,216.0460	0.0978	0.0025	0.0906	3.3340		
C. Grassland		-1,476.2367	NE	NE	NE	NE		
D. Wetlands		IE, NE	NE	NE	NE	NE		
E. Settlements		IE, NE	NE	NE	NE	NE		
F. Other Lands		IE, NE	NE	NE	NE	NE		
E. Other		NO, NE	NO, NE	NO, NE	NO, NE	NO, NE		
6. Waste			**83.8023**	**0.3407**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Solid Waste Disposal on Land			73.5356		NO, NE		NO, NE	
B. Wastewater Handling			10.2667	0.3407	NO, NE	NO, NE	NO, NE	
C. Waste Incineration					NO, NE	NO, NE	NO, NE	NO, NE
D. Other			NO	NO	NO	NO	NO	NO
7. Other	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
Memo Items								
International Bunkers	**217.3668**		**0.0430**	**0.0070**	**0.7949**	**0.8733**	**0.5202**	**0.0689**
Aviation	217.3668		0.0430	0.0070	0.7949	0.8733	0.5202	0.0689
Marine	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
CO_2 emissions from Biomass	**210.8274**							

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

Annex 1-2: Inventory Year - 1991

GHG Source and Sink Categories	CO_2 emissions (Gg)	CO_2 Removals (Gg)	CH_4 (Gg)	N_2O (Gg)	NO_x (Gg)	CO (Gg)	NMVOC (Gg)	SO_x (Gg)
Total emissions and removals	**31,049.9920**	**-5,327.7832**	**225.0300**	**9.6876**	**118.1256**	**375.0938**	**432.5641**	**256.0414**
1. Energy	**29,193.0936**		**40.9872**	**0.5416**	**115.6795**	**372.8662**	**64.6544**	**254.5103**
A. Fuel Combustion	29,192.4796		10.4948	0.5416	115.6795	372.8662	64.1105	254.5103
1. Energy Industries	17,361.2078		0.3826	0.1457	48.8473	4.4530	1.2021	172.1415
2. Manufacturing Industries and Construction	1,684.7939		0.0827	0.0140	4.6748	1.3740	0.1698	19.1446
3. Transport	3,548.3245		1.1143	0.2976	34.9355	270.8410	50.9779	3.9274
4. Other Sectors	6,294.8303		8.9152	0.0818	26.4241	96.1384	11.7409	56.4259
5. Other (other works and needs in energy sector)	303.3231		0.0000	0.0024	0.7977	0.0597	0.0198	2.8710
B. Fugitive Emissions from Fuels	0.6140		30.4924	0.0000	NO, NE	NO, NE	0.5438	NO, NE
1. Solid Fuels			NO		NO	NO	NO	NO
2. Oil and Natural Gas	0.6140		30.4924	0.0000	NO, NE	NO, NE	0.5438	NO, NE
2. Industrial Processes	**1,755.9756**		**NO, NE**	**NO, NE**	**2.2639**	**2.0895**	**333.7068**	**1.5311**
A. Mineral Products	1,745.8036		NO, NE	NO, NE	2.1839	1.0436	326.3613	1.4942
B. Chemical Industry	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	0.2883	NO, NE
C. Metal Production	10.1720		NO, NE	NO, NE	0.0800	1.0459	0.0322	0.0369
D. Other Production	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	7.0250	NO, NE
E. Production of Halocarbons and SF_6								
F. Consumption of Halocarbons and SF_6								
G. Other	NO		NO	NO	NO	NO	NO	NO
3. Solvent and Other Product Use	**100.9228**			**0.0001**	**0.0000**	**0.0009**	**34.2029**	
4. Agriculture			**94.3089**	**8.7423**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Enteric Fermentation			81.2261					
B. Manure Management			13.0828	4.0464			NO, NE	
C. Rice Cultivation			NO				NO	
D. Agricultural Soils				4.6959			NO, NE	
E. Prescribed Burning of Savannas			NO	NO	NO	NO	NO	
F. Field Burning of Agricultural Residues			IE	IE	IE	IE	IE	
G. Other			NO	NO	NO	NO	NO	
5. LULUCF		**-5,327.7832**	**0.0965**	**0.0947**	**0.1822**	**0.1372**	**NO, NE**	**NO, NE**
A. Forest Land		-1,924.1010	0.0019	0.0001	0.0876	0.0426		
B. Cropland		-2,053.7255	0.0946	0.0946	0.0946	0.0946		
C. Grassland		-1,349.9567	NE	NE	NE	NE		
D. Wetlands		IE, NE	NE	NE	NE	NE		
E. Settlements		IE, NE	NE	NE	NE	NE		
F. Other Lands		IE, NE	NE	NE	NE	NE		
E. Other		NO, NE	NO, NE	NO, NE	NO, NE	NO, NE		
6. Waste			**89.6374**	**0.3090**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Solid Waste Disposal on Land			80.3777		NO, NE		NO, NE	
B. Wastewater Handling			9.2598	0.3090	NO, NE	NO, NE	NO, NE	
C. Waste Incineration					NO, NE	NO, NE	NO, NE	NO, NE
D. Other			NO	NO	NO	NO	NO	NO
7. Other	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
Memo Items								
International Bunkers	**232.8115**		**0.0487**	**0.0074**	**0.8447**	**0.9641**	**0.5792**	**0.0738**
Aviation	232.8115		0.0487	0.0074	0.8447	0.9641	0.5792	0.0738
Marine	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
CO_2 emissions from Biomass	**427.7268**							

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

Annex 1-3: Inventory Year - 1992

GHG Source and Sink Categories	CO_2 Emissions (Gg)	CO_2 Removals (Gg)	CH_4 (Gg)	N_2O (Gg)	NO_x (Gg)	CO (Gg)	NMVOC (Gg)	SO_x (Gg)
Total emissions and removals	**21,804.8614**	**-4,386.9748**	**218.4319**	**7.6295**	**78.5301**	**194.1732**	**339.5211**	**170.0244**
1. Energy	**20,581.3267**		**32.7498**	**0.3543**	**76.9851**	**189.6403**	**33.3360**	**169.0182**
A. Fuel Combustion	20,580.8092		5.1462	0.3543	76.9851	189.6403	32.8429	169.0182
1. Energy Industries	13,009.2232		0.2828	0.1102	36.6784	3.3396	0.8992	128.3280
2. Manufacturing Industries and Construction	962.3355		0.0403	0.0070	2.6619	0.4088	0.0879	10.8429
3. Transport	1,983.1429		0.5576	0.1844	20.0606	131.9720	24.8817	2.4029
4. Other Sectors	4,388.8608		4.2655	0.0508	16.9686	53.8737	6.9587	26.7322
5. Other (other works and needs in energy sector)	237.2468		0.0000	0.0018	0.6156	0.0462	0.0154	0.7122
B. Fugitive Emissions from Fuels	0.5175		27.6036	0.0000	NO, NE	NO, NE	0.4931	NO, NE
1. Solid Fuels			NO		NO	NO	NO	NO
2. Oil and Natural Gas	0.5175		27.6036	0.0000	NO, NE	NO, NE	0.4931	NO, NE
2. Industrial Processes	**1,147.1632**		**NO, NE**	**NO, NE**	**1.4637**	**1.5424**	**280.3794**	**1.0062**
A. Mineral Products	1,137.2807		NO, NE	NO, NE	1.3860	0.5263	274.2274	0.9704
B. Chemical Industry	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	0.1580	NO, NE
C. Metal Production	9.8825		NO, NE	NO, NE	0.0777	1.0162	0.0313	0.0359
D. Other Production	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	5.9627	NO, NE
E. Production of Halocarbons and SF_6								
F. Consumption of Halocarbons and SF_6								
G. Other	NO		NO	NO	NO	NO	NO	NO
3. Solvent and Other Product Use	**76.3715**			**0.0001**	**0.0000**	**0.0008**	**25.8057**	
4. Agriculture			**91.6082**	**6.9875**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Enteric Fermentation			79.7791					
B. Manure Management			11.8291	3.5193			NO, NE	
C. Rice Cultivation			NO				NO	
D. Agricultural Soils				3.4682			NO, NE	
E. Prescribed Burning of Savannas			NO	NO	NO	NO	NO	
F. Field Burning of Agricultural Residues			IE	IE	IE	IE	IE	
G. Other			NO	NO	NO	NO	NO	
5. LULUCF		**-4,386.9748**	**0.0884**	**0.0024**	**0.0813**	**2.9896**	**NO, NE**	**NO, NE**
A. Forest Land		-1,766.5038	0.0020	0.0001	0.0013	0.0466		
B. Cropland		-1,342.7037	0.0864	0.0022	0.0800	2.9430		
C. Grassland		-1,277.7673	NE	NE	NE	NE		
D. Wetlands		IE, NE	NE	NE	NE	NE		
E. Settlements		IE, NE	NE	NE	NE	NE		
F. Other Lands		IE, NE	NE	NE	NE	NE		
E. Other		NO, NE	NO, NE	NO, NE	NO, NE	NO, NE		
6. Waste			**93.9855**	**0.2853**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Solid Waste Disposal on Land			86.5813		NO, NE		NO, NE	
B. Wastewater Handling			7.4042	0.2853	NO, NE	NO, NE	NO, NE	
C. Waste Incineration					NO, NE	NO, NE	NO, NE	NO, NE
D. Other			NO	NO	NO	NO	NO	NO
7. Other	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
Memo Items								
International Bunkers	**96.2635**		**0.0189**	**0.0031**	**0.3512**	**0.3847**	**0.2288**	**0.0305**
Aviation	96.2635		0.0189	0.0031	0.3512	0.3847	0.2288	0.0305
Marine	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
CO_2 emissions from Biomass	**531.1505**							

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

Annex 1-4: Inventory Year - 1993

GHG Source and Sink Categories	CO_2 Emissions (Gg)	CO_2 Removals (Gg)	CH_4 (Gg)	N_2O (Gg)	NO_x (Gg)	CO (Gg)	NMVOC (Gg)	SO_x (Gg)
Total emissions and removals	**16,569.5465**	**-1,504.2253**	**205.7320**	**7.5212**	**63.2389**	**157.3955**	**269.2725**	**145.5388**
1. Energy	**15,772.5160**		**28.9677**	**0.2943**	**61.7586**	**151.9012**	**25.4446**	**144.5634**
A. Fuel Combustion	15,772.0778		4.1647	0.2943	61.7586	151.9012	25.0009	144.5634
1. Energy Industries	11,323.7149		0.2531	0.1010	32.0190	2.8820	0.7706	121.2480
2. Manufacturing Industries and Construction	539.8762		0.0267	0.0043	1.4796	0.6719	0.0576	5.0323
3. Transport	1,463.2667		0.3617	0.1391	15.2657	88.2204	16.6396	1.8949
4. Other Sectors	2,249.3719		3.5220	0.0478	12.4355	60.0628	7.5191	15.0889
5. Other (other works and needs in energy sector)	195.8481		0.0012	0.0020	0.5589	0.0641	0.0139	1.2993
B. Fugitive Emissions from Fuels	0.4382		24.8030	0.0000	NO, NE	NO, NE	0.4437	NO, NE
1. Solid Fuels			NO		NO	NO	NO	NO
2. Oil and Natural Gas	0.4382		24.8030	0.0000	NO, NE	NO, NE	0.4437	NO, NE
2. Industrial Processes	**739.4274**		**NO, NE**	**NO, NE**	**1.3710**	**1.4806**	**224.3949**	**0.9754**
A. Mineral Products	729.3501		NO, NE	NO, NE	1.2918	0.4444	218.2458	0.9388
B. Chemical Industry	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	0.1074	NO, NE
C. Metal Production	10.0773		NO, NE	NO, NE	0.0792	1.0362	0.0314	0.0366
D. Other Production	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	6.0103	NO, NE
E. Production of Halocarbons and SF_6								
F. Consumption of Halocarbons and SF_6								
G. Other	NO		NO	NO	NO	NO	NO	NO
3. Solvent and Other Product Use	**57.6031**			**0.0001**	**0.0000**	**0.0008**	**19.4331**	
4. Agriculture			**84.3074**	**6.9561**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Enteric Fermentation			75.0063					
B. Manure Management			9.3011	2.9555			NO, NE	
C. Rice Cultivation			0.0000				NO	
D. Agricultural Soils				4.0005			NO, NE	
E. Prescribed Burning of Savannas			NO	NO	NO	NO	NO	
F. Field Burning of Agricultural Residues			IE	IE	IE	IE	IE	
G. Other			NO	NO	NO	NO	NO	
5. LULUCF		**-1,504.2253**	**0.1179**	**0.0032**	**0.1092**	**4.0129**	**NO, NE**	**NO, NE**
A. Forest Land		-1,491.3852	0.0001	0.0001	0.0001	0.0001		
B. Cropland		1,169.1172	0.1178	0.0031	0.1090	4.0127		
C. Grassland		-1,181.9573	NE	NE	NE	NE		
D. Wetlands		IE, NE	NE	NE	NE	NE		
E. Settlements		IE, NE	NE	NE	NE	NE		
F. Other Lands		IE, NE	NE	NE	NE	NE		
E. Other		NO, NE	NO, NE	NO, NE	NO, NE	NO, NE		
6. Waste			**92.3390**	**0.2677**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Solid Waste Disposal on Land			85.1670		NO, NE		NO, NE	
B. Wastewater Handling			7.1720	0.2677	NO, NE	NO, NE	NO, NE	
C. Waste Incineration					NO, NE	NO, NE	NO, NE	NO, NE
D. Other			NO	NO	NO	NO	NO	NO
7. Other	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
Memo Items								
International Bunkers	**62.0927**		**0.0099**	**0.0020**	**0.2331**	**0.2215**	**0.1293**	**0.0197**
Aviation	62.0927		0.0099	0.0020	0.2331	0.2215	0.1293	0.0197
Marine	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
CO_2 emissions from Biomass	**763.4134**							

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

Annex 1-5: Inventory Year - 1994

GHG Source and Sink Categories	CO_2 Emissions (Gg)	CO_2 Removals (Gg)	CH_4 (Gg)	N_2O (Gg)	NO_x (Gg)	CO (Gg)	NMVOC (Gg)	SO_x (Gg)
Total emissions and removals	**14,997.9621**	**-2,166.0450**	**199.6885**	**5.8129**	**56.8169**	**142.4926**	**175.9493**	**102.5450**
1. Energy	**14,346.4226**		**28.1397**	**0.2616**	**55.7779**	**138.8412**	**23.2294**	**101.8866**
A. Fuel Combustion	14,346.0141		4.2682	0.2616	55.7779	138.8412	22.8025	101.8866
1. Energy Industries	9,998.7215		0.1898	0.0875	28.6601	2.8304	0.7050	82.8434
2. Manufacturing Industries and Construction	807.8587		0.0224	0.0030	2.1880	0.5786	0.0778	1.5249
3. Transport	1,271.1186		0.3311	0.1274	12.5564	80.5874	15.1833	1.4527
4. Other Sectors	2,112.0567		3.7236	0.0423	11.9397	54.7840	6.8245	14.8890
5. Other (other works and needs in energy sector)	156.2586		0.0013	0.0015	0.4338	0.0607	0.0118	1.1766
B. Fugitive Emissions from Fuels	0.4085		23.8714	0.0000	NO, NE	NO, NE	0.4269	NO, NE
1. Solid Fuels			NO		NO	NO	NO	NO
2. Oil and Natural Gas	0.4085		23.8714	0.0000	NO, NE	NO, NE	0.4269	NO, NE
2. Industrial Processes	**607.7326**		**NO, NE**	**NO, NE**	**0.9778**	**1.4021**	**137.9507**	**0.6583**
A. Mineral Products	597.2654		NO, NE	NO, NE	0.8955	0.3258	131.9842	0.6203
B. Chemical Industry	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	0.0323	NO, NE
C. Metal Production	10.4672		NO, NE	NO, NE	0.0823	1.0763	0.0322	0.0380
D. Other Production	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	5.9020	NO, NE
E. Production of Halocarbons and SF_6								
F. Consumption of Halocarbons and SF_6								
G. Other	NO		NO	NO	NO	NO	NO	NO
3. Solvent and Other Product Use	**43.8069**			**0.0001**	**0.0000**	**0.0008**	**14.7692**	
4. Agriculture			**82.0445**	**5.2895**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Enteric Fermentation			73.0080					
B. Manure Management			9.0365	2.8481			NO, NE	
C. Rice Cultivation			0.0000				NO	
D. Agricultural Soils				2.4414			NO, NE	
E. Prescribed Burning of Savannas			NO	NO	NO	NO	NO	
F. Field Burning of Agricultural Residues			IE	IE	IE	IE	IE	
G. Other			NO	NO	NO	NO	NO	
5. LULUCF		**-2,166.0450**	**0.0670**	**0.0018**	**0.0612**	**2.2486**	**NO, NE**	**NO, NE**
A. Forest Land		-1,743.7096	0.0031	0.0002	0.0020	0.0710		
B. Cropland		881.3479	0.0639	0.0017	0.0592	2.1776		
C. Grassland		-1,303.6833	NE	NE	NE	NE		
D. Wetlands		IE, NE	NE	NE	NE	NE		
E. Settlements		IE, NE	NE	NE	NE	NE		
F. Other Lands		IE, NE	NE	NE	NE	NE		
E. Other		NO, NE	NO, NE	NO, NE	NO, NE	NO, NE		
6. Waste			**89.4373**	**0.2598**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Solid Waste Disposal on Land			83.1035		NO, NE		NO, NE	
B. Wastewater Handling			6.3338	0.2598	NO, NE	NO, NE	NO, NE	
C. Waste Incineration					NO, NE	NO, NE	NO, NE	NO, NE
D. Other			NO	NO	NO	NO	NO	NO
7. Other	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
Memo Items								
International Bunkers	**37.8235**		**0.0058**	**0.0012**	**0.1433**	**0.1323**	**0.0766**	**0.0120**
Aviation	37.8235		0.0058	0.0012	0.1433	0.1323	0.0766	0.0120
Marine	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
CO_2 emissions from Biomass	**599.5042**							

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

Annex 1-6: Inventory Year - 1995

GHG Source and Sink Categories	CO_2 Emissions (Gg)	CO_2 Removals (Gg)	CH_4 (Gg)	N_2O (Gg)	NO_x (Gg)	CO (Gg)	NMVOC (Gg)	SO_x (Gg)
Total emissions and removals	**11,552.7408**	**-1,031.9969**	**188.3467**	**6.1827**	**47.8562**	**140.5712**	**161.5871**	**60.9425**
1. Energy	**11,041.7064**		**29.4520**	**0.2001**	**46.9387**	**136.2274**	**23.4038**	**60.4181**
A. Fuel Combustion	11,041.2870		2.9965	0.2001	46.9387	136.2274	22.9277	60.4181
1. Energy Industries	6,913.6176		0.1314	0.0496	19.4831	2.0275	0.5135	46.0290
2. Manufacturing Industries and Construction	452.0136		0.0153	0.0022	1.2336	0.3226	0.0455	1.3217
3. Transport	1,297.6775		0.3473	0.1077	12.4668	84.5649	15.9296	1.4669
4. Other Sectors	2,197.0892		2.5004	0.0387	13.2510	49.2158	6.4242	9.8365
5. Other (other works and needs in energy sector)	180.8891		0.0021	0.0019	0.5042	0.0967	0.0149	1.7640
B. Fugitive Emissions from Fuels	0.4194		26.4555	0.0000	NO, NE	NO, NE	0.4761	NO, NE
1. Solid Fuels			NO		NO	NO	NO	NO
2. Oil and Natural Gas	0.4194		26.4555	0.0000	NO, NE	NO, NE	0.4761	NO, NE
2. Industrial Processes	**476.4837**		**NO, NE**	**NO, NE**	**0.8356**	**1.3336**	**126.5480**	**0.5244**
A. Mineral Products	465.6247		NO, NE	NO, NE	0.7502	0.2171	119.1409	0.4850
B. Chemical Industry	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	0.0270	NO, NE
C. Metal Production	10.8590		NO, NE	NO, NE	0.0854	1.1166	0.0327	0.0394
D. Other Production	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	7.3473	NO, NE
E. Production of Halocarbons and SF_6								
F. Consumption of Halocarbons and SF_6								
G. Other	NO		NO	NO	NO	NO	NO	NO
3. Solvent and Other Product Use	**34.5507**			**0.0000**	**0.0000**	**0.0007**	**11.6353**	
4. Agriculture			**72.0044**	**5.7172**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Enteric Fermentation			64.8174					
B. Manure Management			7.1870	2.7252			NO, NE	
C. Rice Cultivation			NO				NO	
D. Agricultural Soils				2.9920			NO, NE	
E. Prescribed Burning of Savannas			NO	NO	NO	NO	NO	
F. Field Burning of Agricultural Residues			IE	IE	IE	IE	IE	
G. Other			NO	NO	NO	NO	NO	
5. LULUCF		**-1,031.9969**	**0.0884**	**0.0023**	**0.0818**	**3.0095**	**NO, NE**	**NO, NE**
A. Forest Land		-1,620.7949	0.0002	0.0000	0.0001	0.0041		
B. Cropland		1,918.5000	0.0882	0.0023	0.0817	3.0054		
C. Grassland		-1,329.7020	NE	NE	NE	NE		
D. Wetlands		IE, NE	NE	NE	NE	NE		
E. Settlements		IE, NE	NE	NE	NE	NE		
F. Other Lands		IE, NE	NE	NE	NE	NE		
E. Other		NO, NE	NO, NE	NO, NE	NO, NE	NO, NE		
6. Waste			**86.8019**	**0.2631**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Solid Waste Disposal on Land			80.7237		NO, NE		NO, NE	
B. Wastewater Handling			6.0783	0.2631	NO, NE	NO, NE	NO, NE	
C. Waste Incineration					NO, NE	NO, NE	NO, NE	NO, NE
D. Other			NO	NO	NO	NO	NO	NO
7. Other	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
Memo Items								
International Bunkers	**41.9185**		**0.0060**	**0.0013**	**0.1573**	**0.1413**	**0.0820**	**0.0133**
Aviation	41.9185		0.0060	0.0013	0.1573	0.1413	0.0820	0.0133
Marine	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
CO_2 emissions from Biomass	**645.5674**							

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

Annex 1-6: Inventory Year - 1995 (National GHG Inventory of Anthropogenic Emissions of HFCs, PFCs and SF_6)

GHG Source and Sink Categories	HFCs (Gg)					PFCs (Gg)			SF_6 (Gg)
	HFC-32	HFC-125	HFC-134a	HFC-143a	Other HFCs	CF_4	C_2F_6	Other PFCs	
Total emissions	**0.0000**	**0.0000**	**0.0014**	**0.0000**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
1. Energy									
A. Fuel Combustion									
1. Energy Industries									
2. Manufacturing Industries and Construction									
3. Transport									
4. Other Sectors									
5. Other (other works and needs in energy sector)									
B. Fugitive Emissions from Fuels									
1. Solid Fuels									
2. Oil and Natural Gas									
2. Industrial Processes	**0.0000**	**0.0000**	**0.0014**	**0.0000**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Mineral Products									
B. Chemical Industry									
C. Metal Production	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
D. Other Production									
E. Production of Halocarbons and SF_6	NO	NO	NO	NO	NO	NO	NO	NO	NO
F. Consumption of Halocarbons and SF_6	0.000005	0.000008	0.001439	0.000000	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
G. Other									
3. Solvent and Other Product Use									
4. Agriculture									
A. Enteric Fermentation									
B. Manure Management									
C. Rice Cultivation									
D. Agricultural Soils									
E. Prescribed Burning of Savannas									
F. Field Burning of Agricultural Residues									
G. Other									
5. LULUCF									
A. Forest Land									
B. Cropland									
C. Grassland									
D. Wetlands									
E. Settlements									
F. Other Lands									
E. Other									
6. Waste									
A. Solid Waste Disposal on Land									
B. Wastewater Handling									
C. Waste Incineration									
D. Other									
7. Other	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Memo Items									
International Bunkers									
Aviation									
Marine									
CO_2 emissions from Biomass									

Abbreviations: NE – Not Estimated; NO – Not Occurring

Annex 1-7: Inventory Year - 1996

GHG Source and Sink Categories	CO_2 Emissions (Gg)	CO_2 Removals (Gg)	CH_4 (Gg)	N_2O (Gg)	NO_x (Gg)	CO (Gg)	NMVOC (Gg)	SO_x (Gg)
Total emissions and removals	**11,655.5889**	**-1,168.4510**	**181.6801**	**5.7768**	**45.0918**	**137.7967**	**147.7475**	**58.8845**
1. Energy	**11,204.1202**		**32.5540**	**0.1919**	**44.3267**	**134.2790**	**22.6668**	**58.4069**
A. Fuel Combustion	11,203.6475		3.7985	0.1919	44.3267	134.2790	22.1508	58.4069
1. Energy Industries	7,135.1010		0.1349	0.0469	19.9904	2.1475	0.5422	42.2225
2. Manufacturing Industries and Construction	360.0648		0.0131	0.0019	0.9864	0.2736	0.0371	1.2002
3. Transport	1,267.6092		0.3302	0.1010	11.7816	80.4356	15.1429	1.3726
4. Other Sectors	2,293.7489		3.3183	0.0405	11.1565	51.3362	6.4164	12.4324
5. Other (other works and needs in energy sector)	147.1236		0.0020	0.0016	0.4118	0.0861	0.0123	1.1793
B. Fugitive Emissions from Fuels	0.4726		28.7555	0.0000	NO, NE	NO, NE	0.5160	NO, NE
1. Solid Fuels			NO		NO	NO	NO	NO
2. Oil and Natural Gas	0.4726		28.7555	0.0000	NO, NE	NO, NE	0.5160	NO, NE
2. Industrial Processes	**421.4953**		**NO, NE**	**NO, NE**	**0.7080**	**1.4190**	**114.9998**	**0.4776**
A. Mineral Products	410.4329		NO, NE	NO, NE	0.6210	0.2816	107.9721	0.4375
B. Chemical Industry	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	0.0155	NO, NE
C. Metal Production	11.0623		NO, NE	NO, NE	0.0870	1.1375	0.0332	0.0401
D. Other Production	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	6.9791	NO, NE
E. Production of Halocarbons and SF_6								
F. Consumption of Halocarbons and SF_6								
G. Other	NO		NO	NO	NO	NO	NO	NO
3. Solvent and Other Product Use	**29.9734**			**0.000002**	**0.0000**	**0.0009**	**10.0808**	
4. Agriculture			**66.1791**	**5.3242**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Enteric Fermentation			59.6366					
B. Manure Management			6.5425	2.6624			NO, NE	
C. Rice Cultivation			NO				NO	
D. Agricultural Soils				2.6618			NO, NE	
E. Prescribed Burning of Savannas			NO	NO	NO	NO	NO	
F. Field Burning of Agricultural Residues			IE	IE	IE	IE	IE	
G. Other			NO	NO	NO	NO	NO	
5. LULUCF		**-1,168.4510**	**0.0619**	**0.0016**	**0.0570**	**2.0978**	**NO, NE**	**NO, NE**
A. Forest Land		-1,705.1295	0.0010	0.0001	0.0007	0.0237		
B. Cropland		1,830.3078	0.0609	0.0016	0.0564	2.0740		
C. Grassland		-1,293.6293	NE	NE	NE	NE		
D. Wetlands		IE, NE	NE	NE	NE	NE		
E. Settlements		IE, NE	NE	NE	NE	NE		
F. Other Lands		IE, NE	NE	NE	NE	NE		
E. Other		NO, NE	NO, NE	NO, NE	NO, NE	NO, NE		
6. Waste			**82.8851**	**0.2591**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Solid Waste Disposal on Land			77.2264		NO, NE		NO, NE	
B. Wastewater Handling			5.6587	0.2591	NO, NE	NO, NE	NO, NE	
C. Waste Incineration					NO, NE	NO, NE	NO, NE	NO, NE
D. Other			NO	NO	NO	NO	NO	NO
7. Other	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
Memo Items								
International Bunkers	**65.8650**		**0.0048**	**0.0021**	**0.2556**	**0.1687**	**0.0901**	**0.0209**
Aviation	65.8650		0.0048	0.0021	0.2556	0.1687	0.0901	0.0209
Marine	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
CO_2 emissions from Biomass	**615.3433**							

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

Annex 1-7: Inventory Year - 1996 (National GHG Inventory of Anthropogenic Emissions of HFCs, PFCs and SF_6)

GHG Source and Sink Categories	HFCs (Gg)					PFCs (Gg)			SF_6 (Gg)
	HFC-32	HFC-125	HFC-134a	HFC-143a	Other HFCs	CF_4	C_2F_6	Other PFCs	
Total emissions	**0.0000**	**0.0000**	**0.0031**	**0.0000**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
1. Energy									
A. Fuel Combustion									
1. Energy Industries									
2. Manufacturing Industries and Construction									
3. Transport									
4. Other Sectors									
5. Other (other works and needs in energy sector)									
B. Fugitive Emissions from Fuels									
1. Solid Fuels									
2. Oil and Natural Gas									
2. Industrial Processes	**0.0000**	**0.0000**	**0.0031**	**0.0000**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Mineral Products									
B. Chemical Industry									
C. Metal Production	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
D. Other Production									
E. Production of Halocarbons and SF_6	NO	NO	NO	NO	NO	NO	NO	NO	NO
F. Consumption of Halocarbons and SF_6	0.000007	0.000012	0.003098	0.000002	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
G. Other									
3. Solvent and Other Product Use									
4. Agriculture									
A. Enteric Fermentation									
B. Manure Management									
C. Rice Cultivation									
D. Agricultural Soils									
E. Prescribed Burning of Savannas									
F. Field Burning of Agricultural Residues									
G. Other									
5. LULUCF									
A. Forest Land									
B. Cropland									
C. Grassland									
D. Wetlands									
E. Settlements									
F. Other Lands									
E. Other									
6. Waste									
A. Solid Waste Disposal on Land									
B. Wastewater Handling									
C. Waste Incineration									
D. Other									
7. Other	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Memo Items									
International Bunkers									
Aviation									
Marine									
CO_2 emissions from Biomass									

Abbreviations: NE – Not Estimated; NO – Not Occurring

Annex 1-8: Inventory Year - 1997

GHG Source and Sink Categories	CO_2 Emissions (Gg)	CO_2 Removals (Gg)	CH_4 (Gg)	N_2O (Gg)	NO_x (Gg)	CO (Gg)	NMVOC (Gg)	SO_x (Gg)
Total emissions and removals	**10,688.5384**	**-140.0438**	**162.3226**	**6.2089**	**41.8912**	**132.6081**	**73.8989**	**33.8644**
1. Energy	**10,191.5242**		**26.0910**	**0.1579**	**40.9422**	**127.3155**	**22.5155**	**33.3373**
A. Fuel Combustion	10,190.4137		2.4236	0.1579	40.9422	127.3155	22.0972	33.3373
1. Energy Industries	5,641.7033		0.1107	0.0245	15.3909	1.8340	0.4618	21.4411
2. Manufacturing Industries and Construction	586.4696		0.0165	0.0022	1.5900	0.3945	0.0569	0.9572
3. Transport	1,292.0143		0.3751	0.1025	12.5360	91.3353	17.1833	1.4286
4. Other Sectors	2,526.3271		1.9191	0.0271	11.0201	33.6538	4.3822	8.5392
5. Other (other works and needs in energy sector)	143.8993		0.0023	0.0016	0.4053	0.0980	0.0129	0.9712
B. Fugitive Emissions from Fuels	1.1105		23.6674	0.0000	NO, NE	NO, NE	0.4183	NO, NE
1. Solid Fuels			NO		NO	NO	NO	NO
2. Oil and Natural Gas	1.1105		23.6674	0.0000	NO, NE	NO, NE	0.4183	NO, NE
2. Industrial Processes	**471.2245**		**NO, NE**	**NO, NE**	**0.8494**	**1.6288**	**42.6566**	**0.5271**
A. Mineral Products	457.8242		NO, NE	NO, NE	0.7440	0.2510	37.0856	0.4785
B. Chemical Industry	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	0.0046	NO, NE
C. Metal Production	13.4004		NO, NE	NO, NE	0.1054	1.3779	0.0401	0.0486
D. Other Production	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	5.5263	NO, NE
E. Production of Halocarbons and SF_6								
F. Consumption of Halocarbons and SF_6								
G. Other	NO		NO	NO	NO	NO	NO	NO
3. Solvent and Other Product Use	**25.7897**			**0.000003**	**0.0000**	**0.0009**	**8.7268**	
4. Agriculture			**56.7653**	**5.7845**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Enteric Fermentation			51.3958					
B. Manure Management			5.3695	2.2291			NO, NE	
C. Rice Cultivation			NO				NO	
D. Agricultural Soils				3.5553			NO, NE	
E. Prescribed Burning of Savannas			NO	NO	NO	NO	NO	
F. Field Burning of Agricultural Residues			IE	IE	IE	IE	IE	
G. Other			NO	NO	NO	NO	NO	
5. LULUCF		**-140.0438**	**0.1076**	**0.0028**	**0.0995**	**3.6628**	**NO, NE**	**NO, NE**
A. Forest Land		-2,132.2121	0.0003	0.0000	0.0002	0.0072		
B. Cropland		3,439.6509	0.1073	0.0028	0.0993	3.6556		
C. Grassland		-1,447.4827	NE	NE	NE	NE		
D. Wetlands		IE, NE	NE	NE	NE	NE		
E. Settlements		IE, NE	NE	NE	NE	NE		
F. Other Lands		IE, NE	NE	NE	NE	NE		
E. Other		NO, NE	NO, NE	NO, NE	NO, NE	NO, NE		
6. Waste			**79.3587**	**0.2638**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Solid Waste Disposal on Land			73.8246		NO, NE		NO, NE	
B. Wastewater Handling			5.5341	0.2638	NO, NE	NO, NE	NO, NE	
C. Waste Incineration					NO, NE	NO, NE	NO, NE	NO, NE
D. Other			NO	NO	NO	NO	NO	NO
7. Other	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
Memo Items								
International Bunkers	**75.6443**		**0.0055**	**0.0024**	**0.2921**	**0.1965**	**0.1020**	**0.0240**
Aviation	75.6443		0.0055	0.0024	0.2921	0.1965	0.1020	0.0240
Marine	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
CO_2 emissions from Biomass	**322.4374**							

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

Annex 1-8: Inventory Year - 1997 (National GHG Inventory of Anthropogenic Emissions of HFCs, PFCs and SF_6)

GHG Source and Sink Categories	HFCs (Gg)					PFCs (Gg)			SF_6 (Gg)
	HFC-32	HFC-125	HFC-134a	HFC-143a	Other HFCs	CF_4	C_2F_6	Other PFCs	
Total emissions	**0.0000**	**0.0000**	**0.0050**	**0.0000**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
1. Energy									
A. Fuel Combustion									
1. Energy Industries									
2. Manufacturing Industries and Construction									
3. Transport									
4. Other Sectors									
5. Other (other works and needs in energy sector)									
B. Fugitive Emissions from Fuels									
1. Solid Fuels									
2. Oil and Natural Gas									
2. Industrial Processes	**0.0000**	**0.0000**	**0.0050**	**0.0000**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Mineral Products									
B. Chemical Industry									
C. Metal Production	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
D. Other Production									
E. Production of Halocarbons and SF_6	NO	NO	NO	NO	NO	NO	NO	NO	NO
F. Consumption of Halocarbons and SF_6	0.000011	0.000018	0.005031	0.000002	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
G. Other									
3. Solvent and Other Product Use									
4. Agriculture									
A. Enteric Fermentation									
B. Manure Management									
C. Rice Cultivation									
D. Agricultural Soils									
E. Prescribed Burning of Savannas									
F. Field Burning of Agricultural Residues									
G. Other									
5. LULUCF									
A. Forest Land									
B. Cropland									
C. Grassland									
D. Wetlands									
E. Settlements									
F. Other Lands									
E. Other									
6. Waste									
A. Solid Waste Disposal on Land									
B. Wastewater Handling									
C. Waste Incineration									
D. Other									
7. Other	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Memo Items									
International Bunkers									
Aviation									
Marine									
CO_2 emissions from Biomass									

Abbreviations: NE – Not Estimated; NO – Not Occurring

Annex 1-9: Inventory Year - 1998

GHG Source and Sink Categories	CO_2 Emissions (Gg)	CO_2 Removals (Gg)	CH_4 (Gg)	N_2O (Gg)	NO_x (Gg)	CO (Gg)	NMVOC (Gg)	SO_x (Gg)
Total emissions and removals	**9,063.0201**	**-725.5513**	**154.8259**	**5.5591**	**35.1409**	**117.3456**	**61.2282**	**26.9025**
1. Energy	**8,720.8485**		**24.1940**	**0.1406**	**34.2994**	**112.5636**	**19.6852**	**26.4386**
A. Fuel Combustion	8,719.7756		2.0438	0.1406	34.2994	112.5636	19.2929	26.4386
1. Energy Industries	4,846.8481		0.0964	0.0191	13.1501	1.5935	0.4015	17.0883
2. Manufacturing Industries and Construction	537.4686		0.0141	0.0018	1.4532	0.3393	0.0518	0.8653
3. Transport	1,126.3239		0.3203	0.0919	10.9565	78.0073	14.6741	1.2511
4. Other Sectors	2,108.9252		1.6119	0.0267	8.4569	32.5668	4.1570	6.7725
5. Other (other works and needs in energy sector)	100.2098		0.0012	0.0011	0.2828	0.0566	0.0085	0.4613
B. Fugitive Emissions from Fuels	1.0729		22.1502	0.0000	NO, NE	NO, NE	0.3923	NO, NE
1. Solid Fuels			NO		NO	NO	NO	NO
2. Oil and Natural Gas	1.0729		22.1502	0.0000	NO, NE	NO, NE	0.3923	NO, NE
2. Industrial Processes	**322.6857**		**NO, NE**	**NO, NE**	**0.7500**	**1.4194**	**34.8480**	**0.4640**
A. Mineral Products	310.8141		NO, NE	NO, NE	0.6567	0.1987	30.2177	0.4209
B. Chemical Industry	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	0.0037	NO, NE
C. Metal Production	11.8717		NO, NE	NO, NE	0.0933	1.2207	0.0371	0.0431
D. Other Production	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	4.5895	NO, NE
E. Production of Halocarbons and SF_6								
F. Consumption of Halocarbons and SF_6								
G. Other	NO		NO	NO	NO	NO	NO	NO
3. Solvent and Other Product Use	**19.4859**			**0.000005**	**0.0000**	**0.0012**	**6.6950**	
4. Agriculture			**55.0070**	**5.1493**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Enteric Fermentation			49.8940					
B. Manure Management			5.1130	2.0630			NO, NE	
C. Rice Cultivation			NO				NO	
D. Agricultural Soils				3.0864			NO, NE	
E. Prescribed Burning of Savannas			NO	NO	NO	NO	NO	
F. Field Burning of Agricultural Residues			IE	IE	IE	IE	IE	
G. Other			NO	NO	NO	NO	NO	
5. LULUCF		**-725.5513**	**0.0997**	**0.0027**	**0.0914**	**3.3614**	**NO, NE**	**NO, NE**
A. Forest Land		-2,027.8925	0.0031	0.0002	0.0020	0.0714		
B. Cropland		2,729.1805	0.0966	0.0025	0.0894	3.2900		
C. Grassland		-1,426.8393	NE	NE	NE	NE		
D. Wetlands		IE, NE	NE	NE	NE	NE		
E. Settlements		IE, NE	NE	NE	NE	NE		
F. Other Lands		IE, NE	NE	NE	NE	NE		
E. Other		NO, NE	NO, NE	NO, NE	NO, NE	NO, NE		
6. Waste			**75.5252**	**0.2665**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Solid Waste Disposal on Land			70.8531		NO, NE		NO, NE	
B. Wastewater Handling			4.6722	0.2665	NO, NE	NO, NE	NO, NE	
C. Waste Incineration					NO, NE	NO, NE	NO, NE	NO, NE
D. Other			NO	NO	NO	NO	NO	NO
7. Other	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
Memo Items								
International Bunkers	**72.4974**		**0.0046**	**0.0023**	**0.2802**	**0.1828**	**0.0919**	**0.0230**
Aviation	72.4974		0.0046	0.0023	0.2802	0.1828	0.0919	0.0230
Marine	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
CO_2 emissions from Biomass	**409.1761**							

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

Annex 1-9: Inventory Year - 1998 (National GHG Inventory of Anthropogenic Emissions of HFCs, PFCs and SF_6)

GHG Source and Sink Categories	HFCs (Gg)					PFCs (Gg)			SF_6 (Gg)
	HFC-32	HFC-125	HFC-134a	HFC-143a	Other HFCs	CF_4	C_2F_6	Other PFCs	
Total emissions	**0.0000**	**0.0000**	**0.0072**	**0.0000**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
1. Energy									
A. Fuel Combustion									
1. Energy Industries									
2. Manufacturing Industries and Construction									
3. Transport									
4. Other Sectors									
5. Other (other works and needs in energy sector)									
B. Fugitive Emissions from Fuels									
1. Solid Fuels									
2. Oil and Natural Gas									
2. Industrial Processes	**0.0000**	**0.0000**	**0.0072**	**0.0000**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Mineral Products									
B. Chemical Industry									
C. Metal Production	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
D. Other Production									
E. Production of Halocarbons and SF_6	NO	NO	NO	NO	NO	NO	NO	NO	NO
F. Consumption of Halocarbons and SF_6	0.00002	0.00003	0.00719	0.000004	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
G. Other									
3. Solvent and Other Product Use									
4. Agriculture									
A. Enteric Fermentation									
B. Manure Management									
C. Rice Cultivation									
D. Agricultural Soils									
E. Prescribed Burning of Savannas									
F. Field Burning of Agricultural Residues									
G. Other									
5. LULUCF									
A. Forest Land									
B. Cropland									
C. Grassland									
D. Wetlands									
E. Settlements									
F. Other Lands									
E. Other									
6. Waste									
A. Solid Waste Disposal on Land									
B. Wastewater Handling									
C. Waste Incineration									
D. Other									
7. Other	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Memo Items									
International Bunkers									
Aviation									
Marine									
CO_2 emissions from Biomass									

Abbreviations: NE – Not Estimated; NO – Not Occurring

Annex 1-10: Inventory Year - 1999

GHG Source and Sink Categories	CO_2 Emissions (Gg)	CO_2 Removals (Gg)	CH_4 (Gg)	N_2O (Gg)	NO_x (Gg)	CO (Gg)	NMVOC (Gg)	SO_x (Gg)
Total emissions	**7,154.4354**	**-1,137.7025**	**144.9457**	**5.0481**	**25.7394**	**80.7215**	**38.2089**	**13.9042**
1. Energy	**6,842.0509**		**23.9267**	**0.0927**	**25.0082**	**75.9929**	**13.0083**	**13.5100**
A. Fuel Combustion	6,841.0131		1.8290	0.0927	25.0082	75.9929	12.6133	13.5100
1. Energy Industries	3,670.0376		0.0727	0.0088	9.7970	1.2779	0.3199	6.1854
2. Manufacturing Industries and Construction	495.3902		0.0118	0.0015	1.3352	0.2861	0.0461	0.4769
3. Transport	770.1737		0.1903	0.0581	7.3429	46.4687	8.7438	0.8862
4. Other Sectors	1,849.2274		1.5519	0.0235	6.3673	27.8802	3.4965	5.6539
5. Other (other works and needs in energy sector)	56.1841		0.0022	0.0008	0.1658	0.0799	0.0071	0.3075
B. Fugitive Emissions from Fuels	1.0378		22.0978	0.0000	NO, NE	NO, NE	0.3950	NO, NE
1. Solid Fuels			NO		NO	NO	NO	NO
2. Oil and Natural Gas	1.0378		22.0978	0.0000	NO, NE	NO, NE	0.3950	NO, NE
2. Industrial Processes	**285.6313**		**NO, NE**	**NO, NE**	**0.6428**	**1.4772**	**16.1261**	**0.3943**
A. Mineral Products	272.4704		NO, NE	NO, NE	0.5394	0.1239	13.3931	0.3465
B. Chemical Industry	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	0.0032	NO, NE
C. Metal Production	13.1608		NO, NE	NO, NE	0.1035	1.3532	0.0408	0.0478
D. Other Production	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	2.6891	NO, NE
E. Production of Halocarbons and SF_6								
F. Consumption of Halocarbons and SF_6								
G. Other	NO		NO	NO	NO	NO	NO	NO
3. Solvent and Other Product Use	**26.7533**			**0.000043**	**0.0000**	**0.0014**	**9.0744**	
4. Agriculture			**50.6981**	**4.6921**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Enteric Fermentation			46.1613					
B. Manure Management			4.5368	1.8491			NO, NE	
C. Rice Cultivation			NO				NO	
D. Agricultural Soils				2.8430			NO, NE	
E. Prescribed Burning of Savannas			NO	NO	NO	NO	NO	
F. Field Burning of Agricultural Residues			IE	IE	IE	IE	IE	
G. Other			NO	NO	NO	NO	NO	
5. LULUCF		**-1,137.7025**	**0.0962**	**0.0026**	**0.0884**	**3.2501**	**NO, NE**	**NO, NE**
A. Forest Land		-2,111.2238	0.0023	0.0001	0.0015	0.0534		
B. Cropland		2,491.6826	0.0938	0.0024	0.0869	3.1967		
C. Grassland		-1,518.1613	NE	NE	NE	NE		
D. Wetlands		IE, NE	NE	NE	NE	NE		
E. Settlements		IE, NE	NE	NE	NE	NE		
F. Other Lands		IE, NE	NE	NE	NE	NE		
E. Other		NO, NE	NO, NE	NO, NE	NO, NE	NO, NE		
6. Waste			**70.2246**	**0.2607**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Solid Waste Disposal on Land			66.3843		NO, NE		NO, NE	
B. Wastewater Handling			3.8403	0.2607	NO, NE	NO, NE	NO, NE	
C. Waste Incineration					NO, NE	NO, NE	NO, NE	NO, NE
D. Other			NO	NO	NO	NO	NO	NO
7. Other	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
Memo Items								
International Bunkers	**72.4938**		**0.0044**	**0.0022**	**0.2641**	**0.1693**	**0.0862**	**0.0213**
Aviation	72.4938		0.0044	0.0022	0.2641	0.1693	0.0862	0.0213
Marine	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
CO_2 emissions from Biomass	**373.6048**							

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

Annex 1-10: Inventory Year - 1999 (National GHG Inventory of Anthropogenic Emissions of HFCs, PFCs and SF_6)

GHG Source and Sink Categories	HFCs (Gg)					PFCs (Gg)			SF_6 (Gg)
	HFC-32	HFC-125	HFC-134a	HFC-143a	Other HFCs	CF_4	C_2F_6	Other PFCs	
Total emissions	**0.0000**	**0.0000**	**0.0087**	**0.0000**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
1. Energy									
A. Fuel Combustion									
1. Energy Industries									
2. Manufacturing Industries and Construction									
3. Transport									
4. Other Sectors									
5. Other (other works and needs in energy sector)									
B. Fugitive Emissions from Fuels									
1. Solid Fuels									
2. Oil and Natural Gas									
2. Industrial Processes	**0.0000**	**0.0000**	**0.0087**	**0.0000**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Mineral Products									
B. Chemical Industry									
C. Metal Production	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
D. Other Production									
E. Production of Halocarbons and SF_6	NO	NO	NO	NO	NO	NO	NO	NO	NO
F. Consumption of Halocarbons and SF_6	0.000022	0.000038	0.008708	0.000004	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
G. Other									
3. Solvent and Other Product Use									
4. Agriculture									
A. Enteric Fermentation									
B. Manure Management									
C. Rice Cultivation									
D. Agricultural Soils									
E. Prescribed Burning of Savannas									
F. Field Burning of Agricultural Residues									
G. Other									
5. LULUCF									
A. Forest Land									
B. Cropland									
C. Grassland									
D. Wetlands									
E. Settlements									
F. Other Lands									
E. Other									
6. Waste									
A. Solid Waste Disposal on Land									
B. Wastewater Handling									
C. Waste Incineration									
D. Other									
7. Other	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Memo Items									
International Bunkers									
Aviation									
Marine									
CO_2 emissions from Biomass									

Abbreviations: NE – Not Estimated; NO – Not Occurring

Annex 1-11: Inventory Year - 2000

GHG Source and Sink Categories	CO_2 Emissions (Gg)	CO_2 Removals (Gg)	CH_4 (Gg)	N_2O (Gg)	NO_x (Gg)	CO (Gg)	NMVOC (Gg)	SO_x (Gg)
Total emissions and removals	**6,388.3898**	**-1,393.2691**	**138.7908**	**4.5658**	**24.4303**	**77.0622**	**36.5216**	**9.8013**
1. Energy	**6,102.7447**		**25.6899**	**0.0985**	**23.5467**	**74.1975**	**12.8195**	**9.2996**
A. Fuel Combustion	6,101.7207		1.7664	0.0985	23.5467	74.1975	12.3874	9.2996
1. Energy Industries	3,149.1129		0.0600	0.0066	8.4121	1.1286	0.2786	2.5730
2. Manufacturing Industries and Construction	531.0553		0.0122	0.0015	1.4303	0.3089	0.0494	0.4589
3. Transport	838.3532		0.1924	0.0680	8.4152	47.0637	8.8676	1.0574
4. Other Sectors	1,521.1745		1.5001	0.0217	5.1110	25.6371	3.1853	4.9842
5. Other (other works and needs in energy sector)	62.0247		0.0016	0.0007	0.1781	0.0592	0.0065	0.2262
B. Fugitive Emissions from Fuels	1.0240		23.9235	0.0000	NO, NE	NO, NE	0.4321	NO, NE
1. Solid Fuels			NO		NO	NO	NO	NO
2. Oil and Natural Gas	1.0240		23.9235	0.0000	NO, NE	NO, NE	0.4321	NO, NE
2. Industrial Processes	**256.8091**		**NO, NE**	**NO, NE**	**0.8498**	**1.6204**	**13.9202**	**0.5017**
A. Mineral Products	241.7962		NO, NE	NO, NE	0.7317	0.0767	11.3973	0.4472
B. Chemical Industry	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	0.0061	NO, NE
C. Metal Production	15.0129		NO, NE	NO, NE	0.1180	1.5437	0.0462	0.0545
D. Other Production	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	2.4705	NO, NE
E. Production of Halocarbons and SF_6								
F. Consumption of Halocarbons and SF_6								
G. Other	NO		NO	NO	NO	NO	NO	NO
3. Solvent and Other Product Use	**28.8361**			**0.00004**	**0.0000**	**0.0011**	**9.7819**	
4. Agriculture			**47.0489**	**4.1994**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Enteric Fermentation			43.4216					
B. Manure Management			3.6273	1.6121			NO, NE	
C. Rice Cultivation			NO				NO	
D. Agricultural Soils				2.5873			NO, NE	
E. Prescribed Burning of Savannas			NO	NO	NO	NO	NO	
F. Field Burning of Agricultural Residues			IE	IE	IE	IE	IE	
G. Other			NO	NO	NO	NO	NO	
5. LULUCF		**-1,393.2691**	**0.0365**	**0.0009**	**0.0338**	**1.2432**	**NO, NE**	**NO, NE**
A. Forest Land		-2,140.3185	0.0001	0.0000	0.0001	0.0019		
B. Cropland		2,304.0040	0.0364	0.0009	0.0337	1.2413		
C. Grassland		-1,556.9547	NE	NE	NE	NE		
D. Wetlands		IE, NE	NE	NE	NE	NE		
E. Settlements		IE, NE	NE	NE	NE	NE		
F. Other Lands		IE, NE	NE	NE	NE	NE		
E. Other		NO, NE	NO, NE	NO, NE	NO, NE	NO, NE		
6. Waste			**66.0155**	**0.2668**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Solid Waste Disposal on Land			62.3499		NO, NE		NO, NE	
B. Wastewater Handling			3.6656	0.2668	NO, NE	NO, NE	NO, NE	
C. Waste Incineration					NO, NE	NO, NE	NO, NE	NO, NE
D. Other			NO	NO	NO	NO	NO	NO
7. Other	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
Memo Items								
International Bunkers	**66.1989**		**0.0041**	**0.0021**	**0.2528**	**0.1657**	**0.0818**	**0.0210**
Aviation	66.1989		0.0041	0.0021	0.2528	0.1657	0.0818	0.0210
Marine	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
CO_2 emissions from Biomass	**367.8560**							

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

Annex 1-11: Inventory Year - 2000 (National GHG Inventory of Anthropogenic Emissions of HFCs, PFCs and SF_6)

GHG Source and Sink Categories	HFCs (Gg)					PFCs (Gg)			SF_6 (Gg)
	HFC-32	HFC-125	HFC-134a	HFC-143a	Other HFCs	CF_4	C_2F_6	Other PFCs	
Total emissions	**0.0000**	**0.0000**	**0.0101**	**0.0000**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
1. Energy									
A. Fuel Combustion									
1. Energy Industries									
2. Manufacturing Industries and Construction									
3. Transport									
4. Other Sectors									
5. Other (other works and needs in energy sector)									
B. Fugitive Emissions from Fuels									
1. Solid Fuels									
2. Oil and Natural Gas									
2. Industrial Processes	**0.0000**	**0.0000**	**0.0101**	**0.0000**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Mineral Products									
B. Chemical Industry									
C. Metal Production	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
D. Other Production									
E. Production of Halocarbons and SF_6	NO	NO	NO	NO	NO	NO	NO	NO	NO
F. Consumption of Halocarbons and SF_6	0.00003	0.00005	0.01015	0.000006	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
G. Other									
3. Solvent and Other Product Use									
4. Agriculture									
A. Enteric Fermentation									
B. Manure Management									
C. Rice Cultivation									
D. Agricultural Soils									
E. Prescribed Burning of Savannas									
F. Field Burning of Agricultural Residues									
G. Other									
5. LULUCF									
A. Forest Land									
B. Cropland									
C. Grassland									
D. Wetlands									
E. Settlements									
F. Other Lands									
E. Other									
6. Waste									
A. Solid Waste Disposal on Land									
B. Wastewater Handling									
C. Waste Incineration									
D. Other									
7. Other	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Memo Items									
International Bunkers									
Aviation									
Marine									
CO_2 emissions from Biomass									

Abbreviations: NE – Not Estimated; NO – Not Occurring

Annex 1-12: Inventory Year - 2001

GHG Source and Sink Categories	CO_2 Emissions (Gg)	CO_2 Removals (Gg)	CH_4 (Gg)	N_2O (Gg)	NO_x (Gg)	CO (Gg)	NMVOC (Gg)	SO_x (Gg)
Total emissions and removals	**6991.9883**	**-751.5632**	**135.5853**	**5.0542**	**26.6523**	**79.4615**	**44.6699**	**9.3216**
1. Energy	**6703.9021**		**25.3406**	**0.1056**	**25.7926**	**76.0577**	**13.3166**	**8.8515**
A. Fuel Combustion	6702.8467		1.5735	0.1056	25.7926	76.0577	12.8897	8.8515
1. Energy Industries	3674.9208		0.0705	0.0076	9.8228	1.3623	0.3280	2.3780
2. Manufacturing Industries and Construction	616.9501		0.0153	0.0020	1.6795	0.3457	0.0573	0.6479
3. Transport	892.9560		0.2068	0.0748	9.1675	50.5723	9.5319	1.1545
4. Other Sectors	1452.2801		1.2790	0.0202	4.9262	23.7036	2.9651	4.4063
5. Other (other works and needs in energy sector)	65.7398		0.0019	0.0009	0.1965	0.0738	0.0075	0.2648
B. Fugitive Emissions from Fuels	1.0554		23.7671	0.0000	NO, NE	NO, NE	0.4269	NO, NE
1. Solid Fuels			NO		NO	NO	NO	NO
2. Oil and Natural Gas	1.0554		23.7671	0.0000	NO, NE	NO, NE	0.4269	NO, NE
2. Industrial Processes	**245.4626**		**NO, NE**	**NO, NE**	**0.8125**	**1.6712**	**16.9225**	**0.4701**
A. Mineral Products	229.4738		NO, NE	NO, NE	0.6868	0.0271	13.9627	0.4121
B. Chemical Industry	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	0.0099	NO, NE
C. Metal Production	15.9888		NO, NE	NO, NE	0.1257	1.6440	0.0500	0.0580
D. Other Production	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	2.8999	NO, NE
E. Production of Halocarbons and SF_6								
F. Consumption of Halocarbons and SF_6								
G. Other	NO		NO	NO	NO	NO	NO	NO
3. Solvent and Other Product Use	**42.6236**			**0.0000**	**0.0000**	**0.0011**	**14.4307**	
4. Agriculture			**47.8703**	**4.6763**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Enteric Fermentation			44.2080					
B. Manure Management			3.6623	1.6352			NO, NE	
C. Rice Cultivation			NO				NO	
D. Agricultural Soils				3.0411			NO, NE	
E. Prescribed Burning of Savannas			NO	NO	NO	NO	NO	
F. Field Burning of Agricultural Residues			IE	IE	IE	IE	IE	
G. Other			NO	NO	NO	NO	NO	
5. LULUCF		**-751.5632**	**0.0526**	**0.0015**	**0.0472**	**1.7315**	**NO, NE**	**NO, NE**
A. Forest Land		-2195.4199	0.0053	0.0003	0.0034	0.1208		
B. Cropland		3037.5807	0.0473	0.0012	0.0438	1.6108		
C. Grassland		-1593.7240	NE	NE	NE	NE		
D. Wetlands		IE, NE	NE	NE	NE	NE		
E. Settlements		IE, NE	NE	NE	NE	NE		
F. Other Lands		IE, NE	NE	NE	NE	NE		
E. Other		NO, NE	NO, NE	NO, NE	NO, NE	NO, NE		
6. Waste			**62.3218**	**0.2707**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Solid Waste Disposal on Land			58.2796		NO, NE		NO, NE	
B. Wastewater Handling			4.0422	0.2707	NO, NE	NO, NE	NO, NE	
C. Waste Incineration					NO, NE	NO, NE	NO, NE	NO, NE
D. Other			NO	NO	NO	NO	NO	NO
7. Other	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
Memo Items								
International Bunkers	**61.9061**		**0.0041**	**0.0021**	**0.2253**	**0.1718**	**0.0727**	**0.0188**
Aviation	61.9061		0.0041	0.0021	0.2253	0.1718	0.0727	0.0188
Marine	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
CO_2 emissions from Biomass	**353.0871**							

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

Annex 1-12: Inventory Year - 2001 (National GHG Inventory of Anthropogenic Emissions of HFCs, PFCs and SF_6)

GHG Source and Sink Categories	HFCs (Gg)					PFCs (Gg)			SF_6 (Gg)
	HFC-143a	HFC-134a	HFC-125	HFC-32	Other HFCs	CF_4	C_2F_6	Other PFCs	
Total emissions	**0.0000**	**0.0125**	**0.0001**	**0.0000**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
1. Energy									
A. Fuel Combustion									
1. Energy Industries									
2. Manufacturing Industries and Construction									
3. Transport									
4. Other Sectors									
5. Other (other works and needs in energy sector)									
B. Fugitive Emissions from Fuels									
1. Solid Fuels									
2. Oil and Natural Gas									
2. Industrial Processes	**0.0000**	**0.0125**	**0.0001**	**0.0000**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Mineral Products									
B. Chemical Industry									
C. Metal Production	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
D. Other Production									
E. Production of Halocarbons and SF_6	NO	NO	NO	NO	NO	NO	NO	NO	NO
F. Consumption of Halocarbons and SF_6	0.000009	0.01250	0.00007	0.00004	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
G. Other									
3. Solvent and Other Product Use									
4. Agriculture									
A. Enteric Fermentation									
B. Manure Management									
C. Rice Cultivation									
D. Agricultural Soils									
E. Prescribed Burning of Savannas									
F. Field Burning of Agricultural Residues									
G. Other									
5. LULUCF									
A. Forest Land									
B. Cropland									
C. Grassland									
D. Wetlands									
E. Settlements									
F. Other Lands									
E. Other									
6. Waste									
A. Solid Waste Disposal on Land									
B. Wastewater Handling									
C. Waste Incineration									
D. Other									
7. Other	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Memo Items									
International Bunkers									
Aviation									
Marine									
CO_2 emissions from Biomass									

Abbreviations: NE – Not Estimated; NO – Not Occurring

Annex 1-13: Inventory Year - 2002

GHG Source and Sink Categories	CO_2 Emissions (Gg)	CO_2 Removals (Gg)	CH_4 (Gg)	N_2O (Gg)	NO_x (Gg)	CO (Gg)	NMVOC (Gg)	SO_x (Gg)
Total emissions and removals	**6,667.9080**	**-533.0158**	**135.4596**	**5.1940**	**27.3799**	**95.8651**	**44.8823**	**10.4256**
1. Energy	**6,330.7130**		**27.7259**	**0.1257**	**26.4799**	**94.5804**	**16.5281**	**9.9084**
A. Fuel Combustion	6,329.6702		1.9532	0.1257	26.4799	94.5804	16.0610	9.9084
1. Energy Industries	2,940.7433		0.0582	0.0065	7.8718	1.1571	0.2656	1.9609
2. Manufacturing Industries and Construction	423.5694		0.0101	0.0012	1.1434	0.2553	0.0401	0.3329
3. Transport	1,132.2331		0.2666	0.0933	11.4486	65.1431	12.2797	1.4349
4. Other Sectors	1,767.4954		1.6165	0.0238	5.8213	27.9602	3.4688	5.7726
5. Other (other works and needs in energy sector)	65.6289		0.0018	0.0009	0.1948	0.0646	0.0067	0.4072
B. Fugitive Emissions from Fuels	1.0428		25.7726	0.0000	NO, NE	NO, NE	0.4672	NO, NE
1. Solid Fuels			NO		NO	NO	NO	NO
2. Oil and Natural Gas	1.0428		25.7726	0.0000	NO, NE	NO, NE	0.4672	NO, NE
2. Industrial Processes	**300.8909**		**NO, NE**	**NO, NE**	**0.8903**	**0.9288**	**15.9497**	**0.5171**
A. Mineral Products	292.4069		NO, NE	NO, NE	0.8236	0.0565	12.4770	0.4863
B. Chemical Industry	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	0.0196	NO, NE
C. Metal Production	8.4840		NO, NE	NO, NE	0.0667	0.8724	0.0263	0.0308
D. Other Production	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	3.4269	NO, NE
E. Production of Halocarbons and SF_6								
F. Consumption of Halocarbons and SF_6								
G. Other	NO		NO	NO	NO	NO	NO	NO
3. Solvent and Other Product Use	**36.3041**			**0.00004**	**0.0000**	**0.0007**	**12.4044**	
4. Agriculture			**48.7424**	**4.7901**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Enteric Fermentation			45.1402					
B. Manure Management			3.6021	1.6709			NO, NE	
C. Rice Cultivation			NO				NO	
D. Agricultural Soils				3.1191			NO, NE	
E. Prescribed Burning of Savannas			NO	NO	NO	NO	NO	
F. Field Burning of Agricultural Residues			IE	IE	IE	IE	IE	
G. Other			NO	NO	NO	NO	NO	
5. LULUCF		**-533.0158**	**0.0114**	**0.0004**	**0.0097**	**0.3552**	**NO, NE**	**NO, NE**
A. Forest Land		-2,134.8652	0.0028	0.0002	0.0018	0.0648		
B. Cropland		3,095.8181	0.0085	0.0002	0.0079	0.2904		
C. Grassland		-1,493.9687	NE	NE	NE	NE		
D. Wetlands		IE, NE	NE	NE	NE	NE		
E. Settlements		IE, NE	NE	NE	NE	NE		
F. Other Lands		IE, NE	NE	NE	NE	NE		
E. Other		NO, NE	NO, NE	NO, NE	NO, NE	NO, NE		
6. Waste			**58.9800**	**0.2778**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Solid Waste Disposal on Land			55.0141		NO, NE		NO, NE	
B. Wastewater Handling			3.9660	0.2778	NO, NE	NO, NE	NO, NE	
C. Waste Incineration					NO, NE	NO, NE	NO, NE	NO, NE
D. Other			NO	NO	NO	NO	NO	NO
7. Other	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
Memo Items								
International Bunkers	**62.0776**		**0.0039**	**0.0021**	**0.2401**	**0.1719**	**0.0677**	**0.0197**
Aviation	62.0776		0.0039	0.0021	0.2401	0.1719	0.0677	0.0197
Marine	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
CO_2 emissions from Biomass	**389.5020**							

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

Annex 1-13: Inventory Year - 2002 (National GHG Inventory of Anthropogenic Emissions of HFCs, PFCs and SF_6)

GHG Source and Sink Categories	HFCs (Gg)					PFCs (Gg)			SF_6 (Gg)
	HFC-143a	HFC-125	HFC-134a	HFC-32	Other HFCs	CF_4	C_2F_6	Other PFCs	
Total emissions	**0.0000**	**0.0001**	**0.0147**	**0.0001**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
1. Energy									
A. Fuel Combustion									
1. Energy Industries									
2. Manufacturing Industries and Construction									
3. Transport									
4. Other Sectors									
5. Other (other works and needs in energy sector)									
B. Fugitive Emissions from Fuels									
1. Solid Fuels									
2. Oil and Natural Gas									
2. Industrial Processes	**0.0000**	**0.0001**	**0.0147**	**0.0001**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Mineral Products									
B. Chemical Industry									
C. Metal Production									
D. Other Production									
E. Production of Halocarbons and SF_6	NO	NO	NO	NO	NO	NO	NO	NO	NO
F. Consumption of Halocarbons and SF_6	0.00001	0.0001	0.0147	0.0001	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
G. Other									
3. Solvent and Other Product Use									
4. Agriculture									
A. Enteric Fermentation									
B. Manure Management									
C. Rice Cultivation									
D. Agricultural Soils									
E. Prescribed Burning of Savannas									
F. Field Burning of Agricultural Residues									
G. Other									
5. LULUCF									
A. Forest Land									
B. Cropland									
C. Grassland									
D. Wetlands									
E. Settlements									
F. Other Lands									
E. Other									
6. Waste									
A. Solid Waste Disposal on Land									
B. Wastewater Handling									
C. Waste Incineration									
D. Other									
7. Other	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Memo Items									
International Bunkers									
Aviation									
Marine									
CO_2 emissions from Biomass									

Abbreviations: NE – Not Estimated; NO – Not Occurring

Annex 1-14: Inventory Year - 2003

GHG Source and Sink Categories	CO_2 Emissions (Gg)	CO_2 Removals (Gg)	CH_4 (Gg)	N_2O (Gg)	NO_x (Gg)	CO (Gg)	NMVOC (Gg)	SO_x (Gg)
Total emissions and removals	**7,439.1924**	**-1,554.8094**	**131.6232**	**4.4782**	**30.7111**	**112.8889**	**47.1698**	**12.2190**
1. Energy	**7,060.6998**		**29.4614**	**0.1481**	**29.8082**	**111.2909**	**19.5053**	**11.7085**
A. Fuel Combustion	7,059.5989		2.2107	0.1481	29.8082	111.2909	18.9797	11.7085
1. Energy Industries	3,038.6698		0.0594	0.0065	8.1377	1.1963	0.2750	1.3954
2. Manufacturing Industries and Construction	450.9660		0.0106	0.0013	1.2142	0.2802	0.0422	0.4528
3. Transport	1,413.6200		0.3257	0.1139	14.4757	79.5794	15.0205	1.8835
4. Other Sectors	2,076.4566		1.8136	0.0255	5.7520	30.1763	3.6347	7.6472
5. Other (other works and needs in energy sector)	79.8865		0.0014	0.0009	0.2286	0.0588	0.0075	0.3297
B. Fugitive Emissions from Fuels	1.1010		27.2507	0.0000	NO, NE	NO, NE	0.5255	NO, NE
1. Solid Fuels			NO		NO	NO	NO	NO
2. Oil and Natural Gas	1.1010		27.2507	0.0000	NO, NE	NO, NE	0.5255	NO, NE
2. Industrial Processes	**345.6158**		**NO, NE**	**NO, NE**	**0.9008**	**1.5218**	**16.3123**	**0.5105**
A. Mineral Products	330.9647		NO, NE	NO, NE	0.7856	0.0153	12.7619	0.4573
B. Chemical Industry	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	0.0203	NO, NE
C. Metal Production	14.6511		NO, NE	NO, NE	0.1152	1.5065	0.0456	0.0532
D. Other Production	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	3.4844	NO, NE
E. Production of Halocarbons and SF_6								
F. Consumption of Halocarbons and SF_6								
G. Other	NO		NO	NO	NO	NO	NO	NO
3. Solvent and Other Product Use	**32.8768**			**0.00004**	**0.0000**	**0.0007**	**11.3523**	
4. Agriculture			**44.5934**	**4.0618**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Enteric Fermentation			41.2406					
B. Manure Management			3.3528	1.5941			NO, NE	
C. Rice Cultivation			NO				NO	
D. Agricultural Soils				2.4677			NO, NE	
E. Prescribed Burning of Savannas			NO	NO	NO	NO	NO	
F. Field Burning of Agricultural Residues			IE	IE	IE	IE	IE	
G. Other			NO	NO	NO	NO	NO	
5. LULUCF		**-1,554.8094**	**0.0033**	**0.0002**	**0.0021**	**0.0756**	**NO, NE**	**NO, NE**
A. Forest Land		-2,135.8765	0.0031	0.0002	0.0020	0.0710		
B. Cropland		2,207.0431	0.0001	0.0000	0.0001	0.0046		
C. Grassland		-1,625.9760	NE	NE	NE	NE		
D. Wetlands		IE, NE	NE	NE	NE	NE		
E. Settlements		IE, NE	NE	NE	NE	NE		
F. Other Lands		IE, NE	NE	NE	NE	NE		
E. Other		NO, NE	NO, NE	NO, NE	NO, NE	NO, NE		
6. Waste			**57.5651**	**0.2681**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Solid Waste Disposal on Land			53.1641		NO, NE		NO, NE	
B. Wastewater Handling			4.4010	0.2681	NO, NE	NO, NE	NO, NE	
C. Waste Incineration					NO, NE	NO, NE	NO, NE	NO, NE
D. Other			NO	NO	NO	NO	NO	NO
7. Other	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
Memo Items								
International Bunkers	**73.5472**		**0.0039**	**0.0025**	**0.2837**	**0.1957**	**0.0736**	**0.0233**
Aviation	73.5472		0.0039	0.0025	0.2837	0.1957	0.0736	0.0233
Marine	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
CO_2 emissions from Biomass	**359.7899**							

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

Annex 1-14: Inventory Year - 2003 (National GHG Inventory of Anthropogenic Emissions of HFCs, PFCs and SF_6)

GHG Source and Sink Categories	HFCs (Gg)					PFCs (Gg)			SF_6 (Gg)
	HFC-143a	HFC-134a	HFC-125	HFC-32	Other HFCs	CF_4	C_2F_6	Other PFCs	
Total emissions	**0.0000**	**0.0193**	**0.0002**	**0.0002**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**0.0000**
1. Energy									
A. Fuel Combustion									
1. Energy Industries									
2. Manufacturing Industries and Construction									
3. Transport									
4. Other Sectors									
5. Other (other works and needs in energy sector)									
B. Fugitive Emissions from Fuels									
1. Solid Fuels									
2. Oil and Natural Gas									
2. Industrial Processes	**0.0000**	**0.0193**	**0.0002**	**0.0002**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**0.0000**
A. Mineral Products									
B. Chemical Industry									
C. Metal Production									
D. Other Production									
E. Production of Halocarbons and SF_6									
F. Consumption of Halocarbons and SF_6	0.000019	0.019300	0.000209	0.000164	NO, NE	NO, NE	NO, NE	NO, NE	0.0000002
G. Other									
3. Solvent and Other Product Use									
4. Agriculture									
A. Enteric Fermentation									
B. Manure Management									
C. Rice Cultivation									
D. Agricultural Soils									
E. Prescribed Burning of Savannas									
F. Field Burning of Agricultural Residues									
G. Other									
5. LULUCF									
A. Forest Land									
B. Cropland									
C. Grassland									
D. Wetlands									
E. Settlements									
F. Other Lands									
E. Other									
6. Waste									
A. Solid Waste Disposal on Land									
B. Wastewater Handling									
C. Waste Incineration									
D. Other									
7. Other	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Memo Items									
International Bunkers									
Aviation									
Marine									
CO_2 emissions from Biomass									

Abbreviations: NE – Not Estimated; NO – Not Occurring

Annex 1-15: Inventory Year - 2004

GHG Source and Sink Categories	CO_2 Emissions (Gg)	CO_2 Removals (Gg)	CH_4 (Gg)	N_2O (Gg)	NO_x (Gg)	CO (Gg)	NMVOC (Gg)	SO_x (Gg)
Total emissions and removals	**7,912.1694**	**-103.6005**	**129.6899**	**5.2809**	**32.1177**	**115.2139**	**55.6361**	**11.1254**
1. Energy	**7,482.4685**		**31.2627**	**0.1457**	**31.1477**	**113.2212**	**20.8005**	**10.5448**
A. Fuel Combustion	7,480.6281		1.9425	0.1457	31.1477	113.2212	19.7033	10.5448
1. Energy Industries	3,109.5867		0.0622	0.0069	8.3348	1.2814	0.2843	1.3138
2. Manufacturing Industries and Construction	455.8446		0.0112	0.0014	1.2277	0.3231	0.0430	0.5484
3. Transport	1,581.1835		0.3916	0.1147	15.9045	86.5728	16.3519	2.1130
4. Other Sectors	2,265.0630		1.4754	0.0220	5.4847	24.9636	3.0161	6.3810
5. Other (other works and needs in energy sector)	68.9503		0.0021	0.0008	0.1960	0.0803	0.0080	0.1886
B. Fugitive Emissions from Fuels	1.8405		29.3202	0.0000	NO, NE	NO, NE	1.0973	NO, NE
1. Solid Fuels			NO		NO	NO	NO	NO
2. Oil and Natural Gas	1.8405		29.3202	0.0000	NO, NE	NO, NE	1.0973	NO, NE
2. Industrial Processes	**388.0536**		**NO, NE**	**NO, NE**	**0.9629**	**1.7391**	**20.4495**	**0.5806**
A. Mineral Products	371.3023		NO, NE	NO, NE	0.8312	0.0166	16.1435	0.5198
B. Chemical Industry	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	0.0237	NO, NE
C. Metal Production	16.7513		NO, NE	NO, NE	0.1317	1.7224	0.0521	0.0608
D. Other Production	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	4.2303	NO, NE
E. Production of Halocarbons and SF_6								
F. Consumption of Halocarbons and SF_6								
G. Other	NO		NO	NO	NO	NO	NO	NO
3. Solvent and Other Product Use	**41.6473**			**0.0001**	**0.0000**	**0.0004**	**14.3861**	
4. Agriculture			**41.5595**	**4.8590**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Enteric Fermentation			38.4878					
B. Manure Management			3.0717	1.5693			NO, NE	
C. Rice Cultivation			NO				NO	
D. Agricultural Soils				3.2897			NO, NE	
E. Prescribed Burning of Savannas			NO	NO	NO	NO	NO	
F. Field Burning of Agricultural Residues			IE	IE	IE	IE	IE	
G. Other			NO	NO	NO	NO	NO	
5. LULUCF		**-103.6005**	**0.0101**	**0.0005**	**0.0070**	**0.2532**	**NO, NE**	**NO, NE**
A. Forest Land		-2,183.7322	0.0082	0.0005	0.0052	0.1864		
B. Cropland		3,644.1777	0.0020	0.0001	0.0018	0.0668		
C. Grassland		-1,564.0460	NE	NE	NE	NE		
D. Wetlands		IE, NE	NE	NE	NE	NE		
E. Settlements		IE, NE	NE	NE	NE	NE		
F. Other Lands		IE, NE	NE	NE	NE	NE		
E. Other		NO, NE	NO, NE	NO, NE	NO, NE	NO, NE		
6. Waste			**56.8576**	**0.2757**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Solid Waste Disposal on Land			51.8747		NO, NE		NO, NE	
B. Wastewater Handling			4.9829	0.2757	NO, NE	NO, NE	NO, NE	
C. Waste Incineration					NO, NE	NO, NE	NO, NE	NO, NE
D. Other			NO	NO	NO	NO	NO	NO
7. Other	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
Memo Items								
International Bunkers	**67.3626**		**0.0040**	**0.0023**	**0.2627**	**0.1969**	**0.0626**	**0.0213**
Aviation	67.3626		0.0040	0.0023	0.2627	0.1969	0.0626	0.0213
Marine	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
CO_2 emissions from Biomass	**296.5059**							

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

Annex 1-15: Inventory Year - 2004 (National GHG Inventory of Anthropogenic Emissions of HFCs, PFCs and SF_6)

GHG Source and Sink Categories	HFCs (Gg)					PFCs (Gg)			SF_6 (Gg)
	HFC-143a	HFC-134a	HFC-125	HFC-32	Other HFCs	CF_4	C_2F_6	Other PFCs	
Total emissions	**0.0000**	**0.0238**	**0.0003**	**0.0002**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**0.0000**
1. Energy									
A. Fuel Combustion									
1. Energy Industries									
2. Manufacturing Industries and Construction									
3. Transport									
4. Other Sectors									
5. Other (other works and needs in energy sector)									
B. Fugitive Emissions from Fuels									
1. Solid Fuels									
2. Oil and Natural Gas									
2. Industrial Processes	**0.0000**	**0.0238**	**0.0003**	**0.0002**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**0.0000**
A. Mineral Products									
B. Chemical Industry									
C. Metal Production									
D. Other Production									
E. Production of Halocarbons and SF_6	NO	NO	NO	NO	NO	NO	NO	NO	NO
F. Consumption of Halocarbons and SF_6	0.000025	0.023782	0.000306	0.000247	NO, NE	NO, NE	NO, NE	NO, NE	0.0000002
G. Other									
3. Solvent and Other Product Use									
4. Agriculture									
A. Enteric Fermentation									
B. Manure Management									
C. Rice Cultivation									
D. Agricultural Soils									
E. Prescribed Burning of Savannas									
F. Field Burning of Agricultural Residues									
G. Other									
5. LULUCF									
A. Forest Land									
B. Cropland									
C. Grassland									
D. Wetlands									
E. Settlements									
F. Other Lands									
E. Other									
6. Waste									
A. Solid Waste Disposal on Land									
B. Wastewater Handling									
C. Waste Incineration									
D. Other									
7. Other	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Memo Items									
International Bunkers									
Aviation									
Marine									
CO_2 emissions from Biomass									

Abbreviations: NE – Not Estimated; NO – Not Occurring

Annex 1-16: Inventory Year - 2005

GHG Source and Sink Categories	CO_2 Emissions (Gg)	CO_2 Removals (Gg)	CH_4 (Gg)	N_2O (Gg)	NO_x (Gg)	CO (Gg)	NMVOC (Gg)	SO_x (Gg)
Total emissions and removals	**8,310.3227**	**-375.7257**	**131.2257**	**5.3154**	**32.8714**	**117.7508**	**67.1886**	**10.7556**
1. Energy	**7,721.8697**		**33.3638**	**0.1480**	**31.7455**	**115.5713**	**21.3345**	**10.1124**
A. Fuel Combustion	7,719.9490		2.0125	0.1480	31.7455	115.5713	20.1564	10.1124
1. Energy Industries	3,232.6387		0.0627	0.0068	8.6577	1.2731	0.2928	1.1564
2. Manufacturing Industries and Construction	591.0838		0.0137	0.0016	1.5904	0.3990	0.0554	0.4599
3. Transport	1,612.7510		0.3649	0.1172	16.2364	89.1903	16.8446	2.1507
4. Other Sectors	2,216.1375		1.5670	0.0217	5.0697	24.6433	2.9563	6.1363
5. Other (other works and needs in energy sector)	67.3380		0.0041	0.0007	0.1913	0.0657	0.0073	0.2090
B. Fugitive Emissions from Fuels	1.9206		31.3513	0.0000	NO, NE	NO, NE	1.1781	NO, NE
1. Solid Fuels			NO		NO	NO	NO	NO
2. Oil and Natural Gas	1.9206		31.3513	0.0000	NO, NE	NO, NE	1.1781	NO, NE
2. Industrial Processes	**521.0151**		**NO, NE**	**NO, NE**	**1.1163**	**1.8278**	**22.7665**	**0.6432**
A. Mineral Products	503.6855		NO, NE	NO, NE	0.9800	0.0459	17.9288	0.5803
B. Chemical Industry	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	0.0276	NO, NE
C. Metal Production	17.3296		NO, NE	NO, NE	0.1363	1.7819	0.0544	0.0629
D. Other Production	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	4.7556	NO, NE
E. Production of Halocarbons and SF_6								
F. Consumption of Halocarbons and SF_6								
G. Other	NO		NO	NO	NO	NO	NO	NO
3. Solvent and Other Product Use	**67.4379**			**0.0001**	**0.0000**	**0.0005**	**23.0876**	
4. Agriculture			**40.3098**	**4.8784**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Enteric Fermentation			37.0710					
B. Manure Management			3.2388	1.7119			NO, NE	
C. Rice Cultivation			NO				NO	
D. Agricultural Soils				3.1665			NO, NE	
E. Prescribed Burning of Savannas			NO	NO	NO	NO	NO	
F. Field Burning of Agricultural Residues			IE	IE	IE	IE	IE	
G. Other			NO	NO	NO	NO	NO	
5. LULUCF		**-375.7257**	**0.0106**	**0.0003**	**0.0096**	**0.3512**	**NO, NE**	**NO, NE**
A. Forest Land		-2,246.2332	0.0008	0.0000	0.0005	0.0178		
B. Cropland		3,417.9801	0.0098	0.0003	0.0091	0.3334		
C. Grassland		-1,547.4727	NE	NE	NE	NE		
D. Wetlands		IE, NE	NE	NE	NE	NE		
E. Settlements		IE, NE	NE	NE	NE	NE		
F. Other Lands		IE, NE	NE	NE	NE	NE		
E. Other		NO, NE	NO, NE	NO, NE	NO, NE	NO, NE		
6. Waste			**57.5415**	**0.2886**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Solid Waste Disposal on Land			52.1660		NO, NE		NO, NE	
B. Wastewater Handling			5.3754	0.2886	NO, NE	NO, NE	NO, NE	
C. Waste Incineration					NO, NE	NO, NE	NO, NE	NO, NE
D. Other			NO	NO	NO	NO	NO	NO
7. Other	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
Memo Items								
International Bunkers	**67.6961**		**0.0038**	**0.0024**	**0.2608**	**0.2005**	**0.0592**	**0.0214**
Aviation	67.6961		0.0038	0.0024	0.2608	0.2005	0.0592	0.0214
Marine	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
CO_2 emissions from Biomass	**295.0374**							

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

Annex 1-16: Inventory Year - 2005 (National GHG Inventory of Anthropogenic Emissions of HFCs, PFCs and SF_6)

GHG Source and Sink Categories	HFCs (Gg)					PFCs (Gg)			SF_6 (Gg)
	HFC-143a	HFC-134a	HFC-125	HFC-32	Other HFCs	CF_4	C_2F_6	Other PFCs	
Total emissions	**0.0000**	**0.0290**	**0.0005**	**0.0004**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**0.0000**
1. Energy									
A. Fuel Combustion									
1. Energy Industries									
2. Manufacturing Industries and Construction									
3. Transport									
4. Other Sectors									
5. Other (other works and needs in energy sector)									
B. Fugitive Emissions from Fuels									
1. Solid Fuels									
2. Oil and Natural Gas									
2. Industrial Processes	**0.0000**	**0.0290**	**0.0005**	**0.0004**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**0.0000**
A. Mineral Products									
B. Chemical Industry									
C. Metal Production	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
D. Other Production									
E. Production of Halocarbons and SF_6	NO	NO	NO	NO	NO	NO	NO	NO	NO
F. Consumption of Halocarbons and SF_6	0.000035	0.029036	0.000461	0.000371	NO, NE	NO, NE	NO, NE	NO, NE	0.000002
G. Other									
3. Solvent and Other Product Use									
4. Agriculture									
A. Enteric Fermentation									
B. Manure Management									
C. Rice Cultivation									
D. Agricultural Soils									
E. Prescribed Burning of Savannas									
F. Field Burning of Agricultural Residues									
G. Other									
5. LULUCF									
A. Forest Land									
B. Cropland									
C. Grassland									
D. Wetlands									
E. Settlements									
F. Other Lands									
E. Other									
6. Waste									
A. Solid Waste Disposal on Land									
B. Wastewater Handling									
C. Waste Incineration									
D. Other									
7. Other	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Memo Items									
International Bunkers									
Aviation									
Marine									
CO_2 emissions from Biomass									

Abbreviations: NE – Not Estimated; NO – Not Occurring

Annex 1-17: Inventory Year - 2006

GHG Source and Sink Categories	CO_2 Emissions (Gg)	CO_2 Removals (Gg)	CH_4 (Gg)	N_2O (Gg)	NO_x (Gg)	CO (Gg)	NMVOC (Gg)	SO_x (Gg)
Total emissions and removals	**7,651.9217**	**-639.5120**	**126.8867**	**5.0963**	**30.9001**	**112.1234**	**75.5299**	**10.9519**
1. Energy	**6,965.8294**		**29.4697**	**0.1571**	**29.7355**	**110.6030**	**19.7945**	**10.2559**
A. Fuel Combustion	6,964.3972		2.1460	0.1571	29.7355	110.6030	19.1232	10.2559
1. Energy Industries	2,491.4432		0.0492	0.0053	6.6759	1.0122	0.2273	0.8759
2. Manufacturing Industries and Construction	650.9260		0.0140	0.0016	1.7463	0.3660	0.0593	0.5159
3. Transport	1,535.8525		0.3392	0.1262	16.0388	82.8139	15.6779	2.1698
4. Other Sectors	2,206.7315		1.7398	0.0230	5.0458	26.3516	3.1512	6.4079
5. Other (other works and needs in energy sector)	79.4440		0.0039	0.0009	0.2287	0.0593	0.0075	0.2863
B. Fugitive Emissions from Fuels	1.4322		27.3237	0.0000	NO, NE	NO, NE	0.6713	NO, NE
1. Solid Fuels			NO		NO	NO	NO	NO
2. Oil and Natural Gas	1.4322		27.3237	0.0000	NO, NE	NO, NE	0.6713	NO, NE
2. Industrial Processes	**608.9135**		**NO, NE**	**NO, NE**	**1.1557**	**1.1999**	**29.2888**	**0.6960**
A. Mineral Products	597.7500		NO, NE	NO, NE	1.0679	0.0520	25.0377	0.6555
B. Chemical Industry	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	0.0252	NO, NE
C. Metal Production	11.1636		NO, NE	NO, NE	0.0878	1.1479	0.0355	0.0405
D. Other Production	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	4.1905	NO, NE
E. Production of Halocarbons and SF_6								
F. Consumption of Halocarbons and SF_6								
G. Other	NO		NO	NO	NO	NO	NO	NO
3. Solvent and Other Product Use	**77.1787**			**0.0001**	**0.0000**	**0.0003**	**26.4466**	
4. Agriculture			**39.1598**	**4.6555**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Enteric Fermentation			35.8772					
B. Manure Management			3.2826	1.7802			NO, NE	
C. Rice Cultivation			NO				NO	
D. Agricultural Soils				2.8753			NO, NE	
E. Prescribed Burning of Savannas			NO	NO	NO	NO	NO	
F. Field Burning of Agricultural Residues			IE	IE	IE	IE	IE	
G. Other			NO	NO	NO	NO	NO	
5. LULUCF		**-639.5120**	**0.0122**	**0.0006**	**0.0089**	**0.3203**	**NO, NE**	**NO, NE**
A. Forest Land		-2,087.8823	0.0084	0.0005	0.0054	0.1924		
B. Cropland		2,978.5392	0.0038	0.0001	0.0035	0.1279		
C. Grassland		-1,530.1689	NE	NE	NE	NE		
D. Wetlands		IE, NE	NE	NE	NE	NE		
E. Settlements		IE, NE	NE	NE	NE	NE		
F. Other Lands		IE, NE	NE	NE	NE	NE		
E. Other		NO, NE	NO, NE	NO, NE	NO, NE	NO, NE		
6. Waste			**58.2450**	**0.2831**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Solid Waste Disposal on Land			52.9793		NO, NE		NO, NE	
B. Wastewater Handling			5.2657	0.2831	NO, NE	NO, NE	NO, NE	
C. Waste Incineration					NO, NE	NO, NE	NO, NE	NO, NE
D. Other			NO	NO	NO	NO	NO	NO
7. Other	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
Memo Items								
International Bunkers	**75.9977**		**0.0045**	**0.0026**	**0.3029**	**0.2160**	**0.0676**	**0.0241**
Aviation	75.9977		0.0045	0.0026	0.3029	0.2160	0.0676	0.0241
Marine	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
CO_2 emissions from Biomass	**323.6620**							

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

Annex 1-17: Inventory Year - 2006 (National GHG Inventory of Anthropogenic Emissions of HFCs, PFCs and SF_6)

GHG Source and Sink Categories	HFCs (Gg)					PFCs (Gg)			SF_6 (Gg)
	HFC-143a	HFC-134a	HFC-125	HFC-32	Other HFCs	CF_4	C_2F_6	Other PFCs	
Total emissions	**0.0001**	**0.0345**	**0.0006**	**0.0005**	**NO, NE**	**0.0000**	**NO, NE**	**NO, NE**	**0.0000**
1. Energy									
A. Fuel Combustion									
1. Energy Industries									
2. Manufacturing Industries and Construction									
3. Transport									
4. Other Sectors									
5. Other (other works and needs in energy sector)									
B. Fugitive Emissions from Fuels									
1. Solid Fuels									
2. Oil and Natural Gas									
2. Industrial Processes	**0.0001**	**0.0345**	**0.0006**	**0.0005**	**NO, NE**	**0.0000**	**NO, NE**	**NO, NE**	**0.0000**
A. Mineral Products									
B. Chemical Industry									
C. Metal Production	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
D. Other Production									
E. Production of Halocarbons and SF_6	NO	NO	NO	NO	NO	NO	NO	NO	NO
F. Consumption of Halocarbons and SF_6	0.000054	0.034471	0.000618	0.000500	NO, NE	0.000002	NO, NE	NO, NE	0.000011
G. Other									
3. Solvent and Other Product Use									
4. Agriculture									
A. Enteric Fermentation									
B. Manure Management									
C. Rice Cultivation									
D. Agricultural Soils									
E. Prescribed Burning of Savannas									
F. Field Burning of Agricultural Residues									
G. Other									
5. LULUCF									
A. Forest Land									
B. Cropland									
C. Grassland									
D. Wetlands									
E. Settlements									
F. Other Lands									
E. Other									
6. Waste									
A. Solid Waste Disposal on Land									
B. Wastewater Handling									
C. Waste Incineration									
D. Other									
7. Other	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Memo Items									
International Bunkers									
Aviation									
Marine									
CO_2 emissions from Biomass									

Abbreviations: NE – Not Estimated; NO – Not Occurring

Annex 1-18: Inventory Year - 2007

GHG Source and Sink Categories	CO_2 Emissions (Gg)	CO_2 Removals (Gg)	CH_4 (Gg)	N_2O (Gg)	NO_x (Gg)	CO (Gg)	NMVOC (Gg)	SO_x (Gg)
Total emissions and removals	**8,028.3431**	**-3,068.9814**	**123.2219**	**3.1768**	**32.4470**	**112.4844**	**145.4701**	**9.0310**
1. Energy	**7,052.4028**		**30.8011**	**0.1494**	**30.9478**	**108.8763**	**20.0416**	**8.1631**
A. Fuel Combustion	7,050.7326		1.7509	0.1494	30.9478	108.8763	19.1788	8.1631
1. Energy Industries	2,892.5257		0.0556	0.0059	7.7470	1.1434	0.2628	0.5434
2. Manufacturing Industries and Construction	817.0164		0.0159	0.0018	2.1872	0.4318	0.0730	0.3075
3. Transport	1,606.1891		0.3506	0.1220	16.6547	85.6515	16.2163	2.2855
4. Other Sectors	1,664.8721		1.3257	0.0190	4.1589	21.6076	2.6207	4.6981
5. Other (other works and needs in energy sector)	70.1294		0.0031	0.0008	0.2000	0.0420	0.0060	0.3285
B. Fugitive Emissions from Fuels	1.6702		29.0502	0.0000	NO, NE	NO, NE	0.8628	NO, NE
1. Solid Fuels			NO		NO	NO	NO	NO
2. Oil and Natural Gas	1.6702		29.0502	0.0000	NO, NE	NO, NE	0.8628	NO, NE
2. Industrial Processes	**877.8078**		**NO, NE**	**NO, NE**	**1.4465**	**1.7234**	**92.0617**	**0.8679**
A. Mineral Products	861.8512		NO, NE	NO, NE	1.3210	0.0827	88.7208	0.8100
B. Chemical Industry	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	0.0300	NO, NE
C. Metal Production	15.9566		NO, NE	NO, NE	0.1255	1.6407	0.0508	0.0579
D. Other Production	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	3.2601	NO, NE
E. Production of Halocarbons and SF_6								
F. Consumption of Halocarbons and SF_6								
G. Other	NO		NO	NO	NO	NO	NO	NO
3. Solvent and Other Product Use	**98.1325**			**0.0000**	**0.0000**	**0.0002**	**33.3668**	
4. Agriculture			**31.3651**	**2.7540**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Enteric Fermentation			28.9864					
B. Manure Management			2.3788	1.3455			NO, NE	
C. Rice Cultivation			NO				NO	
D. Agricultural Soils				1.4084			NO, NE	
E. Prescribed Burning of Savannas			NO	NO	NO	NO	NO	
F. Field Burning of Agricultural Residues			IE	IE	IE	IE	IE	
G. Other			NO	NO	NO	NO	NO	
5. LULUCF		**-3,068.9814**	**0.0797**	**0.0042**	**0.0527**	**1.8843**	**NO, NE**	**NO, NE**
A. Forest Land		-2,192.3574	0.0736	0.0041	0.0470	1.6764		
B. Cropland		636.4891	0.0061	0.0002	0.0056	0.2079		
C. Grassland		-1,513.1131	NE	NE	NE	NE		
D. Wetlands		IE, NE	NE	NE	NE	NE		
E. Settlements		IE, NE	NE	NE	NE	NE		
F. Other Lands		IE, NE	NE	NE	NE	NE		
E. Other		NO, NE	NO, NE	NO, NE	NO, NE	NO, NE		
6. Waste			**60.9760**	**0.2692**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Solid Waste Disposal on Land			55.9154		NO, NE		NO, NE	
B. Wastewater Handling			5.0606	0.2692	NO, NE	NO, NE	NO, NE	
C. Waste Incineration					NO, NE	NO, NE	NO, NE	NO, NE
D. Other			NO	NO	NO	NO	NO	NO
7. Other	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
Memo Items								
International Bunkers	**79.9382**		**0.0029**	**0.0027**	**0.3261**	**0.1974**	**0.0664**	**0.0253**
Aviation	79.9382		0.0029	0.0027	0.3261	0.1974	0.0664	0.0253
Marine	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
CO_2 emissions from Biomass	**293.1867**							

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

Annex 1-18: Inventory Year - 2007 (National GHG Inventory of Anthropogenic Emissions of HFCs, PFCs and SF_6)

GHG Source and Sink Categories	HFCs (Gg)					PFCs (Gg)			SF_6 (Gg)
	HFC-143a	HFC-134a	HFC-125	HFC-32	Other HFCs	CF_4	C_2F_6	Other PFCs	
Total emissions	**0.0004**	**0.0419**	**0.0014**	**0.0010**	**NO, NE**	**0.0000**	**NO, NE**	**NO, NE**	**0.0000**
1. Energy									
A. Fuel Combustion									
1. Energy Industries									
2. Manufacturing Industries and Construction									
3. Transport									
4. Other Sectors									
5. Other (other works and needs in energy sector)									
B. Fugitive Emissions from Fuels									
1. Solid Fuels									
2. Oil and Natural Gas									
2. Industrial Processes	**0.0004**	**0.0419**	**0.0014**	**0.0010**	**NO, NE**	**0.0000**	**NO, NE**	**NO, NE**	**0.0000**
A. Mineral Products									
B. Chemical Industry									
C. Metal Production	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
D. Other Production									
E. Production of Halocarbons and SF_6	NO	NO	NO	NO	NO	NO	NO	NO	NO
F. Consumption of Halocarbons and SF_6	0.000357	0.041886	0.001396	0.000995	NO, NE	0.000002	NO, NE	NO, NE	0.000015
G. Other									
3. Solvent and Other Product Use									
4. Agriculture									
A. Enteric Fermentation									
B. Manure Management									
C. Rice Cultivation									
D. Agricultural Soils									
E. Prescribed Burning of Savannas									
F. Field Burning of Agricultural Residues									
G. Other									
5. LULUCF									
A. Forest Land									
B. Cropland									
C. Grassland									
D. Wetlands									
E. Settlements									
F. Other Lands									
E. Other									
6. Waste									
A. Solid Waste Disposal on Land									
B. Wastewater Handling									
C. Waste Incineration									
D. Other									
7. Other	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Memo Items									
International Bunkers									
Aviation									
Marine									
CO_2 emissions from Biomass									

Abbreviations: NE – Not Estimated; NO – Not Occurring

Annex 1-19: Inventory Year - 2008

GHG Source and Sink Categories	CO_2 Emissions (Gg)	CO_2 Removals (Gg)	CH_4 (Gg)	N_2O (Gg)	NO_x (Gg)	CO (Gg)	NMVOC (Gg)	SO_x (Gg)
Total emissions and removals	**8,727.8072**	**-60.4929**	**126.1665**	**5.1794**	**34.8352**	**116.8356**	**114.0611**	**13.2886**
1. Energy	**7,656.7600**		**30.7197**	**0.1598**	**33.3493**	**114.2198**	**21.2488**	**12.4070**
A. Fuel Combustion	7,654.7120		1.8267	0.1598	33.3493	114.2198	20.1086	12.4070
1. Energy Industries	3,290.3984		0.0631	0.0110	8.9530	1.2979	0.2902	4.5144
2. Manufacturing Industries and Construction	910.8888		0.0348	0.0047	2.5335	0.6858	0.1051	0.5308
3. Transport	1,696.5716		0.3668	0.1234	17.5305	89.6832	16.9720	2.4258
4. Other Sectors	1,671.5326		1.3581	0.0198	4.0887	22.4985	2.7338	4.5003
5. Other (other works and needs in energy sector)	85.3206		0.0039	0.0009	0.2436	0.0544	0.0075	0.4357
B. Fugitive Emissions from Fuels	2.0480		28.8930	0.0000	NO, NE	NO, NE	1.1402	NO, NE
1. Solid Fuels			NO		NO	NO	NO	NO
2. Oil and Natural Gas	2.0480		28.8930	0.0000	NO, NE	NO, NE	1.1402	NO, NE
2. Industrial Processes	**938.2415**		**NO, NE**	**NO, NE**	**1.4576**	**1.5786**	**47.8774**	**0.8816**
A. Mineral Products	923.6086		NO, NE	NO, NE	1.3425	0.0740	44.1023	0.8285
B. Chemical Industry	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	0.0238	NO, NE
C. Metal Production	14.6330		NO, NE	NO, NE	0.1151	1.5046	0.0464	0.0531
D. Other Production	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	3.7048	NO, NE
E. Production of Halocarbons and SF_6								
F. Consumption of Halocarbons and SF_6								
G. Other	NO		NO	NO	NO	NO	NO	NO
3. Solvent and Other Product Use	**132.8057**			**0.0000**	**0.0000**	**0.0003**	**44.9350**	
4. Agriculture			**29.9467**	**4.7474**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Enteric Fermentation			27.5975					
B. Manure Management			2.3492	1.3457			NO, NE	
C. Rice Cultivation			NO				NO	
D. Agricultural Soils				3.4017			NO, NE	
E. Prescribed Burning of Savannas			NO	NO	NO	NO	NO	
F. Field Burning of Agricultural Residues			IE	IE	IE	IE	IE	
G. Other			NO	NO	NO	NO	NO	
5. LULUCF		**-60.4929**	**0.0321**	**0.0010**	**0.0283**	**1.0368**	**NO, NE**	**NO, NE**
A. Forest Land		-2,223.0019	0.0051	0.0003	0.0033	0.1165		
B. Cropland		3,657.7918	0.0270	0.0007	0.0250	0.9203		
C. Grassland		-1,495.2828	NE	NE	NE	NE		
D. Wetlands		IE, NE	NE	NE	NE	NE		
E. Settlements		IE, NE	NE	NE	NE	NE		
F. Other Lands		IE, NE	NE	NE	NE	NE		
E. Other		NO, NE	NO, NE	NO, NE	NO, NE	NO, NE		
6. Waste			**65.4680**	**0.2712**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Solid Waste Disposal on Land			60.1438		NO, NE		NO, NE	
B. Wastewater Handling			5.3242	0.2712	NO, NE	NO, NE	NO, NE	
C. Waste Incineration					NO, NE	NO, NE	NO, NE	NO, NE
D. Other			NO	NO	NO	NO	NO	NO
7. Other	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
Memo Items								
International Bunkers	**89.3145**		**0.0018**	**0.0030**	**0.3677**	**0.1904**	**0.0713**	**0.0283**
Aviation	89.3145		0.0018	0.0030	0.3677	0.1904	0.0713	0.0283
Marine	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
CO_2 emissions from Biomass	**336.6568**							

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

Annex 1-19: Inventory Year - 2008 (National GHG Inventory of Anthropogenic Emissions of HFCs, PFCs and SF_6)

GHG Source and Sink Categories	HFCs (Gg)					PFCs (Gg)			SF_6 (Gg)
	HFC-143a	HFC-134a	HFC-125	HFC-32	Other HFCs	CF_4	C_2F_6	Other PFCs	
Total emissions	**0.0006**	**0.0517**	**0.0021**	**0.0015**	**NO, NE**	**0.0000**	**NO, NE**	**NO, NE**	**0.0000**
1. Energy									
A. Fuel Combustion									
1. Energy Industries									
2. Manufacturing Industries and Construction									
3. Transport									
4. Other Sectors									
5. Other (other works and needs in energy sector)									
B. Fugitive Emissions from Fuels									
1. Solid Fuels									
2. Oil and Natural Gas									
2. Industrial Processes	**0.0006**	**0.0517**	**0.0021**	**0.0015**	**NO, NE**	**0.0000**	**NO, NE**	**NO, NE**	**0.0000**
A. Mineral Products									
B. Chemical Industry									
C. Metal Production	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
D. Other Production									
E. Production of Halocarbons and SF_6	NO	NO	NO	NO	NO	NO	NO	NO	NO
F. Consumption of Halocarbons and SF_6	0.000597	0.051741	0.002090	0.001460	NO, NE	0.000003	NO, NE	NO, NE	0.000018
G. Other									
3. Solvent and Other Product Use									
4. Agriculture									
A. Enteric Fermentation									
B. Manure Management									
C. Rice Cultivation									
D. Agricultural Soils									
E. Prescribed Burning of Savannas									
F. Field Burning of Agricultural Residues									
G. Other									
5. LULUCF									
A. Forest Land									
B. Cropland									
C. Grassland									
D. Wetlands									
E. Settlements									
F. Other Lands									
E. Other									
6. Waste									
A. Solid Waste Disposal on Land									
B. Wastewater Handling									
C. Waste Incineration									
D. Other									
7. Other	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Memo Items									
International Bunkers									
Aviation									
Marine									
CO_2 emissions from Biomass									

Abbreviations: NE – Not Estimated; NO – Not Occurring

Annex 1-20: Inventory Year - 2009

GHG Source and Sink Categories	CO_2 Emissions (Gg)	CO_2 Removals (Gg)	CH_4 (Gg)	N_2O (Gg)	NO_x (Gg)	CO (Gg)	NMVOC (Gg)	SO_x (Gg)
Total emissions and removals	**9,030.4008**	**-1,285.4883**	**125.4063**	**4.4705**	**35.0592**	**114.1050**	**84.8130**	**17.6388**
1. Energy	**8,484.6735**		**25.7839**	**0.1445**	**34.2665**	**112.9589**	**20.9979**	**17.1364**
A. Fuel Combustion	8,482.5230		1.8722	0.1445	34.2665	112.9589	19.8734	17.1364
1. Energy Industries	4,453.2554		0.0848	0.0177	12.1983	1.7020	0.3838	9.4752
2. Manufacturing Industries and Construction	507.1516		0.0220	0.0030	1.4262	0.4126	0.0622	0.2667
3. Transport	1,619.4923		0.3621	0.1033	16.3804	88.5445	16.7396	2.2617
4. Other Sectors	1,852.8870		1.4003	0.0200	4.1224	22.2567	2.6828	4.9038
5. Other (other works and needs in energy sector)	49.7367		0.0029	0.0005	0.1392	0.0431	0.0050	0.2290
B. Fugitive Emissions from Fuels	2.1505		23.9117	0.0000	NO, NE	NO, NE	1.1245	NO, NE
1. Solid Fuels			NO		NO	NO	NO	NO
2. Oil and Natural Gas	2.1505		23.9117	0.0000	NO, NE	NO, NE	1.1245	NO, NE
2. Industrial Processes	**426.0656**		**NO, NE**	**NO, NE**	**0.7816**	**0.7485**	**23.3151**	**0.5024**
A. Mineral Products	419.0229		NO, NE	NO, NE	0.7263	0.0244	20.8339	0.4768
B. Chemical Industry	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	0.0203	NO, NE
C. Metal Production	7.0427		NO, NE	NO, NE	0.0554	0.7242	0.0227	0.0256
D. Other Production	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	2.4382	NO, NE
E. Production of Halocarbons and SF_6								
F. Consumption of Halocarbons and SF_6								
G. Other	NO		NO	NO	NO	NO	NO	NO
3. Solvent and Other Product Use	**119.6617**			**0.0000**	**0.0000**	**0.0003**	**40.5000**	
4. Agriculture			**31.3701**	**4.0622**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Enteric Fermentation			28.7081					
B. Manure Management			2.6620	1.5352			NO, NE	
C. Rice Cultivation			NO				NO	
D. Agricultural Soils				2.5270			NO, NE	
E. Prescribed Burning of Savannas			NO	NO	NO	NO	NO	
F. Field Burning of Agricultural Residues			IE	IE	IE	IE	IE	
G. Other			NO	NO	NO	NO	NO	
5. LULUCF		**-1,285.4883**	**0.0158**	**0.0008**	**0.0110**	**0.3974**	**NO, NE**	**NO, NE**
A. Forest Land		-2,251.7423	0.0125	0.0007	0.0080	0.2843		
B. Cropland		2,447.6592	0.0033	0.0001	0.0031	0.1130		
C. Grassland		-1,481.4052	NE	NE	NE	NE		
D. Wetlands		IE, NE	NE	NE	NE	NE		
E. Settlements		IE, NE	NE	NE	NE	NE		
F. Other Lands		IE, NE	NE	NE	NE	NE		
E. Other		NO, NE	NO, NE	NO, NE	NO, NE	NO, NE		
6. Waste			**68.2365**	**0.2630**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Solid Waste Disposal on Land			63.2337		NO, NE		NO, NE	
B. Wastewater Handling			5.0028	0.2630	NO, NE	NO, NE	NO, NE	
C. Waste Incineration					NO, NE	NO, NE	NO, NE	NO, NE
D. Other			NO	NO	NO	NO	NO	NO
7. Other	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
Memo Items								
International Bunkers	**82.6447**		**0.0030**	**0.0028**	**0.3397**	**0.1939**	**0.0754**	**0.0262**
Aviation	82.6447		0.0030	0.0028	0.3397	0.1939	0.0754	0.0262
Marine	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
CO_2 emissions from Biomass	**321.2484**							

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

Annex 1-20: Inventory Year - 2009 (National GHG Inventory of Anthropogenic Emissions of HFCs, PFCs and SF_6)

GHG Source and Sink Categories	HFCs (Gg)					PFCs (Gg)			SF_6 (Gg)
	HFC-143a	HFC-134a	HFC-125	HFC-32	Other HFCs	CF_4	C_2F_6	Other PFCs	
Total emissions	**0.0007**	**0.0592**	**0.0023**	**0.0016**	**NO, NE**	**0.0000**	**NO, NE**	**NO, NE**	**0.0000**
1. Energy									
A. Fuel Combustion									
1. Energy Industries									
2. Manufacturing Industries and Construction									
3. Transport									
4. Other Sectors									
5. Other (other works and needs in energy sector)									
B. Fugitive Emissions from Fuels									
1. Solid Fuels									
2. Oil and Natural Gas									
2. Industrial Processes	**0.0007**	**0.0592**	**0.0023**	**0.0016**	**NO, NE**	**0.0000**	**NO, NE**	**NO, NE**	**0.0000**
A. Mineral Products									
B. Chemical Industry									
C. Metal Production	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
D. Other Production									
E. Production of Halocarbons and SF_6	NO	NO	NO	NO	NO	NO	NO	NO	NO
F. Consumption of Halocarbons and SF_6	0.000726	0.059202	0.002281	0.001559	NO, NE	0.000003	NO, NE	NO, NE	0.000019
G. Other									
3. Solvent and Other Product Use									
4. Agriculture									
A. Enteric Fermentation									
B. Manure Management									
C. Rice Cultivation									
D. Agricultural Soils									
E. Prescribed Burning of Savannas									
F. Field Burning of Agricultural Residues									
G. Other									
5. LULUCF									
A. Forest Land									
B. Cropland									
C. Grassland									
D. Wetlands									
E. Settlements									
F. Other Lands									
E. Other									
6. Waste									
A. Solid Waste Disposal on Land									
B. Wastewater Handling									
C. Waste Incineration									
D. Other									
7. Other	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Memo Items									
International Bunkers									
Aviation									
Marine									
CO_2 emissions from Biomass									

Abbreviations: NE – Not Estimated; NO – Not Occurring

Annex 1-21: Inventory Year - 2010

GHG Source and Sink Categories	CO_2 Emissions (Gg)	CO_2 Removals (Gg)	CH_4 (Gg)	N_2O (Gg)	NO_x (Gg)	CO (Gg)	NMVOC (Gg)	SO_x (Gg)
Total emissions and removals	**9,552.3009**	**-657.3257**	**128.7073**	**5.1015**	**39.1098**	**137.6408**	**101.6484**	**19.9704**
1. Energy	**9,034.6186**		**26.5804**	**0.1759**	**38.2707**	**137.0287**	**23.7712**	**19.4418**
A. Fuel Combustion	9,032.7769		3.3931	0.1759	38.2707	137.0287	22.9023	19.4418
1. Energy Industries	4,587.4073		0.0965	0.0180	12.5498	2.0605	0.4137	8.4583
2. Manufacturing Industries and Construction	539.2670		0.0232	0.0032	1.5124	0.5025	0.0652	1.4850
3. Transport	1,861.9021		0.3673	0.1164	19.1324	89.9024	17.0587	2.8018
4. Other Sectors	1,986.9783		2.9042	0.0378	4.9119	44.5507	5.3609	6.4779
5. Other (other works and needs in energy sector)	57.2223		0.0019	0.0005	0.1642	0.0126	0.0039	0.2187
B. Fugitive Emissions from Fuels	1.8417		23.1874	0.0000	NO, NE	NO, NE	0.8689	NO, NE
1. Solid Fuels			NO		NO	NO	NO	NO
2. Oil and Natural Gas	1.8417		23.1874	0.0000	NO, NE	NO, NE	0.8689	NO, NE
2. Industrial Processes	**456.4391**		**NO, NE**	**NO, NE**	**0.8341**	**0.4318**	**56.8267**	**0.5286**
A. Mineral Products	452.4453		NO, NE	NO, NE	0.8027	0.0212	53.4830	0.5141
B. Chemical Industry	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	0.0326	NO, NE
C. Metal Production	3.9938		NO, NE	NO, NE	0.0314	0.4107	0.0128	0.0145
D. Other Production	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	3.2984	NO, NE
E. Production of Halocarbons and SF_6								
F. Consumption of Halocarbons and SF_6								
G. Other	NO		NO	NO	NO	NO	NO	NO
3. Solvent and Other Product Use	**61.2431**			**0.0000**	**0.0000**	**0.0004**	**21.0506**	
4. Agriculture			**31.3811**	**4.6505**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Enteric Fermentation			28.5037					
B. Manure Management			2.8774	1.6089			NO, NE	
C. Rice Cultivation			NO				NO	
D. Agricultural Soils				3.0416			NO, NE	
E. Prescribed Burning of Savannas			NO	NO	NO	NO	NO	
F. Field Burning of Agricultural Residues			IE	IE	IE	IE	IE	
G. Other			NO	NO	NO	NO	NO	
5. LULUCF		**-657.3257**	**0.0067**	**0.0003**	**0.0050**	**0.1799**	**NO, NE**	**NO, NE**
A. Forest Land		-2,193.2612	0.0044	0.0002	0.0028	0.0994		
B. Cropland		2,987.6539	0.0024	0.0001	0.0022	0.0805		
C. Grassland		-1,451.7184	NE	NE	NE	NE		
D. Wetlands		IE, NE	NE	NE	NE	NE		
E. Settlements		IE, NE	NE	NE	NE	NE		
F. Other Lands		IE, NE	NE	NE	NE	NE		
E. Other		NO, NE	NO, NE	NO, NE	NO, NE	NO, NE		
6. Waste			**70.7390**	**0.2748**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Solid Waste Disposal on Land			65.3038		NO, NE		NO, NE	
B. Wastewater Handling			5.4352	0.2748	NO, NE	NO, NE	NO, NE	
C. Waste Incineration					NO, NE	NO, NE	NO, NE	NO, NE
D. Other			NO	NO	NO	NO	NO	NO
7. Other	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
Memo Items								
International Bunkers	**82.7287**		**0.0028**	**0.0028**	**0.3427**	**0.1983**	**0.0701**	**0.0262**
Aviation	82.7287		0.0028	0.0028	0.3427	0.1983	0.0701	0.0262
Marine	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
CO_2 emissions from Biomass	**828.0265**							

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

Annex 1-21: Inventory Year - 2010 (National GHG Inventory of Anthropogenic Emissions of HFCs, PFCs and SF_6)

GHG Source and Sink Categories	HFCs (Gg)					PFCs (Gg)			SF_6 (Gg)
	HFC-143a	HFC-134a	HFC-125	HFC-32	Other HFCs	CF_4	C_2F_6	Other PFCs	
Total emissions	**0.0009**	**0.0693**	**0.0027**	**0.0019**	**NO, NE**	**0.0000**	**NO, NE**	**NO, NE**	**0.0000**
1. Energy									
A. Fuel Combustion									
1. Energy Industries									
2. Manufacturing Industries and Construction									
3. Transport									
4. Other Sectors									
5. Other (other works and needs in energy sector)									
B. Fugitive Emissions from Fuels									
1. Solid Fuels									
2. Oil and Natural Gas									
2. Industrial Processes	**0.0009**	**0.0693**	**0.0027**	**0.0019**	**NO, NE**	**0.0000**	**NO, NE**	**NO, NE**	**0.0000**
A. Mineral Products									
B. Chemical Industry									
C. Metal Production	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
D. Other Production									
E. Production of Halocarbons and SF_6	NO	NO	NO	NO	NO	NO	NO	NO	NO
F. Consumption of Halocarbons and SF_6	0.000905	0.069306	0.002740	0.001856	NO, NE	0.000004	NO, NE	NO, NE	0.000023
G. Other									
3. Solvent and Other Product Use									
4. Agriculture									
A. Enteric Fermentation									
B. Manure Management									
C. Rice Cultivation									
D. Agricultural Soils									
E. Prescribed Burning of Savannas									
F. Field Burning of Agricultural Residues									
G. Other									
5. LULUCF									
A. Forest Land									
B. Cropland									
C. Grassland									
D. Wetlands									
E. Settlements									
F. Other Lands									
E. Other									
6. Waste									
A. Solid Waste Disposal on Land									
B. Wastewater Handling									
C. Waste Incineration									
D. Other									
7. Other	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Memo Items									
International Bunkers									
Aviation									
Marine									
CO_2 emissions from Biomass									

Abbreviations: NE – Not Estimated; NO – Not Occurring

Annex 1-22: Inventory Year - 2011

GHG Source and Sink Categories	CO_2 Emissions (Gg)	CO_2 Removals (Gg)	CH_4 (Gg)	N_2O (Gg)	NO_x (Gg)	CO (Gg)	NMVOC (Gg)	SO_x (Gg)
Total emissions and removals	**9,687.1467**	**-429.9314**	**130.1769**	**5.1874**	**39.9538**	**149.8077**	**88.6763**	**19.6706**
1. Energy	**9,130.1626**		**30.3212**	**0.1889**	**38.9199**	**149.0177**	**25.5742**	**19.0397**
A. Fuel Combustion	9,128.1796		3.9106	0.1889	38.9199	149.0177	24.5655	19.0397
1. Energy Industries	4,179.0392		0.0857	0.0152	11.4004	1.8163	0.3757	6.7064
2. Manufacturing Industries and Construction	604.2945		0.0281	0.0039	1.6908	0.6462	0.0764	2.2493
3. Transport	1,973.8665		0.3807	0.1238	20.3403	93.2318	17.6990	2.9835
4. Other Sectors	2,304.5277		3.4138	0.0454	5.3001	53.3094	6.4101	6.7712
5. Other (other works and needs in energy sector)	66.4516		0.0022	0.0007	0.1882	0.0140	0.0043	0.3293
B. Fugitive Emissions from Fuels	1.9830		26.4106	0.0000	NO, NE	NO, NE	1.0086	NO, NE
1. Solid Fuels			NO		NO	NO	NO	NO
2. Oil and Natural Gas	1.9830		26.4106	0.0000	NO, NE	NO, NE	1.0086	NO, NE
2. Industrial Processes	**488.0670**		**NO, NE**	**NO, NE**	**1.0281**	**0.5858**	**39.4260**	**0.6308**
A. Mineral Products	482.7657		NO, NE	NO, NE	0.9865	0.0407	35.9916	0.6116
B. Chemical Industry	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	0.0359	NO, NE
C. Metal Production	5.3013		NO, NE	NO, NE	0.0417	0.5451	0.0169	0.0192
D. Other Production	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	3.3816	NO, NE
E. Production of Halocarbons and SF_6								
F. Consumption of Halocarbons and SF_6								
G. Other	NO		NO	NO	NO	NO	NO	NO
3. Solvent and Other Product Use	**68.9171**			**0.0000**	**0.0000**	**0.0004**	**23.6761**	
4. Agriculture			**29.5547**	**4.7285**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Enteric Fermentation			26.8515					
B. Manure Management			2.7032	1.5356			NO, NE	
C. Rice Cultivation			NO				NO	
D. Agricultural Soils				3.1930			NO, NE	
E. Prescribed Burning of Savannas			NO	NO	NO	NO	NO	
F. Field Burning of Agricultural Residues			IE	IE	IE	IE	IE	
G. Other			NO	NO	NO	NO	NO	
5. LULUCF		**-429.9314**	**0.0079**	**0.0004**	**0.0057**	**0.2038**	**NO, NE**	**NO, NE**
A. Forest Land		-2,082.9771	0.0058	0.0003	0.0037	0.1330		
B. Cropland		3,114.6612	0.0021	0.0001	0.0019	0.0707		
C. Grassland		-1,461.6155	NE	NE	NE	NE		
D. Wetlands		IE, NE	NE	NE	NE	NE		
E. Settlements		IE, NE	NE	NE	NE	NE		
F. Other Lands		IE, NE	NE	NE	NE	NE		
E. Other		NO, NE	NO, NE	NO, NE	NO, NE	NO, NE		
6. Waste			**70.2932**	**0.2696**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Solid Waste Disposal on Land			64.4465		NO, NE		NO, NE	
B. Wastewater Handling			5.8467	0.2696	NO, NE	NO, NE	NO, NE	
C. Waste Incineration					NO, NE	NO, NE	NO, NE	NO, NE
D. Other			NO	NO	NO	NO	NO	NO
7. Other	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
Memo Items								
International Bunkers	**95.4567**		**0.0043**	**0.0031**	**0.3959**	**0.2279**	**0.0991**	**0.0303**
Aviation	95.4567		0.0043	0.0031	0.3959	0.2279	0.0991	0.0303
Marine	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
CO_2 emissions from Biomass	**1,016.9471**							

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

Annex 1-22: Inventory Year - 2011 (National GHG Inventory of Anthropogenic Emissions of HFCs, PFCs and SF_6)

GHG Source and Sink Categories	HFCs (Gg)					PFCs (Gg)			SF_6 (Gg)
	HFC-143a	HFC-134a	HFC-125	HFC-32	Other HFCs	CF_4	C_2F_6	Other PFCs	
Total emissions	**0.0010**	**0.0752**	**0.0033**	**0.0023**	**NO, NE**	**0.0000**	**NO, NE**	**NO, NE**	**0.0000**
1. Energy									
A. Fuel Combustion									
1. Energy Industries									
2. Manufacturing Industries and Construction									
3. Transport									
4. Other Sectors									
5. Other (other works and needs in energy sector)									
B. Fugitive Emissions from Fuels									
1. Solid Fuels									
2. Oil and Natural Gas									
2. Industrial Processes	**0.0010**	**0.0752**	**0.0033**	**0.0023**	**NO, NE**	**0.0000**	**NO, NE**	**NO, NE**	**0.0000**
A. Mineral Products									
B. Chemical Industry									
C. Metal Production	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
D. Other Production									
E. Production of Halocarbons and SF_6	NO	NO	NO	NO	NO	NO	NO	NO	NO
F. Consumption of Halocarbons and SF_6	0.001022	0.075179	0.003315	0.002300	NO, NE	0.000004	NO, NE	NO, NE	0.000024
G. Other									
3. Solvent and Other Product Use									
4. Agriculture									
A. Enteric Fermentation									
B. Manure Management									
C. Rice Cultivation									
D. Agricultural Soils									
E. Prescribed Burning of Savannas									
F. Field Burning of Agricultural Residues									
G. Other									
5. LULUCF									
A. Forest Land									
B. Cropland									
C. Grassland									
D. Wetlands									
E. Settlements									
F. Other Lands									
E. Other									
6. Waste									
A. Solid Waste Disposal on Land									
B. Wastewater Handling									
C. Waste Incineration									
D. Other									
7. Other	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Memo Items									
International Bunkers									
Aviation									
Marine									
CO_2 emissions from Biomass									

Abbreviations: NE – Not Estimated; NO – Not Occurring

Annex 1-23: Inventory Year - 2012

GHG Source and Sink Categories	CO_2 Emissions (Gg)	CO_2 Removals (Gg)	CH_4 (Gg)	N_2O (Gg)	NO_x (Gg)	CO (Gg)	NMVOC (Gg)	SO_x (Gg)
Total emissions and removals	**9,354.1917**	**-2,472.7503**	**128.3149**	**3.8425**	**37.0639**	**139.7743**	**108.2620**	**18.6718**
1. Energy	**8,782.3211**		**30.1571**	**0.1723**	**36.1156**	**137.7611**	**23.1422**	**18.1033**
A. Fuel Combustion	8,780.4446		4.1262	0.1723	36.1156	137.7611	22.2206	18.1033
1. Energy Industries	4,184.6346		0.0803	0.0144	11.3991	1.6517	0.3682	6.2607
2. Manufacturing Industries and Construction	561.7258		0.0236	0.0032	1.5715	0.6091	0.0678	1.6522
3. Transport	1,723.5767		0.3228	0.1066	17.7956	79.1029	15.0256	2.6512
4. Other Sectors	2,269.1808		3.6979	0.0477	5.2335	56.3886	6.7561	7.4276
5. Other (other works and needs in energy sector)	41.3266		0.0015	0.0004	0.1159	0.0089	0.0028	0.1115
B. Fugitive Emissions from Fuels	1.8765		26.0309	0.0000	NO, NE	NO, NE	0.9216	NO, NE
1. Solid Fuels			NO		NO	NO	NO	NO
2. Oil and Natural Gas	1.8765		26.0309	0.0000	NO, NE	NO, NE	0.9216	NO, NE
2. Industrial Processes	**496.0046**		**NO, NE**	**NO, NE**	**0.9081**	**0.5782**	**59.1945**	**0.5686**
A. Mineral Products	490.7676		NO, NE	NO, NE	0.8669	0.0397	55.4282	0.5495
B. Chemical Industry	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	0.0377	NO, NE
C. Metal Production	5.2370		NO, NE	NO, NE	0.0412	0.5385	0.0171	0.0190
D. Other Production	NO, NE		NO, NE	NO, NE	NO, NE	0.0000	3.7115	NO, NE
E. Production of Halocarbons and SF_6								
F. Consumption of Halocarbons and SF_6								
G. Other	NO		NO	NO	NO	NO	NO	NO
3. Solvent and Other Product Use	**75.8660**			**0.0000**	**0.0000**	**0.0003**	**25.9254**	
4. Agriculture			**28.0175**	**3.3923**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Enteric Fermentation			25.3644					
B. Manure Management			2.6531	1.3743			NO, NE	
C. Rice Cultivation			NO				NO	
D. Agricultural Soils				2.0180			NO, NE	
E. Prescribed Burning of Savannas			NO	NO	NO	NO	NO	
F. Field Burning of Agricultural Residues			IE	IE	IE	IE	IE	
G. Other			NO	NO	NO	NO	NO	
5. LULUCF		**-2,472.7503**	**0.0629**	**0.0035**	**0.0402**	**1.4346**	**NO, NE**	**NO, NE**
A. Forest Land		-2,007.9512	0.0626	0.0035	0.0399	1.4245		
B. Cropland		997.2695	0.0003	0.0000	0.0003	0.0101		
C. Grassland		-1,462.0687	NE	NE	NE	NE		
D. Wetlands		IE, NE	NE	NE	NE	NE		
E. Settlements		IE, NE	NE	NE	NE	NE		
F. Other Lands		IE, NE	NE	NE	NE	NE		
E. Other		NO, NE	NO, NE	NO, NE	NO, NE	NO, NE		
6. Waste			**70.0774**	**0.2744**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Solid Waste Disposal on Land			63.8783		NO, NE		NO, NE	
B. Wastewater Handling			6.1992	0.2744	NO, NE	NO, NE	NO, NE	
C. Waste Incineration					NO, NE	NO, NE	NO, NE	NO, NE
D. Other			NO	NO	NO	NO	NO	NO
7. Other	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
Memo Items								
International Bunkers	**107.1666**		**0.0052**	**0.0035**	**0.4447**	**0.2503**	**0.1194**	**0.0340**
Aviation	107.1666		0.0052	0.0035	0.4447	0.2503	0.1194	0.0340
Marine	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
CO_2 emissions from Biomass	**1,053.5877**							

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

Annex 1-23: Inventory Year - 2012 (National GHG Inventory of Anthropogenic Emissions of HFCs, PFCs and SF_6)

GHG Source and Sink Categories	HFCs (Gg)					PFCs (Gg)			SF_6 (Gg)
	HFC-143a	HFC-134a	HFC-125	HFC-32	Other HFCs	CF_4	C_2F_6	Other PFCs	
Total emissions	**0.0009**	**0.0693**	**0.0027**	**0.0019**	**NO, NE**	**0.0000**	**NO, NE**	**NO, NE**	**0.0000**
1. Energy									
A. Fuel Combustion									
1. Energy Industries									
2. Manufacturing Industries and Construction									
3. Transport									
4. Other Sectors									
5. Other (other works and needs in energy sector)									
B. Fugitive Emissions from Fuels									
1. Solid Fuels									
2. Oil and Natural Gas									
2. Industrial Processes	**0.0009**	**0.0693**	**0.0027**	**0.0019**	**NO, NE**	**0.0000**	**NO, NE**	**NO, NE**	**0.0000**
A. Mineral Products									
B. Chemical Industry									
C. Metal Production	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
D. Other Production									
E. Production of Halocarbons and SF_6	NO	NO	NO	NO	NO	NO	NO	NO	NO
F. Consumption of Halocarbons and SF_6	0.001136	0.083749	0.003934	0.002785	NO, NE	0.000004	NO, NE	NO, NE	0.000026
G. Other									
3. Solvent and Other Product Use									
4. Agriculture									
A. Enteric Fermentation									
B. Manure Management									
C. Rice Cultivation									
D. Agricultural Soils									
E. Prescribed Burning of Savannas									
F. Field Burning of Agricultural Residues									
G. Other									
5. LULUCF									
A. Forest Land									
B. Cropland									
C. Grassland									
D. Wetlands									
E. Settlements									
F. Other Lands									
E. Other									
6. Waste									
A. Solid Waste Disposal on Land									
B. Wastewater Handling									
C. Waste Incineration									
D. Other									
7. Other	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Memo Items									
International Bunkers									
Aviation									
Marine									
CO_2 emissions from Biomass									

Abbreviations: NE – Not Estimated; NO – Not Occurring

Annex 1-24: Inventory Year - 2013

GHG Source and Sink Categories	CO_2 Emissions (Gg)	CO_2 Removals (Gg)	CH_4 (Gg)	N_2O (Gg)	NOx (Gg)	CO (Gg)	NMVOC (Gg)	SOx (Gg)
Total emissions and removals	**8,325.4727**	**-99.3510**	**128.3178**	**5.4033**	**36.3703**	**146.9860**	**128.2985**	**21.8608**
1. Energy	**7,729.1857**		**29.4091**	**0.1866**	**35.1859**	**145.5462**	**23.9916**	**21.1631**
A. Fuel Combustion	7,727.0268		4.6165	0.1866	35.1859	145.5462	23.1204	21.1631
1. Energy Industries	3,308.1821		0.0654	0.0141	9.0957	1.3662	0.2891	7.2092
2. Manufacturing Industries and Construction	607.6708		0.0322	0.0046	1.7193	0.6476	0.0822	2.7863
3. Transport	1,835.2651		0.3203	0.1135	18.9230	78.5783	14.9469	2.8612
4. Other Sectors	1,945.5770		4.1985	0.0542	5.3637	64.9480	7.8002	8.2087
5. Other (other works and needs in energy sector)	30.3317		0.0000	0.0003	0.0843	0.0062	0.0020	0.0978
B. Fugitive Emissions from Fuels	2.1589		24.7926	0.0000	NO, NE	NO, NE	0.8712	NO, NE
1. Solid Fuels			NO		NO	NO	NO	NO
2. Oil and Natural Gas	2.1589		24.7926	0.0000	NO, NE	NO, NE	0.8712	NO, NE
2. Industrial Processes	**529.6953**		**NO, NE**	**NO, NE**	**1.1541**	**0.3585**	**81.5671**	**0.6976**
A. Mineral Products	526.5511		NO, NE	NO, NE	1.1294	0.0352	76.7637	0.6862
B. Chemical Industry	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	0.0404	NO, NE
C. Metal Production	3.1441		NO, NE	NO, NE	0.0247	0.3233	0.0100	0.0114
D. Other Production	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	4.7530	NO, NE
E. Production of Halocarbons and SF_6								
F. Consumption of Halocarbons and SF_6								
G. Other	NO		NO	NO	NO	NO	NO	NO
3. Solvent and Other Product Use	**66.5917**			**0.0000**	**0.0000**	**0.0002**	**22.7398**	
4. Agriculture			**28.3682**	**4.9387**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Enteric Fermentation			25.7746					
B. Manure Management			2.5936	1.2761			NO, NE	
C. Rice Cultivation			NO				NO	
D. Agricultural Soils				3.6626			NO, NE	
E. Prescribed Burning of Savannas			NO	NO	NO	NO	NO	
F. Field Burning of Agricultural Residues			IE	IE	IE	IE	IE	
G. Other			NO	NO	NO	NO	NO	
5. LULUCF		**-99.3510**	**0.0462**	**0.0025**	**0.0302**	**1.0811**	**NO, NE**	**NO, NE**
A. Forest Land		-1,887.6165	0.0435	0.0024	0.0277	0.9896		
B. Cropland		3,245.4858	0.0027	0.0001	0.0025	0.0915		
C. Grassland		-1,457.2203	NE	NE	NE	NE		
D. Wetlands		IE, NE	NE	NE	NE	NE		
E. Settlements		IE, NE	NE	NE	NE	NE		
F. Other Lands		IE, NE	NE	NE	NE	NE		
E. Other		NO, NE	NO, NE	NO, NE	NO, NE	NO, NE		
6. Waste			**70.4943**	**0.2755**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
A. Solid Waste Disposal on Land			63.9950		NO, NE		NO, NE	
B. Wastewater Handling			6.4993	0.2755	NO, NE	NO, NE	NO, NE	
C. Waste Incineration					NO, NE	NO, NE	NO, NE	NO, NE
D. Other			NO	NO	NO	NO	NO	NO
7. Other	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**	**NO, NE**
Memo Items								
International Bunkers	**115.1928**		**0.0147**	**0.0038**	**0.4647**	**0.2849**	**0.1361**	**0.0375**
Aviation	115.1928		0.0147	0.0038	0.4647	0.2849	0.1361	0.0375
Marine	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
CO_2 emissions from Biomass	**1,246.2329**							

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

Annex 1-24: Inventory Year - 2013 (National GHG Inventory of Anthropogenic Emissions of HFCs, PFCs and SF_6)

GHG Source and Sink Categories	HFCs (Gg)					PFCs (Gg)			SF_6 (Gg)
	HFC-143a	HFC-134a	HFC-125	HFC-32	Other HFCs	CF_4	C_2F_6	Other PFCs	
Total emissions	**0.0013**	**0.0940**	**0.0047**	**0.0034**	**NO, NE**	**0.0000**	**NO, NE**	**NO, NE**	**0.0000**
1. Energy									
A. Fuel Combustion									
1. Energy Industries									
2. Manufacturing Industries and Construction									
3. Transport									
4. Other Sectors									
5. Other (other works and needs in energy sector)									
B. Fugitive Emissions from Fuels									
1. Solid Fuels									
2. Oil and Natural Gas									
2. Industrial Processes	**0.0013**	**0.0940**	**0.0047**	**0.0034**	**NO, NE**	**0.0000**	**NO, NE**	**NO, NE**	**0.0000**
A. Mineral Products									
B. Chemical Industry									
C. Metal Production	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
D. Other Production									
E. Production of Halocarbons and SF_6	NO	NO	NO	NO	NO	NO	NO	NO	NO
F. Consumption of Halocarbons and SF_6	0.001256	0.093985	0.004656	0.003380	NO, NE	0.000004	NO, NE	NO, NE	0.000028
G. Other									
3. Solvent and Other Product Use									
4. Agriculture									
A. Enteric Fermentation									
B. Manure Management									
C. Rice Cultivation									
D. Agricultural Soils									
E. Prescribed Burning of Savannas									
F. Field Burning of Agricultural Residues									
G. Other									
5. LULUCF									
A. Forest Land									
B. Cropland									
C. Grassland									
D. Wetlands									
E. Settlements									
F. Other Lands									
E. Other									
6. Waste									
A. Solid Waste Disposal on Land									
B. Wastewater Handling									
C. Waste Incineration									
D. Other									
7. Other	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Memo Items									
International Bunkers									
Aviation									
Marine									
CO_2 emissions from Biomass									

Abbreviations: NE – Not Estimated; NO – Not Occurring

Annex 2. Detailed Description of Considered Mitigation Actions and their Effects

The actions are prepared based on the information available in the Third National Communication of the Republic of Moldova to UNFCCC (2014), draft Low Emission Development Strategy of the Republic of Moldova up to 2030 (LEDS, 2016), data on implementation of "Low Emission Capacity Building – Republic of Moldova" project and other documents.

Annex 2-1: Capacity Building for Producing Electricity and Heat from Renewable Energy 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 700 MW and 1.87 billion kWh by 2030
	Progress indicators	- RES capacity in operation, MW - electricity produced by RES, MWh - GHG emission reduction, tons CO_2eq
Methodology		- application of Feed-in tariffs - annual tenders for building capacities, determined beforehand for each RES type: wind, solar, water, biogas
Assumptions		- technical potential for wind energy – 9000 MW[71] - maximal potential of biogas sources – 50 MW - technical potential of hydro energy – 3 MW
Goals		- enhancing energy security - reducing GHG emissions
Undertaken steps		- in 2007 the Law on Renewable Energy was approved - in 2009 the methodology for Feed-in tariffs calculation was approved - in 2013 the Energy Strategy up to 2030 was published - in 2013 the Government has approved the National Action Plan in Renewable Energy for 2013-2020 - by 01.07.2015 ANRE has approved the Feed-in tariff for one wind plant, two biogas plants and a number of solar plants for electricity generation.
Planned steps		- in 2016 a new Law on Renewable Energy will be approved
Implementation progress	Outputs	By 01.07.2015 the total capacity of the operational RES was about 3.5MW, except for existing plants. In 2013 in the CHP of the Drochia sugar factory, a plant for biogas production from sugar beet pulp was built with 7.3 mil. m3/year capacity. For the CHP to operate round the year, two cogeneration units have been installed, each with 1.2 MW cogeneration power, both operational on biogas. Construction of the first biogas production plant in Colonita in 2004, which was subsequently rehabilitated in frame of MOSEFF project to produce electricity and heat.
	Estimated GHG reduction	- minimum 241,296 tons CO_2 by 2020 - maximum 1,126,048 tons CO_2 by 2030

*) data correspond to the National Action Plan in Renewable Energy for 2013-2020, GD no. 1073 as of 27.12.2013

Annex 2-2: Construction of Electricity Interconnections with ENTSO-E Power System

Description	Nature of action	Expanding capacities for electricity import from neighbour countries
	Sector	Energy
	GHG	CO_2
	Quantitative targets	- enhancing power import capacity up to 870 MW from ENTSO-E by 2030 - power import capacity up to 4.5 billion kWh
	Progress indicators	- interconnection capacities with Romania, MW - electricity imported from ENTSO-E, MWh - GHG emission reduction, tons CO_2 eq
Methodology		- construction of the first interconnection 400 kV with Romania by 2020 - construction of interconnection 2,400 kV, with Romania by 2025-2027 - promotion of the competitive sale platform for electricity, by 2020
Assumptions		- average increase of electricity demand – 2.1%/year - Romania will have generation capacities, including of RES type for export to the RM up to 2030. - Ukraine and CTEM will be able to compete for sale of electricity to the RM
Goals		- enhancing energy security - providing competitiveness on the electricity market, which currently is lacking - GHG emission reduction
Undertaken steps		- Energy Strategy 2030 has established one of the development scenarios for electricity sources – construction of interconnection with Romania - The World Bank has carried out in 2013-2015 a study, which justifies the import of electricity to the RM from ENTSO-E, instead of building power plants on the territory of the country, the latter option being at the discretion of the power market. - in 2015 the Government has approved the Roadmap in the Energy Area for 2015-2030. - in 2015 the project development for the interconnection has started
Planned steps		- determining the ownership type of the interconnector, by 2017 - launching the tender for building the interconnectors, by 2018 - establishment of the Operator for competitive sale of electricity

[71] V. Rachier, I. Sobor, A. Chiciuc, Assessment of Wind Energy Resource of Moldova. Meridian Ingineresc, nr. 2, 2014, p. 23-29. ISSN 1683-853X.

Implementation progress	Outputs	Upon request of the Government of the RM, WB has carried out a study, which economically justifies the feasibility of meeting the energy demand by energy import.
	Estimated GHG reduction	- minimally10% as opposed to CO_2 emission in BAU, they being measured at the regional level.

Annex 2-3: Heat Production from Biomass

Description	Nature of action	Heat production in the residential and tertiary sectors
	Sector	Buildings
	GHG	CO_2
	Quantitative targets	- 130+80 heating systems based on biomass, with total power of 35+20 MW installed in public buildings, by 2017[1] - 500 households equipped with modern boilers based on briquettes and pellets, by 2014 - 21 public institutions equipped with solar panels for hot water, by 2017[2] - 300 boilers on biomass produced / ensemble in the Republic of Moldova[3] - 250 households and 50 microenterprises supported to purchase and install biomass based boilers in preferential conditions[4]
	Progress indicators	- number of installed biomass based boilers - total power of installed biomass based boilers, MW - energy produced by boilers, MWh - GHG emission reduction, tons CO_2eq
Methodology		- project presentation sessions in each region - annual funding tenders, with 80-85% UE support - monitoring of implementation
Assumptions		- sufficient biomass reserves - emission factor for natural gas 0.208 kgCO_2/kWh - capacity of beneficiaries to contribute 15-20% of the funding
Goals		- enhancing energy security - reduction of GHG emissions
Undertaken steps		- In 2011-2014 the Energy and Biomass project was implemented with 14.56 million Euro funding, provided by EU (14 mil. Euro) and UNDP Moldova (560 thou. Euro). - For 2015 – 2017 funding from EU was obtained in the amount of 9.41 million Euros, for Energy and Biomass – 2 projects
Planned steps		- Launching of tenders for funding of specific projects
Implementation progress	Outputs	- Over the period 2011-2014, 620 households and enterprises have installed biomass based boilers with 1.300 Euros reimbursed from EU funds[5] - GHG reduction: 37,620 tons CO_2/year by 2014
	Estimated GHG reduction	- GHG reduction: 72,770 tons CO_2/year by 2017

[1] <http://www.biomasa.md/project-background-ro/>
[2] <http://www.biomasa.md/who-can-apply-biomass-projects-ro/>
[3] In project Energy and Biomass–2
[4] <http://www.undp.org/content/moldova/ro/home/operations/projects/environment_and_energy/moldova-energy-and-biomass-project0.html>
[5] <http://ionmuntean.com/tag/biomasa/>

Annex 2-4: Enhancing Energy Efficiency

Description	Nature of action	Enhancing energy efficiency
	Sector	All sectors
	GHG	CO_2
	Quantitative targets	- reduction by 433 ktoe of the energy demand or by 20% as compared to the baseline scenario by 2020
	Progress indicators	- energy intensity, toe/GDP - global energy demand of the country, ktoe - GHG emission reduction, tons CO_2eq
Methodology		- application of prices and tariffs for energy and fuel, that reflect effective costs - promotion of energy services in the market - establishment of funds for energy efficiency - establishment of additional credit lines - promotion of NAMAs, including with donor support - approval once in 3 years of Action Plans for reaching energy efficiency goals - establishing authorities for MRV of energy efficiency according to set up goals - motivating the Operator of the electricity and heat distribution network to reduce energy loss by setting up energy loss norms in the tariff calculation methodology - dissemination and awareness building - applying the conservative principle in calculating GHG emission reduction
Assumptions		- demand for primary energy in the baseline scenario by 2020 is 2,693 ktoe - external assistance in energy efficiency will stay the same or be higher
Goals		- enhancing energy security - reducing costs for energy consumption - reduction of GHG emissions

Undertaken steps		- in 2010 Law on energy efficiency was approved and the Agency for Energy Efficiency was established, while in 2011 the National Program for Energy Efficiency for 2011-2020 was approved - in 2013 the National Action Plan in Energy Efficiency for 2013-2015 was approved - in 2014 were approved: Law on heat and promotion of cogeneration; Law on energy performance of buildings; Law on labelling products with energy impact - in 2010 the EBRD credit line for small and medium enterprises and the credit line for energy efficiency in the RM were launched: MoSEEF-I, MoSEEF-II – in 2013, totally amounting to 42 mil. Euros - for the 2012 - 2017 implementation period, a credit line of EBRD, EU and the Kingdom of Sweden was launched for the residential sector – MoREEF, totalling 35 mil. Euros - in 2012 the Fund for Energy Efficiency was established with a 32 mil. Euros budget - EU has provided 42 mil Euros for the energy sector, including for technical assistance - GEF has granted technical assistance for support to increasing the energy efficiency in industry, totalling US$0.96 mil.
Planned steps		- in 2016 the National Action Plan in Energy Efficiency for 2016-2018 will be approved - in 2016 the EBRD credit line, MoSEEF-III, will be established - creation of the secondary regulatory framework in energy efficiency - in 2016, negotiation with European Investment Bank for provision of a loan of about 50 million Euros for public buildings and about 200 million Euros for residential buildings of Chisinau[1]) - in 2016 launching of NAMA project in energy efficiency for rural buildings, amounting to about 60 million Euros with GIZ and Green Fund for Climate support - in 2016 finalization of four large NAMA projects in energy efficiency (within LECB project) and their recording in the NAMA registry of UNFCCC - launching new tenders by the Fund for Energy Efficiency for funding eligible projects - application of differential tariffs for electricity, which do not exist now, by 2020
Implementation progress	Outputs	- over the 2006-2013 energy intensity has decreased 2.3 times, with a 11.3% decrease per year, the trend continuing up-to-date - 303,594 MWh/year savings were achieved due to MoSEEF[2]) project implementation - by 2015, through the EEF and EEA 168 projects in energy efficiency and renewable energy sources were implemented, amounting to a total of about 400 mil. MDL (about 30 mil Euros)[3]) - 12,716 MWh/year savings were reached due to implementation of MoREFF[4]) project
	Estimated GHG reduction	- GHG emissions from the Energy sector have decreased from 2.81tCO_2/1000 Euro GDP (current prices) in 2006 to 1.41 tCO_2/1000 Euro GDP (current prices) in 2013, that is, about twice. - 66,880 tCO_2/year in MoSEEF[2]) project by 2015 - 2,887 tCO_2/year in MoREFF[4]) project by 2015 - 1,130 tCO_2/year in EEF and EEA projects by 2015

[1]) <http://www.chisinau.md/libview.php?l=ro&idc=403&id=11038>
[2]) <http://www.moseff.org/fileadmin/files/doc/MoSEFF_presentation/Rom/MoSEFF-presentation-Rom-2015-07-17.pdf>
[3]) <http://www.mec.gov.md/ro/content/republica-moldova-are-un-potential-substantial-dezvoltarea-energieie-regenerabile-si>
[4]) <http://moreeff.info/statistica-moreeff/>

Annex 2-5: Biofuels in Transport Sector

Description	Nature of action	Renewable energy sources in transport
	Sector	Transport
	Gases (GHG)	CO_2
	Quantitative targets	- 10% share of biofuels in total fuels used in the country by 2020
	Progress indicators	- volume of used biofuels - reduction of GHG emissions, tons CO_2 eq
Methodology		- motivation of biofuels trade and consumption - monitoring of biofuels purchase by vehicle owners - monitoring of biofuels import - monitoring of rapeseed export - establishment of bodies for MRV in effective biofuels consumption - dissemination and training
Assumptions		- by 2020 biofuels consumption of 38.5 ktoe, including 11.7 ktoe bioethanol and 26.8 ktoe biodiesel - by 2020 no production of biofuels on the territory of the country for own consumption is planned
Goals		- enhancing energy security - reduction of GHG emissions
Undertaken steps		- The Moldovan-German company "Bio-Company-Raps" is operational in Lipcani community since 2006. - in 2007 Law on Renewable Energy was approved - in 2013 the Energy Strategy up to 2030 was published - in 2013 the Government has approved the National Action Plan in Renewable Energy for 2013-2020
Planned steps		- development and approval of the secondary regulatory framework
Implementation progress	Outputs	- biofuels were not used in the country, however, in 2009 an amount of 887.05 tons of rapeseed were processed, being extracted over 261.5 tons of biofuels, which was exported[1])
	Estimated GHG reduction	50 thousand tons CO_2 by 2030

[1]) <http://mediu.gov.md/images/documente/starea_mediului/rapoarte/nationale/p7_Anuarul_IES_2009.pdf>

Annex 2-6: Technology Line for Low Emission Clinker Production with Residual Heat Recovery

Description	Nature of action	Partial replacement of clinker in cement production
	Sector	Industrial processes
	GHG	CO_2
	Quantitative targets	- up to 40% clinker was replaced with furnace ash, coal ash or other available compounds
	Progress indicators	- clinker volume used in cement production
Methodology		- motivation of cement factories, carrying out feasibility studies for projects - obtaining donor funding, total investment being about US$5.9 mil. - reconstruction of cement production lines - MRV
Assumptions		- sufficient availability in the country of alternative compounds for replacing clinker
Goals		- decrease of cement price - reduction of GHG emissions
Undertaken steps		- only the idea of clinker replacement in cement production was proposed as NAMA in the LECB project
Planned steps		- development of the draft NAMA document with donor support - development and approval of the secondary regulatory framework
Implementation progress	Outputs	- the project template was developed
	Estimated GHG reduction	174.5 thousand tons of CO_2 annually by 2030

Annex 2-7: Improving Structure of Livestock and Poultry

Description	Nature of action	Creation of a more productive structure of livestock and poultry numbers
	Sector	Agriculture, livestock
	GHG	CH_4
	Quantitative targets	By 2020 and 2030, respectively: - cattle 260-290 and 340-385 thousand heads - sheep 740-770 and 780-830 thousand heads - swine 470-485 and 520-550 thousand heads - poultry 24500-25150 and 25800-26450 thousand heads
	Progress indicators	- number of livestock and poultry - productivity levels
Methodology		- dissemination and training for promoting highly productive livestock and poultry breeds - implementation of more productive livestock and poultry breeds - use of state subsidies for promoting new technologies for production of more productive livestock and poultry breeds - MRV
Assumptions		It is expected that by 2030 the productivity level recorded in the livestock sector of the RM will be similar to the one registered currently in the Western Europe states and the emission factors will also be close to the default emission factors for assessment of CH_4 emissions from enteric fermentation specific for Western European countries (109 kg CH_4/head/year – for dairy cows; 57 kg CH_4/ head/year – for other cattle; 8 kg CH_4/ head/year – for sheep).
Goals		- ensuring agricultural land and food security, including with meat products, dairy and eggs with higher productivity
Undertaken steps		- approved: National Strategy for Agricultural and Rural Development for 2014-2020, Environmental Strategy for 2014-2023 and Action Plan for its implementation
Planned steps		- Development of the Action Plan - Development and approval of the secondary regulatory framework
Implementation progress	Outputs	- the RM is importing approximately 60% of consumed dairy and beef products, only 40% being produced domestically[1]) - the state provides funds for a more productive livestock sector[2])
	Estimated GHG reduction	By 2020 and 2030 respectively, thou. tons CO_2eq: - minimally 132 and 200 - maximally 184 and 288

[1]) National Strategy for Agricultural and Rural Development for 2014-2020. GD No. 409 as of 04.06.2014
[2]) <http://aipa.gov.md/en/node/949>

Annex 2-8: Improved Manure Management Systems

Description	Nature of action	Concentration of cattle and swine breeding in large farms
	Sector	Agriculture, livestock
	GHG	CH_4, N_2O
	Quantitative targets	Enhancing concentration of large farms in 2030 as compared to 2012, respectively: - cattle: 81.8% as compared to 5.8% - dairy cows: 74.9% as compared to 3.4% - swine: 81% as compared to 34.6% - sheep and goats: 35.0% as compared to 2.2% - poultry: 53.5% as compared to 13.8%
	Progress indicators	- number of large farms - waste volume from large farms
Methodology		- Development of policies for concentration of livestock and poultry breeding in large farms - motivation of livestock and poultry breeding in large farms - application of modern livestock and poultry breeding in large farms - MRV of livestock waste
Assumptions		- going back to the high performance waste management practices by 2030 - it is expected that by 2030 the productivity levels of the livestock sector in the RM will be similar to those registered currently in the Western Europe states and the emission factors will also be close to the default emission factors for assessment of CH_4 emissions from enteric fermentation specific for Western European countries (109 kg CH_4/head/year – for dairy cows; 57 kg CH_4/ head/year – for other cattle; 8 kg CH_4/ head/year – for sheep).
Goals		- livestock and poultry production at the EU efficiency level - concentration of waste aiming at its processing using modern low emission technologies
Undertaken steps		- Approved: Waste Management Strategy of the Republic of Moldova for 2013-2027; National Strategy for Agricultural and Rural Development for 2014-2020; Environmental Strategy for 2014-2023 and Action Plan for its implementation.
Planned steps		- Development of the Action Plan - Development and approval of the secondary regulatory framework
Implementation progress	Outputs	- share of large farms for breeding of cattle and swine has significantly decreased over the period 1990-2014 - the share of livestock waste management systems specific for large farms has decreased along with the decrease of the share of liquid waste management systems, which contributes to higher generation of CH_4 emissions - the share of livestock solid waste management systems has increased, however, it is a smaller contributor to CH_4 emission generation
	Estimated GHG reduction	By 2020 and 2030 respectively, thou. tons CO_2eq: - minimally 53 and 78 - maximally 78 and 123

Annex 2-9: Soil Conservation and Soil Fertility Improvement

Description	Nature of action	Sustainable practices for agricultural soil tillage
	Sector	Agriculture, agricultural soils
	GHG	N_2O, CO_2
	Quantitative targets	Use of chemical fertilizer, thousand tons: - nitrogen: 45.0-51.5 by 2020, 70-80 by 2030; - natural organic: 0.84-1.40 by 2020, 6.72-8.40 by 2030 Use of green manure, thousand tons of mineral fertilizer equivalent: 1400-2100 by 2020; 4900-5600 by 2030 Area to be covered by conservation agriculture system, thousand hectares: 100-200 by 2020; 300-400 by 2030
	Progress indicators	- amount of chemical fertilizer - amount of green manure - land area to be covered by conservation agriculture system
Methodology		- dissemination and training in sustainable agriculture - roadmap development - development of the Action Plan for soil conservation and soil fertility improvement - motivation for conservation agriculture development - use of „No-Till" and „Mini-Till" technologies - MRV of conservation agriculture
Assumptions		- for green manure (autumn vetch as intermediate crop) the following basic indicators were taken into account: average green mass humidity - 80%; the average nitrogen content in green mass - 0.8%; average productivity - 20 t / ha; coefficient of transfer to manure with litter - 1.4 (in other words, 1 ton of vetch green mass is equivalent to 1.4 tons of cattle manure with litter by nitrogen content) - introducing intermediate crops as green manure will be done in parallel with the implementation of the conservation agriculture tillage based „No-Till" and „Mini-Till" technologies - projections were made based on information available in the National Strategy for Agricultural and Rural Development for 2014-2020 - the total amount of mineralized nitrogen was determined according to an earlier defined methodology[1]) - the basic information is available in the Program for use of new land and increase of soil fertility (Part II. Increasing soil fertility) - On the areas under conservation agriculture, plant residues of the basic crop will be left on the field for mulch formation
Goals		- reaching a positive carbon balance and humus balance in soil, about (+0.03 t/ha) and (+0.05 t/ha) respectively, by 2030 - enhancing soil productivity without soil erosion - GHG emission reduction

Undertaken steps		Approved: - Program for soil conservation and soil fertility improvement for 2011-2020, National Strategy for Agricultural and Rural Development for 2014-2020; Environmental Strategy for 2014-2023 and Action Plan for its implementation. - Action Plan for soil conservation and soil fertility improvement for 2014-2016
Planned steps		- Development of the Action Plans - Development and approval of the secondary regulatory framework
Implementation progress	Outputs	- on about 10% of agricultural land of the country "No-Till" and „Mini-Till" technologies are already employed - the state provides financial incentives (up to 25%) for purchase of advance equipment for soil tillage[2])
	Emission reduction N_2O	By 2020 and 2030 respectively, thousand tons CO_2eq: minimally 35 and 44; maximally 38 and 105.
	Emission reduction / CO_2 sequestration	By 2020 and 2030 respectively, thousand tons CO_2eq: minimally 262 and 681; maximally 567 and 1496.

[1]) Banaru, Anatol (2000), Metodă pentru determinarea emisiilor cu efect de seră din solurile arabile (Method for determining greenhouse gas emissions from arable soils). În culegerea de lucrări „Schimbarea Climei. Cercetări, studii, soluții" (In collection: Climate Change: research, studies, solutions). Ministerul Mediului și Amenajării Teritoriului / PNUD Moldova (Ministry of Environment and Territory Development / UNDP Moldova). „Bons Offices" S.R.L. Chișinău, 2000. P. 115-123.
[2]) <http://aipa.gov.md/en/node/949>

Annex 2-10: Extension of Afforested Areas

Description	Nature of action	Afforestation of new territories
	Sector	Forestry
	GHG	CO_2
	Quantitative targets	Extension of afforested areas, increase, thousand hectares: - minimally 10-32 by 2020 - maximally 32-85 by 2030 Harvested wood mass volume, growth, thousand m^3: - minimally 88-193 by 2020 - maximally 127-292 by 2030
	Progress indicators	- afforested areas - harvested wood mass volume
Methodology		- identification of new territories for afforestation - dedicated planning at national and local levels, securing seedlings and equipment, methodology and technology assistance, assistance in design, on site works, etc. - establishment of highly productive and ecologically stable woody plantations - implementation of the Action Plan for extending the afforested areas - MRV for extending the afforested areas and increase of harvested wood mass volume
Assumptions		- In order to identify annual increase and loss of biomass in forests, national emission factors were calculated / developed - afforestation will take place on 4.5 % glade areas, 10.4 % on clearings and vacant land, 21.6 % in forests affected by hazards, 5.4 % - on unregenerated cutting areas, 20.5% on cutting areas subjected to exploitation up to 2020 and 37.6 % - in other areas
Goals		- reaching an afforestation level in compliance with a sound ecosystem, amounting to about 15% of the territory of the country, the current figure being 9.6% - increase of CO_2 sequestration
Undertaken steps		Approved: - State Program for forest regeneration and afforestation of the forestry fund areas over the period 2003-2020, National Plan for extending forest areas 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.
Planned steps		- The development of the Funding Plan for carrying out the State Program for Forest Regeneration and Afforestation of the Forestry Fund Areas - Approval of subsequent action plans to be developed after 2018 - Promotion of the draft NAMA document "Afforestation of degraded land, impracticable for agriculture" to be implemented within LECB project and registered in the NAMA Registry of UNFCCC in 2016.
Implementation progress	Outputs	- regeneration of forests has grown from 3.3 thousand hectares in 2006 to about 5 thousand hectares in 2013 - extension of areas covered with forest vegetation has declined, from 7.5 thousand hectares in 2006 to 0.1 thousand hectares in 2013[1])
	CO_2 emission sequestration	By 2020 and 2030 respectively: - minimally: -19 and -82 thousand tons CO_2eq; - maximally: -111 and -414 thousand tons CO_2eq.

[1]) <http://www.statistica.md/category.php?l=ro&idc=99&>

Annex 2-11: Improved Solid Waste Management with Biogas Recovery

Description	Nature of action	Efficient management of municipal solid waste
	Sector	Waste
	GHG	CH_4
	Quantitative targets	- establishment of 8 regional systems for primary solid waste collection and depositing - up to 2020 ensuring provision of waste management services in urban and rural areas - provision of 35,650 containers and 120 vehicles with 8m^3 capacity for waste collection
	Progress indicators	- number of maintained solid waste deposits - volume of recycled waste - volume of waste stored at each deposit
Methodology		- designing and building of 8 regional systems for primary collecting and depositing of solid waste - construction of power plants based on biogas from waste deposits, a total of 7 entities - MRV of the generated biogas and of the gas used for power generation
Assumptions		- all plastic, metal, glass and paper waste will be collected and recycled in the amount of 25-30% by 2025 - biodegradable waste will exceed 40% of the total volume of deposited waste - electricity produced from biogas from the waste deposits will be fed into the network based on Feed-in tariff
Goals		- ensuring a high quality of the environment - reducing risks to health to the minimum - reducing need for raw material for producing paper, glass, plastic and metal - significant reduction of CH_4 emission into the atmosphere
Undertaken steps		- The following documents were approved: Waste Management Strategy of the Republic of Moldova for 2013-2027, Environmental Strategy for 2014-2023 and the Action Plan for its implementation. - The German company GIZ has finalized the designing of the system for primary collection and depositing of waste in the urban and rural space for a part of the 8 regions of the country; currently the design process is on-going for the rest of the regions - within the LECB project a draft document is being developed on NAMA "Electricity production based on biogas from waste deposit with extension to cover waste from Cahul-Cantemir-Taraclia zone", to be recorded in the NAMA Registry of UNFCCC for subsequent funding by donors.
Planned steps		- Development and approval of the Action Plan - Identification of funding for primary waste collection and depositing in the urban and rural space, including for implementation of the abovementioned NAMA projects - Dissemination, awareness building and training in importance of recyclable waste selection
Implementation progress	Outputs	- communities were negotiated and established for placing solid waste deposits in all regions of the country - an agreement has been signed with the Japanese company "Asiatica" for development of the draft project document for the abovementioned NAMA - GIZ will implement regional projects for primary waste collection and depositing in the urban and rural space
	Estimated GHG reduction	By 2020: about 300 thousand tCO_2eq/year

Annex 3. NAMA Projects Selected for Detailed Consideration

NAMA project proposals selected for detailed consideration within the UNDP Project „Low Emission Capacity Building Program", implemented in the Republic of Moldova within the April 2014-December 2016 periods, are as following:

1. Construction of a CHP with a capacity of 1 MW to supply heat to residential blocks "Melestiu" of Chisinau (beneficiary: "Glorinal" company). Implementation of this pilot project will serve as a starting point for use of all available reserves for use of cogeneration power plants in the country.
2. Replacing inefficient bulbs with energy-efficient LED bulbs.
3. Afforestation of degraded land, which is impracticable for agriculture.
4. Electricity production based on the biogas created in Cahul landfill, while extending the project to use waste from the Cantemir-Cahul-Taraclia region, and later from other 7 landfills envisaged.

Annex 4. Additional Information on Financing Needs, Access to Financial Resources and Capacity Building

Table A4-1: Specific investments in projects of the Republic of Moldova[72], US$/$tCO_2$ eq/year

Areas	Amount	Share of investment in the energy sector, %
Rehabilitation of buildings	3699	50
RES	63	35
Replacing industrial technology and enterprise rehabilitation	154	15
Replacing agricultural equipment	383	
Industrial processes (replacing clinker in cement factory)	99	
Waste (collection and biogas burning)	407	
Afforestation	160	

[72] According to the results of projects in Moldova: MoSEFF, MoREFF, Energy Efficiency Fund, GIZ

Table A4-2: Investments needed in WM and WAM as compared to BAU

Sectors	WM 2020				WM 2030				WAM 2020				WAM 2030			
	BAU-WM		Investment needed		BAU-WM		Investment needed		BAU-WAM		Investment needed		BAU-WAM		Investment needed	
	Gg CO_2 eq	%	mil. US $	mil US $ /year	Gg CO_2 eq	%	mil. US $	mil. US $ / year	Gg CO_2 eq	%	mil. US $	mil US $ /year	Gg CO_2 eq	%	mil. US $	mil US $ / year
Energy	582	38	1102		1615	37	3060		1917	56	3632		4048	50	7670	
Industrial processes	208	14	21		546	13	54		293	8	29		736	9	73	
Solvents and use of other products	0	0			0	0			0	0			0	0		
Agriculture	221	15	85		331	8	126		301	9	115		517	6	198	
LULUCF	346	23	55		994	23	159		722	21	116		1832	23	293	
Waste	268	17	109		837	19	340		321	9	131		1003	12	408	
Total, with LULUCF	1563	100	1371	274	4323	100	3741	249	3494	100	4022	804	8137	100	8642	576
Total, without LULUCF	1218		1316	263	3329		3582	239	2772		3907	781	6305		8349	557

Table A4-3: Funding needs for capacity building in GHG emission mitigation

No.	Capacity building area	Amount of funding, US$ mil.	Comments
1.	Carrying out climate related studies and research, as well as assessments	0.2128	Annually
2.	Formulation of climate related strategies and policies	0.1064	Assistance of donors for capacity building in formulating justification studies in respect to key elements of national strategies
3.	Implementation of climate related strategies and policies	0.1000	For development of action plans for each of the NAMAs of the LEDS
4.	Negotiation of climate issues internationally	0.6420	Funding from UNDP Project "Republic of Moldova: capacity building for low emission development", 2014-2016
	TOTAL	**1.9124**	

Table A4-4: Calculation of funding for climatic studies and research, as well as assessments

Sectors	Amount, US$	Comments
Energy	30400	=2*500*12/0.4+2000/5, where 2 – number of people, monthly salary-US$500, 12 months, 0.4-social contributions and overheads, US$2,000 – cost of computer, printer, etc.; 5 – equipment depreciation period
Transport	30400	
Buildings	30400	
Industry	30400	
Agriculture	30400	
LULUCF	30400	
Waste	30400	
TOTAL	**212800**	

Annex 5. Summary of Mitigation and Adaptation Related Work Undertaken to Date

Name of Project	Implementing Organization	Total Funds/Years	Highlights
Cross-cutting			
Republic of Moldova: Enabling Activities for the Preparation of the First National Communication under the UNFCCC	GEF/UNDP Grant	Duration: 1997-2000 Budget: US$ 0.315 million	– Summarized findings: (i) of air pollution surveys; (ii) production of first GHG inventory; (iii) national and regional climate change patterns; (iv) vulnerability and adaptation of the natural and artificial ecosystems to climate change, etc. – Findings were used to make climate change forecasts that became basis for mitigation recommendations.
Republic of Moldova: Enabling Activities for the Preparation of the Second National Communication under the UNFCCC	GEF (UNEP, CCO) Grant	Duration: 2005-2009 Budget: US$ 0.420 million	– Include a national inventory of anthropogenic emissions by sources and removal by sinks of all GHGs not controlled by the Montreal Protocol for the period 1990-2005, and a general description of steps envisaged to implement the Convention. – Addressed urgent and immediate domestic issues related to climate change, takes full consideration of the capacity buildings needs of the Republic of Moldova in various thematic areas as highlighted in Decision 2/CP.7, and hence capacity building elements are incorporated in all proposed activities. – The 2nd National Communication constitutes a major analytical basis for development of the National Climate Change Adaptation Strategy (incl. vulnerability analysis for key for current and future climate conditions for 30-50 years, identified adaptation measures and concepts until 2100). These results will serve as a basis for the identification of the most vulnerable sectors in the proposed Project. – Further, the project will make use of the tested approaches on vulnerability assessment and identification of adaptation measures.
Republic of Moldova: Enabling Activities for the Preparation of the Third National Communication under the UNFCCC	GEF (UNEP, CCO) Grant	Duration: 2010-2013 Budget: US$ 0.500 million	– The project objective is to enable the Republic of Moldova to prepare and submit its Third National Communication to the COP of the UNFCCC in accordance to its commitments as a non-Annex 1 Party of the Convention. – The main aim of the project is to develop and enhance national capacities and facilitate the process of mainstreaming climate change, and consider it not only as environmental issue but also as a sustainable development. – The project will contribute to the global effort to better understand the sources and sinks of greenhouse gases, potential impacts of climate change, and provide effective measures to achieve the ultimate objective of the UNFCCC. – The project will help to identify project proposals related to climate change, eligible for further funding by donors community or co-funding by GEF, other multilateral or bilateral organizations and eligible for funding, inclusive under Clean Development Mechanism (CDM) of the Kyoto Protocol as well as under any other global economic mechanisms focused on climate change mitigation. – Within the 3rd NC national climate scenarios were updated according to new results presented by IPCC. Evaluations related to the impact of climate change on the agricultural sector were extended.
Republic of Moldova: Enabling Activities for the Preparation of the Fourth National Communication and First Biennial Update Report under the UNFCCC	GEF (UNEP, CCO) Grant	Duration: 07/07/2014 30/06/2017 Budget: US$ 0.852 million	– The project is being pursued to support the Republic of Moldova in the preparation of its Fourth National Communication and First Biennial Update Report to the Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC). – The main components of the project are as follows: (i) Description of national circumstances, institutional arrangements for the preparation of national communications, national inventory reports and biennial update reports on a continuous basis; (ii) The national inventory of anthropogenic emissions by sources and removal by sinks of all greenhouse gases (GHGs) not controlled by the Montreal Protocol, including a national inventory report for the period since 1990 to 2014; (iii) Information on mitigation actions and their effects; (iv) Information on vulnerability to climate change and adaptation actions taken; (v) Financial, technical and capacity needs including support needed and received; (vi) Domestic measurement, reporting and verification; (vii) Other information relevant to the Convention (i.e., integrating climate change considerations into social, economic and environmental policies and actions; development and transfer of environmentally sound technologies; climate change research and systematic observations; research programs; education, training and public awareness, capacity building, information and networking); (viii) Technical assistance; (ix) Compilation and publication of Fourth National Communication (NC4) and First Biennial Update Report (BUR1) of the Republic of Moldova to the Conference of the Parties; (x) Project monitoring and evaluation; and (xi) Project management. – The preparation of the NC4 and BUR1 is also expected to enhance general awareness and knowledge on climate change-related issues in the Republic of Moldova. It should seek to assist in the process of national planning and policy formulation, especially as it relates to mainstreaming vulnerability and adaptation, and mitigation measures within the work programme of the various stakeholders. In addition, it will contribute to the social and economic development of the country by reducing vulnerability associated with climate change, or proposing options to do so in the key sectors while reducing emissions and enhancing sinks of greenhouse gases.

Name of Project	Implementing Organization	Total Funds/Years	Highlights
Climate Change and Security in the Dniester River Basin (for Moldova and Ukraine)	EC and ADA (UNECE, OSCE)	Duration: 2013-2015 Budget: 500,000 EUR	– The project aims at increasing adaptive capacity of the riparian countries sharing the Dniester river basin, through improved transboundary cooperation. – Main results will include the development of a basin-wide transboundary climate change adaptation strategy together with an implementation and resource mobilization plan and the support for the prioritization of measures and geographical areas for intervention through consultations, cost-benefit assessment and multi-criteria decision analysis as well as other decision-support tools and implementation of a few priority measures in the Basin, such as construction of monitoring stations, restoration of ecosystems, flood risk mapping and communication.
Technology Needs Assessments	UNEP Risoe Centre Grant	Duration: 2011-2013 Budget: 120,000 US$	– The purpose of the project was to assist the Republic of Moldova to identify and analyse priority technology needs, which could form the basis for a portfolio of environmentally sound technology projects and programs to facilitate the transfer of, and access to, the ESTs and know-how in the implementation of Article 4.5 of the UNFCCC Convention. – The overall objective of the TNA Project comprised mitigation and adaptation technology needs assessment, activities associated with sector and technology prioritization, encouraging the creation of enabling environment for the transfer of environmentally sound technologies. The Project also aimed to identify barriers hindering the acquisition, deployment, and diffusion of prioritized technologies and developing Technology Action Plans (TAP), specifying activities and enabling frameworks to overcome the barriers and facilitate the transfer, adoption, and diffusion of selected technologies. – The Multi-Criteria Decision Analysis (MCDA) methodological approach used in the TNA Project for conducting the sectors and technologies evaluation (see the final RM's TNA Reports available on: <http://tech-action.org/publications.asp>), may be used also by the national team involved in the NAMAs prioritization.
National Human Development Report, 2009/2010 Climate Change in Moldova, Socio-Economic Impact and Policy Options for Adaptation	UNDP	Duration: one year - 2009 Budget: 100,000 US$	– Focused on the impact of climate change on Moldova's environment, society and economy. – Discusses adaptation options and their potential synergies with the overarching development goals of the country. – Highlights areas where action is needed in terms of adaptation to climate change, and explains the implications for sectoral and cross-sectoral development policies.
Regional EU Clima East Project	EU	Duration: 2013-2016 Budget: EUR 19.2 million	– Clima East is a European Union funded project package assisting the Eastern Neighbourhood Partnership Countries and Russia in approaches to climate change mitigation and adaptation. The EUR 19.2 million package consists of two components: the first, with a budget of EUR 11 million and implemented by UNDP, consists of a number of Pilot Projects that support the development of ecosystems-based approaches to climate change. – The second is a Policy component that seeks to foster improved climate change policies, strategies and market mechanisms in the partner countries by supporting regional cooperation and improving information access to EU climate change policies, laws and expertise. Implemented by an HTSPE led consortium, this component has a budget of EUR 8.2 million over 4 years.
Regional EU Clima East Project: Clima East Moldova: Climate change mitigation and ecosystem based adaptation Orhei National Park	EU	Duration: 2013-2016 Budget: EUR 0.535 million	– The project is part of a larger EU „Clima East: Supporting Climate Change Mitigation and Adaptation in Neighbourhood East and Russia" initiative, responding to the main biodiversity challenges in the Orhei National Park area (33,792 ha) and its buffer zone such as vulnerability to climate change, loss of biodiversity and forest area, deep soil erosion and landslides, pasture degradation and low grazing capacity of existing pastures. Expected Results include: Pasture inventory for Orhei National Park carried out; Community pasture and forest management plans developed for Orhei National Park; 500 ha of pastures restored and 150 ha of degraded lands afforested; Monitoring system for carbon dividends and ecological integrity of the ecosystem in place and incorporated in the National Inventory Systems; GHG removals enhanced through preventing soil erosion.
Disaster and Climate Risk Reduction in Moldova	UNDP	Duration: 2013-2016 Budget: US$ 1,100,000 UNDP US$ 400,000 Government of Moldova US$ 25,000[73]	– The Disaster and Climate Risk Reduction project aims to help reduce disaster and climate risks in Moldova through development of national and local risk management capacities. The project contributes to increased national ownership and leadership for disaster resilience through better coordination capacities, awareness and knowledge and innovative technology transfer. To achieve these, support is provided to the development of the National Disaster Risk Management Strategy and operationalization of the existing coordination mechanism regarded as a platform for mobilization of combined knowledge, prioritization and advocacy on DRR at all levels. – In addition, actions are taken to mainstream DRR in school curricula, improve the current extension network in the field, as well as to build up the capacities of mass media to communicate on DRR-related issues. At the local level, innovative disaster risk reduction and climate risk management measures with replication potential will be piloted as part of the project's Small Grants Scheme. – The Local Level Risk Management Toolkit developed in the initial project phase will be expanded to cover regional aspects in risk assessment and mainstreaming. – Local level climate risk management measures were piloted at the local level. The tools for local level risk assessment and management developed under this project as well as the lessons learned from the pilot projects will feed into this project.

[73] <http://www.md.undp.org/content/moldova/en/home/operations/projects/environment_and_energy/disaster-and-climate-risk-reduction-in-moldova.html>

Name of Project	Implementing Organization	Total Funds/Years	Highlights
Supporting Moldova's National Climate Change Adaptation Planning Process	ADA, UNDP	Duration: 2014-2016 Budget: 744,000 EUR	– The overall goal of the project is to ensure that Moldova has a system and capacities in place for medium- and long-term adaptation planning and budgeting with the overall aim to reduce vulnerability of the population and key sectors to the impacts of climate change. – The main project objective is to support Moldova to put in place its National Adaptation Plan (NAP) process contributing to and building upon existing development planning strategies and processes and to implement priority adaptation actions. – The following outputs are expected: (1) Institutional and policy frameworks for medium to long-term gender-sensitive adaptation planning and budgeting in place; (2) Institutional and technical capacities for iterative development of comprehensive NAP strengthened; (3) Adaptation interventions in priority sectors implemented including demonstration adaptation projects at a local level to catalyse replication and up scaling.
EU-UNDP Low Emission Capacity Building Programme	UNDP, EU, Australian Agency for Intl. Dev., Gov. of Germany	Duration: 2014-2016 Budget: 642,000 USD	– The results of this project, the Low Emission Capacity Building (LECB) Programme, are expected to be: – Establish a robust national GHG inventory system; – Develop, approve and register 2-4 National Appropriate Mitigation Actions (NAMAs); – Create a Monitoring, Reporting and Verification Systems in support to the implementation of NAMAs, LEDS and NCCAS. – The programme is designed to provide coordinated, expert, capacity-building support to assist Moldova in formulation of the LECBP proposal and identification of the most appropriate activities intended to promote of climate resilient economic growth.
Regional Project "Support for Kyoto Protocol Implementation"	EU TACIS	Duration: 2008-2012	– Promote the energy efficiency activities and broader use of flexible Kyoto Protocol mechanisms. – Adoption of the climate change mitigation and adaptation strategies. – Local capacity strengthening and public awareness-raising.
Prevention, Preparedness and Response to Natural and Man-Made Disasters (PPRD-East)	EC	Duration: December 2010 – June 2014 Budget: 6,000,000 USD	– Regional programme covering 6 countries (Armenia, Azerbaijan, Belarus, Georgia, Moldova, Ukraine). The overall objective of the project is to contribute to the peace, stability, security and prosperity of the Eastern Partner Countries and to protect the environment, the population, the cultural heritage, the resources and the infrastructures of the region by strengthening the countries' resilience, preparedness and response to man-made and natural disasters. – The project aims at strengthening disaster management capacities through review of civil protection capabilities and legislative framework looking into enhancing cooperation with the EU Civil protection Mechanism.
Project on hazard and crisis management in the Danube Delta/ Convention on the Transboundary Effects of Industrial Accidents	UNECE	Duration: 2011-2014 Budget: 290,000 USD (approx.)	– The project on hazard and crisis management in the Danube Delta is carried out within the Assistance Programme of the UNECE Convention on the Transboundary Effects of Industrial Accidents. – The Assistance Programme was launched in 2004 and aims at supporting Parties and ECE countries with economies in transition to improve industrial safety through the implementation of the Convention. – The general objective of the Danube Delta Project (DDP) is to improve the cooperation between the Republic of Moldova, Ukraine and Romania in the Danube Delta region through enhancing and, where possible, harmonizing the mechanisms and approaches for efficient and effective hazard and crisis management.
Emergency Preparedness, Response and Disaster Risk Reduction (DRR) in Moldova	UNICEF (RED CROSS)	Duration: January – October 2013 Budget: 130,000 USD (approx.)	– This project collaborates with relevant national authorities, UN partner agencies, non-governmental partners and local authorities to make children's education, health, protection services and facilities significantly more resilient by October 2013. The project will go on two levels: national (development on awareness and knowledge campaigns) and local. DRR should be on the Local Agenda. In order to introduce the DRR activities communities should emphasise them as a priority areas. – Local authorities should have the understanding of DRR activities to put them into the Local Development Plans and to have the possibility to apply for funding to implement measures. Children are one of the most vulnerable groups and should be one of the focuses for the DRR measures.
Moldova Disaster and Climate Risk Management (DCRMP)	WB, credit	Duration: 2010-2015 Budget: IDA – US$ 10 million GFDRR – US$ 100,000 US$ 2 million [74]	– Strengthen severe weather forecasting capacity and ensure that users of meteorological information, both public and private, are presented with more localized, specific and timely forecasts and warnings; – Improve disaster preparedness and emergency response through strengthening the capacity of the Emergency Command Centre to manage emergencies and disaster response coordination among government agencies; and – Support adaptation to climate risks in agriculture through practical application of agro-meteorological information in the agriculture sector in order to increase its resilience towards adverse weather effects.

[74] Washington, May 19, 2014 — The World Bank's Board of Executive Directors today approved a US$2 million additional financing to the Republic of Moldova for the Disaster and Climate Risk Management Project, which will support the State Hydrometeorological Service's ability to forecast severe weather and improve the country's overall capacity to prepare for and respond to natural disasters. <http://www.worldbank.org/en/news/press-release/2015/05/19/world-bank-helps-moldova-build-resilience-to-disasters-and-climate-risks>

Name of Project	Implementing Organization	Total Funds/Years	Highlights
Small Grants Programme of the Global Environment Facility (GEFSGP)	GEF UNDP	Duration: 2012-2015 Budget: 1,650,000 USD	– The main objective of the Small Grants Programme is to generate national and global environmental benefits and socio-economic development opportunities through community-based initiatives and actions implemented by NGOs and Community Based Organizations in the areas of biodiversity conservation, climate change mitigation, sustainable land management, protection of international waters, phase-out of POPs and chemicals management
MD Second Competitiveness Enhancement Project	Ministry of Economy	Duration: July 11, 2014 January 31, 2020 Budget: Total US$ 45.00 million[75] Inclusive IBRD Commitment US$30.00 million IDA Commitment US$15.00 million Soft Loan	– The development objective of the Second Competitiveness Enhancement Project for Moldova is to increase the export competitiveness of Moldovan enterprises and decrease the regulatory burden faced. The project comprises of four components. – The first component, regulatory reform objective is to support Government of the Republic of Moldova (GoM) in improving the business enabling environment in Moldova, and specifically in implementing its regulatory reform strategies over the next five years. It consists of following two sub-components: (i) reform governance and capacity building; and (ii) reform implementation support. – The second component, small and medium enterprise (SME) development aims to strengthen Moldovan SMEs' linkages to markets and ability to compete in those markets through two closely related aspects: strengthening the institutional capacity of organization for the development of small and medium enterprises (ODIMM) and Moldovan investment and export promotion agency (MIEPO), and providing matching grants to SMEs. It consists of following two sub-components: (i) institutional strengthening; and (ii) matching grant facility. – The third component, access to finance objectives are to improve access to medium to long-term finance for export-oriented enterprises, reduce barriers to finance due to perceived high credit risk in SME finance and high collateral requirements, and promote suitable models for value chain financing, particularly in the agriculture sector. – The fourth component, project management will cover the project implementation unit's (PIU's) cost of managing component one and component two of the project, as well as activities that overlap with component three (for example, accountant, procurement specialist).
Agriculture			
Moldova - Agriculture Competitiveness Project	WB, Ministry of Agriculture and Food Industry, Ministry of Environment	Duration: May 1, 2012 June 30, 2017 Budget: US$ 37.44 million[76] IDA[77] Commitment US$ 18.00 million Sida US$ 3.00 million Beneficiaries US$ 10.00 million	– The objective of the Agriculture Competitiveness Project for Moldova is to enhance the competitiveness of the agro food sector by supporting the modernization of the food safety management system, facilitating market access for farmers, and mainstreaming agro-environmental and sustainable land management practices. It is proposed to trigger OP/BP4.11, Physical Cultural Resources, as the project will support the rehabilitation of the building of the country's Food Safety Agency (FSA), which is listed on the Moldovan National Registry of State-Protected Monuments. – OP/BP 4.11 was not triggered at the time of project preparation because the decision of the Government of Moldova to house the FSA in this particular building came in 2013, during project implementation. An additional changes relates to the substitution from the project of the Chisinau Airport Boarder Inspection Point (BIP), with one located at the Giurgiulesti border crossing point with Romania. – Finally, other minor amendments to the description of activities and definition of the FSA under the Financing Agreement are proposed, to reflect a recent change in the status of the FSA, which became an autonomous state agency reporting directly to the Prime-Minister's office and is no longer subordinated to the Ministry of Agriculture and Food Industry. The implementation arrangements remain unchanged. Project is working on mainstreaming agro-environmental and sustainable land management practices. Exchange on climate change adaptation measures in agriculture
Emergency Agriculture Support Project	WB, Ministry of Agriculture and Food Industry	Duration: March 19, 2013 September 1, 2014 Budget: US$ 10.00 million	– The objective of the Emergency Agriculture Support Project for Moldova is to mitigate the negative effects of the 2012 drought by helping to restore corn and wheat production and prevent livestock destocking in the most affected districts. The credit will help finance the costs associated with alleviating the emergency in the country's agriculture sector caused by the 2012 drought. – The drought caused extensive losses to the country's field crops, i.e. wheat, sunflower, and particularly corn (for example 60 percent losses in corn production), leading to a shortage of animal feed. Without immediate support to affected farmers the livestock sub-sector will be under significant risk for destocking and loss of capital, with potential long-term negative consequences. – The project will help to reduce the risk of destocking by providing conditional cash transfers and technical assistance (awareness and training) to farmers in the most affected districts, so as to maintain their ability to plant spring crops, and particularly corn and wheat. Corn is an especially important crop because pastures are scarce in Moldova, and corn is the main animal feed, both in the form of grain and silage.

[75] <http://www.worldbank.org/projects/P144103?lang=en>
[76] <http://documents.worldbank.org/curated/en/2014/07/19897927/moldova-agriculture-competitiveness-project-restructuring>
[77] International Development Association (IDA)

Name of Project	Implementing Organization	Total Funds/Years	Highlights
Response to 2012 Drought	BCPR, OCHA UNDP	Duration: 2012-2013	– The project is providing support to the government and other entities in coordination and impact assessment effort related to emergency response and recovery following the 2012 drought. – Within this project, 1094 vulnerable families from the Southern part of Moldova were supported with fodder to overcome the consequences of 2012 drought. – The developed recovery framework incorporates short-term rehabilitation measures as well as provision of sustainable medium-term and long-term measures to help communities strengthen resilience to natural disasters and adapt agricultural production to climate change.
Moldova - Second Rural Investment and Services Project	WB, Ministry of Agriculture and Ministry of Finance	Duration: March 28, 2006 June 30, 2013 Budget: US$ 25.98 million[78]	– The Second Rural Investment and Services Project for Moldova will provide long-term support to accelerate agricultural recovery and growth so that Moldova's agricultural and rural sectors can play their full role in providing the underpinnings for future income growth and poverty reduction. – The Rural Advisory Services (RAS) component aims to provide information, knowledge and know-how to newly established private farmers and rural population. The objective of the Rural Business Development Component (RBDC) is to strengthen the emerging rural private sector. – The Rural Finance component will: (a) continue to expand the outreach of formal financial sector to rural areas, to ensure broader access to investment financing for farmers and rural entrepreneurs. It promote rural financial outreach through traditional loans and by expanding the use of leasing, which is still a non-traditional instrument in Moldova's financial sector; (b) strengthen the savings and credit associations industry and the delivery of financial services to a large segment of the population which does not have access to traditional banking services, ensure prudential growth of the industry through proper management and supervision and structure the industry.
Transition to High Value Agriculture project (Millennium Challenge Compact Programme in Moldova)	Millennium Challenge Corporation (MCC), USAID	Duration: 2010-2015 Total Budget: US$ 262 million, inclusive: Agriculture Project: US$ 101.70 million	– It aims at increasing incomes in the rural areas by encouraging high value agriculture and catalysing investments into high value production. – It is also estimated to make benefits to about 29 000 farmers or over 112 thousand individuals (farmers, owners of farmlands, agricultural enterprises and their shareholders, employees of agricultural enterprises operating in the areas covered by the rehabilitated centralized irrigation systems, the producers who grow or intend to grow high value products). – Models for climate change adaptation measures and technologies in agriculture
1) The Rural Finance and Small Enterprise Development Programme (RFSEDP); 2) The Agricultural Revitalization Project; 3) The Rural Business Development Program (RBDP) 4) Rural Financial Service and Marketing Programme (RFSMP)	IFAD	Duration: since 1999, IFAD has financed 4 projects, total: US$ 48.2 million; (RFSEDP) USD 8 million; (ARP) USD 14.5 million; (RBDP) USD 13 million; (RFSMP) USD 18.95 million.	– Focused on the provision of rural financial services products relevant to IFAD's target group, along with complementary technical assistance and support for rural enterprise development. – Assisted in the expansion of some 411 rural enterprises, creating 6,000 additional jobs. Enterprises supported through the project have shown growth rates of up to an impressive 9 per cent annually, demonstrating sound implementation performance and sustainability. – Improved agricultural services and market access for a large number of other rural people. – Create as well job opportunities, income-generation opportunities through on, and off-farm productive activities to reduce rural poverty in the country. – Enhance Moldova's horticultural value chain. – Support rural financial services, develop the rural commercial infrastructure and provide extension services of knowledge and technical expertise required for participation in national and international markets with the aim of making profits. – Focused on areas with the highest concentrations of rural poor people.
Agriculture Revitalization Project	IFAD[79]	Duration: Jan 2006-March 2013 Budget: 14.50 mil USD	– 564 SMEs direct beneficiaries; 1,479 direct beneficiaries from advisory services; 847 participating villages; 221 SME loans approved and financed; 79 Modern fruit tree plantations and vineyards advanced productivity over 1 550 ha; 13 green houses for the production of commercial high value off-season vegetable crops over 42. 6 ha; – 16 Irrigation schemes with reliable irrigation systems over 1 670 ha; 52 Agro-processing storage facilities for 14 600 tons of cold storage; 17 Large size combine harvesters with the potential to service 7 500 ha of field crops; – 27 Highly performing farm machinery sets for timely and optimum land preparation, row sowing, fertilizer application, weed and pest control with the potential to service over 10 000 ha 16 Intensive livestock activities through the acquisition of 3 200 genetically improved reproductive females for intensive meat production.

[78] <http://www.worldbank.org/projects/P090673/rural-investment-services-project-apl-2?lang=en&tab=overview>
[79] Republic of Moldova Inclusive Rural Economic and Climate Resilience Final Design report, 1-Jun 2013

Name of Project	Implementing Organization	Total Funds/Years	Highlights
Rural Business Development Programme (completed)	IFAD	Duration: Jul 2006-Sept 2011 Budget: 13.024 mil USD	– 15,207 direct beneficiaries; 140 communities received project services 131 enterprises accessing facilitated financial services; 37% SMEs reported changes in cropping pattern; SME assets grew by 109% or 27.25% p.a.; Net profit grew by 71% or 17.8% p.a.
Rural Financial Services and Marketing Programme	IFAD	Duration: Feb 2009-Mar 2014 Budget: 13.243 ml USD	– As of Dec 20 2012 14,177 direct beneficiaries; 42,271 people - indirect beneficiaries – Beneficiaries of irrigation schemes reported 3 times in-crease in production; – All 52 enterprises financed under the Programme during 2009-2010 are operational by the end of PY4. – 493 new jobs created by the end of 2012 representing 42% of the appraisal target; – 29% increase in average SME staff salary%; – 280% increased export of table grapes from 24 500 t to 70 000 t; – 15 times increased orchards area from 650 ha to 10 000 ha; – Increased fruit production volume by 50%; – All 52 enterprises financed under the Programme during 2009-2010 are operational by the end of PY4 – 3 times increase in production reported by beneficiaries of irrigation schemes.
Rural Financial Services and Agribusiness Development Project	IFAD	Duration: Jul 2011-Sep 2016 Budget: 34.8 mil. USD Loan IFAD 19.8 mil. USD, Grant IFAD: 0.5 mil. USD Grant DANIDA: 4.5 mil. USD, Government: 1.5 mil. USD, Beneficiaries: 11.7 mil. USD, Financial institutions co-financing of investment projects 1.8 mil. USD[80]	– Development of favourable agribusiness in rural areas: providing technical assistance, training and support to the growth of capital and income of poor people by connecting them to advantageous chains of the agricultural products in the Republic of Moldova. Financial Services in rural areas: providing access for SMEs[81] to financial services given for the medium and long term. Sub-components: a) loans financing SME investments; b) equity financing SME investments; c) The financing of investment loans for young entrepreneurs; d) Micro-financing of agricultural and non-agricultural investment to rural small businesses through Savings and Credit Associations. – Small- scale rural infrastructure: to reduce infrastructure constraints that limit the work of small farmers, agricultural processing enterprises and rural entrepreneurs investing in non-agricultural business based on value chains of goods and services by awarding competitive grants for public infrastructure investment. – As of Dec 2012 787 direct beneficiaries; 3 communities receiving project services; 237 enterprises accessing facilitated financial services; 145 Enterprises accessing facilitated non-financial services; 279 people trained in crop production;
Inclusive Rural Economic and Climate Resilience Program – IRECR	IFAD[82]	Duration: 2014-2020 Budget: 26.08 mil. USD: Loan: IFAD 16.1 mil. USD Grant IFAD 0.5 mil. USD Grant DANIDA: 5.22 mil. USD Grant GEF: 4.26 mil. USD	– Enhanced resilience and adaptive capacity of farmers to climate change, through a) the creation of an enabling environment and b) enhance agriculture production through climate-resilient investments. – At least 2,000 beneficiaries report ability to improve agriculture soil conditions or crop production through CA; – At least 15,000 ha with climate-resilient land restoration practices introduced to enhance food and commercial security in 2,000 farm plots; – Innovative solutions for climate-resilient farm production promoted among 550 farmers. – Quantitatively, the IRECR will increase the climate-resilient of agricultural production of 7,215 farmers by improving the soil conditions of their lands through introduction of the conservation agriculture and land restoration practices and innovative solutions. – It is also expected that about 8,880 people will benefit from the rural enterprises supported by enhanced rural finance services and about 46,380 people would be benefiting from improved rural roads, water supply and market infrastructure. In total the Programme beneficiaries are estimated to be around 62,475 rural people, including about 25,000 women

[80] <http://www.ifad.md/en/programs/dejstvujushhie-programmi/seliskie-finansovie-uslugi-i-razvitija-agrobiznesaIFAD-V/>
[81] Small to medium-sized enterprise, a company with no more than 500 employees
[82] <http://www.ifad.md/en/programs/dejstvujushhie-programmi/Programul-Rural-de-Rezilien-Economico-Climatic-Incluziv-IFAD-VI/>

Name of Project	Implementing Organization	Total Funds/Years	Highlights
Agriculture Competitiveness and Enterprise Development Project (ACED)	United States Grant	Duration: 23/03/2011 22/03/2016 Budget: 9,759,366 EUR	– The Agricultural Competitiveness and Enterprise Development Project (ACED) is a five-year program, co-funded by USAID and MCC. The main objective of the project is to increase the success of the Moldovan agriculture sector in the production and marketing of high value crops. ACED will work with producer groups and value chain enterprises (packers, cold chain facilities, consolidators, input suppliers, exporters, supermarkets and others) to increase the ability of the entire value chain to produce and deliver high value crops of the right type and quality to attain profitable prices from buyers in domestic and export markets. The program will work throughout the country with a special emphasis on areas benefitting from the MCC-financed rehabilitation of central irrigation systems. – The program includes four major elements: 1. Market Linkage Development: Beginning with accurate information about the needs of various domestic and international markets, ACED develops direct long-term linkages between local suppliers and buyers in target markets. 2. Production Training: ACED provides a wide range of producer training and demonstration activities aimed at increasing the cost-effective production of products in high demand. 3. Technical Assistance: ACED increases the capacity of local service providers of all types critical to targeted value chains and increase their ability to provide high quality service on a commercial basis to post-harvest value chain participants. 4. Business Environment: ACED works with government agencies to strengthen phyto-sanitary inspection and testing capacity. ACED will also work with value chain participants to encourage targeted policy change to help attract investment in high value agriculture and facilitate profitable exports. ACED is managed by DAI, a US development project management firm that has worked in Moldova since 1994.
Sector policy support programme economic stimulation in rural areas (ESRA)	European Union Grant	Duration: 26/11/2010- 26/11/2015 Budget: 68 mil EUR	– The objective of this Sector Policy Support Programme (SPSP) is to contribute to the sustainable economic development of rural areas in the RM. – This will be achieved through the support of interventions in (i) the economic and SME sectors and (ii) on regional development that are foreseen in the policy matrix, as well as technical assistance and policy dialogue.
Second Competitiveness Enhancement Project (CEP II)	World Bank Soft Loan	Duration: 15/09/2014 15/10/2020 Budget: 33,078,506.32 EUR	– The development objective of the Second Competitiveness Enhancement Project for Moldova is to increase the export competitiveness of Moldovan enterprises and decrease the regulatory burden faced. The project comprises of four components. – The first component, regulatory reform objective is to support Government of the Republic of Moldova (GoM) in improving the business enabling environment in Moldova, and specifically in implementing its regulatory reform strategies over the next five years.
Innovative business development for local sustainable economic growth	Norway Grant	Duration: 01/11/2014 31/12/2016 1,325,489.946 EUR	– The Project aims at spurring innovations in small and mid-sized business start-ups and business development process for the generation of sustainable jobs at local level and strengthening of the LPAs capacities to manage autonomously such processes. – The Project will achieve the following objectives: (a) build expertise and knowledge for mainstreaming innovations into business development processes and selective cases of new business start-up; (b) facilitate innovative business start-up and development through matching financial support with specific focus on existing businesses to graduate from business incubators; (c) enhance capacities of the LPAs to support innovative business development in a more decentralized framework. – The Project will directly tackle the existing and perceived needs at central and local levels, including: (a) lack of local knowledge and know-how for promotion of innovations in start-ups and business development in post-incumbent phase; (b) lack of financial instruments to match-up available local resources in private sector for development of innovative businesses, including those graduating business incubators; (c) lack of local partnerships between private and public sectors to promote investment in innovative social projects, as extensions to existing innovative businesses and (d) weak capacities of LPAs to promote innovations for business.
Promoting sustainable production and implementation of good practices in the bovine farms from Romania, the Republic of Moldova and Ukraine cross-border region	European Union Grant	Duration: 01/10/2013 31/07/2015 Budget: 416,000 EUR	– Creating a common network of monitoring centres bovine production in terms of quantity and quality in the three partner countries; – Making a joint border survey on production and bovine farms in the three countries; – Develop and implement a software sharing - tool for monitoring the quality of milk and meat production; – Making 2 pilot farms for qualitative and quantitative determinations in Romania and Republic. Moldova; – Campaign implemented training / information and dissemination of specific information to stakeholders in the sector in all three regions
Development of the agriculture sector through creation of an agricultural cross-border network	European Union Grant	Duration: 01/11/2013 31/08/2015 Budget: 552,597.194 EUR	– The purpose of this project is to create a cross-border agricultural network in order to develop the agricultural sector from the cross-border area. The main link of this cross – border network is the Agro-Industrial Logistic Park from Singerei. Inside this Agro – Industrial Logistic Park will be offered services for the agricultural producers: services of sorting, packaging and storage and support services (consulting services in different domains: management, procurement, marketing, product development, accounting). – The second link of the cross-border network is the Viilor Marketplace from Botosani, where an Exhibition Corner will be created, where the producers can present their products. The third link of the cross-border network is the Online Cross-Border Marketplace, for presenting and selling the products.

Name of Project	Implementing Organization	Total Funds/Years	Highlights
Improvement of production and market access for farmers in North Moldova	Switzerland Grant	Duration: 01/01/2014 31/12/2016 Budget: 350,000 EUR	– The goal of the project is to contribute to the increase of productivity, production and income of small and medium cattle and vegetable farmers in the Northern part of Moldova.
Technical assistance Project to support the project Implementation Unit (PIU) for the "Filiere du vin" operation, and the beneficiary Small and Medium-sized Enterprises (SMEs)	European Investment BankGrant	Duration: 01/07/2014 01/07/2016 Budget: 1,706,500 EUR	– The overall objective is to support the modernization and development of the Moldovan wine sector in accordance with the existing 2005-2020 wine sector planning horizon as defined in national legislation.
Development of the National Strategy and Action Plan for animal genetic resources and dairy cattle genetic improvement programme.	United Nations Grant	Duration: 01/01/2015 31/10/2016 Budget: 261,887.224 EUR	– Improvement of genetic resources in the livestock sector of Moldova – The project will contribute to re-establishment of the performance system which helps to build a knowledge base such as baseline animal performance, best production practices, best breeding strategies.
Moldovan Vine and Wine Register (MVWR) Project	United States Grant	Duration: 14/01/2015 13/01/2017 Budget: 168,180.702 EUR	– The project purpose is to develop a Moldova Vine and Wine Registry (VWR). Establishing a valid VWR will help Moldova establish geographic indicators for wine and meet EU ‚place of origin' requirements and enable traceability of wine and vine products before getting access to the EU market. – The establishment of the VWR shall be accomplished through the implementation of two major components: a) b) The first component will be implemented by the „Central Institute for Supervising and Testing in Agriculture (ÚKZÚZ) from the Czech Republic and will be funded by ACD, and the second component - by the National Agency for Rural Development (ACSA) from the Republic of Moldova, under the funding provided by USAID.
Inclusive Rural Economic and Climate Resilience Programme (IRECR) (Danish Grant No. 2000000703)	Denmark Grant	Duration: 01/05/2015 31/12/2017 Budget: 4,699,063.753 EUR	– The overall objective of the Inclusive Rural Economic and Climate Resilience Programme is to increase revenues and climate resilience of poor rural entrepreneurs. – The program will contribute to the development of new businesses managed by young entrepreneurs in rural areas, through the financed actions: rural financial services (through which will be provided investment credits for medium and long term for business initiation and development in agriculture and advisory assistance to develop business plans, training young entrepreneurs).
ENPARD Moldova Program - Support to Agriculture and Rural Development	European Union Grant	Duration: 01/07/2015 01/07/2022 Budget: 64,075,000 EUR	– The specific objectives of the Program are to: improve the financial capability of the Government to achieve agricultural and rural development policy objectives; – promote agricultural and rural development policies and reforms; improve service delivery in the agricultural and rural sector; – improve governance in agricultural and rural development; address the basic needs of the population; sustainable management of natural resources, including water and biodiversity; foster cooperation with regions and territorial administrative units with a special status.
The 2KR instalment sales program in the irrigated agriculture performance of the Millennium Challenge Account Moldova	United States Loan	Duration: 31/03/2015 31/03/2025 Budget: 2,045,560.204 EUR	– The program will enable the small and medium farmers, who have difficulty in contracting credits and loans due to lack of guarantee and / or credit history to buy in instalments the equipment and necessary machineries in order to develop irrigated agriculture performance. – The mechanism provides the instalments by 2KR of the equipment and agricultural machineries, amount not to exceed $ 100,000 per beneficiary. Selling of agricultural equipment is carried out with an advance payment of about 1/4 of the price of the equipment and expenses related to the transaction, the remaining amount being paid for a period of up to three years.
Agreement between the Government of the Republic of Moldova and the Government of the Republic of Poland on extending a tied aid credit(agriculture)	Poland Soft Loan	Duration: 14/07/2014 31/12/2015 Budget: 100,000,000 EUR	– Increasing the competitiveness of the agricultural sector through restructuring, modernization and the gradual increase of high value agricultural products. – Intervention in agriculture will have two main areas of assistance: - Modernization and restructuring of farms specialized in the production of traditional agricultural products (fruits and vegetables, milk, meat). - Investment in technologies for the processing of food products, in order to comply with EU standards on food safety chapter and quality requirements. – However, the contracts to be concluded by entrepreneurs residing in the Republic of Poland, and importers of Moldova, and will be submitted for approval by the Finance Ministers of both sides. Goods exported from the Republic of Poland in the Republic of Moldova under the Agreement may not be re-exported to other countries without the written consent of the Ministry of Finance of the Republic of Poland. The value of goods and services under the Contract Polish origin, funded under the Agreement cannot be less than 60%.

Name of Project	Implementing Organization	Total Funds/Years	Highlights
Project „Fruit garden of Moldova"	European Investment Bank Soft Loan	Duration: 03/11/2014 02/11/2020 Budget: 120,000,000 EUR	– Facilitating the access of horticulture potential beneficiaries of the Republic of Moldova to the funds provided by EIB. – This project will create favourable conditions for restructuring the value chain of the horticultural sector in the Republic of Moldova and will provide new opportunities for financing on favourable terms for the horticultural sector businesses through the access to the resources of the European Investment Bank provided through the financing contract signed between the Republic of Moldova and the EIB in order to implement the Project Fruit garden of Moldova.
Creating an integrated system for sustainable development of the apiarian sector in the North Development Region of the Republic of Moldova	Romania Grant	Duration: 01/01/2015 31/12/2016 Budget: 157,382 EUR	– Creating an integrated system for sustainable development of the apiarian sector in the North Development Region by developing a Centre for processing and storage of honey and a Marketing Information Centre for bee products.
Additional Financing Agreement for Agriculture Competitiveness Project between Republic of Moldova and International Development Association, Credit No. 5639-MD	European Union Grant	Duration: 01/06/2014 01/06/2016 Budget: 10,810,810.81 EUR	– The efforts of the Government of the Republic of Moldova will be supported in reducing emergency situation by providing financial support to producers of fruit, especially those who have grown apples, plums and grapes in the autumn of 2014. To achieve these objectives, Project activities will focus on providing technical and financial assistance (awareness) to affected farmers, with emphasis on gender. The eligible producers must hold fruit horticultural plantations less than or equal to 15 ha. Subsidies come to compensate the difference between the non-embargo (estimated) and domestic stock price. The amount of compensation per kg: apples - 0.11 USD, plums - 0.08 USD, grapes - 0.08 USD for European varieties and 0.05 USD for hybrid varieties.
Rural Investment and Services	IBRD / IDA / SIDA	Duration: Phase I (2002-2006) Budget: USD 19.69 million Duration: Phase II (2006-2010) Budget: USD 26.42 million	– Phase I: Aimed at fostering post-privatization growth in the agricultural sector by improving the access of new private farmers and rural businesses to legal ownership status, knowledge, and finance. – Addressed the lack of access to investment and working capital by the new private farmers, rural entrepreneurs, and rural households. – In 2002-2004, the banking sector portfolio increased by 144 percent in agriculture and 120 percent in agro-industry. – Around 300,000 farmers were reached by 540,000 extension activities through a network of 35 private service providers and over 400 local consultants/advisers. – Phase II: Continue priority interventions in policy, legal, and regulatory reforms, institutional capacity building, technical assistance, and investment. – Facilitated the development of business activities for over 1,600 soon-to-be entrepreneurs; the opening of credit lines for private farmers and rural entrepreneurs with limited or no access to the commercial banking sector; and the financing of 1,200 sub-loans, most of which were to first-time borrowers.
Agricultural Pollution Control	IBRD/GEF	Duration: 2004-2009 Budget: USD 10.95 million	– Improve regulatory frameworks, organic farming, and best agricultural practices by farmers and agro-industry in order to reduce nutrient discharge from agricultural sources into the Danube River and Black Sea. – Provided grants to entrepreneurs and rural enterprises for investing in sustainable agricultural practices and will train rural advisory service providers in crop nutrient management, conservation tillage practices, crop rotation, and planting of buffer strips. – Supported manure management and agro-forestry practices, wetland restoration, and monitoring of soil and water quality. – Assisted Ministry of Ecology and Natural Resources (MENR) and Ministry of Agriculture and Food Industry (MAFI) in developing a Code of Good Agricultural Practices and strengthened the capacity of government institutions to promote organic farming and land use management. – Under the supervision of the Institute of Pedology, Agrochemistry and Soil Protection 'N. Dimo", demonstration fields were set up to monitor the impact of environmentally friendly agricultural practices such as crop rotation, nutrient and manure management, conservation tillage, strip cropping, grassed waterways, and buffer strips in vineyards. – Micro-terraces were created between vineyards planted on sloped land to protect them from soil erosion. Grass was also seeded to hold soil and keep moisture in the micro-terraces. – Manure management practices have been adopted with the assistance of local farmer associations. The price of composted manure is expected to increase and further generate additional income for farmers. – Agro-forestry development has been addressed through the planting of 132 ha of buffer strips. – Made progress in wetland restoration and soil quality monitoring. Wetland restoration includes the introduction of nutrient filtration through hydrologic enhancement practices, improved water quality monitoring, and a tree planting program covering 6.6 ha. – Seven stations to measure soil runoff and nutrient loss have been installed in test/demonstration fields.

Name of Project	Implementing Organization	Total Funds/Years	Highlights
Moldova Soil Conservation Project	Forestry Agency "Moldsilva" under the Clean Development Mechanism of the Kyoto Protocol	Duration: 2002-2023 Budget: transaction value - 7 million USD, which will cover about 37% of the total investment needs - 19 million USD for the implementation of the project, the remainder amount will be funded by the Forestry Agency "Moldsilva"	– Focused on restoration of degraded agricultural lands to productive uses, at the first stage through afforestation of 20,300 hectares (target already completed by end of May 2006); community-based land management; carbon sequestration and reduction of greenhouse gas concentrations. – Selected 1,891 land plots for afforestation are located in 383 villages in 11 districts all over the country. – There were planted trees and shrubs adapted to local conditions (poor soils) on 14,495 ha of degraded pasturelands and has been built community capacity to manage 5 400 ha of these lands. – During 2005-2006, forests planted have sequestered an estimated gross amount of 78,401 tons of CO_2 and approximately 56,000 tons of CO_2 were presented for payment to the Prototype Carbon Fund (PCF). – During the next phase, the project is reforesting 19,768 ha of degraded state-owned and communal agricultural lands throughout the country with the goal of restoring degraded lands and enhancing sustainable supplies of forest products to local communities. – Thus, during 2002-2007 Forestry Agency Moldsilva planted more than 40,000 ha of new forests. The total resultant reductions in the GHG emissions will be around 3.6 million tonnes in CO_2 equivalent (during the first 20 years), including 1.9 million tonnes already contracted by the World Bank Prototype Carbon Fund and BioCarbon Fund for 2004-2017. – The transaction value is about USD 7 million, which will cover about 37 percent of the total investment needs (USD 19 million) for the implementation of the Project, and the remainder amount will be funded by the Forestry Agency "Moldsilva".
Agricultural Schools as Centres of Competence for Regional Education and Training in Rural Areas in Moldova	KulturKontakt Austria	Duration: 2010-2013 (Phase III) Budget: 524,205 EUR Contribution of ADC: 367,300 EUR	– Since 2004, the ADC has contributed to the transformation of the vocational schools in Nisporeni and Leova into regional centres of competence in agriculture. – This third and last project phase aims at developing these two schools into regional centres of competence in "viniculture and oenology" and "farm machinery technology and vegetable gardening". Two new training profiles for "viniculture and oenology" and "farm machinery technology and vegetable gardening", as well as the corresponding curricula and teaching materials, are to be developed within the project. – The long term goal is to create best practices for the reform and modernisation of vocational education and training in agricultural professions capable of responding to economic needs and necessities of the region and thereby fostering regional development.
Support to Strengthening the Food Safety System in Moldova	FAO's Agri-Food Trade and Regional Integration Regional Initiative for Europe and Central Asia	Duration: 2014-2015 Budget: 400,000 USD	– The FAO project will further strengthen the country's food safety legislative framework, develop the capacities of the National Food Safety Agency and raise awareness on and capacity for good hygiene and manufacturing practices among business operators. – The project will also strengthen National Codex Structures by providing training to the National Codex Committee members on rules, procedures and current work of the Codex Alimentarius.
Development of the National Strategy and Action Plan for animal genetic resources and dairy cattle genetic improvement programme.	FAO, Ministry of Agriculture and Food Industry	Duration: 2015-2016 Budget: 320,000 USD	– The project will contribute to re-establishment of the performance system, which helps to build a knowledge base such as baseline animal performance, best production practices, best breeding strategies.
Increasing small scale farmers' resilience to drought by adopting best irrigation practices and modern irrigation technologies	FAO Ministry of Agriculture and Food Industry	Duration: 15/10/2014 30/09/2016 Budget: 398,181 USD	– This project aims to increase farmers' resilience to drought through the introduction and adaptation of best practices of irrigation and modern irrigation technologies. – The main project activities are: consulting, training, studies, creating demonstration plots, field days, farmers field schools, awareness campaign in the mass-media, elaboration and distribution of informative materials, elaboration of strategy for expanding technologies and best practices in irrigation. – FAO will actively implement the activities in joint collaboration with the Ministry of Agriculture and Food Industry (MAFI) of the Republic of Moldova and the National Agency for Rural development (ACSA) in order to reach the three following outputs: – Best irrigation practices and modern technologies introduced and adopted; 2) farmers and Water Users Associations capacities in operating and managing modern on-farm irrigation technologies developed; 3) local extension services capacities in modern on-farm irrigation technologies and best practices strengthened.

Name of Project	Implementing Organization	Total Funds/Years	Highlights
Improvement of fodder conversation and grain storage to reduce the impact of drought on livestock feed	FAO Ministry of Agriculture and Food Industry	Duration: December 2012 - December 2015 Budget: 425,000 USD	– The overall expected impact is to increase the resilience and preparedness of small-scale farmers to natural hazards (mainly droughts and floods), to improve their capacity to mitigate these hazards, and to improve the response of MAFI. – Outputs will focus on substantive technical advice on DRR specific good practices in agriculture and livestock production to be made accessible to small-scale farmers, and also on reinforced capacity of MAFI. Small-scale livestock producers would have quality fodder materials to feed the livestock herd in condition s of natural hazards as the main impact of the project. Silage would be available in rural areas for small-scale livestock producers in quantity and quality.
Moldovan Seed Sector Development in the scope of Climate Change and Disaster Risk Mitigation (TCP/MOL/3302)	FAO Ministry of Agriculture and Food Industry	Duration: September 2011-April 2013 Budget: 475,000 USD	– The project will provide tools for the Ministry of Agriculture and Food Industry through capacity building for better seeds supply and contribute to increasing agricultural production and productivity. – Main areas of coordination are related to improving policies and technical capacity of institutions in – the area of seed production integrated with disaster risk mitigation and climate change adaptation
Biogas Generation from Animal Manure Pilot Project.	WB	Duration: June 24, 2011 June 30, 2015 Budget: US$ 3.49 million[11]	– Use of animal manure for on-farm biogas and electricity generation through introduction of an innovative, environmentally friendly technology. Contribute to the reduction of GHG emissions through the adoption of ongrid renewable energy supplies
Improvement in the management of pastures to reduce the impact of droughts on the livestock sector	FAO Ministry of Agriculture and Food Industry	Duration: December 2012 - December 2015 Budget: 432,000 USD	– The overall expected impact is to increase the resilience and preparedness of small-scale farmers to natural hazards (mainly droughts and floods), to improve their capacity to mitigate these hazards, and to improve the response of MAFI. – Outputs will focus on substantive technical advice on DRR specific good practices in agriculture and livestock production to be made accessible to small-scale farmers, and on reinforced capacity of MAFI. – It is estimated that with proper management and cultivation the productivity of pastures could be increased by up to 50-100 percent, covering most of the needs of Moldovan farmers for forage during the grazing season and providing a significant supply of forage for winterization. – Reduce the impact of drought on the livestock sector by improving the management of pastures as the main impact of the project. Introduce or spread good practices on pasture management and livestock production in areas affected by drought.
Development of ecological agriculture in Moldova	International Development Cooperation of the Czech Republic (People in Need)	Duration: 2011-2013 Budget: 7,500,000 CZK	– The project is focused on the support of organic agriculture in Moldova through building the capacity of farmers, their associations and service providers. In addition access of farmers to investments will be increased and demand for organic products in Moldova stimulated. – Within the project awareness of the public and state officials will be raised about the benefits of organic agriculture.
Increasing Competitive Strength and Efficiency of Moldovan Small and Medium-Scale Farmers through their Orientation to High Value Crops Growing at Selected Target Groups in Districts of Cahul, Anenii Noi, Ungheni	International Development Cooperation of the Czech Republic (Czech University of Life Sciences Prague)	Duration: 2011-2013 Budget: 1,800,000 CZK	– The project envisages establishment of six production-marketing cooperative groups with the minimum total number of 60 farmers based on the above-mentioned groups of vegetable and fruit small- and medium-scale growers. – Vegetable and fruit growers will be trained in growing technologies, strategic plans of commercial growing will be set up for them, they will be supported with deliveries of horticulture mini-machinery, green houses, irrigation equipment and other agricultural inputs; further the project will work out market analyses, organize training in marketing and farm management provide marketing strategies and business plans for each of groups. – Models for climate change adaptation in agriculture

[83] I<http://www.worldbank.org/projects/P120702/biogas-generation-animal-manure-pilot?lang=en>

Name of Project	Implementing Organization	Total Funds/Years	Highlights
Health			
Moldova Health Transformation Project	WB, Ministry of Health	Duration: May 22, 2014 Duration: March 30, 2019 Budget: Loan US$ 30.80 million[84]	– The objective of the Health Transformation Operation Project for Moldova is to contribute to reducing key risks for non-communicable diseases and improving efficiency of health services in Moldova. The project will be a Program for Results, or PforR operation with a technical assistance component (Investment Project Financing, or IPF, with implementation details in annex eight). – This will follow the existing fiduciary framework in the country. The Ministry of Health, or MOH and National Health Insurance Company, or CNAM will implement the program, and both will be conducting procurement and financial management on their own as each have the established structures and the required authority. – Every TT has three accounts within the Treasury Account, or TSA corresponding to the budget components: (i) one for state budget - main component; (ii) one for state budget - special means and special funds; and (iii) for ATU budget.
Moldova - Strengthening the Effectiveness of the Social Safety Net Project	WB	Duration: 2011-2016 Budget: US$ 37.00 million[85]	– The development objective of the Strengthening the Effectiveness of the Social Safety Net Project for Moldova is to improve the efficiency and equity of Moldova's safety net through a fiscally sustainable expansion and strengthening of the social aid program.
Health Services and Social Assistance Project (HSSAP)	WB	Duration: 07-Jun-2007 31-Aug-2011 Budget: USD 44.36 million	– Increase access to quality and efficient health services with the aim of decreasing premature mortality and disability for the local population – Improve the targeting of social transfers and services to the poor in line with the Medium-Term Expenditure Framework (MTEF) for 2007-09. – Specifically, two interventions will have a positive mitigation impact to food price shocks: (i) interventions to reduce nutritional vulnerability of at-risk pregnant women, lactating mothers, and infant young children through the provision of nutritional supplements; and (ii) a temporary cash transfer to social institutions which provide food to children, elderly, mentally or physically handicapped and other vulnerable groups to compensate for food price increases during the upcoming 2008/2009 winter season. – The existing HSSAP has committed the donors' resources to the large-scale, medium-term systemic reform and to policy development and institution building while the additional financing will be able to overcome the constraints of the already made commitments and address the current extraordinary situation. – While the existing project supports a strengthening of the overall health and social protection systems, it did not envisage specific measures to help protect poor families, women, and children in the advent of such an acute and persistent food price crisis. – Nonetheless, Bank engagement in both health and social protection in Moldova provides a solid strategic basis and framework with which to support additional financing in order to respond to this crisis.
Water Resources			
Compact Program	Millennium Challenges Corporation (MCC), US AID	Duration: 2010-2015 Total Budget: US$ 262 million, inclusive for: Irrigation Project: US$ 101.70 million	– Two projects were developed within the Moldova-MCC partnership: (i) Transition to Advanced Agriculture through the rehabilitation of 11 irrigation systems covering around 15,000 ha – a grant in the total amount of USD 101.70 million; and (ii) Rehabilitation of National Roads – a grant in the total amount of USD 132.80 million. – The Compact Program implemented in Moldova comes with a comprehensive approach to the economic growth, including the reforming of the management of water resources and of the maintenance of national roads. – The Compact Program is a way to enhance the private sector and is based on the partnership between MCC and USAID in providing assistance to Moldova in accomplishing its development objectives. – In the end, the Compact Program offers an integrated solution for poverty reduction. This aims at increasing agricultural productivity, promotes food safety and gives access to markets via more reliable roads.
Sector Policy Support Programme (SPSP) in the Water Sector	European Commission	Duration: since 2009 Budget: EUR 45 million	– Strengthen the efforts of all participants in the water supply and sewage sector by ensuring better interaction of selection of priority areas and creating a common database on implemented projects.

[84] <http://www.worldbank.org/projects/P144892?lang=en>
[85] <http://documents.worldbank.org/curated/en/2015/06/24660992/moldova-strengthening-effectiveness-social-safety-net-project-restructuring>

Name of Project	Implementing Organization	Total Funds/Years	Highlights
National Water Supply and Sanitation Programme	World Bank Agency for Construction and Territorial Development	Duration: May 13, 2008 December 30, 2013 Budget: a loan of USD 14 million	– Rehabilitation and development of water supply and sewage systems of which: – Balti, Cahul, Moldova, Floresti, Orhei, Soroca, Ungheni (USD 8 million); – Water systems in 50 villages (USD 4 million); – Strengthen institutional capacities of the Ministry of Environment and Apele Moldovei (USD 1 million); – Energy efficiency (USD 1 million).
Environmental Infrastructure Project in Soroca	World Bank, GEF	Duration: 2007- 2011 Budget: USD 4.562 million	– Environmental Infrastructure Project was focused on building a waste water treatment plant in Soroca.
Environmental Infrastructure Project in Orhei	World Bank, European Commission	Duration: 2009-2012 Budget: EUR 2.8 million	– Environmental Infrastructure Project was focused on building a wastewater treatment plant in Orhei.
Social Investment Fund (SIF) Project	World Bank	Duration: 2009 Budget: USD 8.9 million	– WSS infrastructure development (system rehabilitation); – The beneficiaries included the cities of Briceni and Durlesti, as well as the villages of Molovata, Stetcani, Samalia, Pojareni, Recea, Cruglic, Soldanesti, Decebal, and Gornoe.
Support municipal utilities in most reform-minded municipalities	EBRD	Budget: loan of up to EUR 10 million	– Comprise the regionalization of water companies by expanding their operations into neighbouring localities – Structured as priority investments focusing on the water utilities – Committed to adjust the tariffs and introduce cost recovery of their water companies to ensure financial viability. – Strengthen municipal utilities to ensure provision of adequate supply of drinking water improve wastewater treatment facilities with environmental benefits for the Prut and Nistru river basins and ultimately the Black Sea.
Drinking water supply project	TICA - Turkish Administration for Cooperation and Development	Budget: USD 6.56 million	– Drinking water supply project for the city of Ciadir-Lunga, stage II (Gagauz Yeri).
Develop WSS systems. The list of implemented projects include: Water and Sanitation in Rural Areas „WATSAN”	Swiss Agency for Development and Cooperation (SDC)	Duration: since 2000 Budget: around EUR 1 million annually	– Priority areas are the Nisporeni, Hincesti, Straseni, Calarasi, Ialoveni and Leova districts. – Increasing access to safe drinking water and improving service quality in Iurceni (Nisporeni), Miresti (Hincesti), Goresti (Nisporeni) villages; – Wetland wastewater treatment in Rusca/Prison; – Wastewater treatment plant in Negrea, Sarata and Galbena villages (Hincesti District); – Improving environmental protection and security of water supply sources; – Rationalizing tariffs for water supply and sewerage services.
Cooperation with the Swiss Development Cooperation (SDC): Water and Sanitation Project (WATSAN) in the Republic of Moldova (Phase I and Phase II)	Implemented by: Swiss Agency for Development and Cooperation (SDC), Austrian Development Agency (ADA)	Duration: 01.12.2009 31.05.2015 Budget: ADA 2,100,000 € (for two phases)	– The overall goal of the project, which is now on its second phase of implementation, is to contribute to improved quality of life and public health of the population in rural municipalities of the Republic of Moldova (with a total beneficiary population of approx. 60.000 inhabitants) by increasing sustainable access to safe drinking water and environmental sanitation. – The project aims also at establishing good practices of local good governance, by improving planning and management capacities of the local authorities and water and sanitation services operators in providing qualitative services to the population. – During the first phase of the project about 30.000 inhabitants have already been provided access to safe drinking water and environmental sanitation.
Rehabilitation of the water supply system in the Rayon Nisporeni	EU Austrian Development Agency (ADA), Swiss Agency for Development and Cooperation (SDC)	Duration: 01.11.2010 31.07.2016 Budget: 11.3 mil. euro EU 5.0 mil. euro ADA 3.5 mil. euro SDC 800.000 EUR	– The water supply infrastructure will be designed to immediately service the Municipality of Nisporeni and the villages of Varzaresti and Grozesti, with a current total population of approx. 23,000. The production capacity and basic infrastructure (pumping main, storage capacity) will however be designed to supply about 30 villages with a total population of about 60,000 in the future. – The project covers the following three components: the establishment of the water supply infrastructure, the creation of an institution capable of operating, managing and maintaining water supply infrastructure in a sustainable manner and last but not least, the implementation of priority sanitation measures comprising the elaboration of studies to further develop sanitation solutions for the project area.

Name of Project	Implementing Organization	Total Funds/Years	Highlights
Improving water management and protection of water-related ecosystems in the Lower Dniester Ramsar Site	BIOTICA Ecological Society	Duration 01.12.2012– 30.11.2014 Budget: 358,512 € ADC 322,700 €	– This project aims at improving water management and mitigating the environmental risks in Lower Dniester area in favour of using an ecosystem services approach and sustainable development. – The water and ecosystem management in the Lower Dniester Ramsar Site is to be introduced as a model for a wider context, sustaining a wetland of international importance, while the local water supply of the Talmaza village (about 5.000 inhabitants) will be improved. – The project is being implemented in partnership by four Moldovan NGOs, equally active on the both banks of the Dniester River.
VET Schools as Training Providers for Water and Sanitation Related Professions in Moldova	IFCP (Professional Capacity Building Institute)	Duration: 2010-2013 Budget: 432,231 EUR ADC: 390,120 EUR	– The main purpose of the project is to support training and capacity development in order to respond to the human resources demand in in the water sector. Two VET schools will strengthen their capacities in providing demand - driven initial and further training in occupations relevant for Water and Sanitation Sector (WSS). – By the end of the project, the selected institutions will offer training packages for the two occupations and three specializations related to WSS and a MoE decree will entitle the two VET schools to implement the training packages on a regular basis. Two selected trainers will receive additional training and coaching, and go on a study tour to Austria for an exchange of experience with similar training centres and companies cooperating with them. – The updated curricula will be piloted in at least one long-term training course for each of the two WSS related occupations and one to two short-term courses for the same occupations. – The school management teams and staff will be supported in the development of services, such as tailor-made training courses, for adults, which could become the school's second source of additional income and one of the preconditions for the long-term sustainability of the project.
Rehabilitation of WSS	Kuwaiti Fund for Arab Economic Development (KFAED), Loan	Duration: since 2004 Budget: 6.5 million USD	– Rehabilitation of WSS systems (Straseni, Hincesti, and Taraclia, as well as the villages of Sarata Veche, Risipeni, and Carbalia)
Development assistance	Czech Republic	Duration: official about 900 thousand EUR per year	– Protection of water catchment sources in the city of Iargara; – Wastewater treatment plant construction in the city of Leova; – Systematic monitoring of quality of water sources.
Forestry Sector and Biodiversity Protection			
Improving Coverage and Management Effectiveness of the PAS (The Protected Area System)	Global Environment Facility (GEF) Government of Moldova	Duration: 2009-2013 Budget: US$ 1,985,670 GEF US $ 950,000 Government US $1,035,670 [86]	– The Protected Area System (PAS) aims to enhance the coverage and management effectiveness of the protected area system of Moldova by piloting - within the broader framework of the National Environmental Network. – The establishment of the first National Park in Moldova, and by strengthening the capacities at the systemic, institutional and individual levels to establish and manage a representative protected area system. – Thus, the GEF-funded developmental interventions will lead to creation of an enabling framework for the expansion of the protected area system to include under-represented ecosystems in Moldova. – Information/knowledge sharing on climate change impacts on biodiversity/eco-systems/eco-system based adaptation.
National Biodiversity Planning to Support the implementation of the CBD 2011-2020 Strategic Plan in Republic of Moldova	Global Environment Facility (GEF) UNDP	Duration: 2012-2013 Budget: US$ 414,400 [87]	– The project supports Moldova in fulfilling its obligations under the Convention for Biological Diversity. – It focuses on developing strategies for the conservation and sustainable use of biological diversity in line with the 2011-2020 Strategic Plan of the Convention and Aichi Targets, as well as on integration of biodiversity conservation concerns into relevant sectorial and cross-sectoral plan, programmes and policies. – Knowledge sharing on analysis related to climate change impacts on biodiversity and ecosystems and related adaptation measures
Sustainable tourism development in the Orhei National Park area	National Fund for Regional Development (Agency for Regional Development)	Duration: 2013-2014 Budget: 12,349,572 MDL (1,010,603 USD)	– The main objective of the project is to increase the investment attractiveness and visibility of tourism values in National Park Orhei. – Specific objectives: creation, improvement and diversification of tourism infrastructure and services in National Park Orhei, building, administrative capacity of the park, training and human resources for intercommunity cooperation activities by promoting diversification of the regional economy and tourism. – Developing touristic infrastructure (visitor centres, camping's, craft markets) at a distance of up to one hour from the capital Chisinau – Models for alternative income generation with positive impacts on the environment (incl. climate change adaptation)

[86] <http://www.md.undp.org/content/moldova/en/home/operations/projects/environment_and_energy/improving-coverage-and-management-effectiveness-of-the-protected.html>
[87] <http://www.md.undp.org/content/moldova/en/home/operations/projects/environment_and_energy/national-biodiversity-planning-.html>

Name of Project	Implementing Organization	Total Funds/Years	Highlights
Biodiversity Conservation of the Lower Dniester River	WB/GEF	Duration: 2002-2005 Budget: USD 975 thousand	– Improve biodiversity conservation efforts along the Lower Dniester River – Create a national park in the lower Dniester River Basin, – Build local capacity for its management, and promote sustainable management of forests and meadows in the protected area. – Supported the protection of transboundary wetlands in the Dniester Delta region by improving collaboration with Ukraine. – Included reforestation and afforestation efforts such as the creation of ecological corridors between fragmented forests and pilots on community resource management. – Facilitated community involvement in decision-making and included sustainable resource use in project activities (i.e., financed micro- credits for small-scale green businesses).
Moldova Community Forestry	WB State Forestry Agency	Duration: May 26, 2009 December 31, 2018 Budget: US$ 10.00 million [88]	– The project's development objective is to restore degraded land to economic and environmental use for the benefit of rural communities. In addition to community benefits, the project's forestation activities would support through restored productivity and conservation of soil the global objectives of carbon sequestration and reduction of atmospheric greenhouse gas concentrations. – The project aims to achieve forestation of about 8,000 hectares of degraded agricultural and community land with an aim of creating new community forests and protective forest belts; and to build community-based capacity to manage the newly created forests. – The project will have a single component with two main activities: A. Creation of community forests and protective forest belts. The project would forest some 1,300 plots scattered throughout the country. The plots are located in 265 mayoralties (primarias) in all the rayons of the country. The land to be forested is largely "refused land" – land that has not been privatized and the primarias are unable to restore to productive uses due to a lack of financing and technical know-how. – The local communities have contracted Moldsilva for periods of 5 to 10 years for the execution of forestation works on their behalf. Following contract expiry, forest management activities will be continued by the primarias. – Moldsilva will apply environmentally sound forest management practices, well-developed in Moldova, to ensure the maintenance of healthy plantations, while developing a sustainable flow of wood and non-wood products for subsistence and commercial purposes. – Maintenance cuttings will be carried out from canopy closure to maturity stages, while improvements in phyto-sanitary conditions through the control of forest pests and fires.
Moldova Soil Conservation	WB, Forestry Agency „Moldsilva"	Duration: January 23, 2004 December 31, 2013 Budget: US$ 14.42 million [89]	– The Soil Conservation Project in Moldova, aims promoting sustainable soil conservation in, and around degraded agricultural areas, preventing further erosion, and in addition, the project afforestation activities will support global objectives of carbon sequestration, and reduction of greenhouse gas concentrations. – Despite the environmental nature of the project, project regions exhibit some degree of internal homogeneity, exemplified by prevalent soils, rainfall, and dominant vegetation cover, and hence, a qualitative description emerged of the potential distribution of certain biodiversity values within regions, and should be determined prior to afforestation. – Measures to mitigate adverse environmental impacts are as follows. Biodiversity assessments should be implemented, followed by strict regulatory compliance to afforestation activities: soil preparation, planting, maintenance and trees protection, and, harvesting. – Where tillage is required for site preparation, the use of contour ploughing methods should be the choice to minimize soil impacts, and, where appropriate, the use of hydro technical installations is recommended to reduce erosion. Indigenous species (trees and bushes) will be selected, including the provision of clearings for the establishment of shrubs and grasses, to increase habitat diversity. The creation of orchards, and bush overgrowth using Rosa Canina, Prunus Spinoza, etc., is recommended as places for reproduction of, and food, and shelter for various fauna. Tending activities, such as harvesting of wooden mass, should be implemented in late fall, or winter to minimize fauna disturbances. – It is implemented over 20,289.91 ha of degraded lands. The project contributes to sustainable development in several ways such as restoring degraded lands, preventing soil erosion, increasing forest cover, improving soil productivity and increasing supplies of fuelwood, timber, and non-timber products to meet the needs of rural communities as well as replenishing the carbon stocks of degraded lands and contributing to the mitigation of climate change. [90]

[88] <http://www.worldbank.org/projects/P109459/moldova-community-forestry-project?lang=en>
[89] <http://www.worldbank.org/projects/P077763/soil-conservation-project?lang=en>
[90] <http://www.clima.md/public/files/2_Cadrul_National/PDD_Moldova_Soil_Conservation_Project.pdf>

Name of Project	Implementing Organization	Total Funds/Years	Highlights
The ENPI FLEG Program "Improving Forest Law Enforcement and Governance in the European Neighbourhood Policy East Countries and Russia"	European Union (World Bank, IUCN, WWF)	Duration: 2009-2012 Budget: 600,000 EUR	– The ENPI FLEG Program supports governments, civil society, and the private sector in participating countries in the development of sound and sustainable forest management practices, including reducing the incidence of illegal forestry activities. Participating countries include Armenia, Azerbaijan, Belarus, Georgia, Moldova, Russia and Ukraine. – Models for sustainable forest management (incl. climate change adaptation) – Knowledge sharing on analysis related to climate change impacts on biodiversity and ecosystems and related adaptation measures
Community Forests Development The total value of the net removals from the respective Grant implementation will be around 260 thousand tones in CO_2 equivalent. The cost per ton of reduction in CO_2 equivalent is USD 5.3.	Forestry Agency "Moldsilva"	Duration: 2004-2007 Budget: Grant of the Government of Japan USD 919,900	– Contribute to ensuring the sustainability of forest planting activities – Improved well-being of the population in rural areas via better management of community forests and pastures targeted at public forests covers 50 participating communities. – Expected to produce a positive impact on the respective community forests and pastures, better management capacity, environmental and economic benefits. – Implemented activities: (i) improving the productivity of 2000 ha of pastures owned by local communities; (ii) reconstruction and/or restore of 340 ha of forests and other types of forest vegetation owned by local communities; (iii) development of 5900 ha of managed forests and other types of forest vegetation on the lands owned by local communities.
Moldova Community Forests Development Project	Borrower, Carbon Fund, PHRD Grant WB/Forest Agency Moldsilva	Duration: May 26, 2009 December 31, 2018 Budget: USD 10 million [91]	– The objective is to restore degraded land through forestation to increase economic and environmental benefit to rural communities. In addition to community benefits, the project's forestation activities would support, through restored productivity and conservation of soil, the global objectives of carbon sequestration and reduction of atmospheric greenhouse gas concentrations. – Establish community forests and shelterbelts on 10,600 ha through: (i) the afforestation of eroded and unproductive land, (ii) the application of agro-forestry practices, carbon sequestration and reduction of greenhouse gas emissions, (iii) improving the local and regional forests and pastures resources, – Reduction of erosion through: (i) stabilization of landslides and improvement of the hydrologic regime, (ii) increased access to resources such as timber, firewood, and non-wood forest products, (iii) creation a basis for the sustainable development at the local and regional level. – Introduced to participatory community forestry and pasture management practices approximately 320 communities (some 380,000 people). – The cost per ton of reduction in CO_2 equivalent is USD 7.4. – The total resultant reductions in the GHG emissions will be 3.8 million tonnes in CO_2 equivalent. The Forest Agency Moldsilva has already signed an agreement (May 26, 2009) with the BioCarbon Fund of the World Bank for buying 550 thousand tons of reductions in CO_2 equivalent.
Program to support local communities for the sustainable and integrated management of forests and for the carbon sequestration through afforestation	Grant of the Government of Japan/ Forest Agency Moldsilva, Forest Management and Research Institute	Duration: 2009-2013 Budget: USD 975,900, of which USD 600,000 were allocated to support the local communities in achieving the sustainability of the new created forests.	– Ensure the sustainability of new communal forests created through: (i) capacity building for forest management and reforestation activities at the local level, (ii) the special program on integrated management of forests and interventions targeting afforestation of degraded agricultural land, planting of forest belts for environmental protection and creating a local environmental network; – Ensure global benefits through: (i) carbon sequestration and reduction of greenhouse gas emissions, (ii) generating revenues for local communities from forest products, to help reduce poverty in rural areas. – Envisaged activities are: (a) improving the productivity of 800 ha of communal pastures; (b) reconstruction and/or restoration of 1200 ha of forests and other forest vegetation owned by local communities; (c) development of 3200 ha of managed forests on the land owned by local communities. – The total resultant reductions in the GHG emissions will be 102 thousand tonnes in CO_2 equivalent. The cost per ton of reduction in CO_2 equivalent is USD 9.6.

[91] <http://www.worldbank.org/projects/P109459/moldova-community-forestry-project?lang=en>

Name of Project	Implementing Organization	Total Funds/Years	Highlights
Transport			
Moldova Railways: Environmental, Health and Safety Management Support and Capacity Building	EBRD Government of Moldova with CFM as the end beneficiary	Budget: Loan up to EUR 116.5 million. EBRD EUR 52.5 million Grant provided by the Neighbourhood Investment Facility of the European Commission for the acquisition of locomotives in the amount of up to EUR 5 million [92]	– The EBRD is considering providing a sovereign loan to the Government of Moldova, to be on-lent to Calea Ferata din Moldova (CFM, the national railway operator) to finance (i) the acquisition of new multi-purpose locomotives (to offer a higher level of service quality, safety and energy efficiency benefits), and (ii) conducting priority investments in rail infrastructure rehabilitation and related supervision services. The Project shall also aim to support the railway restructuring reform process, through: providing support to institutional reform to improve transparency and accountability, as well as financial sustainability; providing support for the initial planning and implementation stages of a phased retrenchment programme; and providing sustainability support by improving environmental and health and safety aspects, and applying energy efficient technologies and standards and encouraging lower emission modes to reduce energy consumption. – The EBRD will support the preparation of railway reform strategies by mobilising technical cooperation funding for consulting services, as follows: Restructuring Support - EUR 650,000 (EBRD Shareholder Special Fund); Assistance in preparation and implementation of tender - EUR 250,000 (Central European Initiative); Capacity Building on Energy Efficiency Management - EUR 220,000 (the Czech Official Development Assistance Fund); Environmental, Health and Safety Management Support and Capacity Building - EUR 73,000 (Central European Initiative); Retrenchment Planning - EUR 65,000 (EBRD Shareholder Special Fund). An implementation of an energy management information system is expected to be co-funded through the EBRD Shareholder Special Fund.
Moldova - Local Roads Improvement Project	WB	Duration: since 2014 Budget: US$ 80 million [93] IBRD Commitment US$ 15 million IDA Commitment US$ 65 million	– The objective of the Local Roads Improvement Project for Moldova is to: (a) improve access to basic social services (education, health and access to markets), (b) increase road safety, (c) improve the management of routine maintenance on the selected local roads, and, (d) enhance the capacity of national and local authorities to manage the local road network. – Some of the negative impacts and mitigation measures include: to plan carefully construction works to minimize land affected and ensure soil pollution prevention; to minimize construction site's size/to minimize land affected/to ensure soil pollution prevention; to select proper site for placing of mobile asphalt plant, if appropriate to minimize impact on land/soil; to avoid loss of vegetation along the roads; to rehabilitate borrow areas, quarries and temporary haul /access roads by planting grass and trees and other measures; control construction methods and used machinery and equipment; careful timing of works in residential areas)/ restrict construction to certain hours; to avoid laud beep signals in settlements/to minimize disturbance to residents; restrictions speed of construction vehicles, especially in residential areas; and to construct and rehabilitate sidewalks in residential areas/ the required width of the sidewalk corresponds to the intensity of pedestrian's traffic (final determination of the location shall be arranged with local stakeholders).
Road Sector Program Support Project	WB / EBRD	Duration: 29-Mar-2007 30-Jun-2011 Budget: USD 48.7 million	– Reduce road transport costs for road users by improving the condition and quality of road network and the way it is managed. – This will be achieved by: (1) the road network recovery component which will rehabilitate about 400 lane-km of main roads (equivalent to about 160 to 200km of main roads) and thereby reducing user costs in the short term; (2) the institutional strengthening component which will improve the capacity of the State Road Administration to manage effectively the road network and to carry out road maintenance, rehabilitation, and investment programs in a transparent manner.
Financing Agreement between EBRD and the Republic of Moldova on Road Rehabilitation Project IV[94]	European Bank for Reconstruction and Development Soft Loan	Duration: 28/06/2013 31/07/2017 Budget: 150,000,000 EUR	– The EBRD is providing a sovereign loan of up to EUR 150 million to be provided to the Government in three tranches to finance the rehabilitation of main road sections in Moldova (rehabilitation of about 213 km of national roads). – The purpose of the project is to help reverse the deterioration of the road network in Moldova and to ensure key road links are properly maintained to facilitate economic growth and regional integration. The total project cost will be around 315.5 million EUR.
Financing Agreement between EIB and the Republic of Moldova on Road Rehabilitation Project III[95]	European Investment Bank	Duration: 25/06/2013 31/07/2017 Budget: 150,000,000 EUR Soft Loan	– The EIB is providing a sovereign loan of up to EUR 150 million to be provided to the Government to finance the rehabilitation of main road sections in Moldova (rehabilitation of about 176 km of national roads).

[92] <http://www.ebrd.com/work-with-us/projects/psd/moldovan-railways-fleet-renewal.html>
[93] <http://www.worldbank.org/projects/P150357?lang=en>
[94] <http://www.ebrd.com/work-with-us/projects/psd/moldova-roads-rehabilitation-iv.html>
[95] <http://www.ncu.moldova.md/doc.php?l=en&idc=479&id=2191&t=/NORMATIVE-FRAMEWORK/Agreements/EBRDEIB/Finance-contract-between-the-Republic-of-Moldova-and-European-Investment-Bank-on-Moldova-Roads-III>

Name of Project	Implementing Organization	Total Funds/Years	Highlights
Moldova Road Rehabilitation Project III [96]	ERBD, EIB	Duration: 26/10/2010 01/11/2013 Budget: 75,000,000 EUR Soft Loan	– The purpose of the project is to help reverse the deterioration of the road network in Moldova and to ensure key road links are properly maintained to facilitate economic growth and regional integration. Loan of 75 million Euro for roads reconstruction. – The EBRD loan is divided into three tranches, it will be used in the road sector for financing the primary projects that are established in the investment plan with the World Bank support. – The first tranche of the loan, with the value of 27 million Euro, financed the reconstruction of two sections from M3 Chisinau - Giurgiulesti road, that has the total length 55km and it is placed between the Comrat and Ciumai city. – The next tranche of the loan with a value of 25 and 23 million Euro, were used to finance the supplementary investments in the road infrastructure of the Republic of Moldova.
Moldova Road Rehabilitation III Project (NIF Contribution)	European Union	Duration: 06/12/2011 05/12/2017 Budget: 16,200,000 EUR Grant	– The new proposed project is a continuation of the existing engagement of International Financing Institutions and the EU in the road sector and will involve rehabilitation of priority road sections identified in the Land Transport Infrastructure Strategy, reconfirmed in May 2010, for which feasibility and design have been finalized. – The investment will bring positive transport interconnection effects by rehabilitation the Chisinau-Ungheni-Sculeni road. This road is one of the main roads connecting the Republic of Moldova to the EU and is part of a central east-west corridor linking Romania-Republic of Moldova-Ukraine and part of the Extension of the Trans-European Transport Network. Also it will contribute to the construction of the Ungheni bypass forming part of the R1 Chisinau-Ungheni-Sculeni Romanian border road.
Chisinau Urban Road Sector Project[97]	ERBD, EIB, EU	Duration: 16/10/2012 15/04/2016 Budget: 32,700,000 EUR Grant, Soft Loan	– The EBRD is providing financing to the City of Chisinau to finance the rehabilitation of the main streets in the City centre. The project has two components: (1) street rehabilitation works, covering the renewal of roads and pavements, building new central pedestrian areas, as well as the establishment of on-street parking facilities to be used under a new parking charging scheme; and (2) public and street lighting refurbishment which will entail the replacement of the existing high pressure mercury-based lamps with modern energy-efficient technology. This is expected to produce budgetary savings for the City as a consequence of energy efficiency gains. – The contract envisages rehabilitation of 6 primary and secondary streets in the central area of Chisinau municipality: Stefan cel Mare si Sfant, Constantin Negruzzi, Vasile Alecsandri, Tighina, Alexandru cel Bun, 31 August 1989, having a total length of 14,290 m. The works consist of rehabilitation of carriageways and footways, the establishment of on-street parking facilities and the upgrading of street lighting. – The EBRD will provide a non-sovereign loan to the City in an amount of up to €11.4 million. The loan will comprise a tranche of up to EUR 10.3 million for the Bank's own account, and a tranche of up to EUR 1.4 million funded by the Green Energy Special Fund ("GESF") administered by the Bank. The overall project cost is up to €32.7 million. The includes parallel financing from the European Investment Bank ('EIB'), a contribution from the City in an amount of €9.5 million to finance water and heating infrastructure on the selected streets and a loan from the Green Energy Special Fund ('GESF') to finance the street lighting component. The project also includes €1.2 million for post-signing technical cooperation.
Balti Trolleybus Project[98]	ERBD, EU Neighbourhood Investment Facility	Duration: 2012-2015 Budget: 4.6 million USD ERBD: 3 million EUR	– The EBRD provided a loan of up to € 3 million to the Municipal Enterprise "Balti Trolleybus Company" to improve the quality of public transport services and for the modernization of the trolleybus fleet in the City of Balti. – The project was co-financed by the EU Neighbourhood Investment Facility via a capital investment grant of €1.6 million. – The Project consists of acquiring up to 23 new trolleybuses, spare parts, power supply infrastructure components and purchasing essential maintenance equipment. – The project will include commercialization of trolleybus services through signing a Public Service Contract ("PSC") between the City and the Company to improve the services of the Company as well as a corporate development programme for the Company through a twinning arrangement.

[96] <http://www.ebrd.com/work-with-us/projects/psd/moldova-road-rehabilitation-iii.html>
[97] <http://www.ebrd.com/work-with-us/projects/psd/chisinau-urban-road-sector-project.html>
[98] <http://www.ebrd.com/work-with-us/projects/psd/balti-trolleybus-project.html>

Name of Project	Implementing Organization	Total Funds/Years	Highlights
Moldova Road Rehabilitation Project III (BERD & BEI)	ERBD, EIB Soft Loan	Duration: 01/11/2010 01/11/2015 Budget: 150,000,000 EUR	– The purpose of the project is to help reverse the deterioration of the road network in Moldova and to ensure key road links are properly maintained to facilitate economic growth and regional integration. – Loan of 75 mil. Euro for roads reconstruction. – The EBRD loan is divided into three tranches, it will be used in the road sector for financing the primary projects that are established in the investment plan with the World Bank support. The first tranche of the loan, with the value of 27 million Euro, will finance the reconstruction of two sections from M3 Chisinau - Giurgiulesti road, that has the total length 55km and it is placed between the Comrat and Ciumai city. – The next tranche of the loan with a value of 25 and 23 million Euros, will be used to finance the supplementary investments in the road infrastructure of the Republic of Moldova that will be further defined.
Danube Logistics - Giurgiulesti Harbour[99]	ERBD	Duration: 2012-2015 Budget: 30.7 million USD ERBD: 12 million USD	– The EBRD provided a senior loan to Danube Logistics SRL, an enterprise established in Moldova, which owns and operates the only port in the country, Giurgiulesti International Free Port, located on the Lower Danube, near the village of Giurgiulesti, the southernmost point of Moldova, on the border with the EU and 10 km away from Romanian city of Galati, the largest port town on the Danube River. – The loan is part finance the completion of the port infrastructure and in particular building of mixed-gauge rail terminal and roll-on-roll-off ramp. Specifically, building of up to 100 m of mixed-gauge rail on the territory of the port will connect the Romanian and Moldovan railways where Romania as the rest of the EU uses narrow gauge and Moldova as well as the neighbouring Ukraine and other CIS countries uses broad gauge. – First of all, it will enable the trains to enter the port and, secondly, it will help avoid long hours of lifting each carriage to have its bogies changed. The EBRD's investment is also used for balance sheet restructuring through the refinancing of the short-term debt with long-term loans. With the help of the EBRD's loan the port will become a multipurpose logistics hub at the crossings of maritime trade routes between Eastern Europe and the EU, with due access to road, rail (broad and narrow gauges), the Danube River and the Black Sea. – It will also contribute to an increased competition for Moldovan cargo traffic with the regional ports, including Galati in Romania and Odessa in Ukraine.
Technical Assistance for the implementation of the legal and regulatory framework in the Aviation Sector according to the Common Aviation Area Agreement between the European Union and its Member States and the Republic of Moldova	European Union	Duration: 11/02/2013 11/02/2016 Budget: 2,395,158 EUR Grant	– The overall objective of the project is to improve air transport safety and security by assisting civil aviation authorities of the Republic of Moldova in adoption and implementation of the legal and regulatory framework for the aviation sector according to the terms agreed in the EU–Moldova Common Aviation Area Agreement. – The purposes of this contract are as follows: assist Moldovan civil aviation authorities in drafting of national legal and regulatory documents in accordance with the EU aviation legislation to be transposed according to the CAA Agreement; provide support during the adoption and enforcement phases of the new legal and regulatory framework; carry out the functional analysis of the existing system and practices, prepare recommendations for the necessary changes, including strengthening of the administrative and technical capacity of the Moldovan civil aviation authorities required to implement the agreed legal and regulatory framework, and provide assistance during the change process, including special training for the Moldovan partners and study visits to the EU Member States.
Millennium Challenge Compact Programme in Moldova	Millennium Challenges Corporation USAID	Duration: 01/09/2010 01/09/2015 Road Project Budget: 115,053,179 EUR Grant	– The Rehabilitation of National Roads Project implemented in Moldova through the MCC Program comes with a comprehensive approach to the economic growth, including the reforming of the management of water resources and of the maintenance of national roads. – The Compact Program is a way to enhance the private sector and is based on the partnership between MCC and USAID in providing assistance to Moldova in accomplishing its development objectives. – In the end, the MCC Program offers an integrated solution for poverty reduction. This aims at increasing agricultural productivity, promotes food safety and gives access to markets via more reliable roads.
Energy			
ESCO Moldova	GEF/UNDP	Duration: 2014 – 2018 Budget: US $ 1,450,000 [100]	– "ESCO Moldova - Transforming the market for Urban Energy Efficiency in Moldova by introducing Energy Service Companies" project objective is to create a functioning, sustainable and effective ESCO market in Moldova by converting existing energy service provider companies into ESCO companies, as the basis for scaling up mitigation efforts in the whole municipal building sector in Moldova, leading to CO_2 emission reductions by implementing energy performance contracts. – Energy Service Company (ESCO) is private business unit that provides integrated financial and technical solutions for achieving energy cost reductions (energy savings), and whose overall compensations are linked to the performance (Energy Performance Contract) of the implemented solutions. – The project will work on the largely untapped energy efficiency market in the municipal sector, especially in facilities owned and operated by municipalities, in the Chisinau area for the first stage and then to other parts of Moldova.

[99] <http://www.ebrd.com/work-with-us/projects/psd/danube-logistics---giurgiulesti-port.html>
[100] <http://www.md.undp.org/content/moldova/en/home/operations/projects/environment_and_energy/esco-moldova/>
[101] <http://www.worldbank.org/projects/P132443/district-heating-efficiency-improvement-project?lang=en&tab=overview>

Name of Project	Implementing Organization	Total Funds/Years	Highlights
District Heating Efficiency Improvement Project	WB Ministry of Economy	Duration: November 21, 2014 June 30. 2020 Budget: Total US$ 61.10 million IBRD US$ 40.50 million [101]	– The District Heating Efficiency Improvement Project of Moldova will contribute to improved operational efficiency and financial viability of Newco and to improve quality and reliability of heating services delivered to the population of Chisinau. – Component one will support priority investments aimed at optimizing and modernizing the heat distribution network, with the objective of reduced heat losses, improved service quality, and increased efficiency and security of supply of heat and hot water to end-user consumers. – Component two will support the Government's decision to streamline operation and corporate structure of Newco, including closing down of the operation of CHP-1. Component three will provide technical and financial support for project management.
Moldova Energy and Biomass Project (II)	EU/UNDP	Duration: 2015-2017 Budget: 9.41 million Euro [102]	– The Moldova Energy and Biomass Project aims to contribute to a more secure, competitive and sustainable energy production in the Republic of Moldova from biomass sources, the most readily available renewable energy source in the country. – The project will increase the use of energy from biomass sources, thus contributing to both, a more secure, competitive and sustainable energy production and local development. – The target communities will produce their own energy, which will result in the creation of new businesses and jobs, and not least, in a better protection of our environment for future generations.
Moldova Energy and Biomass Project (I)	EU/UNDP	Duration: 2011-2014 Budget: 14.56 mil Euro [103]	– The Energy and Biomass Project aims to contribute to a more secure, competitive and sustainable energy production in the Republic of Moldova. It lays the basis for the establishment of functional markets for biomass technologies while increasing the use of renewable energy sources, in particular for heating public buildings and households in rural areas. – New jobs and income are created and secured through the establishment of value added chains at the local and regional level through the supply of biomass fuel and technologies. In addition, the project significantly contributes to reducing the greenhouse gas emissions and environmental pollution by replacing the traditional energy sources with readily available biomass fuels, training programmes and a country-wide awareness raising campaign combined with a school education programme aim to change people's knowledge and attitude towards renewable energy sources, laying the basis for increased uptake of sustainable energy technologies in the future. – Models for alternative income generation with positive impacts on the environment (incl. climate change adaptation)
Moldova Energy Conservation and Greenhouse Emissions Reduction	Community Development Carbon Fund WB	Duration: 07/04/2014 2006- 2016 Budget: US$ 10 million [104]	– The overall project goal is improving efficiency of heating in the selected priority public buildings and to ensure energy consumption and respectively greenhouse gases emissions reduction, and thus providing global environmental benefits through the WB Energy-II project, which is under implementation in the Republic of Moldova. – This Moldovan project aims at GHG emission reduction as a result of efficiency improvements and fuel switching measures for a series of public buildings (kindergartens, schools, vocational schools, hospitals, policlinics etc.) implemented via the WB Moldova Energy II Project.
Grant Agreement between JICA and the GRM for the project for effective use of biomass fuel	Japan Grant	Duration: 26/06/2013 31/03/2017 Budget: 9,016,413.936 EUR	– The project objectives will contribute to: i) reduce energy costs, ii) developing sustainable heating systems and iii) improving living conditions in rural communities in Moldova.
Energy to Innovation - Reinforcing cooperation with ENP countries on bridging the gap between energy research and energy innovation (Ener2i)	European Union Grant	Duration: 01/10/2014 01/10/2016 Budget: 329,853.15 EUR	– Energy concentrates on the following main objectives: - To enhance the innovation capacity and improve the innovation performance of manufacturers, energy service companies and industry in the field of energy efficiency (EE) and renewable energy sources (RES); – To improve knowledge transfer and innovation support in the field of EE/RES through a comprehensive trans-national cooperation; – To stimulate effective linkages between research and innovation with effective knowledge transfer methods in the participating EaP countries Armenia, Belarus, Georgia, and Moldova; – To strengthen cooperation between research and business actors in EE/RES in the participating countries and at the same time facilitating the cooperation between EU and participating EaP countries.

[102] <http://www.md.undp.org/content/moldova/ro/home/operations/projects/environment_and_energy/moldova-energy-and-biomass-project0.html>
[103] <http://www.md.undp.org/content/moldova/en/home/operations/projects/environment_and_energy/moldova-energy-and-biomass-project01/>
[104] <https://cdm.unfccc.int/filestorage/T/E/7/TE7NS3ZA9MOPKJXHQ180BRYGW6IF2D/0173_PDD_ver07.pdf?t=ZVN8bnI4bTgwfDCO5zWjkb9IkWG6gjLWHkvg>

Name of Project	Implementing Organization	Total Funds/Years	Highlights
Green Light Moldova – Modernisation and Saving Energy in Street Lighting	European Union Grant	Duration: 2014-2016 Budget: 400,000 EUR	– This project will work on the modernization and installation of modern, energy efficient street lightings in the three municipalities of Ocnita, Soroca and Cantemir; – The project is planned for 24 months and the EU is to finance 80% of the total cost of the project.
Comprehensive demonstrational project for sustainable energy development in the town of Orhei	European Union, Local Government, Grant	Duration: 22/12/2014 22/02/2018 Budget: 1,000,698.6 EUR	– This project will work on the development of high efficiency cogenerations, development of use of renewable energy, modernization of the district heating system, and reinforcement of energy efficiency in several public and residential buildings of the city; – The project is planned for 38 months and the EU is to finance 75.4% of the total cost of the project.
Finance and project agreement between KFW, Republic of Moldova and social investment fund, signed on 15 December 2010	Germany Grant	Duration: 15/12/2010 15/12/2014 Budget: 7,000,000 EUR	– The Project concerns investments in municipal and social infrastructure (water and gas supply, energy supply, schools, kindergartens, roads, etc.) of local communities up to 20.000 inhabitants in the Northern part of Moldova and on both sides of Nistru/Dniester with a specific focus on the efficient use of energy and the use of alternative energy sources.
Sector policy support programme to reform of the energy sector	European Union Grant	Duration: 06/12/2011 05/12/2015 Budget: 50,000,000 EUR	– The main objective of this SPSP is to support the reform of the energy sector and to facilitate technical improvements in its operation. It will offer a flexible instrument to support the Government of the Republic of Moldova (GoM) efforts towards further progress on the implementation of the Moldovan energy strategy and energy sector development. This will be achieved through the support of interventions in the preparation and adoption of appropriate legislation that are set out in the policy matrix, as well as technical assistance and policy dialogue.
Moldelectrica Power Transmission	EBRD & EIB Soft Loan	Duration: 26/06/2012 26/06/2019 Budget: 32,526,744.82 EUR	– The purpose of the project is to assist the borrower in rehabilitation of the existing internal power transmission network
Moldelectrica Power Transmission Network Rehabilitation (NIF)	European Union Grant	Duration: 01/04/2013 01/11/2019 Budget: 8,000,000 EUR	– To reinforce regional interconnections and develop regional electricity trade, helping the integration of the Republic of Moldova to the European Network of Transmission System Operators for Electricity
Support to reform of the energy sector	European Union Grant	Duration: 05/06/2012 03/12/2015 Budget: 2,600,000 EUR	– The project provides technical assistance and support to the Government of Moldova and specifically to the Ministry of Economy, to achieve fulfilment of the targets and indicators specified in the Financing Agreement of the SPSP "Support to Reform of the Energy Sector", as well as the commitments under the Energy Community Treaty. – The project covers manly the areas of Energy Efficiency and Renewable Energy Sources from policy, legislative, institutional and regulatory points of view, as well as capacity building and promotional activities.
Balti District Heating Project[105]	ERBD, Eastern Europe Energy Efficiency and Environmental Partnership (E5P) facility	Duration: 01/11/2014 01/01/2019 Budget: 10,000,000 EUR Loan, grant	– The EBRD is providing a sovereign loan of up to €7 million to the Government, to be on-lent to the Company. The project is expected to be supported by a grant of up to €3 million from the Eastern Europe Energy Efficiency and Environmental Partnership (E5P) facility. The proceeds of the loan will be used to finance a Priority Investment Programme to modernize and upgrade the district heating services in the municipality of Balti. The investment is expected to reduce coal and gas consumption, reduce CO_2 emissions; help CET-Nord JSC (the Company) maintains its customer base and ensure sustainability of its services. The Programme is expected to result in significant energy efficiency improvements and water savings as a result of customer controlled heat supply, improved efficiency of generation capacity, electricity co-generation and reduced losses in the distribution network. The Project is expected to have a positive impact on Moldova's energy security and balance of trade. It will also be the first project expected to make use of the Eastern Europe Energy Efficiency and Environmental Partnership (E5P) facility.
Public Biomass Systems in Moldova Rural Communities (Community Development Carbon Fund Facility)	WB, Carbon Finance Unit of the Ministry of Environment	Duration: 24 Feb 2006-30 Jun 2017 Budget: US$ 1.49 million [106]	– Objective: to generate an added value to Moldova Social Investment Fund (SIF) II Project, under implementation in Moldova through gained GHG emissions reduction benefits, directed towards SIF project participants, thus creating incentives for further implementation of GHG mitigation measures

[105] <http://www.ebrd.com/work-with-us/projects/psd/balti-district-heating-project.html>
[106] <http://www.worldbank.org/projects/P092516/public-heating-biomass-systems-moldovan-rural-communities-community-development-carbon-fund-facility?lang=en>

Name of Project	Implementing Organization	Total Funds/Years	Highlights
Moldovan Sustainable Energy Financing Facility (MoSEFF I and II)[107]	ERBD	2009-2012 (MoSEFF I) 2013-2016 (MoSEFF II) Budget: 20 million EUR (MoSEFF I) 22 million EUR (MoSEFF II) MoSEFF II is complemented by grant support of €6.8 million, provided by the European Union	– The ERBD has recognized the increasing importance of energy efficiency and the key role it will play in the future of Europe. In September 2009 MoSEFF I was launched in order to support energy efficiency investments in Moldovan enterprises. – A credit line of 42 million Euro (20 million EUR for MoSEFF I and 22 million EUR for MoSEFF II) combined with a 5-20% grant component was provided for on-lending to Moldovan companies through EBRD's partner banks. – MoSEFF provides also technical assistance to the projects through Fichtner - a leading German engineering and consulting company. MoSEFF loans are provided by local partner banks to Moldovan companies applying for financing. MoSEFF loans start from 10 thousand to a maximum of 2 million Eur. – The financing is bound to investments fostering sustainable energy saving and production of renewable energy (please see the section Eligibility and Case Studies for more information on eligible technologies). A team of technical and financial experts will assist the applicants in the assessment and optimization of their projects. – The Moldovan partner banks are responsible for the financial due diligence and the final decision on the loan disbursement. After the project is implemented, an independent verification consultant (Allplan, Austria) will verify successful project implementation and actual energy savings. A grant of up to 20% of the loan amount is then paid to the company. – To make energy efficiency (EE) and renewable energy (RE) investments even more attractive, MoSEFF offers grants for eligible projects. Depending on the energy savings and CO_2 emission reductions of a project, the grant may reach between 5% and 20% of the loan amount. – The main aim of these grants is to make a sound project economically viable and feasible for implementation. Another aim is to foster the application of advanced technologies in Moldova. This is achieved by offering higher grants for projects that employing Best Available Technology (BAT). – MoSEFF II is complemented by grant support, provided by the European Union, which will be used for technical assistance and investment incentives to sub-borrowers.
Residential Energy Efficiency Financing Facility (MoREEFF)[108]	EBRD, EU NIF, SIDA	Duration: 2012-2017 Budget: 35 million EUR	– To help Moldovan households reduce their energy bills and consumption the ERBD have developed the MoREEFF to provide credit lines to reputable Moldovan banks to make loans to householders, Condominiums / Associations of Apartment Owners, Housing Management Companies, Energy Service Companies or any other eligible service companies providing maintenance, operation, construction and refurbishment services for the purpose of implementation of eligible energy efficiency projects in the residential sector in Moldova including double-glazing; wall, floor, and roof insulation; efficient biomass stoves and boilers; solar water heaters; efficient gas boilers; heat pump systems; building-integrated photovoltaic systems; and heat-exchanger stations and building installations. – To help stimulate the uptake of residential energy efficiency projects, the MoREEFF credit lines are complemented by grant funding from EU NIF and SIDA, earmarked in support of project development and investment incentives paid to MoREEFF borrowers after verification that each eligible residential energy efficiency project has been completed. – Borrowers will benefit from up to a 35% incentive towards the cost of the energy saving projects subject to the terms and conditions of the MoREEFF. The MoREEFF loans and investment incentives are available to borrowers until 30 June 2017. – It is anticipated that the total number of energy efficiency home improvement projects to be financed under the MoREEFF facility will be in the range of 8,000. – To date, the MoREEFF Programme has committed to 1528 energy efficiency loans totalling 5,944,993 Euro and incentive grants amounting to 1,659,317 Euro. – MoREEFF financed projects have saved 12,599 MWh per year, which is enough energy to drive a car over 18,898,645 kilometres. – MoREEFF supported projects have brought reduction in CO_2 emissions of 2,860 tons per year, which is equivalent to the amount of CO_2 annually absorbed by a forest of 105,926 trees.

[107] <http://www.moseff.org/index.php?id=88&L=1>
[108] <http://moreeff.info/en/about-us/?lang=en>

Name of Project	Implementing Organization	Total Funds/Years	Highlights
Energy-II Project in the Republic of Moldova	WB, SIDA, IBRD/ IDA, Ministry of Economy	Duration: 2004–2008 (phase I), 2009–2012 (phase II) Budget: USD 35 million (phase I), USD 11 million (phase II)	– Electricity System Upgrade: improvement of metering in the electricity transmission network; Rehabilitation and upgrade of power system dispatch and telecommunications; Upgrade of substation equipment: it is at the stage of completing, this component includes modernization of operating substations 110 and 330 kV of Moldelectrica; Priority rehabilitation of the transmission network: this component covers the most urgently needed repair of a number of 110-kV and 330-kV high-voltage lines, which sustained damage from an ice storm in November 2000 and from strong winds in early March 2002 and due to other reasons; – Environmental upgrades in the transmission system: it is 95% completed, this component consists of physical mitigation measures for appropriate disposal of old PCB-containing condenser batteries; Improved access to heating during the heating season (about 120 days in a year) for approximately 35 institutions (including schools, hospitals, kindergartens (pre-schools), orphanages) and 37 apartment houses; Improved access to heat was ensured to approximately 8,400 schoolchildren, approximately 1 million patients and visitors of the polyclinics and hospitals, and about 2,130 families whose apartments were connected to new heat plants during the last two heating seasons (2006/2007 and 2007/2008). The additional funding of USD 11 million approved for 2009-2012 were used to ensure improved access to heating for about 18 public institutes and social assistance centres located in 10 administrative units.
Energy Efficiency Project	SIDA	Duration: On July 27, 2009 Budget: grant in amount of 16 million Swedish Kronor	– Provision of Technical Assistance in the implementation of the Extended Heating Component of Energy II Project (Packages B8 and B9 - financed by the Word Bank through the Additional Financing Agreement dated March 16, 2009); – Performance of a Feasibility Study for the Reconstruction of the Heating, Ventilation, DHW, DCW and Sanitation Systems at the Medical Centre for Mother and Child; – Installation of a New Boiler Plant, Heating and DHW Substations, Reconstruction of Distribution Pipes, Internal Heating and DHW systems at the Children's Phthisiopulmonology (Tuberculosis) Centre in Tirnova village.
Reducing Greenhouse Gas Emissions through Improved Energy Efficiency in the Industrial Sector	UNIDO/GEF	Duration: 2010-2015 Budget: USD 4,252,500, from which USD 960,000 are provided by GEF	– Improve the energy efficiency of Moldovan industrial sector leading to reduced global environmental impact and enhanced competitiveness. – Establishment of policy, legal and regulatory frameworks that promote and support sustainable industrial energy efficiency and stimulate the creation of a national market for IEE products and services; – Increased adoption by Moldovan industries of energy efficient technologies and energy management as integral part of their business practices; – Accelerated and increased adoption by Moldovan industries of energy efficient practice and technologies as result of showcasing and disseminating successful national IEE projects.
Renewable Energy from Agricultural Wastes	WB/GEF, Consolidated Agricultural Projects Management Unit (CAPMU)	Duration: 2005-2008 Budget: USD 2.63 million	– Large-scale efficient use of biomass which should replace the imported fossil fuel and trigger the introduction and promotion of the primary agricultural waste (biomass) for generation of heat based on efficient technologies. – Remove obstacles to popularization of biomass procession technologies, showing the best practice examples (11 model units have been installed and commissioned with the total capacity of 2720 kW) of using biomass-based energy systems as an alternative to fossil fuel and sustainable solution for the energy supply problem for the rural communities and agribusinesses; – Encourage the development of the market for baled straw and the post-project replication of the biomass production and distribution business among agricultural companies; – Increase in the number of public buildings, which have switched to biomass-based heating systems as result of the lessons learned from the project implementation results; – Promotion of an awareness-raising campaign on the use of renewable energy, extension among the public and promotion of the replication strategy.
Project Proposal: Construction of a Co-Generation Plant with the Capacity of 31 MW at State Enterprise "Tirotex" in Tiraspol, Republic of Moldova	CDM / State Enterprise "Tirotex" in Tiraspol, Republic of Moldova.	Duration: intended project lifetime was 25 years (2009–2034)	– Reduction of GHG emissions and more efficient use of primary energy sources in generation of electricity and heat (including: to ensure the quality and reliability of electricity supply; – Abandonment of obsolete equipment in the boiler section of the above enterprise; reduction of the enterprise's fuel consumption and associated costs; reduction of GHG emissions from burning of fossil fuel for power generation). – The average annual reduction of GHG emissions will vary between 47,640 and 54,760 tons in CO_2 equivalent. The cost per ton of reduction in CO_2 equivalent will make EUR 10.
Project Proposal: Biogas Production from Sugar Beet Press Pulp at Südzucker Sugar Factory in Drochia, Republic of Moldova	CDM / Südzucker Moldova S.A., a joint German- Moldovan company	Duration: Since 2012	– Abate GHG emissions stemming from the decay of sugar beet press pulp utilize an anaerobic digester in which the sugar beet press pulp will be transformed to biogas, which in turn will be captured and used to generate heat. – Replace heat generation from fossil fuels with heat generation from biogas. – The total amount of emission reductions expected for the 10year crediting period is 203,660 t CO_2eq. Of this 88,200 t CO_2eq will be generated form the replacement of natural gas and 115,460 t CO_2eq, from the reduction of methane emissions.