The Netherlands Second Biennial Report under the United Nations Framework Convention on Climate Change (2015)

Ministry of Infrastructure and the Environment

CONTENTS

1. SUMMARY

Introduction

This report presents the second Biennial Report from the Netherlands, as required under the United Nations Climate Change Convention (UNFCCC). It describes the information in accordance with the UNFCCC biennial reporting guidelines for developed country Parties[1]. Tabular information as defined in the common tabular format (CTF) is submitted using the electronic reporting facility provided by the UNFCCC Secretariat[2].

Greenhouse gas emissions and trends

In 2013, total direct greenhouse gas emissions (excluding emissions from LULUCF) in the Netherlands were estimated at 195.8 Mton CO_2 eq. This is 11.5 per cent lower than the 221.1 Mton CO_2 eq reported in the base year (1990).
Figure 1.1 shows the trends and contributions of the different gases to the aggregated national greenhouse gas emissions. In the period 1990–2013, emissions of carbon dioxide (CO_2) increased by 3.5 per cent (excluding LULUCF), while emissions of non-CO_2 greenhouse gases decreased by 49 per cent compared with base year emissions. Of the non-CO_2 greenhouse gases, methane (CH_4), nitrous oxide (N_2O) and fluorinated gases (F-gases) decreased by 42 per cent, 56 per cent and 75 per cent, respectively.

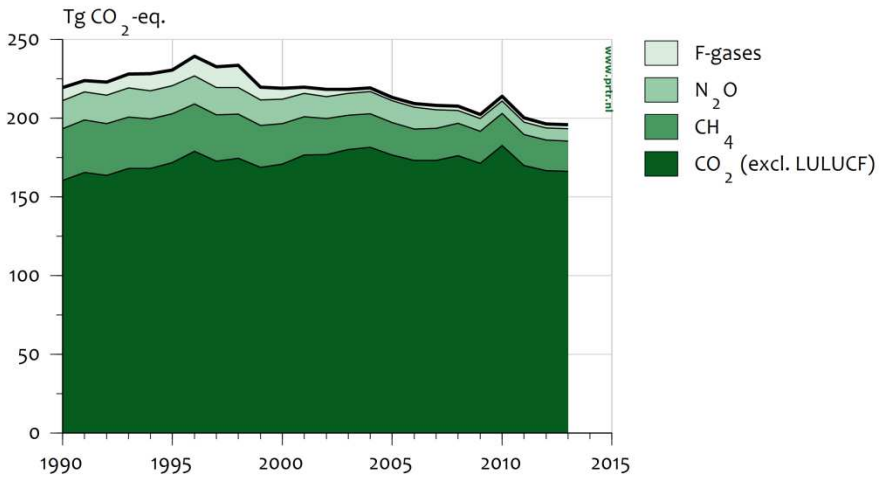


Figure 1.1 Greenhouse gases: trend and emission levels (excl. LULUCF), 1990–2013.

Quantified economy-wide emission reduction targets

In 2010, the European Union (EU) submitted a pledge to reduce its GHG emissions by 2020 by 20 % compared to 1990 levels (UNFCCC, 2014a). As this target under the Convention has been submitted by EU-28, as a group and not by each of its Member States, there are no specified convention targets for individual Member States under the Convention. Due to this, the Netherlands, as part of the EU-28, is pursuing this quantified economy-wide emission reduction target jointly with all other Member States.

[1] Annex I to UNFCCC Decision 2/CP.17
[2] UNFCCC Decision 19/CP.18

The EU's 2020 climate and energy package sets internal legally binding rules to underpin the implementation of the target under the Convention. The package introduced a clear approach to achieving the 20% reduction in total GHG emissions compared to 1990 levels, which is equivalent to a 14% reduction compared to 2005 levels. This 14% reduction objective is divided between two sub-targets for the EU's Emission Trading Sytem (ETS) and non-ETS sectors, responsible for two thirds versus one third of the EU's emissions, respectively.
The Netherlands is committed to its reducing emissions in sectors covered under the Effort Sharing Decision (ESD, non-ETS) by 16% compared to 2005 emissions. The Dutch quantified annual reduction targets set by EU Decisions[3] and Annual Emission Allocations (AEA) in tons CO_2 eq. are 122.9 million AEA in 2013, decreasing to 107.0 million in 2020 (according to AR4 GWPs). The cumulative amount of AEAs for the period 2013-2020 is set at 920 Mton CO_2-equivalents.

Progress in achievement of Quantified economy-wide emission reduction target

The emissions under ESD were 109 Mton CO_2 eq. in the year 2013, and the provisional number for the year 2014 is 97.9 Mton CO_2 equivalent, while the allocated AEAs for these years were 123 Mton and 121 Mton respectively. For the period 2013-2020 the projected emissions are calculated to be 819 Mton. It is therefore anticipated that the emissions in 2020 as well as the cumulative emissions will be lower than the target and the cumulative AEAs over the period (see figure 1.2). The Netherlands has decided to cancel any surplus of AEAs for the period up to 2020, presently estimated to amount to about 100 Mton CO_2 equivalent.

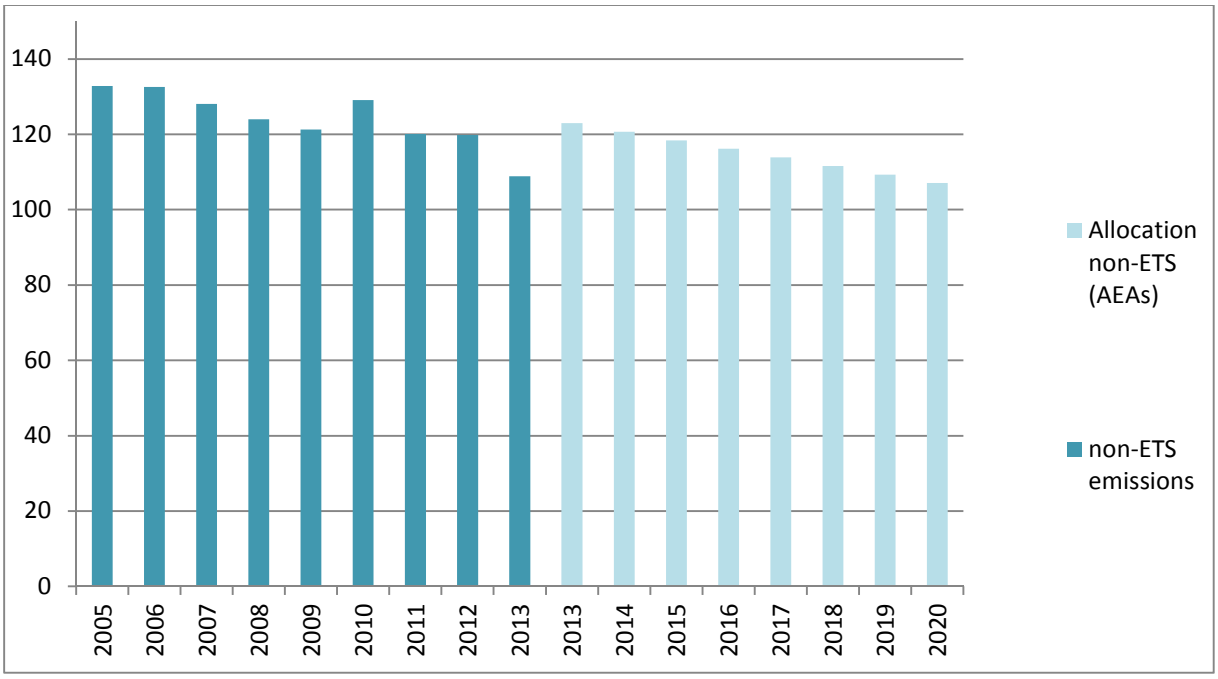


Figure 1.2 Greenhouse gas emissions 2005-2013 for non-ETS sector and AEA allocation for 2013-2020 (Mton CO_2 eq).

[3] Decision 2013/162/ EU http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013D0162&rid=1 and 2013/634/EU http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013D0634&rid=1

This report describes policies and measures (PAMs) implemented since 1990 that have had, or are expected to have, a significant impact on greenhouse gas emissions in the Netherlands, even if the primary objective of the policy is (or was) not directly related to climate change. It also describes cross-sectoral policies and measures. The scope of the report is limited to domestic and EU policies and measures implemented or planned in the Netherlands.
The policies and measures in this report are described by sector and by greenhouse gas.
The most important PAMs are mentioned below:

Agreement on Energy for Sustainable Growth (Energy agreement)
In 2013, the Netherlands concluded a cross-sectoral agreement with more the 40 parties including central and regional governments. This Agreement on Energy for Sustainable Growth marks a significant step in the transition towards a sustainable energy system in the Netherlands. Signatories to the Agreement share responsibility and commitment to achieve the following overarching objectives:

- an average energy efficiency improvement of 1.5% per year (adding up to a reduction of 100 PJ by 2020);
- 14% share of renewable energy in the Netherlands' total consumption of energy by 2020 and 16% by 2023;
- creation of at least 15,000 additional jobs by 2020, of which a significant number to be created in the next few years.

Reduction Programme for Non-CO_2 Gases (ROB)
The target is a reduction of 50% by 2020, compared to the reference year (1990).In 2012, a reduction of about 50% (relative to 1990) had already been achieved based on reductions in, for example, the nitric acid industry (through admission into the EU Emissions Trading System, ETS), the aluminium industry, HCFC-22 production, the waste disposal sector and agriculture.

SDE+ (Stimulering Duurzame Energieproductie/Stimulation of Sustainable Energy Production)
This adapted scheme is an operating grant. Producers receive financial compensation for the renewable energy they generate. Production of renewable energy is not always profitable because the cost price of renewable energy is higher than that of energy derived from fossil fuel. The difference in cost price is called the unprofitable component. SDE+ compensates producers for this unprofitable component for a fixed number of years.

Long-Term Agreements on Energy Efficiency (LTA3/MJA3 and LEE/MEE)
The Long-Term Agreements LTA3 and LEE are voluntary agreements that focus on the promotion of energy savings in industry. They are concluded between the national government, the trade associations and the participating companies. These Long-Term Agreements are enforced using environmental permits: companies not participating are required (in their permits) to implement all energy-saving measures with an internal rate of return of at least 15% after taxes. Participants in the LTA draw up an Energy Efficiency Plan (EEP) every four years for the next four years. They have to submit annual monitoring reports on projects that have actually been implemented and their results.

Agrocovenant
The Agro covenant is a Public-Private Partnership signed in 2008 dealing with greenhouse gas emissions, biomass and wind power. With respect to the first, the aim is to reduce CO2 emissions in 2020 by at least 3.5 Mton and those of non-CO_2 greenhouse gases like methane and nitrous oxide by 4.0 to 6.0 Mton (in CO_2-equivalents). The targets for the year 2020 are production of 200 PJ per year of renewable energy from biomass and a total amount of wind energy on land of 3.5 billion kWh per year, equivalent to approximately 12 PJ.

Ecodesign directive

Besides the further development and introduction of a broad package of policy instruments at national level, several EU Directives are important for this sector, among which the Energy Performance of Buildings Directive (EPBD), the Energy Efficiency Directive (EED) and the Ecodesign Directive. The Ecodesign Directive [2009/125/EC] provides consistent EU-wide rules for improving the environmental performance of products, such as household appliances. The Directive sets out minimum mandatory requirements for energy efficiency of these products. For 2020 an emission reduction of almost 3 Mton is expected.

Biofuels

European Directive 2009/28/EG on renewable energy has been implemented into Dutch legislation. This Directive states that Member States should ensure that in 2020 a minimum of 10% of all energy consumption in transport must come from renewable sources. In practice, this target is mainly fulfilled with biofuels.

Projections and the total effects of policies and measures

The projections described in this report are based on the 'Referentiescenario NEV 2015' (Reference Projection NEV 2015) as published in the National Energy Outlook 2015 (NEV, 2015) in October 2015. Compared with the 'Geactualiseerde Referentieraming 2012' that was used in the previous Biennial Report, the 'Referentiescenario NEV 2015' has incorporated new insights with regard to economic and demographic developments, sectoral developments, fossil fuel prices and the CO_2 price and policies. The present scenario has taken into account, for example, the policies and measures of the Energy agreement of 2013 regarding energy policies up to 2020 (SER Energieakkoord) and the implementation of the 2006 IPCC Guidelines (e.g. GWPs according to AR4). Recent statistics were also taken into account, e.g. data from the revised Dutch Energy Balance by Statistics Netherlands (CBS). The base year for this model is 2013, whereas emission levels now reflect statistics on historical emission levels and projects emission levels for greenhouse gases and air pollutants for 2020 and 2030.

The 'Referentiescenario NEV 2015' sets out the most plausible developments, based on information as at 1 May 2015 relating to prices, markets, technology and policy.
The scenario distinguishes two different policy variants which are based on the underlying principles of Dutch and European policy, including the measures from the Energy Agreement. They also contain measures made binding by market participants, public organisations and other government bodies on or before that date.

Two policy scenarios were included in the 2015 projections:

- Variant 'With Existing Measures' (WEM)
- Variant 'With Additional Measures' (WAM)

A variant 'Without Measures' is not included in this scenario.
The results of the projections per greenhouse gas are shown in figure 1.3.

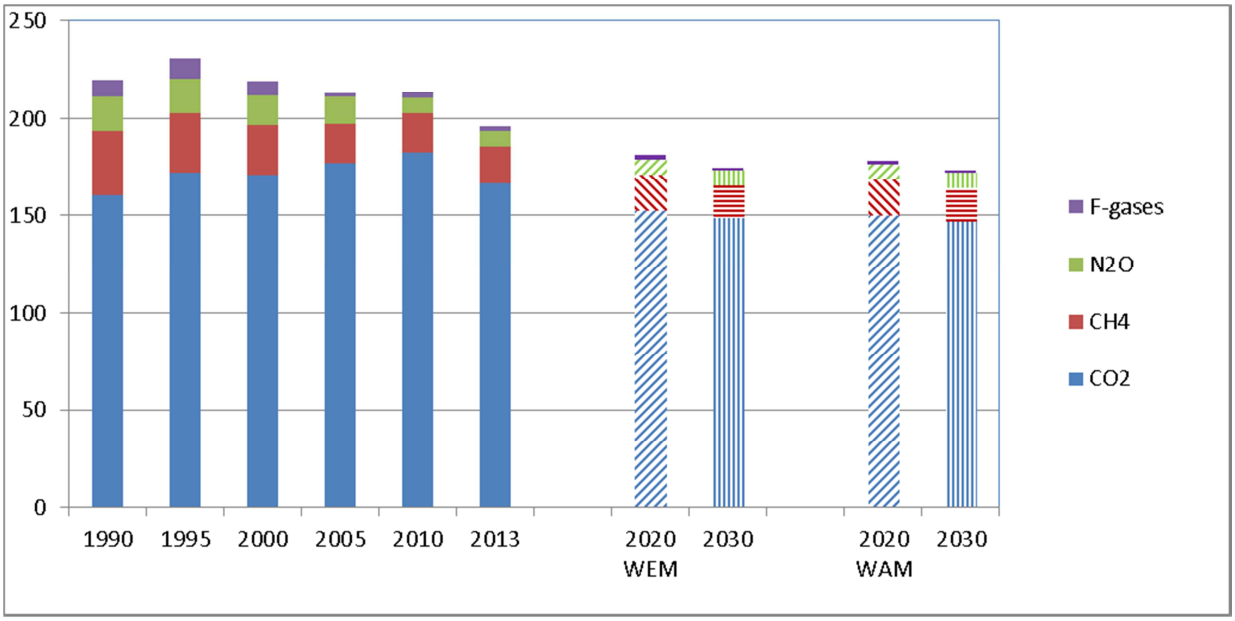


Figure 1.3 Historic and projected emissions of greenhouse gases.

Financial, technological and capacity-building support to developing countries

For the period under review, the Netherlands stepped up its efforts to address climate change, realising a year on year increase after it delivered on its commitment of Fast Start Finance during 2010-2012. In 2013, EUR 286 million and in 2014, EUR 395 million were spent on climate projects and programmes in the fields of renewable energy, forestry, water management and climate-resilient agriculture. These resources were directed at both mitigation and adaptation activities. The Netherlands also contributed to multilateral climate funds that finance adaptation and mitigation programmes in developing countries. In 2013, adaptation expenditure made up 12% of the Netherlands Climate Finance portfolio. In 2014, adaptation expenditure was raised to 34% due to better integration of our efforts with the development programs in this area. The share of mitigation expenditure decreased slightly (26% in 2013 to 21% in 2014), but increased in absolute terms. The remaining expenditure was used on projects that cover both adaptation and mitigation. Some results of the Dutch contributions in 2014 were:

- an additional 2.6 million people gained access to clean energy;
- 1.7 million people benefitted directly from projects that increased protection and availability of water for irrigation or domestic use;
- 4.7 million smallholder farmers became more resilient to climate change;
- more sustainable management of a total of 1.8 million hectares (ha), of which 1.4 million ha in Sub-Saharan Africa.

2. INFORMATION ON GHG EMISSIONS AND TRENDS, GHG INVENTORY INCLUDING INFORMATION ON NATIONAL INVENTORY SYSTEM

2.1 Summary information from the national GHG inventory

The Netherlands submitted its most recent greenhouse gas inventory (period 1990-2013) to the UNFCCC in November 2015. Summary tables of GHG emissions for emission trends by gas and by sector are presented in CTF Tables 1 in the CTF Application.

2.2 Greenhouse gas emissions and trends

This section summarises the trends in greenhouse gas emissions over the period 1990-2013, by greenhouse gas and by sector, as described in the National Inventory Report 2015. More detailed explanations are provided in the NIR 2015 (Coenen et al, 2015).

2.2.1 Emission trends for aggregated greenhouse gas emissions

In 2013, total direct greenhouse gas emissions (excluding emissions from LULUCF) in the Netherlands were estimated at 195.8 Mton CO_2 eq. This is 11.5 per cent lower than the 221.1 Mton CO_2 eq reported in the base year (1990; 1995 is the base year for fluorinated gases).
Figure 2.1 shows the trends and contributions of the different gases to the aggregated national greenhouse gas emissions. In the period 1990–2013, emissions of carbon dioxide (CO_2) increased by 3.5 per cent (excluding LULUCF), while emissions of non-CO_2 greenhouse gases decreased by 49 per cent compared with base year emissions. Of the non-CO_2 greenhouse gases, methane (CH_4), nitrous oxide (N_2O) and fluorinated gases (F-gases) decreased by 42 per cent, 56 per cent and 75 per cent, respectively.

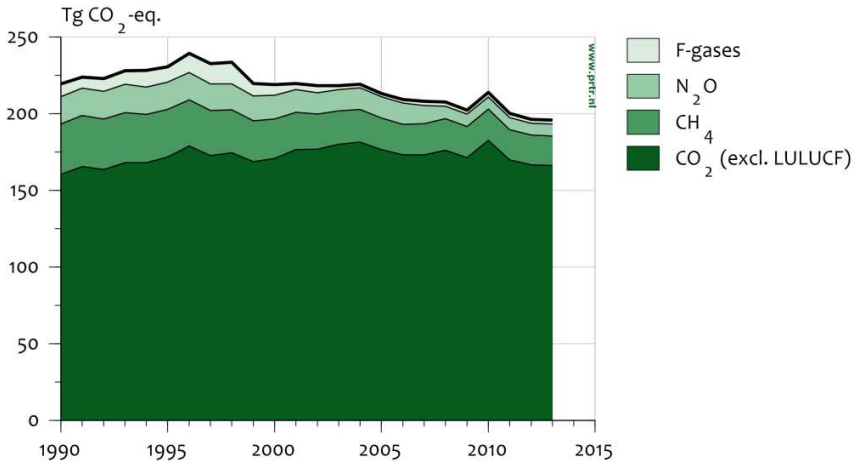


Figure 2.1 Greenhouse gases: trend and emission levels (excl. LULUCF), 1990–2013.

Emissions from LULUCF-related sources increased by about 10 per cent between 1990 and 2013. Compared with 2012, emissions from LULUCF increased by 1 per cent in 2013.
Total emissions (including LULUCF) decreased by 10.9 per cent between 1990 and 2013. Compared with 2012, total emissions (including LULUCF) decreased by 0.2 percent in 2013 (202.0 Mton CO_2 eq in 2013).

2.2.2 Emission trends by gas

Carbon dioxide
Figure 2.2 shows the contribution of the most important sectors, as defined by the Intergovernmental Panel on Climate Change (IPCC), to the trend in total national CO_2 emissions (excluding LULUCF). In the period 1990–2013, national CO_2 emissions increased by 3.6 per cent (from 160.5 to 166.2 Mton). The Energy sector is by far the largest contributor to CO_2 emissions in the Netherlands (96 per cent), with the categories 1A1 Energy industries (38 per cent), 1A4 Other sectors (24 per cent) and 1A3 Transport (22 per cent) as the largest contributors in 2013.

The relatively high level of CO_2 emissions in for instance 2010 is mainly explained by the cold winter, which increases energy use for space heating in the residential sector. The resulting emissions are included in category 1A4 (Other sectors).

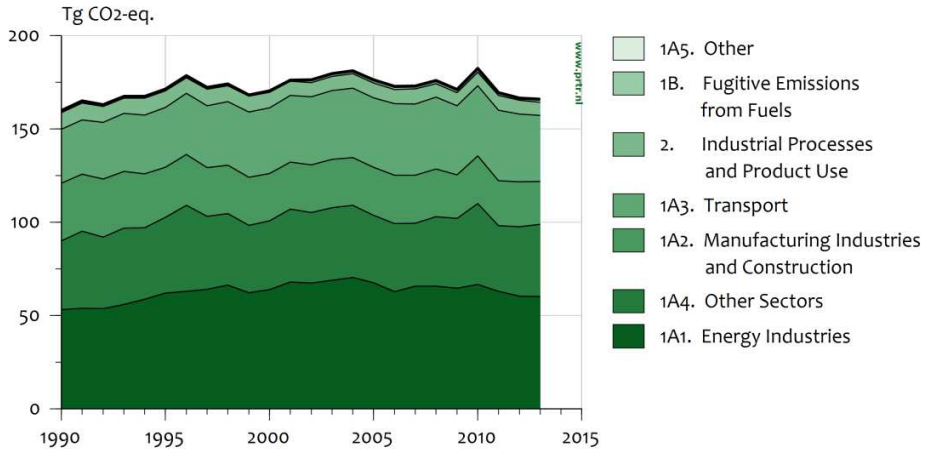


Figure 2.2 CO_2: trend and emission levels of sectors (excl. LULUCF), 1990–2013.

Methane
Figure 2.3 shows the contribution of the most important IPCC sectors to the trend in total CH_4 emissions. National CH_4 emissions decreased by 42 per cent, from 32.9 Mton in 1990 to 19.2 Mton CO_2 eq in 2013. The Agriculture and Waste sector (65 per cent and 19 per cent, respectively) were the largest contributors in 2013.
Compared with 2012, national CH_4 emissions decreased by about 0.1 per cent in 2013 (0.01 Mton CO_2 eq). CH_4 emissions decreased in category 5A (Solid waste disposal on land) but were counterbalanced by an increase in the emission in category 3 (Agriculture).

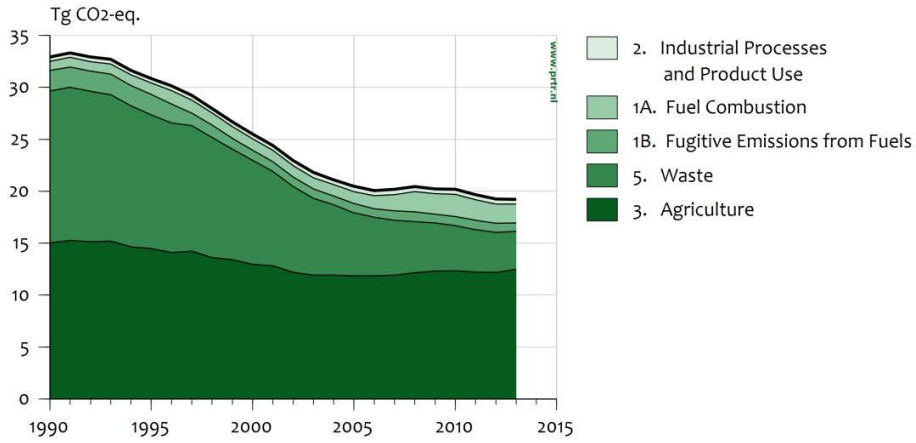


Figure 2.3 CH_4: trend and emission levels of sectors, 1990-2013.

Nitrous oxide

Figure 2.4 shows the contribution of the most important sectors to the trend in national total N_2O emissions. The total national inventory of N_2O emissions decreased by about 55 per cent, from 17.6 Mton CO_2 eq in 1990 to 7.9 Mton CO_2 eq in 2013. The Industrial processes contributed the most to this decrease in N_2O emissions (emissions decreased by more than 81 per cent compared with the base year). Compared with 2012, total N_2O emissions increase by 2.3 per cent in 2013, mainly due to a rise in emissions in the chemical industry.

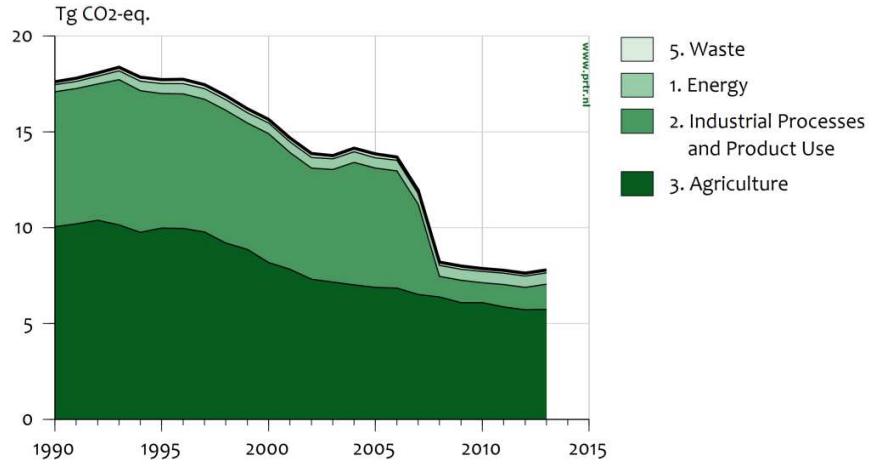


Figure 2.4 N_2O: trend and emission levels of sectors, 1990–2013.

Fluorinated gases
Figure 2.5 shows the trend in F-gas emissions included in the national greenhouse gas inventory. Total emissions of F-gases decreased by 75 per cent from 10.1 Mton CO_2 eq in 1995 (base year for F-gases) to 2.6 Mton CO_2 eq in 2013. Emissions of hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs) decreased by approximately 70 per cent and 95 per cent, respectively, during the same period, while sulphur hexafluoride (SF_6) emissions decreased by 52 per cent. Please note that due to national circumstances the emissions of NF_3 cannot be reported separately and are included in the PFC emissions. Emissions between 2012 and 2013 decreased by 0.4 per cent and 27 per cent, respectively, for HFCs and PFCs. SF_6 emissions decreased by 29 per cent in the last year. The aggregated emissions of F-gases decreased by 3.5 per cent.

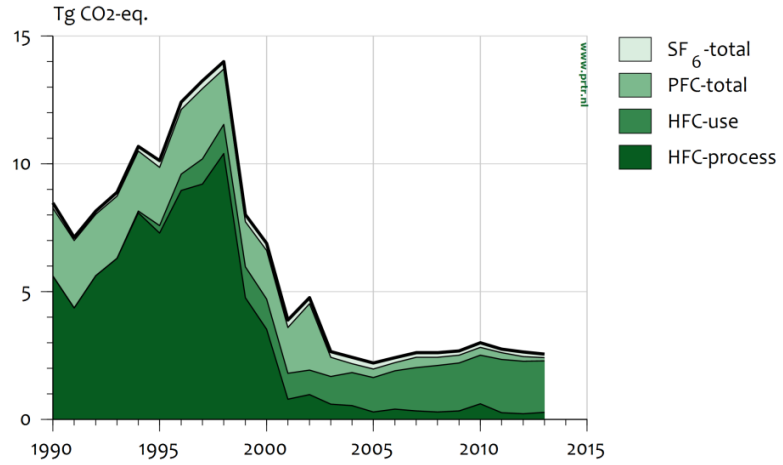


Figure 2.5 Fluorinated gases: trend and emission levels of individual F-gases, 1990–2013.

Emission trends specified by source category
Figure 2.6 provides an overview of emissions trends for each IPCC sector in Mton CO_2 equivalents. The IPCC Energy sector is by far the largest contributor to total greenhouse gas emissions in the national inventory (contributing 70 per cent in the base year and 83 per cent in 2013; the relative share of the other sectors decreased correspondingly). The emissions level of the Energy sector increased by approximately 5 per cent in the period 1990–2013, and total greenhouse gas emissions from the Waste, Industrial processes and Agriculture sectors decreased by 74 per cent, 54 per cent and 28 per cent, respectively, in 2013 compared with the base year.
CO_2 emissions from LULUCF did increase in the period 1990 to 2013 from 5.7 to 6.2 Mton CO_2 eq.

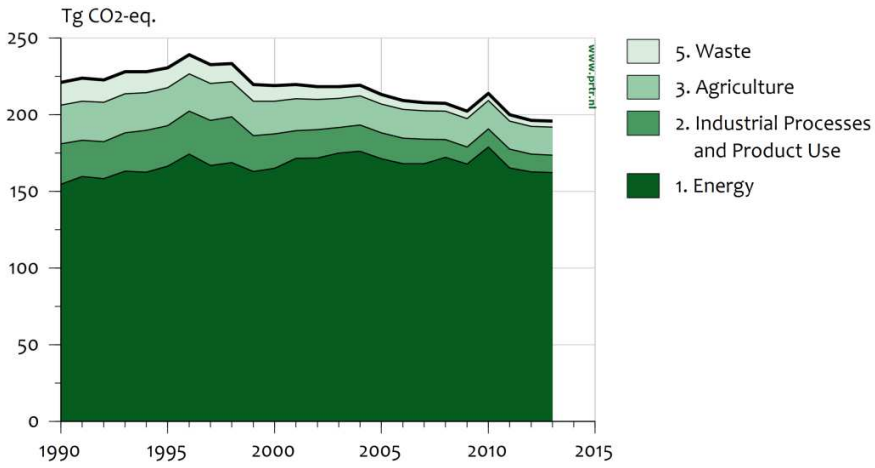


Figure 2.6 Aggregated greenhouse gases: trend and emission levels of sectors (excl. LULUCF), 1990-2013.

Emission trends for indirect greenhouse gases and SO_2

Figure 2.7 shows the trends in total emissions of carbon monoxide (CO), nitrogen oxides (NO_x), non-methane volatile organic compounds (NMVOC) and sulphur dioxide (SO_2). Compared with 1990, CO and NMVOC emissions in 2013 were reduced by 50 per cent and 69 per cent, respectively. For SO_2, the reduction was as much as 85 per cent; and for NO_x, 2013 emissions were 60 per cent lower than the 1990 level. With the exception of NMVOC, most of the emissions stem from fuel combustion.

Because of the problems identified with annual environmental reporting, emissions of CO from industrial sources have not been verified. Therefore the emission data for these years are of poor quality. The same holds for the emissions of other compounds in the years 1991-1994 and 1996-1998.

In contrast to direct greenhouse gases, calculations of the emissions of precursors from road transport are not based on fuel sales according to the national energy statistics, but are directly related to transport statistics on a vehicle-kilometre basis. To some extent, this is different from the IPCC approach.

Uncertainty in the EFs for NO_x, CO and NMVOC from fuel combustion is estimated to be in the range of 10–50 per cent. The uncertainty in the EFs of SO_2 from fuel combustion (basically the sulphur content of the fuels) is estimated to be 5 per cent. For most compounds, the uncertainty in the activity data is relatively small compared with the uncertainty in the EFs. Therefore, the uncertainty in the overall total of sources included in the inventory is estimated to be in the order of 25 per cent for CO, 15 per cent for NO_x, 5 per cent for SO_2 and approximately 25 per cent for NMVOC (TNO, 2004).

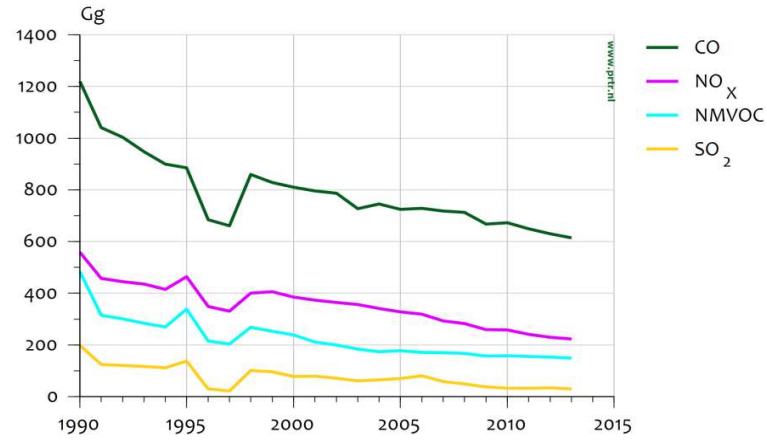


Figure 2.7 Emission levels and trends of NO_x, CO, NMVOC and SO_2 (Units: Kton).

2.3 Description of the National System and the national inventory arrangement

2.3.1 Scope and objectives of the National System and the national inventory arrangement

Introduction

As a Party to the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol, the Netherlands has in place a National System for estimating anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol. The Netherlands established its National System in 2005. During the initial review it was found to comply with all the necessary requirements. Since then the following changes have been implemented:

- The coordination of the PRTR (Pollutant Release and Transfer Register) project was transferred in 2010 from PBL (Netherlands Environmental Assessment Agency) to RIVM (National Institute for Public Health and the Environment). Processes and methods were unchanged. Many of the former experts from PBL have also transferred to RIVM;
- Until 2014, about 40 monitoring protocols described the methodologies according to the 1996 IPCC Guidelines. According to the Act on the Monitoring of Greenhouse Gases, these protocols required an official announcement in the Government Gazette (*Staatscourant*). In 2015, the monitoring protocols were replaced by methodology reports that describe the methodologies according to the 2006 IPCC Guidelines. These methodology reports do not require an official announcement in the Government Gazette, but publication on a website. For this reason, the Act on the Monitoring of Greenhouse Gases was changed in 2014. The methodology reports are approved by the National Inventory Entity and the PRTR project leader;
- According to Decision 24/CP.19 (section F, paragraph 20 of Annex I) Annex I, Parties should implement and maintain national inventory arrangements for the estimation of anthropogenic GHG emissions by sources and removals by sinks. The Dutch National System also functions as the national inventory arrangement from 2015 onwards.

This section describes details of the system as it operates on 31 December 2015 and how the required functions are performed in the Netherlands.

Since the first Biennial Report, the following changes have been made:

- Replacement of the monitoring protocols, formerly published in the Government Gazette, by methodology reports, now published on a website;
- The National System (under the Kyoto Protocol) also functions as the national inventory arrangement (under the Climate Convention);
- The organisation NL Agency merged with another governmental organisation into the Netherlands Enterprise Agency (RVO.nl).

Objectives of the National System

Under the Kyoto Protocol, a National System[4] includes all institutional, legal and procedural arrangements made within a party (included in Annex I) for estimating anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, and for reporting and archiving inventory information. The objectives of the Netherlands' National System, in accordance with the guidelines, are:

- to enable the estimation and reporting of anthropogenic GHG emissions by sources and removals by sinks[5];
- to facilitate meeting the commitments under Articles 3 and 7;
- to facilitate the review of the information submitted;
- to ensure and improve the quality of the inventory.

Netherlands Enterprise Agency (RVO.nl) coordinated the establishment of the National System and was subsequently also assigned the role of 'Single National Entity' (National Inventory Entity, NIE)'.

2.3.2 Institutional, legal and organisational aspects

Name and contact information of the Single National Entity

The Minister of Infrastructure and the Environment (I&M) has appointed Netherlands Enterprise Agency (RVO.nl) as the Single National Entity (National Inventory Entity, NIE).

Contact information of the Single National Entity:

Netherlands Enterprise Agency (RVO.nl), PO Box 8242
3503 RE Utrecht, The Netherlands.

Designated representatives with overall responsibility for the inventory:

Harry Vreuls, Harry.Vreuls@rvo.nl, telephone: +31 88 602 22 58
Peter Zijlema, Peter.Zijlema@rvo.nl, telephone: +31 88 602 25 13

Legal arrangements for the National System

The Greenhouse Gas Monitoring Act came into effect at the end of 2005. This act established a National System for monitoring greenhouse gases and empowered the minister of Infrastructure and the Environment (I&M) to appoint an authority responsible for the National System and the national inventory. The minister has appointed Netherlands Enterprise Agency (RVO.nl) as this authority (NIE) [2005, Netherlands Government Gazette (Staatscourant)].

[4] Definitions used in this report are those used in UNFCCC guidelines

[5] As required by Article 5, and to report these emissions by sources and removals by sinks in accordance with Article 7, paragraph 1, and relevant decisions of the Conference of the Parties (COP) and/or the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (COP/MOP)

The Act also specified that the national inventory must be based on methodologies and processes as laid down in the monitoring protocols. Adjustments to the protocols required an official publication of the new protocols and an announcement of publication in the Netherlands Government Gazette (Staatscourant). This Act was changed in 2014: on 1 January 2015, the monitoring protocols were replaced by methodology reports that describe the methodologies according to the 2006 IPCC Guidelines. In addition, the administrative procedure has been simplified because these methodology reports do not require an official announcement in the Government Gazette, but publication on a website managed by the NIE.

Roles and responsibilities regarding the inventory process
The Ministry of Infrastructure and the Environment (I&M) is the Netherlands' coordinating ministry for Climate Change Policy. The minister of Infrastructure and the Environment has been given the authority to appoint a Single National Entity (also known as NIE), as defined in the guidelines under Article 5.1 of the Kyoto Protocol. The minister has appointed Netherlands Enterprise Agency (RVO.nl) as NIE with overall responsibility for the national inventory. RVO.nl is responsible for, amongst other things, assembling and providing the annual reports to the UNFCCC, coordinating the QAQC process, and operating as focal point for the UNFCCC for the report, including supporting the UN review process. Parts of the annual report are provided by other organisations.

The inventory and reporting process is illustrated in Figure 2.8 and briefly described below in three parts:
- arrangements for data collection;
- arrangements for data processing;
- arrangement for reporting.

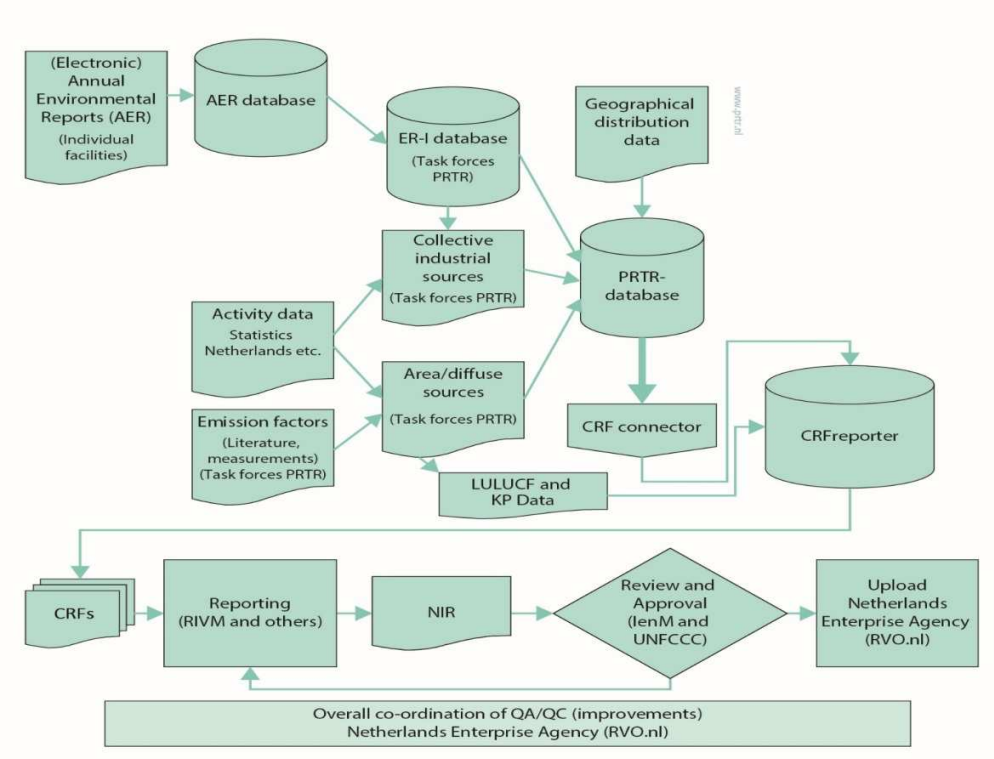


Figure 2.8. The main steps in the primary process. In practice, there are various feedback loops.

The emission data are taken from the national emissions registrations project (ER). This collaborative project was started around 1974 and involves a series of bodies and ministries in the Netherlands. The objective of the project is to agree on one national dataset for emissions inventories covering some 350 pollutants to air, water and soil; this dataset is used for a variety of international and national applications. Its coordination is assigned to RIVM, an agency under the Ministry of Health, Welfare and Sport (Ministry of VWS).
The data sources, methods and processes used for elaborating the greenhouse gas emission estimates are described in the National System documentation, notably in the form of methodology reports. These reports are published on a website managed by RVO.nl (the NIE).

The ER project uses primary data from the following data suppliers:

- Statistical data are provided under various (not specifically greenhouse gas-related) obligations and legal arrangements. These include national statistics from Statistics Netherlands (CBS) and a number of other sources of data on sinks, water and waste. The provision of relevant data for greenhouse gases is guaranteed through covenants and an Order in Decree (which is being prepared by the Ministry of Infrastructure and the Environment). For greenhouse gases, relevant agreements with respect to waste management are in place with CBS and Rijkswaterstaat Environment. An agreement with the Ministry of Agriculture, Nature and Food Quality (LNV, now EZ) and related institutions was established in 2005;
- Data from individual companies are provided in the form of electronic annual environmental reports (AERs). A large number of companies have a legal obligation to submit an AER that includes, in addition to other pertinent information, emission data validated by the competent authorities (usually provincial and occasionally local authorities that also issue environmental permits to these companies). A number of companies with large combustion plants are also required to report information under the EU emission trading system (ETS) and under the BEES/A regulation. Some companies provide data voluntarily within the context of environmental covenants. The data in these specific AERs is used to verify the CO_2 emissions calculated from energy statistics for industry, the energy sector and refineries. If reports from major industries contain plant-specific information on activity data and EFs of sufficient quality and transparency, these data are used in the calculation of CO_2 emission estimates for specific sectors. The AERs from individual companies provide essential information for calculating the emissions of substances other than CO_2. The calculations of industrial process emissions of non-CO_2 greenhouse gases (e.g. N_2O, HFC-23 and PFCs released as by-products) are mainly based on information from these AERs, as are the calculated emissions from precursor gases (CO, NOx, NMVOC and SO_2). Only those AERs with high-quality transparent data are used as a basis for calculating total source emissions in the Netherlands;
- Additional greenhouse gas-related data are provided by other institutes and consultants that are specifically contracted to provide information on sectors not sufficiently covered by the abovementioned data sources. For greenhouse gases, contracts and financial arrangements are made by RIVM with, for example, various agricultural institutes and TNO. During 2004, the Ministry of EZ issued contracts to a number of agricultural institutes; these consisted of, in particular, contracts for developing a monitoring system and methodology description for the LULUCF dataset. Based on a written agreement between the EZ and RIVM, these activities are also part of the PRTR.

The calculation of greenhouse gas emissions and sinks is the responsibility of the ER project. Data are collected and processed by five task forces according to predetermined methods described in the methodology reports. These five task forces are:

- Taskforce on Energy, Industry and Waste Management (ENINA):
  Covers the emissions to air from the industry, energy production, refineries and waste management sectors. ENINA includes emission experts from the following organisations: RIVM, TNO, Statistics Netherlands (CBS), Rijkswaterstaat Environment (Waste Management Department), Deltares and Fugro-Ecoplan;
- Taskforce on Transportation
  Covers the emissions to soil, water and air from the transport sector (aviation, shipping, rail and road transport). The following organisations are represented: Netherlands Environmental Assessment Agency (PBL), Statistics Netherlands (CBS), Rijkswaterstaat, Deltares and TNO;
- Taskforce on Agriculture
  Covers the calculation of emissions from agriculture and LULUCF to soil, water and air. Participating organisations include: RIVM, the Netherlands Environmental Assessment Agency (PBL), LEI, Alterra, Statistics Netherlands (CBS) and Deltares;
- Taskforce on Water – MEWAT
  Calculates the emissions from all sectors to water. Includes: Rijkswaterstaat, Deltares, Netherlands Environmental Assessment Agency (PBL), RIVM, Statistics Netherlands (CBS) and TNO;
- Taskforce on Consumers and other sources of emissions - WESP
  Covers emissions caused by consumers, trade and services. The members are emission experts from RIVM, TNO and Statistics Netherlands (CBS).

The data are stored in the ER's central database system. The CRF is generated automatically from this ER database.

The overall annual report for the UNFCCC is drafted and coordinated by Netherlands Enterprise Agency (RVO.nl in its role as NIE). To ensure the involvement of the relevant experts from the various bodies (CBS, TNO, PBL, RIVM, etc.) that supplied the relevant emission estimates, this is implemented as an annual project in which each section of the NIR is assigned to one lead author; this lead author usually involves other experts. A co-author is assigned for mutual checks. The NIE is closely involved, but the coordination and fine-tuning of the contents of Part 1 of the NIR is delegated to RIVM to ensure consistency with the ER data. Overall coordination, including the elaboration of Part 2 of the NIR, is carried out by Netherlands Enterprise Agency (RVO.nl)/NIE. The elaboration of Part 2 involves various bodies, including the Ministry of Economic Affairs (EZ).

RVO.nl/NIE submits the annual report to the UNFCCC after approval by the Ministry of Infrastructure and the Environment. RVO.nl has also been assigned overall QA/QC coordination of the inventory, its process and the National System, facilitation of UNFCCC reviews and coordination of requests for clarification.

2.3.3 Methodology and process aspects

Introduction
The annual cycle is a key quality management tool (based on the Deming cycle of plan–do–check–act) and encompasses:

- inventory planning;
- inventory preparation;
- inventory evaluation;
- inventory improvement.

The following sections describe how the required specific functions are performed for each of these steps. Figure 2.9 illustrates the steps and the QA/QC tools used in each step.

Inventory planning
This step comprises the annual planning. QA/QC tools include the set of planning documents, updated annually as part of the evaluation and improvement cycle:

- *Methodology reports,* describing methodologies and processes for estimating emissions and sinks. These reports replace the system of monitoring protocols that was used until 2014. The methodology reports are approved by NIE/RVO.nl (as a delegated task of I&M) and the PRTR project leader. They are also made accessible on the National System website (http://english.rvo.nl/nie) and listed in annual working plans;
- *Set of procedures* describing other relevant processes, for example the preparation of CRF and NIR, documentation and archiving, key source and uncertainty analyses;
- *Set of agreements* on the basic institutional, legal and organisational structure. These have been recorded in contracts, legal arrangements and covenants (see previous section);
- *QA/QC programme*, including the planning of activities and improvement projects;
- *Annual work plans* of the ER providing more detail on planning of the ER process, including the working procedures to be used and documentation/registration sheets to be applied.

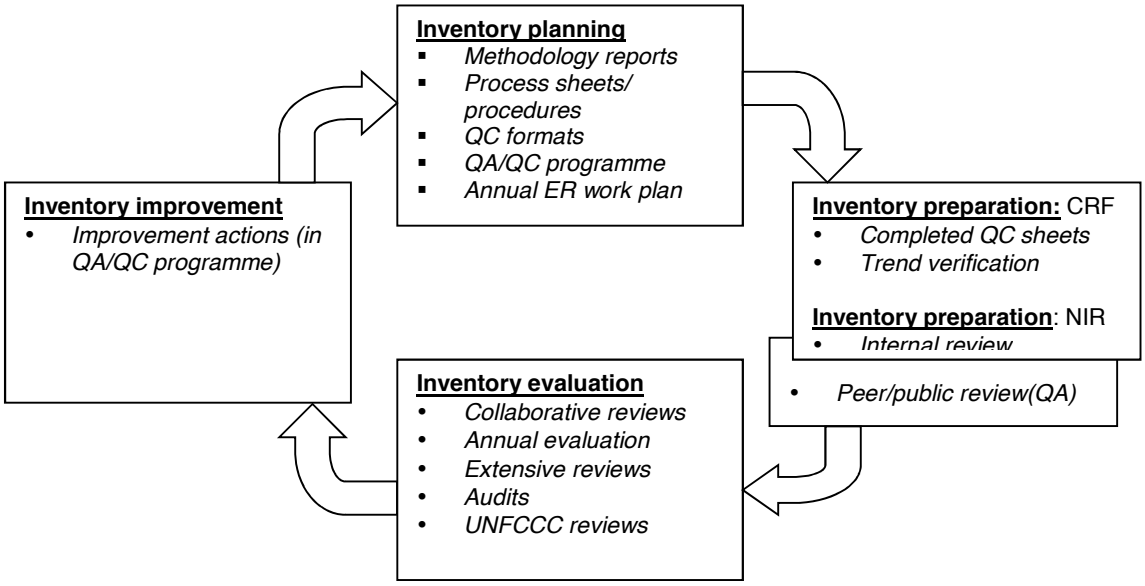


Figure 2.9 Annual cycle.

The agreements, methodology reports, procedures and QA/QC programme are reviewed annually, updated (if necessary) and approved for use in the next cycle. RVO.nl is responsible for updating the QA/QC programme, including the improvement cycle. Updates are approved by I&M, in consultation with the Advisory Board NIE[6]. For LULUCF issues, I&M seeks agreement from the Ministry of Economic Affairs (EZ).
The annual planning is further detailed in annual work plans, which specify staffing, time budgets and scheduling of the next inventory cycle. These plans also describe the tasks involved in performing the general QC (Tier 1), including the sample calculations, and further describe which work instructions, databases, documentation sheets and other tools should be used. Work plans are approved by the respective organisations[7] after consultation.

Inventory preparation
The inventory preparation comprises of the following functions and activities:
- Data collection, data processing and emission estimation in accordance with the methodology reports and the timetable in the annual work plan. The actual process is documented in documentation sheets that include information on data used, any necessary deviations from the agreed methods (including their approval) and any other relevant information needed for a 'paper trail' for the estimates;
- Performing the general QC procedures (Tier 1) as detailed in the annual work plans, results and corrections (and approval) are documented;
- Elaborating the CRF and NIR in accordance with the related procedures, including trend verification workshop and internal review.

Inventory evaluation
The annual inventory evaluation consists of various elements:
- Annual internal review of the draft NIR before submission to the UNFCCC. This review is coordinated by the NIE and comprises internal quality assurance, a basic peer review and a public review. The last-mentioned is realised by notifying experts and organisations that have a potential interest, that the draft NIR has been published on the National System website;
- Implementing an annual internal evaluation and improvement cycle, implemented jointly by NIE and ER, comprising two major steps:
    - around June: evaluating the previous cycle and updating the QA/QC programme;
    - around October: updating planning and methodology reports, if needed, for the next cycle.

Inventory improvement
The annual list of improvement actions is an integral part of the QA/QC programme. If results, particularly those from UN reviews, give rise to urgent improvement actions, additional actions may be adopted. Improvements that influence methods or may cause recalculations require formal approval in accordance with the relevant procedure. Proposals for methodological changes are sent by the ER to the NIE, which adds a recommendation about the proposals and sends them to the NIE Advisory Board for approval. The QA/QC programme also includes non-annual review and audit activities that contribute to the evaluation and continuous improvement of the National System.

[6] Consisting of representatives of the Ministry of Infrastructure and the Environment (IenM), the Ministry of Economic Affairs (EZ), National Institute for Public Health and the Environment (RIVM), Statistics Netherlands (CBS), Dutch Emissions Authority (NEa) and Netherlands Environmental Assessment Agency (PBL)

[7] For the ER, approval is given by the Steering Committee. ER

Inventory management
Management of the inventory in the Netherlands encompasses:

- Documenting and archiving the relevant information for each cycle, using an annual file of relevant documents. The NIE can access the Netherlands' archiving system, with the exception of confidential information. Confidential information is not archived centrally, but is maintained and archived by the work package leader. The confidential information can also be accessed by the project leader, the project secretary and the work package leader's deputy. It is available on request for UN review in line with the CP decision and the code of practice. Non-confidential key documents are made accessible through the National System website, as far as such is possible;
- Facilitating UN reviews and responding to any related requests for clarification under the EU monitoring mechanism and the UNFCCC. This task is performed by the RVO.nl as the NIE.

2.3.4 Quality management aspects

Introduction
The National System itself is a key tool in improving the quality and process management of the inventory process, as described in the previous section. The various tools and QA/QC activities are further elaborated in the QA/QC programme. Various improvements have been implemented in recent years. The main inputs have been the result of internal and external evaluation and review processes.

QAQC programme
The QA/QC programme describes the quality objectives of the inventory, the National System and the QA/QC plan. It is based on previous experiences with the inventory process, including relevant information and results from internal and external evaluation and review processes, as well as the results of recent UN reviews. The QA/QC programme includes a timetable, tasks and responsibilities. The programme is essentially an internal document that is available for UN review. RVO.nl (NIE) is responsible for the coordination and implementation of the programme. It will be updated, where necessary, about once a year, usually in the autumn as part of the planning cycle.
The objectives are further elaborated in the programme into more specific quality objectives relating to improving transparency, consistency, comparability, completeness and accuracy (the 'inventory principles').
The QA/QC plan consists of four groups of activities. In selecting activities, it takes into account general considerations, such as practicality, acceptability, cost-effectiveness and existing experience. The activities are grouped as follows:

- quality control;
- quality assurance;
- documentation and archiving;
- evaluation and improvement.

The main actions generally include:

Quality control

- Maintaining a transparent system through methodology reports, procedures and the QA/QC programme. This step is essential for the planning phase. It defines requirements and outputs;
- Regularly reviewing and updating the information on QA/QC held by external agencies;
- Applying General QC (Tier 1) procedures as part of the standard working processes, in accordance with the 2006 IPCC Guidelines and, where applicable, source-specific QC procedures for selected sources. The main responsibility for implementation lies with the ER. The NIE regularly checks whether activities and outputs comply or still comply with the guidelines;
- Updating Tier 1 uncertainty analysis (annually) and Tier 2 uncertainty analysis (every 5 years).

Quality assurance
This is primarily implemented by staff who are not directly involved in the inventory process that is coordinated or implemented by RVO.nl (NIE). The main activities include:

- Basic review process of CRF/NIR before submission to the UNFCCC: internal review, public review and peer reviews;
- Annual audit of a part or parts of the National System;
- Outside agencies archive the reports of internal audits as far as GHG activities are involved.

Documentation and archiving
The main activities relate to the cycle as a whole:

- Document and archive relevant information about inventory, QA/QC programme, QA/QC activities, reviews, and implemented and planned improvements;
- Facilitating reviews and responses for clarification. The NIE coordinates this process.

Evaluation and improvement
The main activities include:

- Implementation of the annual evaluation and improvement cycle, as mentioned above; activities are determined annually in the QAQC programme, based on experiences from reviews and QAQC actions.

Results of internal and external evaluations and reviews
Various actions are taken to improve and maintain the quality of the National System. These actions include:

- Annual UNFCCC reviews of the functioning of the National System. In 2007, the National System was reviewed during the initial review. The review team concluded that the Netherlands' National System had been established in accordance with the guidelines for National Systems under Article 5, Section 1 of the Kyoto Protocol (decision 19/CMP.1) and that it met the requirements for implementation of the general functions of a National System as well the specific functions of inventory planning, inventory preparation and inventory management. In the annual review reports, the expert review teams state that the National System continues to fulfil the requirements and they do not provide any recommendation;
- Follow-up of the annual recommendations of the UNFCCC reviews. In recent national inventory reports (NIRs), a more detailed overview on the recommendations and actions is incorporated in Chapter 10;
- Each year, the European Commission conducts a check on the Dutch draft data on greenhouse gas emissions, the elaborations in the draft national inventory report and changes compared to previous years. Results from these checks are used in finalising the reporting to the UNFCCC;
- Annual QA activities by RVO.nl in its role as NIE: internal reviews of the entire NIR, audits of part of the NIR and a peer review of a part of the NIR, outsourced to an external expert. Recommendations arising from these activities are used to improve the quality of the NIR and the methodology reports.

Official consideration and approval
The Ministry of Infrastructure and the Environment gives approval for the NIR/CRF to be submitted by the NIE to the UNFCCC after reviewing the results of the checks by the NIE and, if needed, consulting with the Ministry of Economic Affairs on LULUCF issues.

3. QUANTIFIED ECONOMY-WIDE EMISSION REDUCTION TARGET

3.1 The EU target under the Convention

In 2010, the European Union (EU) submitted a pledge to reduce its GHG emissions by 2020 by 20 % compared to 1990 levels[8] (UNFCCC, 2014a). As this target under the Convention has been submitted by EU-28 as a group and not by each of its Member States, there are no specified convention targets for individual Member States under the Convention. Due to this, the Netherlands, as part of the EU-28, is pursuing this quantified economy-wide emission reduction target jointly with all other Member States.

The following assumptions and conditions apply to the EU's 20% target under the UNFCCC:

- The EU Convention pledge does not include emissions/removals from Land Use, Land-Use Change and Forestry, but it is estimated to be a net sink over the relevant period. EU inventories also include information on emissions and removals from LULUCF in accordance with relevant reporting commitments under the UNFCCC. Accounting for LULUCF activities only takes place under the Kyoto Protocol. The target refers to 1990 as a single base year for all gases and all Member States.
- Emissions from international aviation, to the extent it is included in the EU Emission Trading Scheme, (EU ETS) are included in the target[9].
- A limited number of CERs, ERUs and units from new market-based mechanisms may be used to achieve the target . Under EU ETS, the use of international credits is capped (up to 50 % of the reduction required from EU ETS sectors by 2020). Quality standards also apply to the use of international credits in the EU ETS, including a ban on credits from LULUCF projects and certain industrial gas projects. In the ESD sectors (non-ETS), the annual use of international credits is limited to up to 3 % of each Member State's ESD emissions in 2005, with a limited number of Member States being permitted to use an additional 1% from projects in Least Developed Countries (LDCs) or Small Island Developing States (SIDS), subject to conditions..
- The Global Warming Potentials (GWPs) used to aggregate GHG emissions up to 2020 under EU legislation were those based on the Second Assessment Report of the IPCC when the target was submitted. In its submission to clarify the 2020 target dated 20 March 2012, the EU announced that the implications of the CMP Decision to revise the GWPs to those from the IPCC Fourth Assessment Report (AR4) were under review. This review has been completed and revised GWPs from AR4 were adopted for the EU ETS. For the revision of ESD targets the revised GWPs were taken into account. For the implementation until 2020, GWPs from AR4 will be used consistently with the UNFCCC reporting guidelines for GHG inventories..
- The target covers the gases CO_2, CH_4, N_2O, HFCs, PFCs and SF_6.

The information above is summarised in table 3.1.

[8] http://unfccc.int/resource/docs/2014/sbsta/eng/inf06.pdf
http://unfccc.int/files/meetings/cop_15/copenhagen_accord/application/pdf/europeanunioncphaccord_app1.pdf

[9] In the EU, total emissions covered by category 'international aviation' would go beyond the scope of the EU target, as emissions from international aviation are included in the EU Climate and Energy Package and the EU target under the UNFCCC to the extent to which aviation is part of the EU ETS. As such emissions cannot be separated in the EU inventory nor in the projections for the entire time series, emissions from international aviation have been considered in their entirety throughout the report. Over the period, total emissions from international aviation were between 1.2-2.9% of the annual total EU GHG emissions.

Parameter	Target
Base year	1990
Target year	2020
Emission reduction target	-20% in 2020 compared to 1990
Gases covered	CO_2, CH_4, N_2O, HFCs, PFCs, SF_6
Global warming potential	AR4
Sectors covered	All IPCC sources and sectors, as measured by the full annual inventory, partly international aviation.
Land Use, Land-Use Change and Forestry (LULUCF)	Excluded
Use of international credits (JI and CDM)	Possible to certain extent under the EU-ETS and the ESD.
Other	Conditional offer to move to a 30% reduction by 2020 compared to 1990 levels as part of a global and comprehensive agreement for the period beyond 2012, provided that other developed countries commit themselves to comparable emission reductions and that developing countries contribute adequately according to their responsibilities and respective capabilities.

Table 3.1 Key facts of the Convention target of the EU-28.

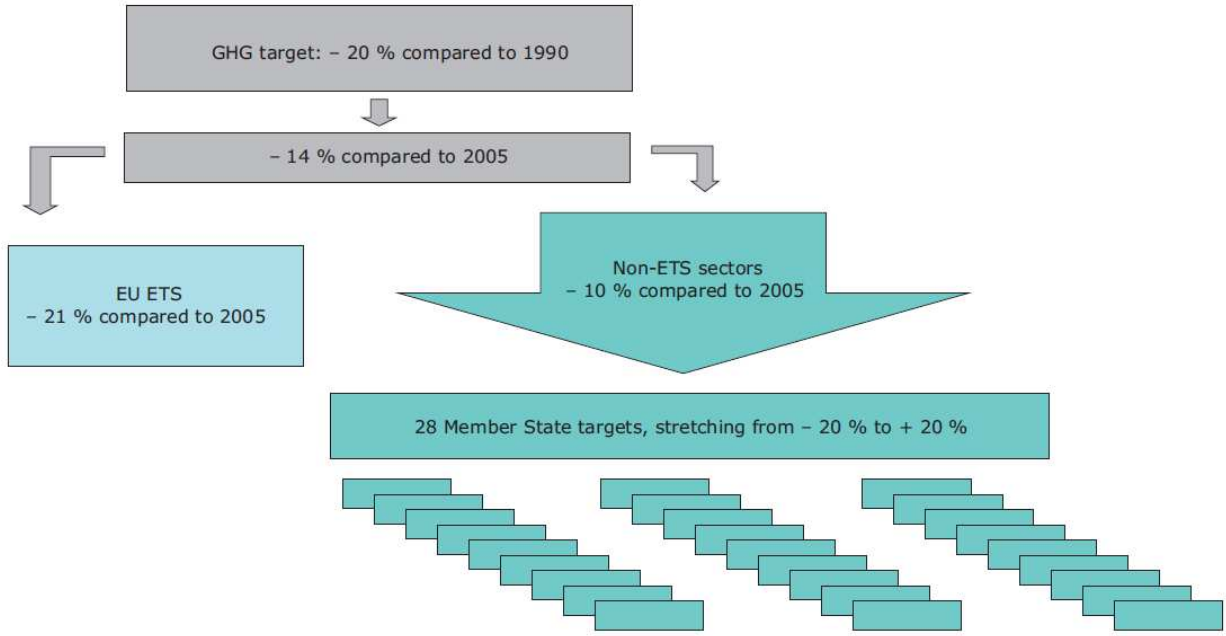
3.2 The EU target compliance architecture

The EU's 2020 climate and energy package sets internal legally binding rules to underpin the implementation of the target under the Convention. The package introduced a clear approach to achieving the 20% reduction in total GHG emissions compared to 1990 levels, which is equivalent to a 14% reduction compared to 2005 levels. This 14% reduction objective is divided between two sub-targets for the EU's Emission Trading Sytem (ETS) and non-ETS sectors, responsible for two thirds versus one third of the EU's emissions, respectively (EU, 2009[10]).

Under the revised EU-ETS Directive[11], one single EU-ETS cap covers the EU Member States and the three participating non-EU Member States (Norway, Iceland and Liechtenstein), that is, caps are no longer differentiated per country. For allowances allocated to the EU-ETS sectors, annual caps have been set for the period 2013–2020; these decrease by 1.74% annually, starting from the average level of allowances issued by Member States for the second trading period (2008–2012). The annual caps imply interim targets for emission reductions in sectors covered by the EU-ETS for each year until 2020. For further information on the EU-ETS, see EU-BR.

[10] Directive 2009/29/EC of the European Parliament and of the Council of 23 April 2009 amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading scheme of the Community (OJ L 140, 05.06.2009, p. 63) http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32009L009&from=EN

[11] Directive 2009/29/EC of the European Parliament and of the Council amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading scheme of the Community



Source: EEA 2013 Trends and Projections Report[12]

Figure 3.1 GHG targets under the 2020 climate and energy package.

The amended EU-ETS Directive 2009/29/EC (Article 11a(8)) sets the upper limit for credit use for the period 2008–2020 at 50% of the reduction effort below 2005 levels. This is further specified into installation-level limits in the Commission Regulation on International Credit Entitlements (RICE)[13]. Since 2013 it is no longer possible to track the use of flexible mechanisms in the EU-ETS directly via information on the EUTL public website: CERs and ERUs are exchanged for EUAs, and after the exchange they cannot be tracked as CERs or ERUs. These exchanges will become public at the installation level two years after transfers are conducted; thus, the first information reflecting their use in 2013 will become available in 2016.

Non-ETS emissions are addressed under the Effort Sharing Decision (ESD)[14], which covers emissions from all sources outside the EU-ETS, except for those from international maritime and domestic and international aviation (which were included in the EU-ETS from 1 January 2012) and emissions and removals from land use, land-use change and forestry (LULUCF). It thus includes a diverse range of small-scale emitters in a wide range of sectors: transport (cars, trucks), buildings (in particular heating), services, small industrial installations, fugitive emissions from the energy sector, emissions of fluorinated gases from appliances and other sources, agriculture and waste. Such sources currently account for about 55% of total GHG emissions in the EU.

[12] Trends and projections in Europe 2013: Tracking progress towards Europe's climate and energy targets until 2020, EEA Report No 10/2013
[13] Commission Regulation (EU) No 1123/2013 of 8 November 2013 on determining international credit entitlements pursuant to Directive 2003/87/EC of the European Parliament and of the Council
[14] Decision No 406/2009/EC

Whereas the EU-ETS target is to be achieved by the EU as a whole, the ESD target was divided into national targets to be achieved by individual Member States (see figure 3.1). National emission targets for 2020, expressed as percentage changes from 2005 levels, are laid down in the ESD. These changes have been converted into binding quantified annual reduction targets for the period 2013–2020 (EC 2013)[15],[16], expressed in Annual Emission Allocations (AEAs).

The monitoring process is harmonised for all Member States, as laid down in the Monitoring Mechanism Regulation[17]. The use of flexible mechanisms is possible under the EU-ETS and the ESD. More information on the use of CERs and ERUs under the ETS is available in the European BR2 .

The ESD allows Member States to use flexibility provisions to meet their annual targets, with certain limitations. The use of project-based credits is subject to an annual limit of 3% for each Member State. For the Netherlands the annual limit for the use of international credits (CERs and ERUs) is 3.2 Mton . If these are not used in any specific year, the unused part for that year can be transferred to other Member States or be banked for own use until 2020.

3.3 The Netherlands's reduction target under the ESD

The Netherlands is committed to reducing its emissions in sectors covered under the Effort Sharing Decision (ESD, non-ETS) by 16% compared to 2005 emissions. The Dutch quantified annual reduction targets set by EU Decisions[18] and Annual Emission Allocations (AEA) in tons CO_2 eq. are 122.9 million AEA in 2013, decreasing to 107.0 million in 2020 (according to AR4 GWPs), see table 3.2 and figure 3.2. The cumulative amount of AEAs for the period 2013-2020 is set at 920 Mton CO_2-equivalents.

Year	Annual Emission Allocations (t CO_2 eq.)	Year	Annual Emission Allocations (t CO_2 eq.)
2013	122,948,129	2017	113,859,321
2014	120,675,928	2018	111,587,118
2015	118,403,725	2019	109,314,916
2016	116,131,523	2020	107,042,714

Table 3.2 The Netherlands' ESD annual emission allocations (tons CO2 eq.) for the period 2013–2020, using GWPs according to AR4.

[15] Commission decision of 26 March 2013 on determining Member States' annual emission allocations for the period from 2013 to 2020 pursuant to Decision No 406/2009/EC of the European Parliament and of the Council (2013/162/EU)

[16] Commission Implementing Decision of 31 October 2013 on the adjustments to Member States' annual emission allocations for the period from 2013 to 2020 pursuant to Decision No 406/2009/ EC of the European Parliament and of the Council (2013/634/EU)

[17] Regulation (EU) No 525/2013 of the European Parliament and of the Council of 21 May 2013 on a mechanism for monitoring and reporting greenhouse gas emissions and for reporting other information at national and Union level relevant to climate change and repealing Decision No 280/2004/EC

[18] Decision 2013/162/ EU http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013D0162&rid=1 and 2013/634/EU http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013D0634&rid=1

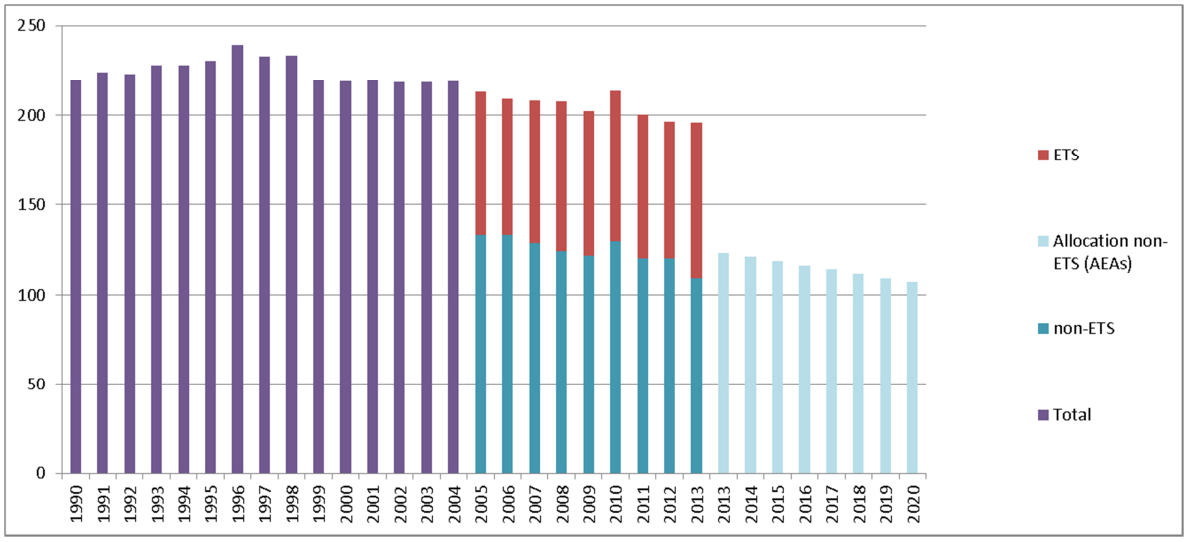


Figure 3.2 The Netherlands' total greenhouse gas emissions for the period 1990-2013, including a breakdown of the emissions 2008-2013 in emissions under ETS and emissions under ESD (non-ETS) and the ESD target for 2012-2020 (Mton CO_2 eq).

In 2011, the Netherlands' government agreed upon a translation of the Dutch non-ETS 2020 goal into sectoral 2020 goals, along with agreements about which ministry is responsible for achieving each goal[19]. These goals are presented in Table 3.3.

The sectoral goals were set using GWPs from the AR2. It is not foreseen to recalculate these targets the non-CO_2 greenhouse gasses, using the GWPs from the AR4.

Sector	**Sectoral goal (Mton, 2020)** GWPs as in AR2	**Responsible Ministry**
CO_2 industry & energy	10.7	Ministry of Economic Affairs
CO_2 transport	35.5	Ministry of Infrastructure and the Environment
CO_2 built environment	22.5	Ministry of the Interior and Kingdom Relations
CO_2 agriculture	5.75	Ministry of Economic Affairs
Non-CO_2 GHG agriculture	16	Ministry of Economic Affairs
Non-CO_2 GHG other sectors	8.8	Ministry of Infrastructure and the Environment
Total	**99.25**	

Table 3.3 Sectoral goals for 2020.

When these sectoral goals were decided on in 2011, the process of Annual Emission Allocations was still ongoing. As reported above, the Dutch emissions reduction target of 16% and the resulting cap on Annual Emission Allocations are leading for the Dutch contribution to the EU target for 2020 under the Convention. As the table shows, however, the Netherlands is likely to contribute more to meeting the EU

[19] Kabinetsaanpak Klimaatbeleid op weg naar 2020, 2011

target than required. The Dutch government has decided to cancel any surplus of AEAs for the period up to 2020.

In June 2015, the Netherlands' government faced a court decision in the case filed by Urgenda on the Netherlands' overall national greenhouse gas emission reduction by 2020. The court ruled that by 2020, the Dutch government should reduce national greenhouse gas emissions by 25% compared to 1990 emissions. Although the government has appealed against this decision, it is obliged to start executing this ruling. Thus an evaluation of the effectiveness of the GHG reduction measures, which is ongoing, will be used to decide on additional steps on GHG reductions by 2016.

4. PROGRESS IN ACHIEVEMENT OF QUANTIFIED ECONMY-WIDE EMISSION REDUCTION TARGETS AND RELEVANT INFORMATION

4.1 Introduction

This section describes policies and measures implemented since 1990 that have had, or are expected to have, a significant impact on greenhouse gas emissions in the Netherlands, even if the primary objective of the policy is (or was) not directly related to climate change. It also describes cross-sectoral policies and measures. The scope of the section is limited to domestic and EU policies and measures implemented or planned in the Netherlands.

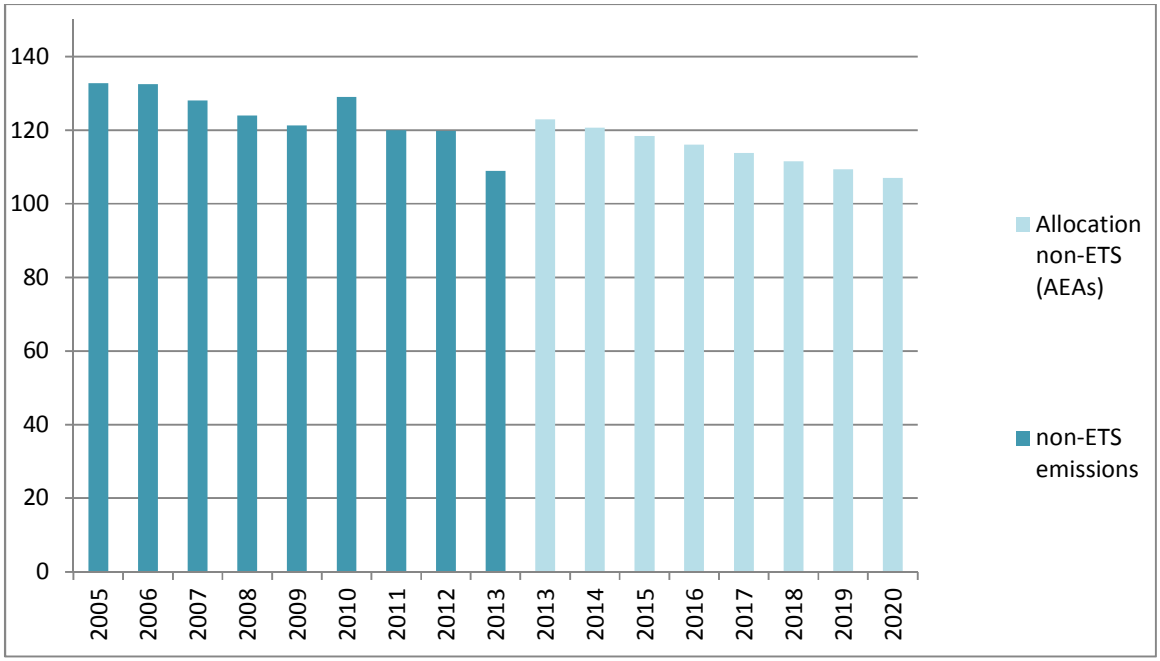


Figure 4.1 Greenhouse gas emissions 2005-2013 for non-ETS sector and AEA allocation for 2013-2020 (Mton CO_2 eq).

The implemented policies contributed to the reductions of GHG emissions in the ETS sector as well as in the non-ETS sector. As elaborated in chapter 3, the Dutch quantified annual reduction targets are set by EU Decisions and are 122.9 Mton CO_2 eq in 2013, 120.7 Mton in 2014 and decreasing to 107.0 Mton in 2020 for the non-ETS sector. While the GHG emissions of the non-ETS sector in the year 2012 were 119 Mton CO_2 eq, the emissions as reported to the European Union were 109 Mton CO_2 eq. in the year 2013, and the provisional number for the year 2014 is 97.9 Mton CO_2 eq. (see Figure 4.1). These numbers are publicly available on the PRTR-website[20].

[20] http://www.emissieregistratie.nl/erpubliek/erpub/international/ets.aspx

The decrease in 2013 compared to 2012 was for a large part – about 8 Mton – caused by a change in the scope of the EU-ETS, resulting in a larger number of companies (and their emissions) participating in the EU-ETS from 2013 onwards. The decrease in emissions in 2014 was also influenced by the mild winter, resulting in less energy use for space heating and relatively low sales of motor fuels.

It is projected that by 2020 the GHG emissions in the non-ETS sector will be 100 Mton and the cumulative GHG emissions for the period 2013-2020 around 819 Mton . It is therefore anticipated that the emissions in 2020 as well as the cumulative emissions will be lower than the target and the cumulative AEAs over the period (NEV 2015 page 99).

Following sections further describe the groups of policies and measures organised per sector and greenhouse gas. Only the most relevant measures are described in detail. The projected effects have been estimated based on the projections described in the National Energy Outlook 2015 [ECN, 2015]. The estimated impacts of the (packages of) the main policies and measures are summarized in Table 4.3. Please be also aware of the fact that some level of double counting cannot be avoided as the policies and measures are not implemented in isolation but often in combination/interaction..

Complementing the descriptions of policies and measures in the respective sectoral sections, quantifications of the policies and measures (PaMs') impacts on GHG emission reduction are summarised in CTF table 3 in the CTF application.

The effects are often presented for groups of policies and measures affecting the different sectors rather than for individual measures. In the analyses performed at a fairly high level of aggregation, it is often neither possible nor meaningful to separate out the impacts of individual instruments and programmes that focus on the same emissions source or activity. The policy descriptions in the main text include the actual and expected interactions with other relevant policies and measures, and with Common and Coordinated Policies and Measures of the European Union (CCPMs).

Impacts other than emission reductions are included in the text where possible (including where feasible economic impacts, costs, non-greenhouse gas mitigation).

4.2 Cross-Sectoral Policies

This section describes the most relevant cross-cutting policies and measures, notably the Agreement on Energy for Sustainable Growth, the CO_2 Emissions Trading System, the Reduction Programme for Non-CO_2 Gases (ROB), the Energy Tax and the Local Climate Agenda. Some other cross-cutting instruments, such as the Energy Investment Tax Deduction (EIA), Sustainable Energy Production (SDE+) and Long-Term Agreements have their major impact in specific sectors and are, therefore, described in the respective sectoral sections. The previously (earlier BR) reported Benchmark Covenant was terminated in 2011: the participating companies have concluded a new Long-Term Agreement. These changes will also be described in the relevant sectoral section. A distinction is made between an 'existing measures' scenario (WEM) and an 'additional measures' scenario (WAM).

4.2.1 Agreement on Energy for Sustainable Growth ("Energy Agreement'')

In 2013, the Netherlands concluded a cross-sectoral agreement with more the 40 parties including central and regional governments. This Agreement on Energy for Sustainable Growth marks a significant step in the transition towards a sustainable energy system in the Netherlands. Signatories to the Agreement share responsibility and commitment to achieve the following overarching objectives:

- an average energy efficiency improvement of 1.5% per year (adding up to a reduction of 100 PJ by 2020);
- 14% share of renewable energy in the Netherlands' total consumption of energy by 2020 and 16% by 2023;
- creation of at least 15,000 additional jobs by 2020, of which a significant number to be created in the next few years.

The agreement includes some 160 actions for the participating parties to implement this commitment, including actions by the central government. The Standing Committee consisting of representatives of the parties is responsible for monitoring of the progress. Some of the actions are new, others imply intensification or modification of existing policy measures. We will describe the most relevant measures in the sections where they will have the most impact.

4.2.2 CO_2 Emissions Trading (WEM+WAM)

As prescribed by Directive 2003/87/EC, a trading system for CO_2 emissions started in the EU on 1st January 2005, focusing on CO_2 emissions from large industrial emitters. It is a 'cap and trade' system, where participants are assigned a set amount of allowances upfront and are required to annually submit allowances that are equal to their actual emissions. Companies are allowed to use credits from Kyoto mechanisms to comply with their obligations. The EU ETS covers more than 11,000 power stations and industrial plants in 31 countries, as well as airlines. It covers around 45% of the EU's greenhouse gas emissions.

The EU ETS is now in its third phase, running from 2013 to 2020. A major revision (Directive 2009/29/EC) in 2009 to reinforce the system means that the third phase is significantly different from the first two phases and is based on rules that are far more harmonised than was previously the case. One of the changes is a single, EU-wide cap on emissions instead of the previous system of national caps. Auctioning is now the default method for allocating allowances. For those allowances that are still free, harmonised allocation rules apply that are based on ambitious EU-wide benchmarks for emissions performance. The ETS now also includes more sectors (i.e. aviation) and gases (nitrous oxide, PFCs). The ETS cap will be reduced over time in order to reduce total emissions. In 2020, emissions from sectors covered by the EU ETS will be 21% lower than in 2005. Despite the stringent cap, the carbon price has dropped. This is due to a growing surplus of allowances, largely because of the economic crisis, which limited emissions more than anticipated.

4.2.3 Reduction Programme for Non-CO_2 greenhouse gases (WEM+WAM)

This programme (Dutch acronym: ROB) was set up in 1998 and focuses on the reduction of Dutch emissions of non-CO_2 greenhouse gases. The target is a reduction of 8-10 Mton CO_2 eq. in 2020, working towards the desired level of 25-27 Mton CO_2 eq. This would mean a reduction of 50% in these gases compared to the reference year (1990). In 2012, a reduction of about 50% (relative to 1990) had already been achieved based on reductions in, for example, the nitric acid industry (through admission into the EU Emissions Trading System, ETS), the aluminium industry, HCFC-22 production, the waste disposal sector and agriculture.

Over the period 1998 - 2009, ROB subsidised the development and implementation of innovative reduction technologies (demonstration projects and market introduction) and supported research and communication projects. This was done in close cooperation with private companies, research institutions, universities, and provincial and municipal authorities.

Since 2009, ROB has been focusing on targeting the most significant sources: cooling (fluorinated gases), industry (semiconductor industry, caprolactam production), sewage treatment facilities (methane and nitrous oxide), agriculture (methane and nitrous oxide), CHP engines (methane) and the monitoring of sources of non-CO_2 greenhouse gases. Subsidies have stopped, as they are not considered to be as effective anymore. Other areas of focus of the reduction policy were research, communication, and cooperation and deals with the sectors and stakeholders. The reduction of fluorinated gases is mainly based on the national implementation of EU-legislation regarding ozone and F-gases. The revision of the F-gases regulation provides opportunities for implementation and a new impetus to further reduce F-gas emissions in the Netherlands.

Where emission reductions in agriculture (the major source of non-CO_2 greenhouse gas emissions in the Netherlands) are concerned, the Ministry of Economic Affairs is now the prime responsible party. Based on a voluntary agreement between the government and the sector (the 'Agrocovenant'), which was signed in 2008, projects aiming for an emission reduction of 30% in 2020 (relative to 1990) are being carried out. For more information on the Agrocovenant, see section 4.6.

Though the programme has been phased down, it is still having an effect on emissions and therefore it is still included in the reporting and projections.

4.2.4 Energy tax (WEM + WAM)

The objective of this policy is to boost energy savings by incentivising the reduction of gas and electricity consumption, which should direct consumers toward more energy efficient behaviour. The Regulatory Energy Tax (REB) was introduced in 1996, changing its name to Energy Tax in 2004. Taxing energy use makes energy saving (by changing behaviour or investing in energy-saving measures) more attractive. The energy tax is levied on electricity and natural gas, and the level of the Energy Tax depends on 1) the consumer's energy consumption – the higher the consumption, the lower the energy tax levied (degressive tariff structure) –, and 2) specific agreements between different sectors and the government.

For small (residential) consumers the Energy Tax accounted for approximately 40% of the natural gas and 30% of the electricity price in 2012. Industrial consumers pay a much lower tariff because of their larger consumption. In addition, there is a specific clause in the Environmental Taxes Act (Article 36q), which exempts companies that enter into a Long-Term Agreement with the government from paying energy taxes on electricity consumption that goes over 10 million kWh per year and from taxes on fuel for non-energy use (feedstocks). The conditions for applying for this exemption have become more stringent under the Energy Agreement for Sustainable Growth: companies are now required to provide an annual declaration of good progress in achieving the commitments they agreed to in the Long-Term Agreement. These declarations are issued only after checks of progress by RVO.nl based on the annual monitoring reports of the companies. The Energy Tax also has a separate lower gas tariff for the horticulture sector, linked to the sectoral emission system. More recently, a lower tariff has also been introduced for cooperatives and associations of owners of private dwellings that produce their own renewable energy.

4.2.5 Local Climate Agenda

The Local Climate Agenda is a joint initiative bringing together local authorities (provinces, municipalities and regional water authorities) and central government. They exchange knowledge on best practices and report and address obstacles in legislation, aimed at realising more successful initiatives . Under the Energy Agreement actions were concluded for further intensification of support actions by regional governments. The progress is being monitored.

4.3 Energy

The Energy Agreement is a major overarching instrument for energy saving and renewable energy targets in the Netherlands. It uses and reinforces a series of other instruments described in this chapter. Since 2014, an overall monitoring and outlook document has been published annually in the autumn. The National Energy Outlook (NEV) describes realised and expected progress for targets on energy saving, emission reduction and renewable energy. This document is prepared by a consortium of the planning agencies ECN and PBL, Netherlands Statistics (CBS) and the Netherlands Enterprise Agency (RVO.nl). The former two agencies are responsible for projections, evaluative analyses and final editing, while the other two are involved in information on realised progress and ongoing actions, both within society at large and in policies and measures. Much of the information required by the EU and UNFCCC is provided by this annual NEV, which is why this report and the organisation procedures and methods underlying the NEV-process are a cornerstone in the Dutch National System for projections and reporting on policies and measures that was established in 2015 (see section 5.5).

The most important policy instruments currently in effect with major impact on the energy sector are described below.

4.3.1 SDE: Stimulation Renewable Energy Production

SDE general issues
In 2011, the feed-in premium scheme for renewables was transformed into the so-called SDE+, a floating feed-in premium system, financed by a surcharge on the energy tax paid by the end-consumers of natural gas and electricity. The SDE+ takes an innovative tender approach based on a selection of projects proposed by the private sector along cost-effectiveness lines with regard to the expected cost of the various available technologies. The premium is to be paid once the facility is in operation based on the power production for a period of up to 10 or 15 years. Payments within the context of the previous feed-in premium schemes, MEP and SDE, are still ongoing as the subsidies run for 10 to 15 years; these payments are financed through the government budget.

SDE+ (Stimulering Duurzame Energieproductie/Stimulation of Sustainable Energy Production)
This adapted scheme is an operating grant. Producers receive financial compensation for the renewable energy they generate. Production of renewable energy is not always profitable because the cost price of renewable energy is higher than that of energy derived from fossil fuel. The difference in cost price is called the unprofitable component. SDE+ compensates producers for this unprofitable component for a fixed number of years, depending on the technology used. SDE+ is available for the production of renewable electricity, renewable gas and renewable heat or a combination of renewable heat and electricity (CHP). The primary target groups for SDE+ are companies, institutions and non-profit organisations. The project must be implemented in the Netherlands. The national government is excluded from participation.

The cost price for the production of renewable energy is set in the base sum for the technology. The yield of fossil energy is established in the correction sum. This makes the level of the SDE contribution dependant on energy-price developments. When the energy price is high, they receive less SDE+ and more from the energy consumer. When the energy price is lower, they will get more SDE+ and less from the energy consumer. The correction amount is the average energy price per category during the year of production. The base energy price is the lower limit for the correction amount. The maximum grant is reached when the correction amount is equal to the base energy price. The final payments are calculated per year on the amount of energy produced and the actual energy price. SDE+ is implemented through the Netherlands Enterprise Agency (RVO.nl).

SDE+ Offshore Wind Energy
The Regulation on Offshore Wind Energy 2015 (Regeling windenergie op zee 2015) and the Implementation Regulation on the Offshore Wind Energy Act (Uitvoeringsregeling Wet windenergie op zee) were published on 3 July 2015. Both regulations will apply from December 1st, 2015. The draft site allocation criteria for Sites I and II of the Borssele wind farm zone were available for inspection from 7 August 2015. In issuing these new regulations the Ministry of Economic Affairs and the Ministry of Infrastructure and the Environment aim to encourage offshore wind energy production. Offshore wind energy is one of the important pillars of the Energy Agreement. The legislative framework establishes statutory provisions for the allocation of suitable sites for offshore wind farms and for the process of issuing of permits and awarding subsidies for the construction and operation of offshore wind farms. The Wind Energy Roadmap, which outlines how offshore wind energy generation capacity is to be increased from 1,000 MW to 4,500 MW in 2023, is an important part of the Energy Agreement. Five offshore wind farm zones have been designated for the development of new wind farms and a new scheme has been launched to facilitate the establishment of these farms. This first round of tenders is for Borssele Wind Farm sites I and II, 22 kilometres off the coast of Zeeland. The offshore wind farms built on Borssele sites I and II will have a capacity of 350 MW per site.

4.3.2 Wind energy (on shore) agreements (Intergovernmental Wind Energy Agreement (BLOW) and the new Energy Agreement)

The BLOW target of 1,500 MW of onshore wind power in 2010 was reached in 2007. In March 2009, the Government Coordination Rule was introduced for onshore wind projects above 100 MW. This means that, for these projects, the Minister of Economic Affairs is responsible for spatial planning and coordinates the attribution of environmental and other permits. Early in 2013, new agreements were concluded between provincial governments and national government in order to increase the onshore wind capacity up to 6000 MW in 2020. The Energy Agreement of 2013 has integrated these agreements. As per January 1st, 2015, all provinces have included the spatial possibilities for their part of the agreement into their spatial planning and are now focussing on integrating these into specific regional plans and permit processes. In this process the provinces aim to maximise the support within society for these plans. Larger projects are coordinated with the national government, small installations with municipalities. At the time of writing the report, some 2,500 MW wind power has been installed and some 700 MW is under construction.

4.3.3. CCS

The CCS directive was implemented in 2012. Newly built coal-fired plants must be ‘capture ready’. The large-scale CCS demonstration project ROAD has been ongoing since 2010. The central government will produce a long-term strategy regarding the role of CCS in the transition to an entirely sustainable energy system.

4.3.4 Smart metering (dissemination of smart meters)

The smart meter rollout will take place in two stages. A small-scale rollout was in place for pilot purposes from 2012. During the small-scale rollout some 600,000 smart meters for electricity and gas were installed during regular meter replacements (e.g. depreciation), in newly built houses, during large-scale renovations and by customer request. This phase and its effects were monitored. Based on these experiences, it was decided to continue with a larger scale rollout from 2015 onwards. The aim is to have smart meters fitted in at least 80% of households and small businesses by 2020, as mandated through the third Energy Package of the EU.

4.3.5 Reduction measures for methane (CH_4)

Gas engines are widely used to simultaneously produce heat and electricity (CHP) in the horticulture sector in the Netherlands and in the service sector to a lesser extent. Part of the natural gas in gas engines remains unburned and is emitted as methane. This is called 'methane slip'. Through the Emission Requirements Combustion Installation Decree (BEMS), the government has set maximum emission levels for methane (hydrocarbons). The BEMs was evaluated in 2013. This regulation, together with a series of other regulations on emissions of installations was integrated into the Activities Decree (Activiteitenbesluit) and the Activities Regulations (Activiteitenregeling) in 2013. These regulate about 100 activities, such as storage in tanks and packages, mid-sized combustion plants, work on materials (mechanical labour, coating, etc), agricultural activities and some industrial processes (such as large combustion plants). For some of these activities, the regulations are an implementation of EU legislation, such as the Industrial Emissions Directive.

4.4 Industry

The EU ETS is an important policy for industry. Further policies are generally aimed at improving industrial energy efficiency and emission reduction of greenhouse gases. These include the Long-Term Agreements (LTA) with industrial sectors backed up by environmental permits based on the Environmental Management Act, and the Energy Investment Tax Deduction regime (EIA) , included in parallel with the corporate tax system.

4.4.1 Long-Term Agreements on Energy Efficiency

In the year 1992 the first series of Long-Term Agreements (LTA/MJA) started. LTAs are voluntary agreements on energy efficiency between the national government, the trade associations and the participating companies. In LTA1 (1992-1998) the focus was on process efficiency.
In 1998 most parties continued the covenant through LTA2, while the large industrial enterprises adopted the Benchmarking Covenant. Apart from the Ministry of Economic Affairs, the ministries of Housing, Spatial Planning and the Environment, of Agriculture, Nature and Food Quality and of Transport, Public Works and Water Management were also involved with LTA2. In LTA2, the focus was still on process efficiency, but the scope was broadened to include sustainable energy and chain efficiency, amongst others.
In 2015, there are two different categories of LTAs:

- MEE/LEE covenant (Long-Term Agreement on Energy Efficiency for ETS companies): LEE is intended for large industrial companies that are obliged to participate in the EU Emissions Trading System. It is follow-up of the Energy Efficiency Benchmarking Covenant;
- MJA3/LTA3: in 2008, the choice was made to intensify, extend and broaden the LTA instrument. Amongst others, the intensification means that businesses exert efforts to attain an improvement in energy efficiency of 30 per cent in the period 2005–2020. Roadmaps have been introduced as well. There is also more focus on chain efficiency and cooperation across sectors.

Long-Term Agreements LTA3 and LEE are voluntary agreements that focus on the promotion of energy savings in industry. They are concluded between the national government, the trade associations and the participating companies. Long-Term Agreements are enforced using environmental permits: companies not participating are required (in their permits) to implement all energy-saving measures with an internal rate of return of at least 15% after taxes. Participants in the LTA draw up an Energy Efficiency Plan (EEP) every four years for the next four years. They have to submit annual monitoring reports on projects that have actually been implemented and their results. The details of new four-year plans are being worked out for 2016.

Furthermore, the different economic sectors have prepared strategic visions for 50% energy savings in 2030 as a continuation of the work that is still to be completed by 2020 (WAM).

Within the scope of the Energy Agreement for Sustainable Growth a series of reinforcing measures were agreed upon:

- Participating companies are required to produce an annual declaration of progress, based on their annual monitoring reports, to benefit from certain advantages of participating in the LTA (eligibility for lower energy tax, eligibility for participation in the ETS compensation measure, etc.). These declarations are only issued after compliance checks by RVO.nl , i.e. on progress in fulfilling their agreed commitments. If the declarations are not issued for a specific company this has repercussions;
- Large energy-intensive companies – the ones that are covered by the ETS – will join the government in endeavouring to supplement the Long-Term Voluntary Agreement on Energy Efficiency [MEE/LEE Covenant] with a framework of company-specific (i.e. one-to-one) agreements. These will focus on improving the energy efficiency and competitiveness of the companies concerned;
- There is an EPA (Energy Performance Assessment) pilot project (with evaluation) for other companies (i.e. non-MEE companies). An independent centre of expertise will be set up to assist businesses and funding bodies in identifying the most effective measures regarding energy efficiency in industry (and agriculture). The pilots are running at the time of writing this report within the framework of a specific Green Deal.

The impending decrease in combined heat and power (CHP) will not help energy efficiency. However, apart from the generic measures mentioned here, the government chooses not to interfere in the market economy process for mature technologies such as CHP. Support for CHP under the SDE / SDE+ scheme ceased in 2010.

4.4.2 Energy Investment Tax Deduction

The Energy Investment Allowance (EIA) is a tax relief programme. It gives a direct financial advantage to companies in the Netherlands that invest in energy-saving equipment and sustainable energy. Entrepreneurs may deduct 41.5% of the investment costs for such equipment from their company's profits for tax, over the calendar year in which the equipment was purchased. As part of the Energy Agreement, the EIA has focussed more on energy-saving technologies; renewable energy options are referred to other policies and measures.
A similar programme (MIA Vamil) exists for (other) environmental measures.

4.4.3 Green Deals

The Dutch government has set up the Green Deal programme to encourage, amongst other things, energy saving and the local generation of renewable energy. Exploiting opportunities related to saving energy and local sustainable energy generation is not only a matter of access to finance. In practice, there are often other obstacles and difficulties to finding innovative solutions in society for scaling up green growth options, e.g. difficulties with regard to regulations/permits, appropriate forms, networks for cooperation, etc. The Green Deal instrument helps civil-society parties, companies and local authorities that embark on green growth-related initiatives but face obstacles that may require assistance from the national government in tackling them. For the energy and industry sectors, a series of green deals has been concluded on renewable energy projects, bio-based economy projects (new business cases through cooperation between sectors), energy saving projects (including many heat networking projects) and new types of energy services, etc. The effects in terms of energy savings are often included in related policy measures. However, outputs of green deals often refer not only to 'PJ' but to creating better access to financial resources, providing more space for innovative solutions in permits and regulations, reinforcing network cooperation for more innovative projects that require joint actions of various sectors in the industrial chain, etc. Annual progress reports to parliament give examples of green deal achievements.

4.4.4 Other policy for non-CO_2 greenhouse gases in industry (WEM + WAM)

The main policy instrument in this field was the Reduction Programme for Non-CO_2 Gases (described in section 4.2.3). Around the year 2000, substantial reductions in non-CO_2 greenhouse gases were achieved through: 1) environmental permit requirements for the producers of HCFC-22 and aluminium; 2) limiting emissions of fluoride and other pollutants, resulting in a reduction in HFC emissions achieved through the implementation of an after burner system; 3) reduction in PFC emissions; 4) voluntary agreements with the oil and gas and the aluminium industries to improve their energy efficiency, resulting in reductions in CH_4 and PFC emissions; and 5) adapting regulations to reduce emissions of methane from landfill sites, which were introduced to reduce local safety hazards due to the potential build up and explosion of methane as well as cutting down on odours associated with landfill sites. From 2008, significant N_2O reductions were achieved in nitric acid production. Emissions in 2007 were 4.4 Mton CO_2 eq., and after the introduction of reduction techniques they had fallen to 0.6 Mton CO_2 eq. in 2008 and 0.2 Mton CO_2 eq. by 2011. The Climate Commission of the European Member States ratified the European Commission proposal to incorporate the nitrous-oxide emissions (N_2O) into the European Emissions Trading System (ETS) for greenhouse gases. In the Netherlands, two nitric acid production facilities – DSM and Yara – were affected by this decision by being given an emissions permit ceiling of 1.2 Mton CO_2 eq. in 2010 and 1.0 Mton CO_2 eq. in 2020.

PFC and SF_6 are used for cleaning processing chambers and in the etching process in the semiconductor industry. SF_6 is also used in the power current sector and in the production of double-glazing and electron microscopes. Total Dutch emissions of SF_6 (as reported under IPCC sector 2F8) contribute less than 0.5%. There is only one producer of semiconductors in the Netherlands, with a single production location. Due to production growth and the increased complexity of the production processes, absolute emissions increased by around 0.1 Mton CO_2 eq. over the last decade. Thanks to several PFC-reduction measures, the producer realised a high relative emission reduction. With a new Global Semiconductors Industry Voluntary Agreement (2010 -2020), the semiconductor industry aims to achieve a 30% relative reduction of F-gases in 2020 compared to 2010.

Though these measures were taken years ago, significant reductions are still included in the projections, which is reason to briefly mention these policies and measures again in this report.

4.5 Transport

Mobility and transport is one of the areas within the Energy Agreement for which a common target and working programme has been agreed. There is broad agreement on an emission target of 25 Mton CO_2 eq. for 2030, which entails an additional 6 Mton reduction based on existing policy. Ambitious European measures regarding cleaner (and more economical) cars and fuels play a crucial role in this, but a working programme will also come into force under the Agreement. Measures include the continuation of fiscal measures to boost the production of cleaner vehicles, pilots for zero-emission distribution into cities, and stimulating working plans for large companies in order to achieve a 20% reduction in CO_2 emissions in the mobility area.

4.5.1 Reduction measures for Carbon Dioxide (CO_2)

Biofuels (WEM+WAM)
European Directive 2009/28/EG on renewable energy has been implemented into Dutch legislation. This Directive states that Member States should ensure that in 2020 a minimum of 10% of all energy consumption in transport must come from renewable sources. In practice, this target is mainly fulfilled with biofuels. Due to the incentive of the double counting of advanced biofuels, their share was more than 50% of the target in 2012. Dutch policy is aimed at maximising the share of advanced biofuels that are not produced from food/feed crops.

Because blending biofuels is obligatory, there are no additional tax incentives or subsidy programmes. There are some initiatives to promote cars with alternative fuels at local and regional level.

There was a national subsidy programme for Innovative Biofuels for Transport some years ago. A total of EUR 60 million was set aside for the production of innovative biofuels in the Netherlands. This programme helped build biodiesel plants that can produce biodiesel from waste and residues. A subsidy programme for filling stations for alternative fuels has also been implemented. This resulted in the construction of around 100 filling stations for biogas and 35 for high blend bio-ethanol (E85).

Eco Driving (Het Nieuwe Rijden)
The Dutch Eco Driving programme was started in 1999 and is based on a long-term strategy. For a period of four years from 2010, the Institute for Sustainable Mobility (IVDM) has been tasked with implementing the programme before it is transferred to the market. IVDM had set a target to achieve 1 Megaton of CO_2 savings by the end of 2014. To this end, IVDM financed projects that had demonstrated the ability to save CO_2 and provided information about saving CO_2. The programme was finalised in 2014. IVDM reported a reduction of 1.5 Mton CO_2 equivalent[21] .

EU CO_2 emission performance standards
In 2009, the legislation on CO_2 emissions from passenger cars was officially published in the shape of Regulation (EC) No. 443/2009 of the European Parliament and of the Council of 23 April 2009 setting emission performance standards for new passenger cars as part of the Community's integrated approach to reduce CO_2 emissions from light-duty vehicles. The fleet average to be achieved by all cars registered in the EU is 130 grams per kilometre (g/km). A so-called 'limit value curve' implies that heavier cars are allowed to produce higher emissions than lighter cars while preserving the overall fleet average. In 2012, 65% of each manufacturer's newly registered cars had to comply (on average) with the limit value curve set by the legislation. This rose to 75% in 2013, 80% in 2014, and will rise to100% from 2015 onwards. A target of 95g/km is specified for the year 2020. The Netherlands had already achieved the 130 gram level by 2011. The Dutch car tax system may have contributed to this. Due to the fiscal policy, sales of electric cars and especially dual fuel cars have risen sharply over the past years.

In 2011, the legislation on CO_2 emissions for light-commercial vehicles was officially published in the shape of Regulation (EU) No. 510/2011 of the European Parliament and of the Council of 11 May 2011 setting emission performance standards for new light-commercial vehicles as part of the Union's integrated approach to reduce CO_2 emissions from light-duty vehicles. The fleet average to be achieved by all cars registered in the EU is 175 grams per kilometre (g/km). A so-called 'limit value curve' implies that heavier cars are allowed to produce higher emissions than lighter cars, while preserving the overall fleet average. In 2014, 70% of each manufacturer's newly registered light-commercial vehicles had to comply (on average) with the limit value curve set by the legislation. This will rise to 75% in 2015, 80% in 2016, and 100% from 2017 onwards. A target of 147g/km is specified for the year 2020.

[21] www.hetnieuwerijden.nl

As a result of the Energy Agreement a new government approach towards the different fuels is being developed (Brandstofvisie). This is expected to be translated into specific measures in 2015/2016 and encompasses a wide variety of transport mode-fuel combinations. Electric vehicles are also included: at present the roll out of electric vehicles and the infrastructure is ongoing, most of the measures are being implemented within the framework of the green deals and, in recent years, fiscal policies.

Increase of maximum speed limit
In 2012, the maximum speed limit on motorways was raised from 120 to 130 km/h on those stretches where this was deemed acceptable in terms of safety, noise, nature and air quality. If 130 km/h is not possible the whole day, then via a dynamic speed limit for part of it. Some further stretches are being considered for 130 km/h.

The Netherlands has no policies aimed specifically at N_2O emissions from the traffic sector. NO_x policies have led to more petrol-driven passenger cars being equipped with catalytic converters, resulting in higher N_2O emissions per kilometre. Since the percentage of petrol-driven cars with catalytic converters has increased substantially since 1990, the average N_2O emission factor also rose dramatically during the period 1990-1999 (from 9 to 15 mg/km), slightly dropping to 12 mg/km in 2003. The total impact has stabilised over the last few years.

4.6 Agriculture

4.6.1 The Agrocovenant

The covenant with sectors in agriculture and horticulture, the Agrocovenant (also referred to as the Clean and Efficient programme for agricultural sectors) distinguishes three separate main areas of concern regarding policy measures pertaining to the reduction of CO_2 emissions in agriculture:

- The agricultural processing industry (mainly Long-Term Agreements and innovation)is allocated to the Ministry of Economic Affairs whereas the resulting CO_2 emission reductions fall within the 'Industry' sector;
- Greenhouse horticulture focuses on energy savings and sustainable production of the energy demand (electricity and heat), also through developing energy efficient greenhouse systems and new growing methods;
- Other agricultural activities (primary sectors etc.) focus on energy saving, sustainable production of energy through, for example, fermentation, the production of biomass to generate energy.

Reduction measures for Carbon Dioxide (CO_2)
The Agrocovenant (Schone en Zuinige Agrosectoren) main aims are:

- CO_2 emissions: a reduction of 3.5 to 4.5 Mton in 2020 compared to 1990;
- Non-CO_2 greenhouse gases: reduction of 4.0 to 6.0 Mton CO_2 equivalents in 2020 compared to 1990;
- energy saving: an average annual energy efficiency improvement of 2% over the period 2011-2020;
- approximately 200 PJ of biomass production and 12 PJ of wind energy.

Secondary aims relate to:

- contributing to making the agricultural sector generally more sustainable through a 'green growth strategy';
- presenting the agricultural sector as a producer of sustainable energy, reducing fossil fueldependence.

Annual plans must describe specific projects that, in the given year, must contribute to the realisation of the final policy target.

The Covenant is being evaluated in 2015, including a re-assessment of its objectives. A new document is planned to be published at the end of 2015 or early 2016.

New policy measures have been agreed on for the greenhouse horticulture sector. The CO_2 Covenant[22] of 14th February 2012, concluded for the period 2013-2020, regulates CO_2-emission allowances for greenhouse horticulture. The total allocation declines yearly to a level of 6.2 Mton CO_2-eq. in 2020. The Energy agreement sets a target for energy saving of 11 PJ in 2020 (this is equivalent to a CO_2-reduction of 0.7 Mton).

Reduction measures for methane (CH_4) and nitrous oxide (N_2O)
No sectoral reduction targets are planned to be imposed on agriculture until 2020. The sector is expected to take cost-effective measures that contribute to emission reductions of greenhouse gases on a voluntary basis. There are three categories of measures that can contribute to reducing emissions:

- Developing Best Management Practices for reducing nitrogen input on farms;
- Measures related to cattle feed to reduce CH_4 emissions. The composition of feed can affect the production of methane by the cattle's digestive systems. In general: the better the digestibility, the lower the methane emissions;
- Measures concerning manure storage to reduce emissions of CH_4. Manure fermentation is the main option for reducing methane emissions from manure.

An important piece of legislation for restricting methane emissions has been the EU milk quota, which limits the number of dairy herds held in the Member States including the Netherlands. The milk quota ends in 2015, which means an increase in the number of cattle in the country. At the moment phosphate rights define the limits of the dairy herds.

Research indicates that precision soil cultivation in agriculture using GPS can considerably reduce N_2O emissions. By implementing this method, N_2O emissions can be reduced by around 169 tons of N_2O-N per year. The effects are most significant on clay soil.

4.7 Forestry (CO2) and LULUCF

Over the past decades, forest policy in the Netherlands has been integrated into the nature policy. The development of a nature network is a central theme of the nature (and forest) policy. The nature network is a cohesive network of high-quality nature wetland and terrestrial reserves.
Estimates for emissions and removals in the land use, land use change and forestry (LULUCF) sector are given in CTF table 1.

[22] The covenant '*CO_2 emissieruimte binnen het CO_2 sectorsysteem glastuinbouw voor de periode 2013-2020' (*Scope for CO_2 emissions within the CO_2 greenhouse horticulture sector system for the period 2013-2020*)*.

4.8 Waste (CH_4)

According to the Environmental Management Act (Wet Milieubeheer), the Minister of Infrastructure and the Environment (I&M) must issue a Waste Management Plan once every six years. The National Waste Management Plan 2002-2012 (Landelijk Afvalbeheerplan 2002-2012) was the first such plan. It was replaced in 2009 by a new plan for the period 2009-2021.

The policy aims to minimise the production of waste, to maximise recycling and other recovery, and to minimise the amount of waste that remains for disposal, especially landfill. An important target of the waste policy is to increase overall recycling from 79% (in 2008) to 83% (in 2015). In order to achieve this target, the focus has been on the separating of household waste for collection, because almost 50% of this waste flow is still incinerated. Non-recyclable waste is incinerated in energy-efficient incinerators, which are all designated as installations for other recovery in accordance with the Waste Framework Directive.

Optimisation of waste management makes an important contribution to the mitigation of the greenhouse effect. Landfill of organic waste, for example, generates substantial methane emissions. This is one of the reasons why the waste policy focuses on maximising waste recycling and limiting waste disposal. In 2010, around 2% of waste produced in the Netherlands was sent to landfill. This waste could not be recycled or burned.

4.9 Buildings Sector (households and services)

The building stock is an important sector where significant CO_2 emission reduction and energy efficiency improvements can be achieved for both new and existing buildings. The policies developed by the Dutch government for building stock (from 2005 to August 2020) can be divided into three main categories:

- New Buildings;
- Existing Buildings;
- Appliances (Ecodesign).

Besides the further development and introduction of a broad package of policy instruments at national level, several EU Directives are important for this sector, among which the Energy Performance of Buildings Directive (EPBD), the Energy Efficiency Directive (EED) and the Ecodesign Directive.

In order to achieve policy targets in the building sector, the government, actors on the housing market, social housing associations, private home owners and residents must work closely together. The Dutch government explicitly opted for a stakeholder-oriented approach by working through agreements, for instance. In 2012, the government concluded an agreement (called the 'Koepelconvenant') with many relevant organisations in the sector. The parties agreed upon an ambition for the sector to reduce energy consumption with some 110 PJ between 2008 and 2020 (and CO_2 reduction of some 22,5 Mton CO_2 eq. in 2020). The NEV 2015 [page 175] concluded that this ambition with present insights and progress seems within reach.
This policy is implemented through more specific agreements or covenants (see the next sections).

4.9.1 New Buildings

Up to 2010, the amount of non-residential building space increased rapidly. Due to the economic crisis this has slowed down significantly since 2010. The WEM projections for this subsector are based mainly on policies such as energy efficiency requirements for buildings and requirements under the Ecodesign Directive. The government has stated that, as of 2015, new non-residential buildings must be 50% more energy efficient compared to the standard (in 2007). Therefore, the Energy Performance Requirement for commercial buildings will be tightened.

In April 2008, an agreement was signed with several builders' associations to underline the following aspects: tightening of energy efficiency requirements for new buildings, recasting of the calculating methodology, and the introduction of 10 areas of excellence in which extremely low-energy houses will be constructed. This agreement, called the *Lenteakkoord*, was renewed in 2012 under the '*Koepelconvenant*' and aims at a 50% energy reduction in new buildings over the period 2012-2015.

4.9.2 Existing Buildings

Two specific agreements were concluded for the housing sector under the '*Koepelconvenant*' with the sectors for private dwellings and social housing/rental housing respectively. These agreements (referred to in the Netherlands as More with Less/*Meer met Minder*) aim to improve the energy efficiency of some 300,000 dwellings every year until 2020 by two steps in the energy label system. This target was adopted in the Energy Agreement in 2013, together with some additional specific actions to support the implementation.

- For the *private sector housing* the support actions are focussed on awareness, financial support and new arrangements ('unburdening 'of house owners and/or using new 'business models') for implementing energy saving measures. These actions include:
    - The energy label system: 5 million homeowners have received a notification with their preliminary label, Since the label is expected to influence house prices this should drive further energy saving measures);
    - A national (revolving) fund (starting with some EUR 300 million) for energy-saving-oriented loans. This started in 2014 and saw a large increase in applications in 2015, probably also due to the energy label notifications (NEV 2015). Making higher mortgages available for investments in energy saving measures. A support programme by the joint municipalities: regional governments are developing (usually in regional clusters) energy programmes, encompassing the so-called local energy 'counters' (information etc.) agreed on in the Energy Agreement. These actions are an intensification of the earlier mentioned Local Climate Agenda actions;
    - Development of new servicing and business models in energy services by energy suppliers, the installation sector and other companies. New arrangements and services are being developed and tried out, for example in various green deals and in 'block-by-block' trial projects (a set of some 10 pilot projects with new service arrangements, each for a block of more than 1,500 houses). Successful arrangements are intended to be rolled out further;
    - Smart metering: energy distribution companies aim at 80% of the dwellings having a smart meter in 2020 (see section 4.3.4).

  Monitoring results up to 2014 estimate around 550,000 houses taking an average 1.5 energy saving measures with a total effect of some 6 PJ annually (NEV 2015). This is expected to increase by the actions from the Energy Agreement outlined above;

- For the *social housing sector* the parties agreed to aim for energy savings of 24 PJ. This is supported by measures such as:
    - A subsidy scheme (STEP) for improving energy efficiency in social housing;
    - A programme to realise as a first step 11,000 'zero energy' dwellings (scaling up after 2016 to 100,000 in 2020) and a support programme with parties at local level. The NEV 2015 concluded that whether this will be reached depends on the level of ambition that local parties (municipalities, tenants, housing organisations) agree upon within the framework.

At present some 60,000 social housing dwellings are estimated to be improved by 2 label scale steps every year. The annual rate of improvement is expected to accelerate in the coming years (NEV 2015).

Further measures that influence savings:

- The national plan for nearly energy-neutral buildings outlines the Dutch measures for achieving such buildings after 2018 and 2020. As per January 1st 2015, the energy efficiency requirements for houses and buildings in the utility/services sector have been made more stringent, followed by requirements for nearly-energy neutral government buildings by the end of 2018 and for other buildings in the utility/services sector by the end of 2020[included in the WAM projections];
- The Long-Term Agreements on energy efficiency (LTAs, see under industry; section 4.4.1) also include some services sectors: universities, higher professional education buildings, and university hospitals;
- The Energy Agreement includes a stricter control of energy requirements under environmental legislation with the help of a list of economically viable energy saving measures, an expert information centre on energy saving measures and the use of periodical energy performance assessments (EPK) by recognised energy service providers, to support parties in their energy saving actions and check on progress and updates.

Table 4.1 contains information on the policies and measures as described in the sections above. Please note that the effects of some PAMs cannot be singled out from other measures in the sectors affected. Therefore the effects of those measures are summed in one row for that sector in this table.

Name of mitigation action	Sector(s) affected	GHG(s) affected	Objective and/or activity affected	Type of instrument	Start year of implementation	Mitigation impact (not cumulative, in Mton CO2-eq.) 2020		
						Total	ETS	non-ETS
Agreement on Energy for Sustainable Growth	Cross-cutting	CO2	Increase in renewable energy, Energy efficiency improvements, Multisector policy	Voluntary/ negotiated Agreement	2013	IE	IE	IE
Green Deals	Cross-cutting	CO2, CH4	Multisector policy green growth, Reduction of GHG emissions (CO2, CH4, N2O, F-gases), Increase in renewable energy, Energy efficiency improvements	Voluntary/ negotiated Agreement	2011	IE	IE	IE
VAMIL/MIA/EIA, Ecodesign, ETS, MEE, Long Term Agreements; intensifying Long Term Agreements and MEE; maintaining EIA	Cross-cutting	CO2	Energy efficiency improvements, Mulitsector policy	Voluntary/ negotiated Agreement Fiscal	1997	1,97	1,82	0,15
SDE+ Subsidy scheme for renewable energy production (Stimulation of Sustainable Energy Production)	Energy Supply	CO2	Increase in renewable energy	Economic (subsidy)	2008	13,91	13,27	0,64
Maintaining the Environmental Protection Act in industry and the built environment	Cross-cutting	All	Installation of abatement technologies, Reduction of environmental effects, Multisector policy, Reduction of GHG emissions (CH4, CO2, N2O, F-gases)	Regulatory	2013	0,94	0,55	0,38
Ecodesign Directive and intensifying the Ecodesign Directive	Energy Consumption (Built environment)	CO2	Efficiency improvements in appliances	Regulatory	2005	2,69	2,83	-0,14
Covenant 'More with less' (private dwellings)	Energy Consumption (Built environment)	CO2	Efficiency improvements in buildings	Voluntary/ negotiated Agreement	2008	0,16	0,00	0,16
Covenant 'More with less' with the social housing organisations	Energy Consumption (Built environment)	CO2	Efficiency improvements in buildings	Voluntary/ negotiated Agreement	2008	0,25	0,00	0,25
Smart metering	Energy Consumption (Built environment)	CO2	Efficiency improvements in buildings	Information	2012	0,36	0,36	0,00
Agrocovenant, with various sectors in horticulture and agricultures, incl. effects of fiscal measures, ecodesign and ETS in this sector	Agriculture (incl.horticulture)	CO2 CH4 N2O	Efficiency improvements energy end-use agro-sectors	Voluntary/ negotiated Agreement	2008	0,78	0,20	0,59
Sectoral emission trading system in horticulture	Agriculture (incl.horticulture)	CO2	Efficiency improvements energy end-use agro-sectors	Regulatory	2011	0,13	0,04	0,09
Reduction Programm for non-CO2 greenhouse gases (ROB). Reported here are N2O reduction measures in industrial processes and reduction of waste disposal in landfills.	Cross-cutting	Non-CO2 GHG	Reduction of GHG emissions (CH4, N2O), Multisector policy	Economic (subsidy), Information	1998	1,77	0	1,77
Legislation on manure management	Agriculture (incl.horticulture)	CH4	Reduction of fertilizer/manure use on cropland; Improved livestock management;	Regulatory	1986	0,1	0	0,1
EU regulation and various other measures (F-gases)	Cross-cutting	F-gases	Reduction of GHG emissions (F-gases)	Regulatory	1998	0,36	0	0,36
Fiscal policy on car efficiency (BPM) and EU directives on emission standards, green deals, fuel tax	Transport	CO2	Efficiency improvements of vehicles	Fiscal	1992	1,40	0,00	1,40
Efficient Driving Campaign, car pooling, tyre choice and pressure	Transport	CO2	Improved behaviour	Economic (subsidy), Information	1999	0,81	0,00	0,81
Decision Biofuels as renewable energy for transport	Transport	CO2	Increase in renewable energy	Regulatory	2011	1,60	0,00	1,60
VAMIL/MIA/EIA, ETS, EPC (built environment)	Energy Consumption (Built environment)	CO2	Efficiency improvements in buildings	Regulatory Fiscal		4,21	1,40	2,81

Table 4.1 description of policies and measures and their effects in 2020.

4.10 Assessment of the economic and social consequences of response measures

4.10.1 Foreign policy agenda

Climate change is an integral part of the Netherlands' foreign policy, which includes ambitions on sustainable and inclusive growth all over the world and eradication of extreme poverty in one generation. The climate policy aims to contribute to resilient communities that are empowered to face climate-related shocks and stresses and have access to renewable energy. It includes mitigation and adaptation and has a special focus on the most vulnerable groups, and within these groups the women, as they are most vulnerable to the effects of climate change.

4.10.2 International Financial support

The Netherlands has fulfilled the Copenhagen agreement on 'Fast Start Finance'. This involved financially supporting immediate action on climate change and kick-starting mitigation and adaptation efforts in developing countries from 2010 to 2012. The Netherlands provided EUR 308 million in Fast Start Finance over the period 2010-2012.
In the context of meaningful mitigation actions and transparency of implementation and collective action, the Netherlands now scaling up its climate finance action in order to contribute its share to the developed countries' goal to jointly mobilise 100 billion dollars per year by 2020. In 2013, EUR 286 million and in 2014, EUR 395 million was spent on climate projects and programmes in the fields of renewable energy, forestry, water management and climate-resilient agriculture. These resources were directed at both mitigation and adaptation activities. With Dutch support in international development programmes, 2.6 million more people in developing countries gained access to sustainable energy in 2014, reaching a total of 16.7 million, and protection against flooding was improved for 1.7 million people. More information on the results of our international financial support is provided in section 6.1 and can be found in the publication Results Climate 2014[23].

4.10.3 Market mechanisms

Since April 2011, the Netherlands has been supporting the World Bank's "Partnership for Market Readiness", with a total pledge of 7.2 million dollars[24]. The PMR will help countries to make use of the benefits and advantages of the carbon market. It promotes collective innovation and piloting of market-based instruments for GHG emissions reduction. In addition, the PMR also provides a platform for technical discussions about instruments to spur innovation and support implementation.

The flexible mechanisms under the Kyoto Protocol – International Emissions Trading, Joint Implementation and Clean Development Mechanism – are all tools incorporated into the Protocol in order to share efforts aimed at reducing greenhouse gases. Their aim is to ensure that investments are made where the money has optimal greenhouse gas reducing effects with a minimum impact on the world economy. The Netherlands has made use of each of the flexible mechanisms. During the first commitment period of the Kyoto Protocol, the Netherlands contracted in total 33.2 Mton of carbon credits from CDM-projects, 17.1 Mton from JI-projects, and 2.2 Mton from participation in Carbon Funds (PCF).

[23] https://www.rijksoverheid.nl/onderwerpen/ontwikkelingssamenwerking/documenten/kamerstukken/2015/11/06/bij-age-29
[24] https://www.thepmr.org/pmrimplements/1

4.10.4 Collaboration between authorities, with business, knowledge institutions and civil society

The Netherlands is working more closely with companies and knowledge institutions to contribute to combating climate change and its consequences. The innovations and financial strength of these parties are essential to meet the challenges of climate change together. The Netherlands has, for example, extensive expertise in the fields of water, food security and energy. We are collaborating with various countries in these fields. On water security, for instance, with Vietnam, Colombia and Indonesia. More information is provided in chapter 6.

In addition to mitigation the Netherlands attaches great importance to adaptation to climate change. For some time now it has been assisting other countries financially or with knowledge provided by the business community to make them more resilient to the consequences of climate change. In 2014, adaptation expenditure made up 34% of the Netherlands Climate Finance portfolio.

4.10.5 Biofuels production

All biofuels on the market in Europe and the Netherlands must comply with the sustainability criteria laid down by the Renewable Energy Directive (2009/28/EC). Only if the biofuels are sustainable, are they allowed to be used for fulfilling the blending target. Compliance with these criteria must be demonstrated through one of the adopted certification systems. These certification systems are controlled by an independent audit. All biofuels produced in the Netherlands fulfil these requirements. The national policy aims to increase the production of biofuels to ensure that by 2020 renewable energy sources will account for 10% of the energy use in the transport sector. For the year 2014, the contribution of biofuels was 5.5%, while the target was 3.5%. The major raw material sources (about 68% in 2014) are waste and residual materials. While in 2013 about 3% of the raw materials originated from South-East Asia, this had increased in 2014 to 11%.[25]

4.10.6 Sustainability requirements for co-firing and large scale heat production

The sustainability requirements for co-firing and large-scale heat production were changed in the SDE+ subsidy programme (see section 4.3) from 1st January 2015 to ensure a high level of sustainably[26].
The use of biomass that competes with food (or food production) for the production of bioenergy is prohibited In addition, for all forest biomass, the organisation must be in possession of documentary evidence showing that the forest management unit from which the wood is sourced is being managed with a view to the long-term conservation or expansion of carbon stocks.

[25] *Rapportage hernieuwbare energie 2014* (Renewable Energy Report 2014), Dutch Emissions Authority (NEa), 14-07-2015
[26] http://english.rvo.nl/sites/default/files/2015/04/SDE%2B%20sustainability%20requirements%20for%20co-firing%20and%20large%20scale%20heat%20production.pdf

4.11 Policies and measures no longer in place

The following policies have been repealed or have expired since the first Biennial Report and the Netherlands' 6th National Communication:

- The MEP and earlier SDE schemes have been replaced by the more cost-effective SDE+ scheme. There are still payments taking place for projects with an MEP or earlier SDE grant, as subsidies in the SDE typically run for 12 to 15 years. Support for CHP under the SDE / SDE+ scheme was repealed in 2010, as the government prefers generic measures over financial or fiscal favouring of specific – mature – technologies such as CHP;
- The Benchmarking Covenant has been replaced by a new Long-Term Agreement on energy efficiency for ETS companies (MEE/LEE Covenant, see section 4.4.1).

All these changes have been further explained in the previous sections.

4.12 Monitoring and evaluation of progress relating to climate change measures

The overall development of greenhouse gas emissions is being monitored through the emission inventory system (described in section 2.3). Emissions under the EU-ETS are being monitored through annual reporting in accordance with EU-ETS. The non-ETS emissions are reported annually to the European Commission, as regulated in Commission implementing Regulation (EU) No 749/2014. Starting in 2015 and every two years thereafter, all EU Member States have to report to the European Commission information on national policies and measures related to greenhouse gas reductions by 15th March, in line with Regulation (EU) 525/2013.

Since 2014, an annual National Energy Outlook (*Nationale Energie Verkenning; NEV*) has been published for the first time. NEV 2014 and NEV 2015 describe the development observed from 2000 up to the present, as well as expected developments up to 2030 (see chapter 5). The NEV covers physical indicators, such as energy supply, energy demand and greenhouse gases emissions, and economic indicators, such as Economic Value Added and employment related to energy. It aims to provide a fact base for the societal debate about energy in the Netherlands.

Since September 2013, the Netherlands has had the SER "Agreement on Energy for Sustainable Growth" (see section 4.2.1), in which over forty parties (including central, regional and local government, employers and unions, nature conservation and environmental organisations, plus other civil society organisations and financial institutions) agreed on a package of additional measures related mainly to the built environment, energy and transport. As part of the agreement, parties agreed to appoint a committee to monitor progress in the light of the 2020 and longer term goals. The first progress report[27] was published in June 2014. Parties have committed themselves to considerg additional measures if the evaluation in 2016 shows too little progress.

The Environmental Assessment Agency (PBL) publishes "The Assessment of the human environment", which is a biennial report on the current status and future trends in the Dutch environment in relation to government policies and societal trends. The most recent publication is "The future is now; Assessment of the Dutch Human Environment 2014"[28].

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[27] http://www.google.nl/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=2&ved=0ahUKEwjdysWit_JAhVB6A4KHcOeDRgQFggmMAE&url=http%3A%2F%2Fwww.energieakkoordser.nl%2F~%2Fmedia%2Ffiles%2Fenergieakkoord%2Fpubliciteit%2Fvoortgangsrapportage-2014.ashx&usg=AFQjCNGiyRhqob2fou0PJ3q7cWYw_39Zvw&bvm=bv.110151844,d.ZWU

[28] http://www.pbl.nl/sites/default/files/cms/publicaties/pbl-2014-Assessment-of-the-dutch-human-environment-1597.pdf

4.13 Domestic and regional programmes and/or legislative arrangements, as well as enforcement and administrative procedures

4.13.1 Arrangements and procedures: European policy context

As an EU Member State, the Netherlands is also subject to EU climate policy and so it applies the EU Common and Coordinated Policies and Measures (CCPMs) relevant to climate change. These include Directive 2003/87/EC, which introduced the European system for CO_2 emissions trading, and the Effort Sharing Decision 406/2009/EC. Also included are the European Council Decision 2002/358/CE on sharing the burden of the EU's emission-reduction target for the Kyoto Protocol, and Regulation (EU) No 525/2013 on the Monitoring Mechanism, which ensures that EU progress towards meeting the Kyoto target is assessed annually and that Member States provide sufficient information to the European Commission to achieve this aim. Other CCPMs encourage combined heat and power production, the introduction of biofuels for transport and the reduction of methane (CH_4) emissions from landfill waste sites.

4.13.2 Arrangements and procedures: national policy context

Environmental Management Act
Almost all national legislation on the environment is incorporated in the Environmental Management Act. This act sets out an integrated approach to environmental management in the Netherlands and provides the legal framework by defining the roles of national, provincial or regional, and municipal government[29]. The Act stipulates the tools to be used in environmental management including:

- Environmental plans, for instance, the national waste management plan that regulates municipal waste collection, disposal of discarded equipment such as refrigerators and TVs, and permits for hazardous waste shipment;
- Environmental quality criteria for emissions and discharges of harmful substances such as greenhouse gases and heavy metals to air, water and soil;
- Environmental impact assessment is a prerequisite for the construction of major infrastructure such as oil refineries, nuclear power plants, chemical plants, roads, railways, and oil and gas pipelines;
- Environmental permits: in addition to regulations for the emission of substances harmful to the environment, large companies, such as chemical plants, are required to obtain environmental permits that stipulate limits for the discharge of substances harmful to the environment;
- Environmental reporting which is directed at stimulating companies to make production cleaner and more environmentally friendly. Many companies, such as those involved in metal processing and chemical production, are required to publish an annual environmental report. The Ministry is responsible for ensuring that the reporting requirements of the EU Pollutant Release and Transfer Register (PRTR) are met. Those companies and organisations required to prepare an Integrated PRTR report on waste, air emissions (greenhouse gases) and discharges into water sources are listed in Annex II of the PRTR Regulation which is published in the Official Journal of the European Union;
- Enforcement: the Human Environment and Transport Inspectorate is largely responsible for ensuring the provisions of the Environmental Management Act are enforced. Enforcement is also a task of the municipalities, the police and the justice system.

[29] https://www.government.nl/topics/environment/contents/roles-and-responsibilities-of-central-government/environmental-management-act

The Environmental Management Act therefore provides the legal basis for most environmental regulations that affect emissions of greenhouse gases (for example regarding waste prevention and landfill policy, environmental permits and CO_2 emissions trading). The Act also provides the framework for enforcing commitments undertaken in Long-Term Agreements by companies that do not participate in emissions trading.
Chapter 18 of the Environmental Management Act regulates enforcement of the legal measures. It denotes which authorities are responsible for enforcement and requires them to designate officials to be charged with monitoring compliance. In the event of violations, authorities have several sanctions at their disposal. For example, they may order that the situation be brought into compliance at the expense of the violator, or impose a pecuniary penalty or withdraw a licence. Another option is criminal sanctions. Public prosecutors may bring cases against offenders in the criminal court, which could result in high financial penalties or even imprisonment (maximum of six years).
There are no changes in the Environmental Management Act relevant for the domestic institutional arrangements related to greenhouse gas emissions since the BR1.

Housing Act and Building Decree
The Housing Act provides the legal basis for the energy performance standards (EPN and EPC) that apply to new buildings. With the EPN it is possible to calculate the EPC (energy performance certificate). The standards are laid down in the Buildings Decree pursuant to the Housing Act. The Buildings Decree also sets a maximum EPC level to limit the energy consumption of a building. Furthermore, the Buildings Decree empowers municipal authorities to grant building permits. In the event of violations of building permits, municipal authorities have recourse to administrative sanctions based on Article 25 of the Municipalities Act and to criminal sanctions based on Article 108 of the Housing Act.
In March 2015 the Dutch Senate approved new legislation for housing associations in The Netherlands. The New Housing Act (Nieuwe Woningwet) came into effect on 1st July 2015. It defines the core tasks and activities of housing associations, that is providing affordable housing to people on a low income. The New Housing Act makes a strict distinction between social activities and commercial activities. Housing associations have to focus their future activities on Services of General Economic Interest (SGEI) or have to meet the strong restrictions imposed by the national government and the European Commission for activities in the commercial sector (non-SGEI). The Buildings Decree was also amended on 1st July but the energy performance standards and the regulations on sustainable building remained unchanged.

4.13.3 Provisions to make arrangements and procedures publicly accessible

After adoption, all laws and underlying legislative arrangements in the Netherlands are published in one of several official government bulletins and/or directly on the National System website as indicated in Section 2.3. The Freedom of Information Act and the Environmental Management Act also provide for public access to information regarding the enforcement of environmental rules and regulations. Under the Act of 22nd December 2005, the Freedom of Information Act was extended with a provision for the reuse of official government information, in accordance with Directive 2003/98/EC of the European Parliament and the European Council of 17 November 2003.
Since the BR1 there have been no changes to the provisions on making arrangements and procedures publicly accessible.

4.14 Use of units from the market-based mechanisms and land use, land-use change and forestry activities

No units from market-based mechanisms and land use, land-use change and forest activities (LULUCF) are used to make progress toward meeting the target. The Cabinet informed the Parliament in 2011 that it anticipated that the target for greenhouse gas emissions in the non-ETS sector could be achieved domestically and that it would not be necessary to buy units from market-based mechanisms such as CDM and JI30.

CTF Table 4 holds the notation key Not Applicable (NA) as LULUCF is excluded in the target and so the contribution of LULUCF is not relevant to relevant mitigation actions. It holds values zero as no Kyoto Protocol units or other units are used to make progress toward meeting the target.

CTF Table 4(a)I holds no values as LULUCF is excluded in the target and so the net emissions/removals from activities under Articles 3.3 and 3.4 of the Kyoto Protocol and the related accounting quantities for the years since 2008 are not relevant to relevant mitigation actions.

CTF Table 4(b) shows the values zero as no Kyoto Protocol units or other units are used to make progress toward meeting the target.

[30] *Kabinetsaanpak Klimaatbeleid op weg naar 2020 (Cabinet's approach to climate policy on the road to 2020)*, Letter to Parliament 8 June 2011

5. PROJECTIONS

5.1 Introduction

The previous Biennial Report[31] described the projections made in 2012, also known as the 'Geactualiseerde Referentieraming 2012' (Updated Reference Projection 2012) (Verdonk and Wetzels, 2012)[32]. The projections in this second Biennial Report are based on the report 'National Energy Outlook 2015' (NEV 2015)[33].

Section 5.2 presents the main results for greenhouse gases for the years 2020 and 2030. Emission projections for precursor gases are described in Section 5.3, while Section 5.4 is dedicated to uncertainty and sensitivity analyses. The methodologies and assumptions underlying the projections are described in more detail in Section 5.5.

5.2 Projections

Scenario used, and major changes relative to the previous Biennial Report
The projections described in this chapter are based on the 'Referentiescenario NEV 2015' (Reference Projection NEV 2015) as published in the National Energy Outlook 2015 (NEV, 2015) in October 2015. Compared with the 'Geactualiseerde Referentieraming 2012' that was used in the previous Biennial Report, the 'Referentiescenario NEV 2015' has incorporated new insights with regard to economic and demographic developments, sectoral developments, fossil fuel prices and the CO_2 price and policies. The present scenarios have taken into account, for example, the policies and measures of the Energy Agreement for Sustainable Growth of 2013 regarding energy policies up to the 2020-2023 period (SER *Energieakkoord*) and the implementation of the 2006 IPCC Guidelines (e.g. GWPs according to AR4). Recent statistics were also taken into account, e.g. data from the revised Dutch Energy Balance by Statistics Netherlands (CBS). The base year for this model is 2013, whereas emission levels now reflect statistics on historical emission levels and projects emission levels for greenhouse gases and air pollutants for 2020 and 2030.

The 'Referentiescenario NEV 2015' sets out the most plausible developments, based on information as at 1 May 2015 relating to prices, markets, technology and policy.
The scenario distinguishes two different policy variants which are based on the underlying principles of Dutch and European policy, including the measures from the Energy Agreement. They also contain measures made binding by market participants, public organisations and other government bodies on or before that date.

Variant 'With Existing Measures' (WEM)
This variant encompasses currently implemented and adopted policies and measures. This variant includes measures, such as the European Emissions Trading System (ETS), subsidies for renewable energy, the abolition of the milk quota and some measures from the Energy Agreement that are sufficiently concrete and have been made binding.

[31] BR_1
[32] www.ecn.nl/docs/library/report/2012/e12039.pdf
[33] National Energy Outlook 2015

Variant 'With Additional Measures' (WAM)
In addition to all measures from the WEM variant, this variant also encompasses planned policies and measures. These had been published but not yet officially implemented by until 1 May. However, they were specific enough to incorporate in the calculations, for example the Real Driving Emissions (RDE) regulations for private cars and delivery vehicles, and a large number of measures from the Energy Agreement.
A variant 'Without Measures' is not included in this scenario.

5.3 Projection results

5.3.1 General trends

National greenhouse gas emissions have fallen since 1990
Total greenhouse gas emissions fell by 11% between 1990 and 2013, from 219 to 196 Mton of CO_2-equivalents (see figure 5.1). This decrease has been achieved because the emission of non-CO_2 greenhouses gases fell sharply after 1995 as a result of measures taken to reduce them; at 166 Mton in 2013, CO_2 emissions were 3% higher than in 1990. According to the provisional estimate from the emission register, greenhouse gas emissions fell in 2014 to 187 Mton of CO_2-equivalents (ER 2015b). However,this is thought to be a one-off, partly because 2014 was an exceptionally warm year and less motor fuel was sold. According to the provisional estimate, CO_2 emissions fell to 158 Mton in 2014 (2 Mton below the 1990 level).

National greenhouse gas emissions will continue to fall until 2020
Based on the existing policy (the 'With Existing Measures' variant; WEM), greenhouse gas emissions are expected to fall to 181 Mton of CO_2-equivalents in the period to 2020. This is a decrease of almost 18% from 1990 levels (see figure 5.1).
When the intended policy is taken into account (the 'With Additional Measures' variant, WAM), emissions fall to 178 Mton of CO_2-equivalents by 2020. This is a decrease of almost 19% from 1990 levels. There is a higher proportion of renewable energy in this policy variant and more energy saving in buildings. However, the reduction in 2020 in the WAM variant is still 6% below the level that corresponds to the reduction imposed by the courts on the State of the Netherlands (that is 25% below 1990 levels).

Nevertheless, with the projected emissions in both WEM and WAM variant in 2020 the Netherlands would comfortably meet its 2020 European target for reducing greenhouse gases.
In the European context, the Netherlands only has a national emissions target for the emission of greenhouse gases that are not regulated by the European Emissions Trading System (ETS) (see chapter 3). This target relates to cumulative (non-ETS) emissions in the period 2013-2020 and is set at 920 Mton CO_2-equivalents. Annual non-ETS emissions will decrease in the variant 'With Existing Measures' (WEM) as well as in the variant 'With Additional Measures' (WAM) from 109 Mton CO_2 equivalents in 2013 to 100 Mton in 2020 (see figure 5.2). Cumulative emissions amount to approximately 820 Mton CO_2-equivalents. The Netherlands will thus meet the target by a comfortable margin. In June 2015, the government announced that any surpluses will be cancelled and therefore will not be carried over to the period after 2020.
In the same period (2013-2020) the emissions under EU ETS will decrease from 87 Mton to 81 Mton (WEM variant) and 79 Mton (WAM variant).

After 2020 emissions of greenhouse gases are projected to decrease further

If the WEM variant is followed, the emissions of greenhouse gases will decrease further to 175 Mton of CO_2-equivalents in the period 2020–2030. This is almost 21% lower than in 1990. This decrease can be entirely attributed to the sector that is not in the Emissions Trading System (ETS); in 2030, emissions in the ETS sector will be at the same level as in 2020.

The decrease between 2020 and 2030 will mainly be due to a fall in energy consumption in buildings, greenhouse horticulture and vehicles (mainly non-ETS). Emissions of non-CO_2 greenhouse gases will also decrease further. Despite the increase in the proportion of renewable energy, emissions in the energy sector are still increasing (mainly ETS). This is mainly because, after 2022, the Netherlands is expected to become a net exporter of electricity. The WAM variant will lead to a slightly lower energy consumption in the built environment and in transport. As a result of this greenhouse gas emissions will fall by an extra 1.5 Mton to 173 Mton CO_2-equivalents. This is over 21% lower than in 1990.

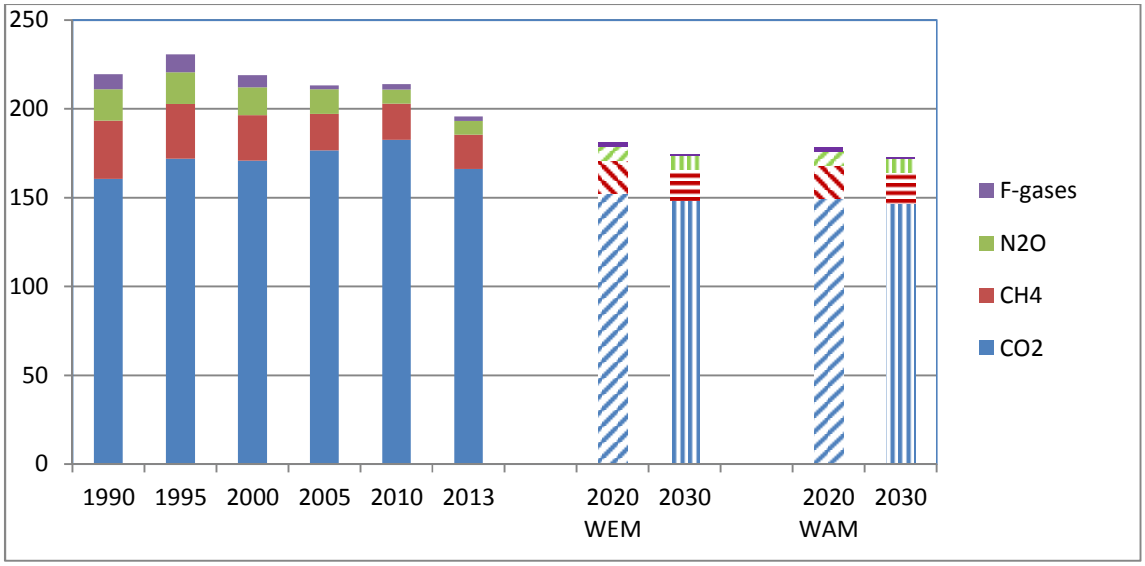

Figure 5.1 historic emissions and projections of greenhouse gases per gas (Mton CO_2 eq).

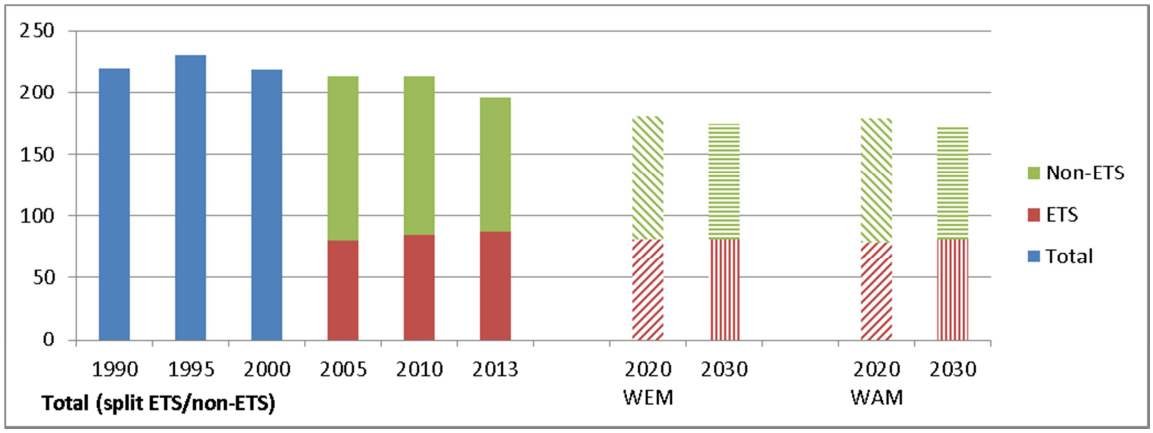

Figure 5.2 historic emissions and projections (split ETS/non-ETS) (Mton CO_2 eq).

5.3.2 Energy and industry (CO_2)

More than 90% of the emissions in these sectors are covered by the European Emission Trading System (ETS).
Emissions fell from 98 Mton in 2000 to 92 Mton in 2013. Important measures for these sectors are the Subsidy Scheme for Renewable Energy Production (*Stimulering Duurzame Energieproductie*), Long-Term Agreements on Energy Efficiency (MJA/LTA and MEE/LEE) and the Energy Investment Allowance scheme (EIA). Growth will continue in the renewable energy sector until 2020. After 2020 (from 2022), the Netherlands is expected to become a net exporter of electricity.
In the WEM variant, emissions in the energy sector will decrease until 2020, while emissions from industry will stabilise. Emissions for energy and industry together will come to 87 Mton in 2020. Then emissions in the energy sector will rise while industry emissions will fall slightly until 2030, when the total emissions will remain at 87 Mton.

The WAM variant takes into account the tightening up of enforcement of the Environmental Management Act (*Wet milieubeheer*) under the Energy Agreement (*Energieakkoord*). It also assumes a slightly higher price for CO_2. This leads to projected emissions of 85 Mton in 2020 and 86 Mton in 2030.

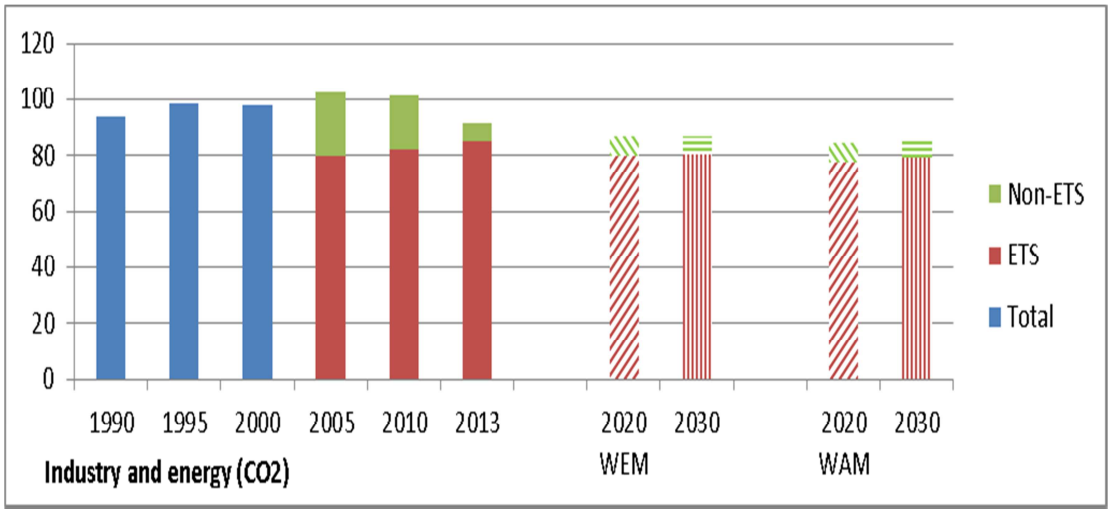

Figure 5.3 historic emissions and projections for CO_2 from Energy and Industry (Mton CO_2 eq).

5.3.3 Built Environment (CO_2)

Homes
The average gas consumption per house heated with gas central heating fell from approximately 2,150 cubic metres in 1995 to approximately 1,500 cubic metres in 2013 due to energy-saving measures in existing and new homes.
The current requirements for energy performance certificates (EPCs) for new homes and the current energy efficiency requirements for domestic appliances and lighting under the EU's Ecodesign Directive are included in the WEM variant. A number of measures from the Energy Agreement, such as the agreements aimed at domestic consumers and the rented housing sector, have also been accounted for, as has the increase in the number of homes heated with electric heat pumps from 2% to 5–6% by 2020.
This will reduce emissions from homes from 19 Mton in 2013 to a projected 17 Mton in 2020 and 15 Mton in 2030.

In addition, the intended policy (WAM variant) also takes account of a further accelerated roll-out of zero-energy homes after 2016, the review of energy-efficiency requirements for domestic appliances under the EU's Ecodesign Directive and the tightening up of EPC requirements to make them almost energy-neutral from 2020.
These measures will reduce emissions from homes from 19 Mton in 2013 to a projected 16 Mton in 2020 and 15 Mton in 2030.

Services
The building stock in the services sector almost doubled between 1980 and 2010, but there has been a marked decrease in new building since 2010. This is the visible effect of the economic recession and a surplus of office and retail premises. However, the slowdown in growth is not only due to these two factors. The growth in the stock of utility buildings will also remain slower than previously in the longer term.
This is related to expected demographic trends: an ageing population, smaller population of professionals and fewer students in education. Trends such as online shopping, new methods of working ('Het Nieuwe Werken') and senior citizens staying in their own homes for longer are also playing a role in the decreasing need for space.
Vacancy levels have also increased in recent years. At the beginning of 2015, over 17% of office space and over 9% of retail space was empty (Netherlands Environmental Assessment Agency [PBL] 2015). These vacant premises consist partly of readily marketable and partly of unmarketable oversupply. The first category comprises empty or, frequently, part-empty offices that one might expect to be occupied again when the economy picks up. The second category comprises buildings that have fallen into disuse due to obsolescence or which are in areas with poor prospects (contracting regions).
Since 2000, emissions in the services sector have stabilised at around 9 Mton (2013 level).
In the services sector, only the current energy performance requirements for new buildings and the current energy consumption requirements under the EU's Ecodesign Directive are included in the WEM variant. This will reduce emissions to a projected 8 Mton in 2020 and 8 Mton in 2030.

Measures under the Energy Agreement (*Energieakkoord)*, such as enforcement of the energy-saving requirements from the Environmental Management Act (*Wet milieubeheer*) through lists of approved measures, agreements with environmental services, pilots under the Energy Performance Assessment (EPK) and information from the Energy Saving Expertise Centre, have also been accounted for in the intended policy (WAM variant). Furthermore, there is an assumption that, from 2020, the energy performance requirements for new buildings will be made more stringent so that they are almost energy-neutral. This will reduce emissions to a projected 8 Mton in 2020 and 7 Mton in 2030.

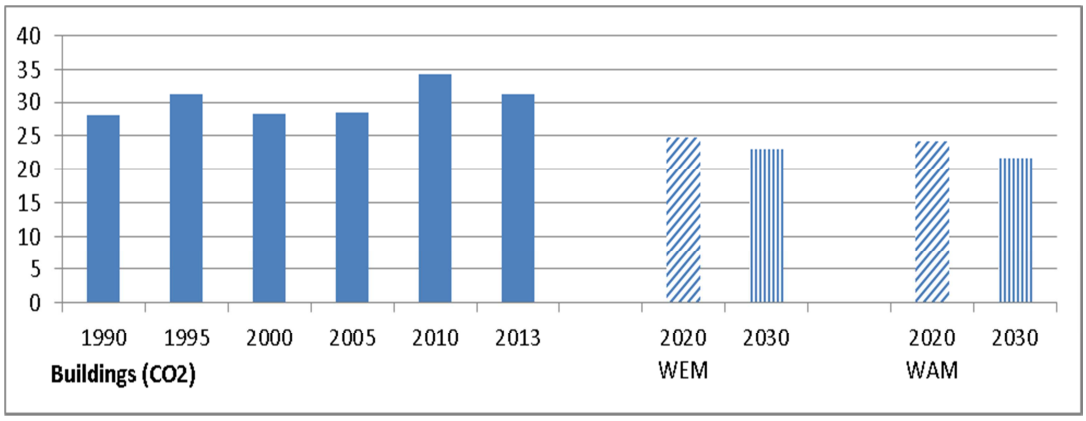

Figure 5.4 historic emissions and projections for CO_2 from Buildings (Mton CO_2 eq).

5.3.4 Transport (CO_2)

Between 2000 and 2008, emissions from traffic and transport in the Netherlands rose from 37 to 40 Mton. This increase was mainly due to the growth in traffic on the roads. Goods transport and its associated emissions decreased in 2009 and 2010 due to the economic recession. Following an increase in 2011, emissions fell again in 2012, 2013 and 2014, partly due to weaker growth in traffic, a more economical vehicle fleet under the influence of the European standards for CO_2 and tax incentives to boost economical vehicles.

In the WEM variant, energy consumption in the sector would stabilise until 2020 but, as a result of a growing share of biofuels, emissions are projected to fall from 36 Mton in 2013 to 35 Mton in 2020. By 2030, the emissions are projected to have decreased further to 34 Mton.

A number of measures from the Energy Agreement (*Energieakkoord*) are also included in the WAM variant. The main effect of these will be seen after 2020. There is also the EU's proposed tightening up of the CO_2 emissions standard for new private cars in 2025. These more stringent standards in the WAM variant are expected to speed up sales of electric and hybrid vehicles after 2020. Market shares in the sale of new plug-in hybrids and electric cars are estimated to be 20% and 5% respectively from 2025 in this variant. The 'Choose the best tyre' public information campaign and the Green Deal Car Sharing are also making a small contribution to reducing CO_2. In the WAM variant, emissions are projected to fall to 35 Mton in 2020 and 33 Mton in 2030.

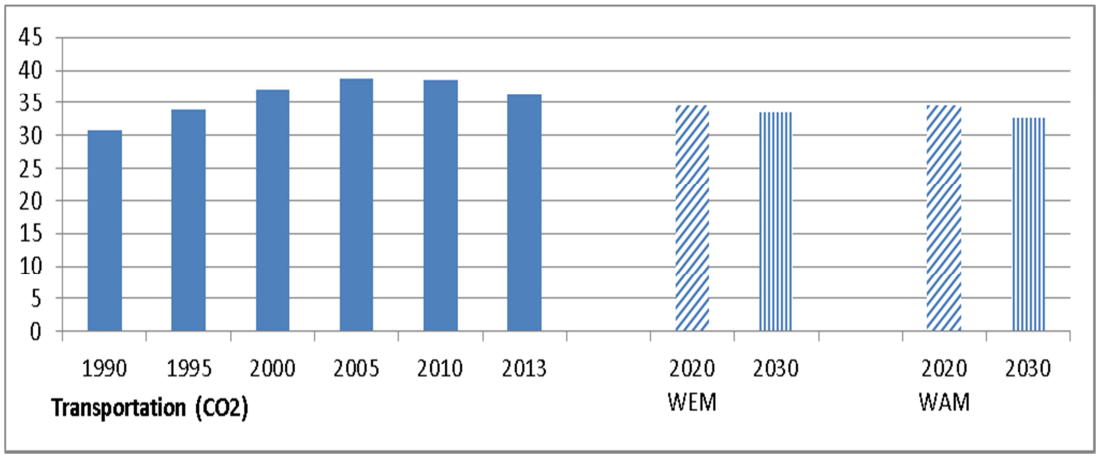

Figure 5.5 historic emissions and projections for CO2 from Transportation (Mton CO_2 eq).

5.3.5 Agriculture (CO_2)

In terms of energy consumption, the agriculture sector can be divided into two parts: greenhouse horticulture and other agriculture, with the latter covering arable farming and intensive livestock farming. The majority of energy consumption in agriculture is accounted for by greenhouse horticulture, mainly for heating greenhouses and for lighting for the growth and development of the plants. Combined heat and power systems (CHP) and boilers currently provide the greatest part of the necessary heat; the CO_2 released from burning natural gas can then be used for CO_2 supplementation in the greenhouses.

The area being cultivated under glass in 2014 was 10% less than in 2000. The number of companies involved fell by 60% in that period due to increases in scale and clustering. The area being cultivated under glass is expected to decrease between 2014 and 2020 from 9,490 to approximately 9,100 hectares (Agricultural Economics Research Institute (LEI) 2014c). As it is very uncertain how the area will develop after 2020, stabilisation at the 2020 level is expected between 2020 and 2030. Despite the decreasing area being cultivated under glass, total production in greenhouse horticulture continues to increase due to intensification and optimisation of cultivation. The shift over the last few years from cultivation of cut flowers and flowering plants in greenhouses to vegetables is also expected to continue in the future.
In 2008, an agreement was reached with the greenhouse horticulture sector that they would achieve a number of targets by 2020: CO_2 emissions related to cultivation must be cut to 6.2 Mton, 20% of energy used must be renewable and energy efficiency must be improved by 2% per year (Ministry of Economic Affairs 2008). The energy policy for greenhouse horticulture has been intensified in the Energy Agreement (*Energieakkoord*) to achieve further reductions in emissions.
To achieve additional energy savings (11 PJ in 2020), the sector and the government have already implemented or strengthened a number of measures: a plan to speed up the measure known as 'Het Nieuwe Telen' (The Next Generation Cultivation) as part of the 'Kas als Energiebron' (Greenhouse as a source of energy); the introduction since 1 January 2015 of an individual CO_2 system, under the name 'Energiebesparingssysteem in de Glastuinbouw' (Energy saving system in greenhouse horticulture) and the 'LED-it-be' research programme. Government support for rolling out geothermal energy in the sector has been reinforced by means of guarantee systems and accelerated planning. In addition to the policy above, the Energy Investment Allowance (*Energie-investeringsaftrek,* EIA) and the agreements on energy tax ('energie-belastings-afspraken' (EB)) are relevant to agriculture.

In 2000, CO_2 emissions from agriculture amounted to 7.5 Mton and these emissions were back at the same level in 2013.
In the WEM variant, CO_2 emissions are projected to fall to 6.2 Mton in 2020 and 5.2 Mton in 2030.
In the WAM variant, the emissions are projected to fall to 6.6 Mton in 2020 and 6.2 Mton in 2030. The main reason for this difference is that the WAM variant leads to more use of combined heat and power (CHP) within this sector.

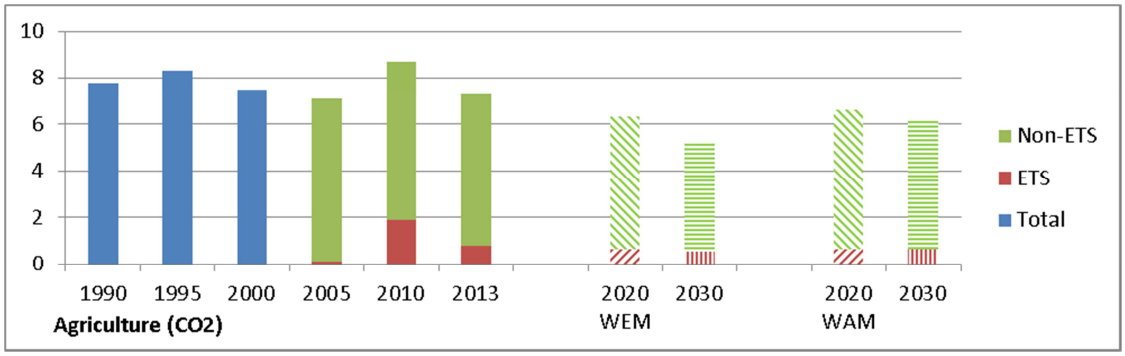

Figure 5.6 historic emissions and projections for CO2 from Agriculture (Mton CO_2 eq).

5.3.6 Agriculture (non-CO_2)

Non-CO_2 emissions from agriculture come from the following sources:

- methane (CH_4) emissions from enteric fermentation and manure management;
- nitrous oxide (N_2O) emissions from manure management and direct and indirect emissions from agricultural soils.

The developments and expected trends for methane and nitrous oxide are set out below.

Methane emissions

Methane emissions from agriculture fell by approximately 21% between 1990 and 2005 from 15 to 12 Mton of CO_2-equivalents. From 2005, these emissions rose again to 12.5 Mton of CO_2-equivalents in 2013.

A further small increase to 13 Mton of CO_2-equivalents by 2020 is expected under both the WEM and WAM policies. Methane emissions will increase due to the increase in milk production of around 25% since 2015 as a consequence of the abolition of milk quotas. Most of this increase has been achieved by increasing the milk production per cow but the number of dairy cows has also increased by almost 5%. The 'wet Verantwoorde groei melkveehouderij' (Diary farming responsible growth act) will temper the growth somewhat.

The rise in methane emissions from dairy cattle is being partly cancelled out by the decrease in the number of young cows as dairy cattle now have a longer productive life. The scale of co-fermentation of manure for biogas production will remain at around current levels in the near future (approximately 2% of manure), and a temporary decrease is expected around 2020 as old plants are taken out of production. Fermentation of manure reduces the methane emissions from manure storage, as the manure is not stored for long.

Methane emissions from agriculture will stabilise after 2020. The emissions for 2030 are estimated at 13 Mton in both policy variants. While milk production will increase further, the number of young dairy cows will also decrease further and the Subsidy Scheme for Renewable Energy Production (SDE+) scheme will increase co-fermentation of manure to 4% in both the WEM and WAM variant after 2020.

Nitrous oxide emissions

In 1990, agriculture emitted 10.1 Mton of CO_2-equivalents in the form of nitrous oxide. By 2013 that had fallen to 5.7 Mton of CO_2-equivalents. The decrease was mainly achieved through reduced use of artificial fertiliser under the influence of the manure policy and because fewer dairy cattle graze outdoors. Emissions will stabilise at 5.7 Mton of CO_2-equivalents by 2020. After that a small decrease to 5.6 Mton of CO_2-equivalents in 2030 is expected due to a further decrease in outdoor grazing. These figures apply to both variants.

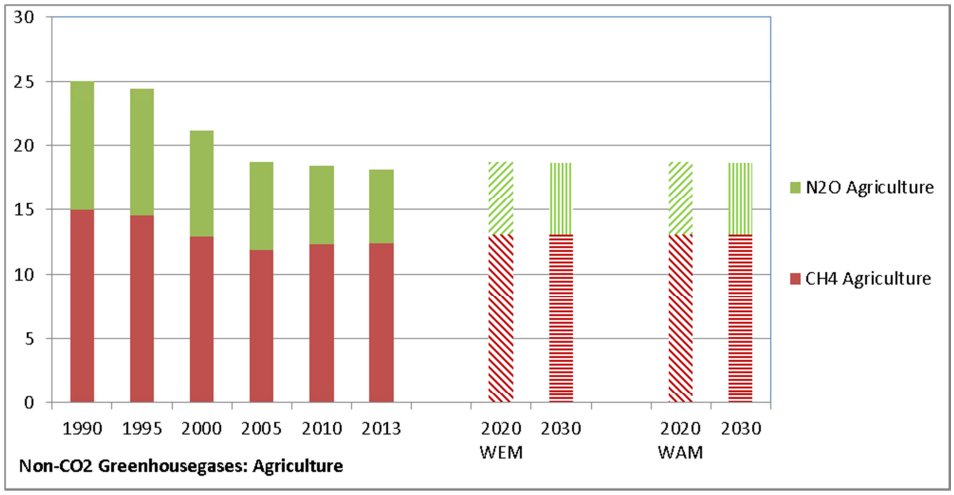

Figure 5.7 historic emissions and projections for CH_4 and N_2O from Agriculture (Mton CO_2 eq).

5.3.7 Non-CO_2 (other sectors)

General matters
Since 1990, there has been a substantial decrease in emissions of non-CO_2 greenhouse gases in the other sectors: from 33.9 to 26.9 Mton of CO_2-equivalents in 2000, and to 11.4 Mton of CO_2-equivalents in 2013. These emissions will decrease further between 2013 and 2030 but not at the same tempo. The projected emissions in 2020 and 2030 amount to 9.7 and 7.4 Mton of CO_2-equivalents respectively under the existing policy (WEM), and 9.8 and 7.6 Mton of CO_2-equivalents under the intended policy (WAM). The difference between the WEM and the WAM variant is due to methane emissions from combined heat and power plants (CHPs). There is no difference between the two policies with respect to the other sources. The historical developments and estimated future trends for the most important sources are set out below.

Methane from waste disposal
Methane emissions from waste disposal (such as landfill sites) have fallen substantially in the past, from 14.3 Mton of CO_2-equivalents in 1990 to 3.4 in 2013. These emissions are expected to continue to fall to 1.2 Mton of CO_2-equivalents in 2030. This decrease is due to reducing emissions from waste put into landfill in the past, the fact that less waste is being dumped in landfill and the fact that the biogenic fraction in that is getting smaller and smaller.

Methane emissions from combined heat and power plants (CHPs)
A marked increase in the use of CHPs in greenhouse horticulture since 2005 has caused a rise in methane emissions from 0.4 Mton of CO_2-equivalents in 2005 to 1.1 Mton in 2013 Between 2013 and 2030, the decrease in the use of CHPs in greenhouse horticulture will reduce the emissions to 0.8 Mton of CO_2-equivalents under the existing policy (WEM) and 1.0 Mton CO_2-equivalents under the intended policy (WAM).

Nitrous oxide emissions from industry
Nitrous oxide emissions from industry result from the production of caprolactam (0.9 Mton of CO_2-equivalents in 2013) and nitric acid (0.3 Mton of CO_2-equivalents in 2013). Nitrous oxide emissions from nitric acid production have been falling since 2008 under the EU Emissions Trading System (EU ETS). Measures to reduce emissions were taken at the nitric acid factories in 2007. This achieved a reduction of five Mton of CO_2-equivalents in 2008 compared with 2006. As the production of caprolactam and nitric acid is expected to increase slightly in the period 2013-2030 and no further reduction measures are anticipated, there will be a small increase in nitrous oxide emissions from industry to 1.4 Mton of CO_2-equivalents in 2030.

Emissions of F-gases
F-gases are produced as a by-product of a number of industrial production processes, especially the production of HCFC-22 (emission of HFC-23) and primary aluminium production (emission of PFCs). F-gases are also released during the use of these substances. The main uses are of HFCs as refrigerants, PFCs in the semiconductor industry and SF_6 in the power current industry.
After increasing between 1990 and 1998 (from 8.2 to 12.4 Mton of CO_2-equivalents), emission of F-gases as a result of production processes plummeted to 0.3 Mton of CO_2-equivalents in 2013. This decrease resulted from reduction measures taken under the Reduction Programm for non-CO_2 greenhouse gases (ROB).
However, emissions from the use of F-gases increased between 1990 and 2013 from 0.2 to 2.2 Mton of CO_2-equivalents. The increase is mainly due to a large increase in the use of HFCs due to the phasing out of ozone-depleting substances (especially HCFCs) since 1995. On balance, emissions of F-gases decreased between 1990 and 2013 from 8.5 to 2.6 Mton of CO_2-equivalents. Total emissions (from use and processing) of F-gases are expected to fall to 2.3 Mton of CO_2-equivalents in 2020 and 1.1 Mton of CO_2-equivalents in 2030. This decrease will mainly be in the use of HFCs. Following the new EU Regulation that came into effect on 1 January 2015, the use of HFCs (calculated in CO_2-equivalents) must be reduced by 79% between 2015 and 2030. The effect of this will be to cut emissions from the use of HFCs by 2.0 Mton of CO_2-equivalents by 2020 and 0.8 Mton of CO_2-equivalents by 2030. Processing emissions of F-gases from the most important industrial processes will remain at 2013 levels in 2020 and 2030, namely 0.3 Mton of CO_2-equivalents.

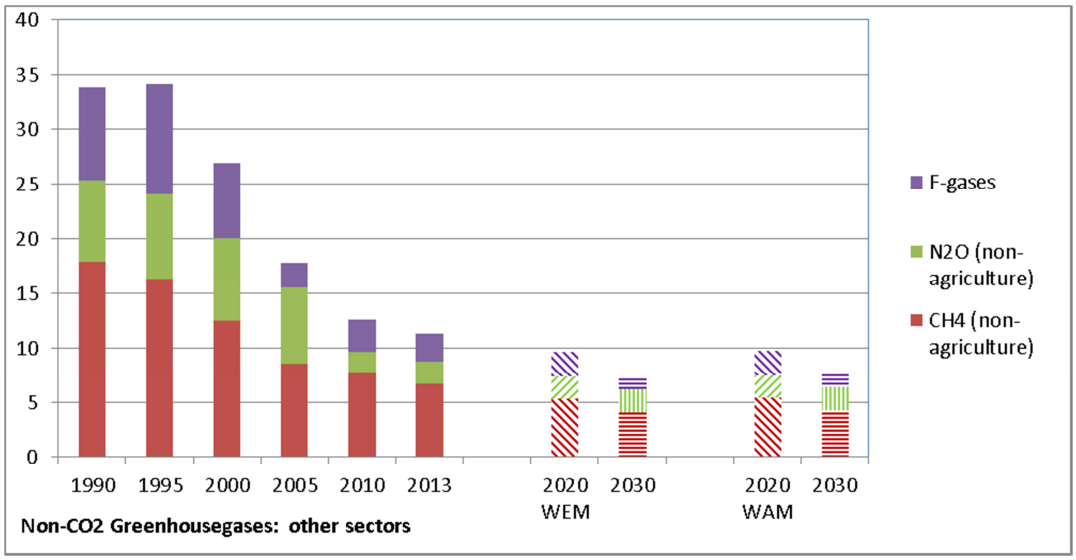

Figure 5.8 historic emissions and projections for non-CO_2 from other sectors (Mton CO_2 eq).

5.3.8 Forestry sector (not included in national totals presented elsewhere)[34]

Forest land

A projection of emissions and removals for the period 2013-2020 was carried out under the assumption that the observed rate of land-use change from 2009-2013 will remain unchanged until 2020. Changes to standing stocks in forests were projected until 2020 using the EFISCEN model), which was parameterised using information from the recent 6th National Forest Inventory[35]. This approach is similar to the approach used to report to the Convention and Kyoto Protocol for the years in between, until information from a new National Forest Inventory becomes available. Wood harvests from forests were assumed to remain similar to those in 2013 (~1.2 million m^3). This is slightly more than projected for the forest management reference level (roughly 0.05 million m^3 above that level)

The methods used to calculate the projection followed the 2013 supplementary guidelines for KP reporting (IPCC 2014). Emissions from deforestation (D) are projected to increase from 1,573 kton CO_2-equivalents in 2014 to 1,834 kton CO_2-equivalents in 2020. Removals from afforestation and reforestation (AR) will increase from 807 kton CO_2-equivalents in 2014 to 982 kton CO_2-equivalents in 2020. The removals under forest management (FM) decrease from 2,901 kton CO_2-equivalents to 2,113 kton CO_2-equivalents.

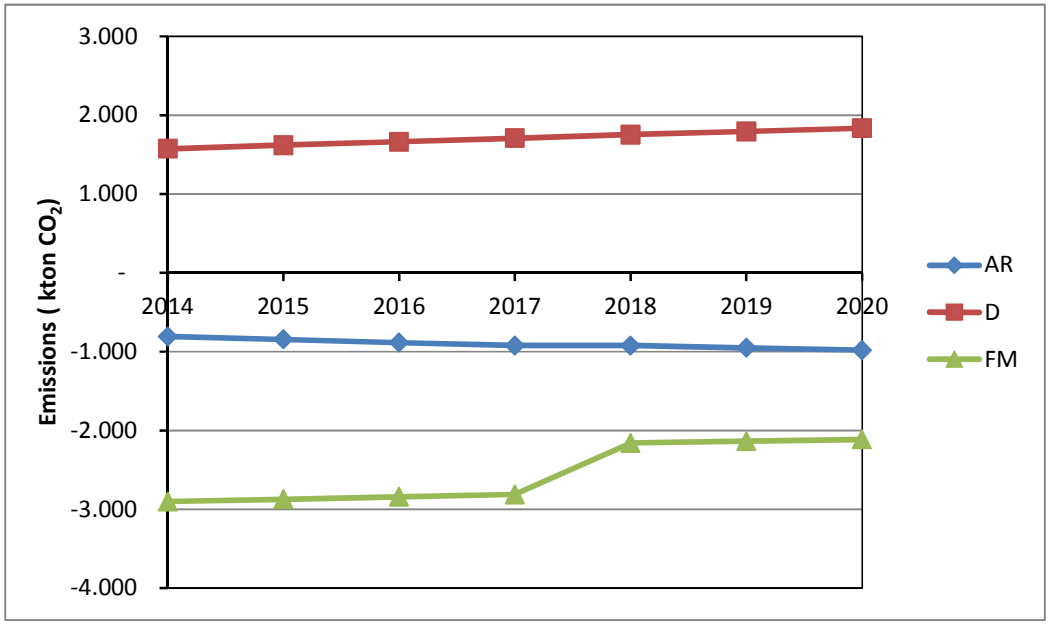

Figure 5.9 Projections of removals and emissions from Afforestation/reforestation (AR), Deforestation (D) and Forest Management (FM) (kton CO_2 eq).

[34] Ministry of Economic Affairs, Information on LULUCF actions, The Netherlands Reporting in accordance with Article 10 of Decision No 529/2013/EU, 2015

[35] Schelhaas et al. 2014

For accounting purposes the emissions and removals from FM need to be compared to the Forest Management Reference level (FMRL). The Dutch FMRL was established following a common approach by the Joint Research Centre of the European Commission that was applied to several EU Member States. However, due to the fact that the FMRL was established before the 2013 guidelines existed, the methods used to calculate FM differ from the guidelines. As a result a technical correction on the FMRL is needed. This technical correction will be made in the near future. Moreover, calculation of harvested wood products needs to take into consideration the wood production from deforestation, which will be considered as well in the technical correction of the FMRL.

Grazing land and cropland management
Projections for grazing land management and cropland management have not been implemented yet (see previous section on past emissions and removals). Nevertheless, some preliminary remarks on grazing land management and cropland management can be made. The results for 2012 as reported to the Convention (covering all land-use classes, including those not reported under KP-LULUCF) in the NIR2014 show that the carbon stocks (kton C per year) in mineral soils aggregated for all land-uses increased from 2.4 kton yr^{-1} in 1990 to 41.7 kton C yr^{-1} in 2008[36, 37] and thus acted as a small sink of carbon. However, after 2008, the aggregated changes in carbon stock in mineral soils decreased substantially. This was a result of the increased rate of conversion of grassland to cropland between 2009 and 2013 as observed from the land-use change matrix over that time period. However, within this period of time it is not known when these changes actually occurred, nor is it known what type of grasslands (temporary or permanent) are being converted to cropland. It is assumed, however, that this increased rate of conversion stems from farmers anticipating restrictions on conversion of permanent grassland under the new CAP regulations. It is expected, therefore, that land-use changes from grassland to cropland will normalise again over the next few years. This should then show up in a new land-use change matrix, which is foreseen to covering the period 1 January 2013 – 1 January 2017.

5.3.9 International bunkers

Energy consumption (and the related CO_2 emissions) for international transport over water does not count as domestic consumption but, for policy purposes around energy and CO_2, is treated as a form of export and not attributed to the Netherlands. The CO_2 emissions from international aircraft are also not attributed to the Netherlands but do count towards the target for total gross end consumption of renewable energy from the RED. A great deal of bunker fuel is sold to international shipping and aviation in the Netherlands.
In 2013, the CO_2 emissions from international bunkers amount almost 53 Mton. The bunker emissions therefore exceed emissions from domestic transport. In both the WEM and the WAM variant, total emissions from international bunkers are expected to grow to 55 Mton in 2020 and 58 Mton in 2030 as a consequence of the estimated growth in transport volumes.

[36] Arets et al 2014
[37] Coenen et al. 2014

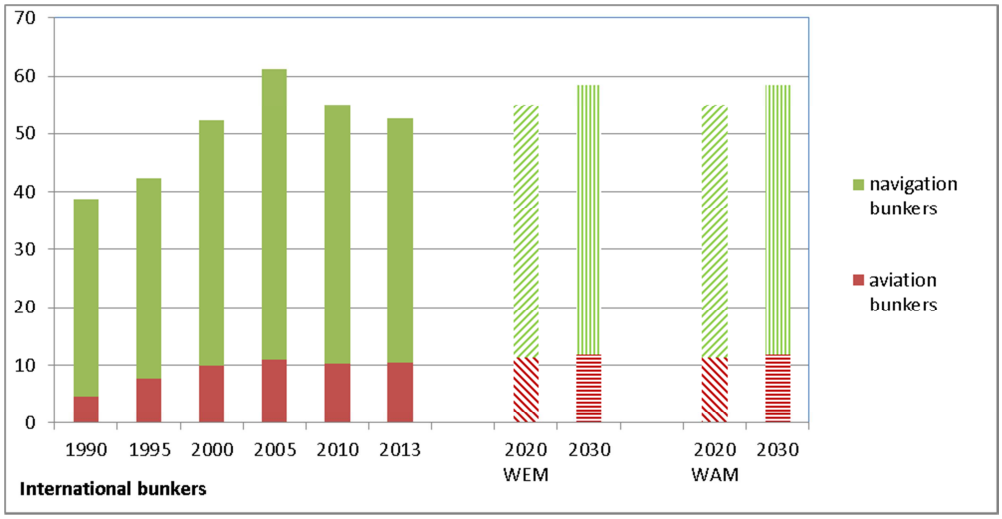

Figure 5.10 Historic emissions and projections for CO_2 from international aviation and navigation (Mton CO_2 eq).

5.3.10 Emissions of NOx, NMVOCs and SO_2

A significant proportion of the emissions of air-polluting substances are related to energy consumption. Burning fossil fuels and biomass produces both greenhouse gases and air-polluting substances. Combustion processes are the main cause of the release of nitrogen oxides and sulphur dioxide. Non-combustion processes are also major contributors to the emission of non-methane volatile organic compounds (NMVOCs). NMVOCs are also released from the use of paint and cosmetics, for example. Emissions of air-polluting substances have decreased substantially since 1990 due to the implementation of national and European legislation and regulations. These large decreases have mainly been achieved through policies which have led to the application of scrubbing methods and cleaner processes as well as the use of cleaner fuels, such as gas instead of coal or oil. Since 2000, however, emissions have not been falling as rapidly as in the 1990s.

Sulphur dioxide (SO_2)
Emissions of sulphur dioxide fell by 84% in the period 1990-2013. Over the coming years, emissions of sulphur dioxide are only expected to decrease slightly compared with average emissions in the period 2010–2013 under both the existing (WEM) and the intended (WAM) policies (see figure 5.11). Various developments in several sectors are behind this small decrease. For example, the closure of five old coal-fired power stations in 2016 and 2017 agreed in the Energy Agreement (Energieakkoord) will reduce emissions from coal-fired electricity generation. By 2030, emissions from refineries will be reduced from their average levels over recent years. This small decrease will result from two developments. First, there will be fewer emissions due to the estimated lower production (oil throughput) in the long term. Second, the expected intensification of desulphurisation of ships' fuel as a result of international IMO requirements will decrease emissions. Emissions from industry (including base metals, building materials and chemicals) will increase slightly due to projected economic growth while the current emissions standards remain in force.

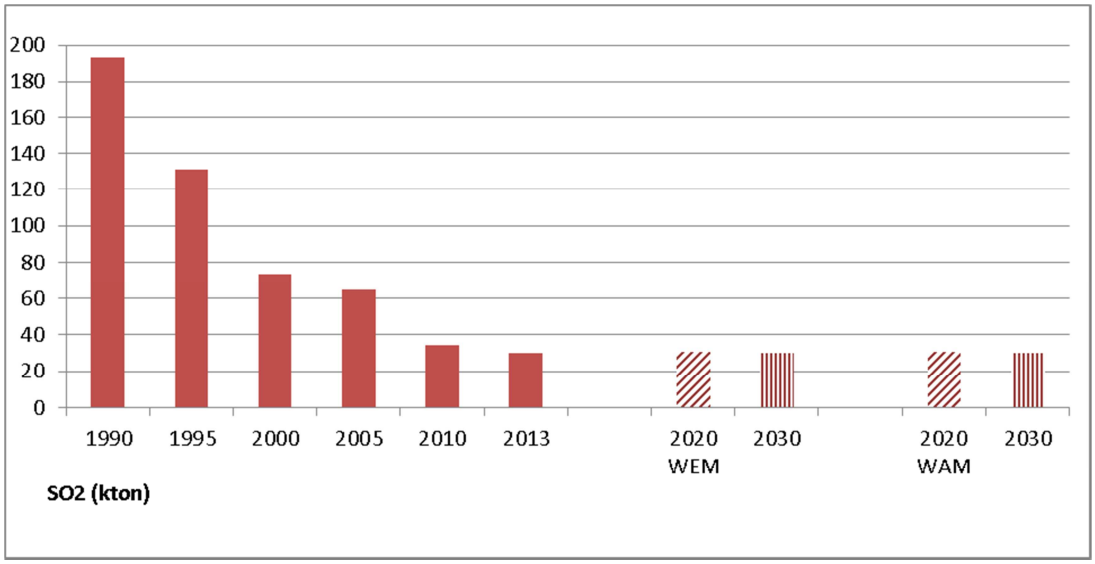

Figure 5.11 historic emissions and projections for sulphur dioxide (SO_2) (kton).

Nitrogen oxides (NO_x)

Emissions of nitrogen oxides (NO_x) fell by 58% in the period 1990-2013 and they will continue to fall through to 2030.

The decrease in national emissions of nitrogen oxides in the WAM variant (see figure 5.12) can be traced back to reductions in most sectors except industry. The greatest absolute decrease will be in transport. This will be achieved through the existing European standards for road transport, other transport and mobile machinery. Emissions are projected to fall by around 70 kilotons between 2013 and 2030 due to the existing standards. The estimate for the WEM variant excludes the effect of the intended tightening up of procedures for testing emissions from private cars and delivery vans. This is included in the proposed European policy as are European plans to further tighten up emissions standards for mobile machinery and inland waterways vessels. With both of these proposed European measures, the Netherlands will be able to achieve an extra reduction of approximately twenty kilotons by 2030.

Emissions from electricity generation will decrease up to 2030 as old coal-fired power stations are decommissioned (agreed in the Energy Agreement [Energieakkoord]) and because of incentives for renewable generation (wind and solar). Emissions from small combustion installations in greenhouse horticulture, utility building and homes will be reduced largely due to reduced energy consumption and national emissions regulations. In greenhouse horticulture, one of the reasons for this is a reduction in the use of CHP in favour of gas boilers. A rise in emissions from industry is anticipated as a consequence of the assumed economic growth and the continuation of the present emission standards. The projections for air-polluting substances take into account the incentives under the SDE+-scheme for use of biomass in medium-sized combustion plants (larger than 500 kilowatt especially in industry, agriculture and utility buildings). Biomass plants are mostly replacing plants fired by natural gas. This measure reduces CO_2 emissions but it does, however, increase emissions of nitrogen oxides, NMVOCs and Particulate Matter (PM2.5). The use of biomass in medium-sized combustion plants will increase by a factor of 1.5 between 2010 and 2020 and 1.75 between 2020 and 2030. The nitrogen oxide emissions per petajoule of biomass fuel used is more than a factor of 2 higher than for natural gas plants.

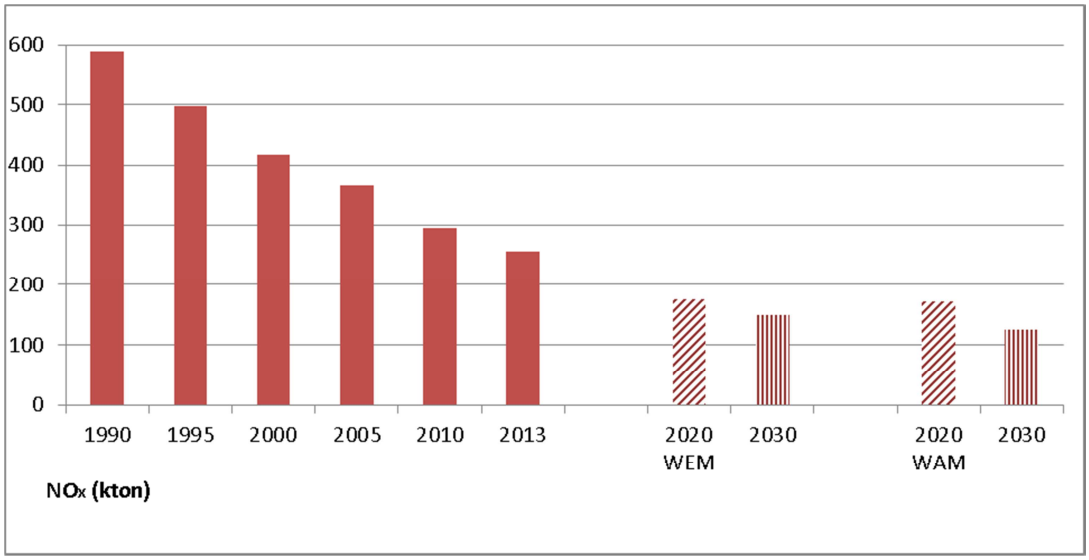

Figure 5.12 historic emissions and projections for Nitrogen Oxides (NOx) (kton).

NMVOCs

Emissions of non-methane volatile organic compounds (NMVOCs) decreased by 69% in the period 1990–2013 and they will remain fairly stable in the coming years. Although total NMVOC emissions seem to have been stabilising since 2013, a number of relevant developments are projected in the underlying sectors. Both the WEM and the WAM anticipate a decrease in road transport up to 2020 as a consequence of the European emissions standards for road vehicles and mobile machinery (see figure 5.13). Emissions from onshore and offshore gas and oil production will also fall in the short term, due to reduced production on Dutch territory. A small reduction in emissions from wood-burning stoves is expected, in part due to a small increase in certified, and therefore cleaner, stoves on the assumption that the amount of wood used by households will not change from now until 2030.

On the other hand, emissions from industry, the storage and transshipment of chemical products and fuels and from consumer products such as cosmetics (deodorant sprays and hairsprays), car products and cleaning products will increase. These increases are associated with the expected growth in these activities and a continuation of the current product and emission standards. The intended policy (WAM variant) leads to a small one-kilotonne reduction in NMVOC emissions by 2030. This effect is mainly explained by an increase in the number of electric cars (and a decrease in the number of petrol cars with higher NMVOC emissions) and the tightening up of emission standards for mobile machinery (known as stage V).

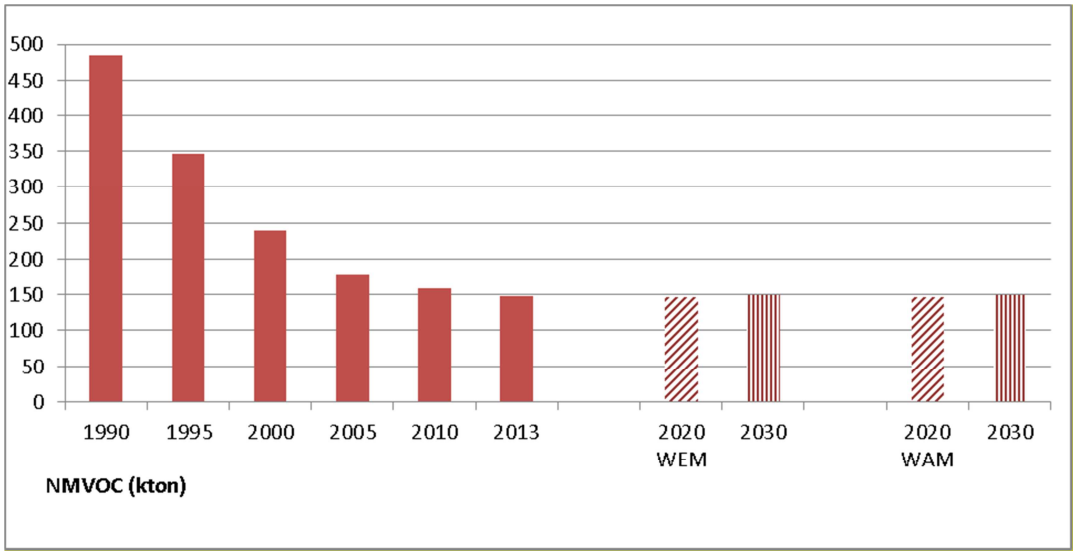

Figure 5.13 historic emissions and projections for non-methane volatile organic compounds (NMVOC) (kton).

5.4 Assessment of the aggregate effects of policies and measures and uncertainty analysis

5.4.1 Effects on emissions of greenhouse gases

All measures taken together will bring about a reduction in total greenhouse gas emissions in the period 2013-2020 of 15 Mton (8%) under the existing policy (WEM variant) and of 17 Mton (9%) under the intended policy (WAM variant) (Figures 5.1 and 5.2 and Table 5.1). The greatest reduction will be achieved in CO_2 (14 and 16 Mton respectively). Under both policy variants, reductions of 1 Mton for methane and 0.3 Mton for F-gases are projected. No further reductions in emissions of N_2O are expected. Additional emissions reductions of 6 Mton under the existing policy (WEM) and 5 Mton under the intended policy (WAM) are projected for the period 2020–2030. CO_2 emissions fall by 4 Mton and 3 Mton respectively and methane emissions by 1 Mton. F-gases fall by 1 Mton and the emissions of N_2O stabilise at 2013 levels until 2030.

Almost half of the Netherlands' emissions are covered by EU ETS. The emissions under EU ETS are projected to fall by 6 Mton (WEM) and 8 Mton (WAM) in the period 2013-2020. The non-ETS emissions are projected to fall by 9 Mton under both policy variants.
The emissions under ETS increase slightly in the period 2020-2030, while non-ETS emissions decrease by an additional 7 Mton.

(Mton of CO_2-equivalents)	Historic emissions						Projections			
	1990	1995	2000	2005	2010	2013	2020 WEM	2020 WAM	2030 WEM	2030 WAM
Total emissions	220	231	219	213	214	196	181	178	175	173
Breakdown by gas										
Carbon dioxide	161	172	171	177	183	166	152	150	149	147
Methane	33	31	26	21	20	19	18	19	17	17
Nitrous oxide	18	18	16	14	8	8	8	8	8	8
Fluorinated	9	10	7	2	3	3	2	2	1	1
Breakdown ETS/non-ETS										
ETS				80	85	87	81	79	81	81
Non-ETS				133	129	109	100	100	93	93

Table 5.1 Projections by gas and broken down into ETS/non-ETS.

5.4.2 Uncertainty analysis

The Netherlands uses the 'Referentiescenario NEV 2015' for the projections. Developments in factors which are largely exogenous such as the economy, demography, fuel prices, technology and human behaviour can only be predicted to a limited extent but do have a great influence on the trends in emissions. The effects of policy measures can also be uncertain, because it is usually difficult to predict how the market will behave.
Therefore, there is inevitably a large degree of uncertainty about the projections. Based on the most up-to-date information about these factors, NEV 2015 presents a picture of the most plausible scenario in the future. The projections give one estimation of future trends in these factors. One scenario is produced that constitutes the conditional point of departure for the projections: if the trends go as expected, the consequences for the emissions will be as described. The varying degrees of uncertainty around the exogenous and other factors are shown by means of uncertainty ranges, which have a 90% reliability interval, meaning that an outcome outside the given ranges is very improbable but is still predictable.
The uncertainty calculations produce ranges in total emissions of 2% for 2020 and 5% for 2030 (see Table 5.2)

Mton of CO_2-equivalents	2020 (WEM)	2020 (WAM)	2030 (WEM)	2030 (WAM)
Total emissions	181	178	175	173
Uncertainty range	177-185 (2%)	175-182 (2%)	168-186 (5%)	164-181 (5%)

Tabel 5.2 Projected national emissions with uncertainty ranges

5.5 Description of methodology

Much of the information below is based on the Dutch National System for projections and reporting on policies and measures that was established in 2015 (RVO.nl, 2015)

5.5.1 Models and methods used

The 'Referentiescenario NEV 2015' uses a combination of models to construct an energy balance sheet of energy consumption in the Netherlands that reflects on the past and projects the future. The 'Referentiescenario NEV 2015' analyses the developments in different socio-economic sectors that result in energy demands and energy production. An overview of energy flow is provided based on these analyses. The quantitative developments of the activities themselves are the basis for this and include the production of electricity and goods, the use of devices, the heating of buildings and the number of kilometres travelled. Statistics Netherlands (CBS), collects information from questionnaires completed by businesses and the information registered by network companies and government institutions to construct an overview of the history. For future projections, the expected changes to these activities are calculated based on assumptions about economic, demographic and energy market developments. These particular projections are calculated taking into account confirmed and announced projects and the intended policy measures of government institutions and other social players. The expected levels of activity will be converted into the relevant energy usages and the necessary energy production. The expected developments in technology are an important aspect in these calculations, especially those which relate to improved energy efficiency and those that lead to a change in the fuels needed for the production of electricity. Energy usage is then finally converted into CO_2 emissions. The emissions created by non-CO_2 greenhouse gases and air pollutants are determined based on the levels of the relevant activities that produce these emissions. A brief description of the models used to create the overview is included in annex 1.

5.5.2 Key variables and assumptions

The key variables used in the projections are listed in Table 5.3 below.

Key underlying assumptions		Historical					Projected		
	Unit	2000	2005	2010	2011	2015	2020	2025	2030
GDP	index (2000 = 100)	100.00	106.00	114.00		117.00	128.00		152.00
Population	thousands	15,863.95	16,305.53	16,574.99	16,656.00	16,900.00	17,200.00	17,500.00	17,700.00
Population grow th	%	0.80	0.20	0.50	0.50	0.40	0.40	0.30	0.20
Number of households	thousands	6,801.01	7,090.97	7,386.14	7,443.80	7,700.00	8,000.00	8,300.00	8,400.00
International oil price	US $ per barrel	39.00	66.00	87.00		55.00	89.00	114.00	140.00
International coal price	Euro per ton	52.00	75.00	89.00		70.00	81.00	85.00	88.00
International gas price	Euro per m3	0.16	0.18	0.20		0.24	0.28	0.31	0.33

Table 5.3 Key variables used in the projections.

6. PROVISION OF PUBLIC FINANCIAL SUPPORT, TECHNOLOGICAL AND CAPACITY-BUILDING SUPPORT TO DEVELOPING COUNTRY PARTIES

6.1 Summary information on public financial support

For the period under review, the Netherlands stepped up its efforts to address climate change, realising a year on year increase after it delivered on its commitment of Fast Start Finance during 2010-2012. In 2013, EUR 286 million and in 2014, EUR 395 million were spent on climate projects and programmes in the fields of renewable energy, forestry, water management and climate-resilient agriculture. These resources were directed at both mitigation and adaptation activities. The Netherlands also contributed to multilateral climate funds that finance adaptation and mitigation programmes in developing countries. In 2013, adaptation expenditure made up 12% of the Netherlands Climate Finance portfolio. In 2014, adaptation expenditure was raised to 34% due to better integration of our efforts with the development programs in this area. The share of mitigation expenditure decreased slightly (26% in 2013 to 21% in 2014), but increased in absolute terms. The remaining expenditure was used on projects that cover both adaptation and mitigation. Some results of the Dutch contributions in 2014 were:

- an additional 2.6 million people gained access to clean energy;
- 1.7 million people benefitted directly from projects that increased protection and availability of water for irrigation or domestic use;
- 4.7 million smallholder farmers became more resilient to climate change;
- more sustainable management of a total of 1.8 million hectares(ha), of which 1.4 million ha in Sub-Saharan Africa.

6.1.1 Meeting developing country needs

The Netherlands prioritises a strong poverty focus in its bilateral and multilateral climate finance. Climate change vulnerabilities are unevenly distributed and are generally greater for disadvantaged people and communities[38]. The Dutch climate finance is therefore intended first and foremost to assist the poorest communities and poorest countries. Gender is being integrated into all aspects of Dutch climate finance: equality between women and men is essential and the important role women can play in transforming societies is essential for accelerating sustainable economic growth.
Integration of climate policies in the bilateral relations with Dutch partner countries was further structured around the climate country profiles of fifteen developing countries and regions[39]. These profiles were formulated in 2014. They were used by Dutch embassies in developing countries to assess the impact of climate change on the water and food security programmes in their respective countries and and integrate climate change in the embassy programs. The country profiles contain an overview of country specific climate change impacts, national government policies and of climate change projects, and they describe the focus areas of the respective embassy's climate contribution. With these instruments and ongoing dialogue, the Netherlands is constantly seeking to increase the number of projects that address climate change, particularly in the food security and water sectors. Public private partnerships are another essential feature of Dutch climate policies. The Netherlands has joined or initiated several alliances such as the Global Delta Coalition, the Climate Smart Agriculture Alliance and the Tropical Forest Alliance.

[38] IPCC, Climate Change 2014 Synthesis Report, Summary for Policymakers, 2014
[39] http://dsu.eia.nl/publications/advisory-reports/7152

6.1.2 Methodology

Bilateral public climate finance
The Netherlands uses the OECD/DAC Rio Marker definitions to report on climate activities. Reporting is based on disbursements.

For most activities, the OECD/DAC's Rio Marker methodology is used to provide an approximate quantification of Dutch climate finance. If an activity is marked as 'principal' for mitigation or adaptation, 100% of the support is considered and reported as climate finance. If an activity is marked as 'significant' for mitigation or adaptation, 40% of the support is considered and reported as climate finance. Together with other donors, we consider this percentage to be a reasonable estimate of the average climate contribution of projects that have climate change adaptation or mitigation as a significant objective.
If more than one climate Rio Marker is assigned to an activity, double counting is avoided as follows:
• if an activity has 2 'principal' markers, both count as 50%;
• if an activity has 2 'significant' markers, both count as 20%;
• if an activity has 1 'principal' and 1 'significant' marker, the 'principal' marker counts as 60% and the 'significant' marker counts as 40%.

For the sizeable contributions to NGOs in the framework of MSF-2 (the Dutch grant policy framework for working with NGOs), the Netherlands uses a mixed approach. Rio Markers are used when they are considered to give a reasonable estimate of the climate relevance of the NGO's programme. In other cases, the Netherlands has established the climate-relevant share (percentage) of their programmes in close cooperation with the NGOs concerned .

To improve our tracking of commitments, a review has been carried out since the first biennial report on the use of the Rio Markers in our systems. This review was performed by a group of independent experts, coordinated by the Dutch Sustainability Unit, part of the Netherlands Commission for Environmental Assessment. It resulted in many small changes and overall a more consistent approach to using the Rio Markers. In addition, the format of new project approval documents has changed and now includes an explicit question to indicate the applicability of Rio Markers.

Multilateral climate finance
The Netherlands applies a climate-relevant percentage to its core contributions to MDBs, climate-relevant funds and a number of climate-relevant multilateral organisations. We apply the percentages established by OECD/DAC where available. In a number of other cases, we have set these percentages ourselves in close cooperation with the organisations concerned. The percentages range between 5% and 20%.

Private climate finance
This report does not yet include private climate financing. The Ministry of Foreign Affairs has recently started tracking private climate funding and will include private sector funds in its reporting from 2015 onwards. In the period of review, the Dutch Ministry of Foreign Affairs commissioned a pilot study to review its climate finance programmes on the ability to mobilise private climate finance. In close collaboration with the Ministry, a methodology was developed and a trial calculation of mobilised private climate finance by Dutch public interventions was performed. The report 'PILOT – Tracking Mobilised Private Climate Finance' summarises the methodological choices that have been made and the results of this first attempt to track private climate finance mobilised by the Netherlands.

The pilot was a contribution to the international effort to enhance transparency of mobilised private financial flows for climate action in developing countries. The report was presented at the OECD Research Collaborative on tracking private climate finance in Paris.

Remarks to CTF tables 7
The Ministry of Foreign Affairs uses an annually established corporate currency exchange rate. For the years 2013 and 2014 this was EUR 1.33 per USD. In the tables, cross-cutting refers to country programmes that include both mitigation and adaptation activities.

Please note that reported financial data over 2014 differ slightly from data reported earlier to the European Commission (Member State reports on financial and technology support for climate action provided to developing countries pursuant to Article 16 of Regulation (EU) No 525/2013), due to the application of the latest OECD/DAC information on the climate relevant share of multilateral funds (dated 26-11-2015). Data for 2013 have not been changed and are based on OECD/DAC information that was available in September 2014. Conform OECD/DAC guidance we have used the average share (2013-2014) to report over 2014.

6.1.3 Financial support provided to non-Annex 1 parties

An overview of financial support provided to non-Annex 1 parties is presented in Tables 6.1 (2013) and 6.2 (2014). The contributions through multilateral organisations for specific programs count as part of the bilateral and regional channels.

Allocation channels	European euro - EUR				USD			
		Climate-specific				Climate-specific		
	Core/general	Mitigation	Adaptation	Cross-cutting	Core/general	Mitigation	Adaptation	Cross-cutting
2013								
Total contributions through multilateral channels	1,018,244,312.00	532,836.20		71,385,592.76	1,351,922,974.24	707,446.62		94,778,651.47
Multilateral climate change funds	41,576,181.00	504,836.20		31,621,720.00	55,200,695.51	670,271.02		41,984,157.64
Other multilateral climate change funds	2,524,181.00	504,836.20			3,351,355.11	670,271.02		
Multilateral financial institutions, including regional development banks	795,697,223.00			35,214,026.76	1,056,447,202.98			46,753,663.33
Specialized United Nations bodies	180,970,908.00	28,000.00		4,549,846.00	240,275,075.75	37,175.60		6,040,830.50
Total contributions through bilateral, regional and other channels	214,645,311.00	74,038,508.97	33,664,314.31	106,942,487.34	284,977,842.00	98,298,604.58	44,695,053.52	141,984,183.94
Total	1,232,889,623.00	74,571,345.17	33,664,314.31	178,328,080.10	1,636,900,816.24	99,006,051.20	44,695,053.52	236,762,835.41
exchange rate 1 Euro/USD: 1.33								

Table 6.1 : CTF table 7 (2013) Provision of public financial support: summary information in 2013.

Allocation channels	European euro - EUR				USD			
		Climate-specific				Climate-specific		
	Core/general	Mitigation	Adaptation	Cross-cutting	Core/general	Mitigation	Adaptation	Cross-cutting
2014								
Total contributions through multilateral channels	451,782,578.00	12,060,766.00		90,157,228.45	599,425,124.39	16,002,224.33		119,620,610.03
Multilateral climate change funds	23,122,972.00	2,397,972.00		11,440,200.00	30,679,559.25	3,181,629.25		15,178,857.36
Other multilateral climate change funds	2,397,972.00	2,397,972.00			3,181,629.25	3,181,629.25		
Multilateral financial institutions, including regional development banks	190,417,137.00			71,055,842.45	252,645,457.38			94,276,891.76
Specialized United Nations bodies	238,242,469.00	9,662,794.00		7,661,186.00	316,100,107.76	12,820,595.08		10,164,860.91
Total contributions through bilateral, regional and other channels	292,467,298.00	71,403,956.00	134,351,471.00	86,711,871.00	386,775,285.00	94,738,768.82	176,987,205.37	115,049,310.45
Total	744,249,876.00	83,464,722.00	134,351,471.00	176,869,099.45	986,200,409.39	110,740,993.15	176,987,205.37	234,669,920.48
exchange rate 1 Euro/USD: 1.33								

Table 6.2: CTF table 7 (2014) Provision of public financial support: summary information in 2014.

6.1.4 Multilateral climate change-related funds

The Netherlands contributed to the Global Environment Fund (GEF) and the Least Developed Countries Fund (LDCF). The climate relevance of the contribution to the Montreal Protocol has changed from 20% (2013) to 100% (2014) following OESO/DAC guidance.

6.1.5 New and additional financial support

The Netherlands delivered on its commitment of Fast Start Finance during 2010-2012. In the period after Fast Start Finance, we have chosen a more flexible approach. Since 2013, our annual budget for international climate expenditures increases year on year, reaching EUR 550 million in 2016. EUR 100 million in 2015 and EUR 200 million in 2016 will be in the form of mobilised private climate finance. In international negotiations, the Netherlands has pledged to contribute a fair share to the extra costs of mitigation and adaptation to climate change in developing countries. We will also actively engage with private funds in order to understand and address bottlenecks, which currently prevent them from engaging with climate finance in developing countries. From 2015, private funding will be included in the reporting.

The Dutch government announced in its coalition agreement ‘Building Bridges’ that the Netherlands will have an ambitious international climate policy. Based on that political intention, Dutch international climate finance has focused on themes in which the Dutch public and private sectors excel, such as water management, food security and emergency response. Even though there were substantial cuts in the overall development budget (EUR 750 million a year between 2014-2016), a larger share of the budget is dedicated to climate change mitigation and adaptation and this budget will further increase between 2014-2017, owing to our international commitments.

6.2 Contribution through multilateral channels

Remarks to CTF tables 7(a)
Status includes provided, committed or pledged.
Funding source includes ODA = Official Development Assistance or OOF = Other Official Flows
Financial instruments include Grant, Concessional loans, Non-concessional loan, Equity, Other
Type of support includes Mitigation, Adaptation, Cross-cutting (Mitigation and Adaptation), Other.
Sectors include Energy, Transport, Industry, Agriculture, Forestry, Water & Sanitation, Cross-cutting, Other, Not Applicable.

Donor funding	Total amount				Status	Funding source	Financial instrument	Type of support	Sector
	Core/general		Climate-specific						
	European euro - EUR	USD	European euro - EUR	USD					
2013									
Total contributions through multilateral channels	1,018,244,312.00	1,351,922,974.24	71,918,428.96	95,486,098.09					
Multilateral climate change funds	41,576,181.00	55,200,695.51	32,126,556.20	42,654,428.66					
1. Global Environment Facility	19,052,000.00	25,295,340.40	11,621,720.00	15,430,157.64	Provided	ODA	Grant	Cross-cutting	Cross-cutting
2. Least Developed Countries Fund	20,000,000.00	26,554,000.00	20,000,000.00	26,554,000.00	Provided	ODA	Grant	Cross-cutting	Cross-cutting
3. Special Climate Change Fund									
4. Adaptation Fund									
5. Green Climate Fund									
6. UNFCCC Trust Fund for Supplementary Activities									
7. Other multilateral climate change funds	2,524,181.00	3,351,355.11	504,836.20	670,271.02					
Montreal Protocol	2,524,181.00	3,351,355.11	504,836.20	670,271.02	Provided	ODA	Grant	Mitigation	Cross-cutting
Multilateral financial institutions, including regional development banks	795,697,223.00	1,056,447,202.98	35,214,026.76	46,753,663.33					
1. World Bank									

Donor funding	Total amount				Status	Funding source	Financial instrument	Type of support	Sector
	Core/general		Climate-specific						
	European euro - EUR	USD	European euro - EUR	USD					
2013									
2. International Finance Corporation	6,526,702.00	8,665,502.25			Provided	ODA	Grant	Cross-cutting	Cross-cutting
3. African Development Bank	5,607,686.00	7,445,324.70	201,876.70	268,031.69	Provided	ODA	Grant	Cross-cutting	Cross-cutting
4. Asian Development Bank									
5. European Bank for Reconstruction and Development	600,000.00	796,620.00	21,600.00	28,678.32	Provided	ODA	Grant	Cross-cutting	Cross-cutting
6. Inter-American Development Bank									
7. Other	782,962,835.00	1,039,539,756.03	34,990,550.06	46,456,953.32					
International Development Association	182,960,000.00	242,915,992.00	6,586,560.00	8,744,975.71	Provided	ODA	Grant	Cross-cutting	Cross-cutting
					Provided	ODA	Grant	Cross-cutting	
					Provided	ODA	Grant	Cross-cutting	
European Development Fund Association	156,125,000.00	207,287,162.50	7,806,250.00	10,364,358.13	Provided	ODA	Grant	Cross-cutting	Cross-cutting
ODA budget European Union	329,867,000.00	437,964,415.90	16,493,350.00	21,898,220.80	Provided	ODA	Grant	Cross-cutting	Cross-cutting
Regional Development Bank Group	114,010,835.00	151,372,185.63	4,104,390.06	5,449,398.68	Provided	ODA	Grant	Cross-cutting	Cross-cutting
Specialized United Nations bodies	180,970,908.00	240,275,075.75	4,577,846.00	6,078,006.10					
1. United Nations Development Programme	135,877,123.00	180,404,056.21	2,875,000.00	3,817,137.50					
Add specific programme									
UNDP	57,500,000.00	76,342,750.00	2,875,000.00	3,817,137.50	Provided	ODA	Grant	Cross-cutting	
UNDP specific programmes	78,377,123.00	104,061,306.21			Provided	ODA	Grant	Cross-cutting	Cross-cutting

Donor funding	Total amount				Status	Funding source	Financial instrument	Type of support	Sector
	Core/general		Climate-specific						
	European euro - EUR	USD	European euro - EUR	USD					
2013									
2. United Nations Environment Programme	9,648,409.00	12,810,194.11	1,424,846.00	1,891,768.00					
Add specific programme									
UNEP specific programmes	2,524,181.00	3,351,355.11			Provided	ODA	Grant	Cross-cutting	Cross-cutting
UNEP	7,124,228.00	9,458,839.00	1,424,846.00	1,891,768.00	Provided	ODA	Grant	Cross-cutting	Cross-cutting
3. Other	35,445,376.00	47,060,825.43	278,000.00	369,100.60					
FAO	2,500,000.00	3,319,250.00	250,000.00	331,925.00	Provided	ODA	Grant	Cross-cutting	Agriculture
International Fund for Agricultural Development	20,000,000.00	26,554,000.00			Provided	ODA	Grant	Mitigation	Water and sanitation
IFAD specific programmes	5,965,808.00	7,920,803.00			Provided	ODA	Grant	Mitigation	Water and sanitation
UNCCD	140,000.00	185,878.00	28,000.00	37,175.60	Provided	ODA	Grant	Mitigation	Water and sanitation
United Nations Office for Disaster Risk Reduction	1,000,000.00	1,327,700.00			Provided	ODA	Grant	Mitigation	Water and sanitation
FAO specific programmes	5,839,568.00	7,753,194.43			Provided	ODA	Grant	Cross-cutting	Agriculture

exchange rate 1 Euro/USD: 1.33

Table 6.3: CTF table 7(a) (2013) Provision of public financial support: contribution through multilateral channels in 2013.

Donor funding	Total amount				Status	Funding source	Financial instrument	Type of support	Sector
	Core/general		Climate-specific						
	European euro - EUR	USD	European euro - EUR	USD					
2014									
Total contributions through multilateral channels	451,782,578.00	599,425,124.39	102,217,994.45	135,622,834.36					
Multilateral climate change funds	23,122,972.00	30,679,559.25	13,838,172.00	18,360,486.61					
1. Global Environment Facility	20,725,000.00	27,497,930.00	11,440,200.00	15,178,857.36	Provided	ODA	Grant	Cross-cutting	Cross-cutting
2. Least Developed Countries Fund									
3. Special Climate Change Fund									

Donor funding	Total amount				Status	Funding source	Financial instrument	Type of support	Sector
	Core/general		Climate-specific						
	European euro - EUR	USD	European euro - EUR	USD					
2014									
4. Adaptation Fund									
5. Green Climate Fund									
6. UNFCCC Trust Fund for Supplementary Activities									
7. Other multilateral climate change funds	2,397,972.00	3,181,629.25	2,397,972.00	3,181,629.25					
Montreal Protocol	2,397,972.00	3,181,629.25	2,397,972.00	3,181,629.25	Provided	ODA	Grant	Mitigation	Cross-cutting
Multilateral financial institutions, including regional development banks	190,417,137.00	252,645,457.38	71,055,842.45	94,276,891.76					
1. World Bank									
2. International Finance Corporation	7,508,800.00	9,962,675.84	9,962,675.84	13,218,478.30	Provided	ODA	Grant	Cross-cutting	Cross-cutting
3. African Development Bank	3,256,000.00	4,320,060.80	677,248.00	898,572.65	Provided	ODA	Grant	Cross-cutting	Cross-cutting
4. Asian Development Bank	2,242,000.00	2,974,685.60	405,802.00	538,418.09	Provided	ODA	Grant	Cross-cutting	Cross-cutting
5. European Bank for Reconstruction and Development									
6. Inter-American Development Bank									
7. Other	177,410,337.00	235,388,035.14	60,010,116.61	79,621,422.72					
International Development Association	42,019,000.00	55,750,809.20	8,529,857.00	11,317,414.27	Provided	ODA	Grant	Cross-cutting	Cross-cutting
International Bank for Reconstruction and Development	10,845,000.00	14,389,146.00	2,060,550.00	2,733,937.74	Provided	ODA	Grant	Cross-cutting	Cross-cutting
					Provided	ODA	Grant	Cross-cutting	
European Development Fund Association									

Donor funding	Total amount				Status	Funding source	Financial instrument	Type of support	Sector
	Core/general		Climate-specific						
	European euro - EUR	USD	European euro - EUR	USD					
2014									
African Development Bank fund	102,926,170.00	136,562,442.36	42,334,357.13	56,169,225.04	Provided	ODA	Grant	Cross-cutting	Cross-cutting
Asian Development Bank fund	21,620,167.00	28,685,637.58	7,085,352.48	9,400,845.67	Provided	ODA	Grant	Cross-cutting	Cross-cutting
Specialized United Nations bodies	238,242,469.00	316,100,107.76	17,323,980.00	22,985,455.99					
1. United Nations Development Programme	135,269,394.00	179,475,431.96	1,486,340.00	1,972,075.91					
Add specific programme									
UNDP specific programmes	105,542,594.00	140,033,913.72			Provided	ODA	Grant	Cross-cutting	Cross-cutting
UNDP	29,726,800.00	39,441,518.24	1,486,340.00	1,972,075.91	Provided	ODA	Grant	Cross-cutting	Cross-cutting
2. United Nations Environment Programme	7,124,228.00	9,452,426.00	1,424,846.00	1,890,485.00					
Add specific programme									
UNEP	7,124,228.00	9,452,426.00	1,424,846.00	1,890,485.00	Provided	ODA	Grant	Cross-cutting	Cross-cutting
3. Other	95,848,847.00	127,172,249.80	14,412,794.00	19,122,895.08					
FAO	2,500,000.00	3,317,000.00	250,000.00	331,700.00	Provided	ODA	Grant	Cross-cutting	Agriculture
International Fund for Agricultural Development	21,000,000.00	27,862,800.00	9,639,000.00	12,789,025.20	Provided	ODA	Grant	Mitigation	Water and sanitation
UNCCD	118,970.00	157,849.40	23,794.00	31,569.88	Provided	ODA	Grant	Mitigation	Water and sanitation
World Food Programme	36,000,000.00	47,764,800.00	4,500,000.00	5,970,600.00	Provided	ODA	Grant	Cross-cutting	Agriculture, Cross-cutting
FAO specific programmes	7,443,737.00	9,876,350.25			Provided	ODA	Grant	Cross-cutting	Agriculture
WFP Specific programmes	25,518,140.00	33,857,468.15			Provided	ODA	Grant	Cross-cutting	Cross-cutting
IFAD Specific programmes	3,268,000.00	4,335,982.00			Provided	ODA		Mitigation	Water and sanitation

exchange rate 1 Euro/USD: 1.33

Table 6.4: CTF table 7(a) (2014): Provision of public financial support: contribution through multilateral channels in 2014.

6.3 Provision of public financial support: contribution through bilateral, regional and other channel.

The financial contribution through bilateral and regional channels also includes the financial contribution to multilateral organisations when provided to countries and regions in specific programmes (for example, through embassies in non-Annex I countries).

Remarks:
Status includes provided, committed or pledged.
Funding source includes ODA = Official Development Assistance or OOF = Other Official Flows
Financial instruments include Grant, Concessional loans, Non-concessional loan, Equity, Other
Type of support includes Mitigation, Adaptation, Cross-cutting (Mitigation and Adaptation), Other.
Sectors include Energy, Transport, Industry, Agriculture, Forestry, Water & Sanitation, Cross-cutting, Other, Not Applicable.

Recipient country/ region/project/programme	Total amount		Status	Funding source	Financial instrument	Type of support	Sector
	Climate-specific						
	European euro - EUR	USD					
2013							
Total contributions through bilateral, regional and other channels	214,645,310.62	284,977,842.04					
worldwide /	33,664,314.31	44,695,053.52	Provided	ODA	Grant	Adaptation	Cross-cutting
worldwide /	72,271,705.72	95,952,875.36	Provided	ODA	Grant	Mitigation	Cross-cutting
Burundi /	4,011,612.40	5,326,091.87	Provided	ODA	Grant	Cross-cutting	Energy, Agriculture
Benin /	8,121,700.77	10,782,927.21	Provided	ODA	Grant	Cross-cutting	Energy, Agriculture, Water and sanitation
Ethiopia /	6,425,302.40	8,530,672.33	Provided	ODA	Grant	Cross-cutting	Agriculture, Forestry, Cross-cutting
Ghana /	2,861,707.61	3,799,399.37	Provided	ODA	Grant	Cross-cutting	Agriculture, Forestry, Cross-cutting
Kenya /	6,123,812.00	8,130,393.00	Provided	ODA	Grant	Cross-cutting	Water and sanitation, Other (Biodiversity)
Marocco /	87,616.20	116,325.28	Provided	ODA	Grant	Cross-cutting	Water and sanitation
Mali /	3,251,543.11	4,316,971.73	Provided	ODA	Grant	Cross-cutting	Energy, Cross-cutting
Mozambique /	19,490,239.92	25,876,579.82	Provided	ODA	Grant	Cross-cutting	Energy
Senegal /	1,304,999.99	1,732,607.53	Provided	ODA	Grant	Cross-cutting	Energy, Cross-cutting
South Africa /	791,776.00	1,051,216.14	Provided	ODA	Grant	Mitigation	Energy
Regional Africa /	33,914,003.45	45,026,557.95	Provided	ODA	Grant	Cross-cutting	Energy, Agriculture, Forestry, Water and sanitation
Bangladesh /	11,909,730.00	15,812,174.72	Provided	ODA	Grant	Cross-cutting	Energy, Agriculture, Water and sanitation, Cross-cutting

Recipient country/ region/project/programme	Total amount		Status	Funding source	Financial instrument	Type of support	Sector
	Climate-specific						
	European euro - EUR	USD					
2013							
Indonesia /	1,919,034.00	2,547,841.21	Provided	ODA	Grant	Cross-cutting	Energy, Agriculture, Water and sanitation, Cross-cutting
Mongolia /	44,833.58	59,524.13	Provided	ODA	Grant	Cross-cutting	Energy, Cross-cutting
Pakistan /	975,027.25	1,294,513.08	Provided	ODA	Grant	Mitigation	Energy
Viet Nam /	190,683.94	253,165.08	Provided	ODA	Grant	Cross-cutting	Water and sanitation, Cross-cutting
Bolivia /	1,918,973.91	2,547,761.43	Provided	ODA	Grant	Cross-cutting	Agriculture, Water and sanitation, Cross-cutting
Brazil /	20,494.10	27,209.37	Provided	ODA	Grant	Cross-cutting	Forestry, Cross-cutting
Colombia /	3,874,088.27	5,143,505.41	Provided	ODA	Grant	Cross-cutting	Agriculture, Forestry, Cross-cutting
Surinam /	678,294.40	900,550.19	Provided	ODA	Grant	Cross-cutting	Forestry, Cross-cutting
Regional Latin America /	793,817.29	1,053,926.31	Provided	ODA	Grant	Cross-cutting	Forestry, Water and sanitation

exchange rate 1 Euro/USD: 1.33

Table 6.5: CTF table 7(b) (2013): Provision of public financial support: contribution through bilateral, regional and other channels in 2013.

Recipient country/ region/project/programme	Total amount		Status	Funding source	Financial instrument	Type of support	Sector
	Climate-specific						
	European euro - EUR	USD					
2014							
Total contributions through bilateral, regional and other channels	292,467,298.00	386,775,284.64					
worldwide /	53,590,785.00	71,104,253.54	Provided	ODA	Grant	Adaptation	Cross-cutting
worldwide /	44,568,171.00	59,133,049.28	Provided	ODA	Grant	Mitigation	Cross-cutting
worldwide /	74,390,000.00	98,700,652.00	Provided	ODA	Grant	Cross-cutting	Cross-cutting
Benin /	10,042.00	13,323.73	Provided	ODA	Grant	Mitigation	
Ethiopia /	1,182,938.00	1,569,522.14	Provided	ODA	Grant	Cross-cutting	Agriculture, Forestry, Cross-cutting
Benin /	6,070,585.00	8,054,452.18	Provided	ODA	Grant	Adaptation	
Benin /	4,416,241.00	5,859,468.56	Provided	ODA	Grant	Cross-cutting	
Burundi /	1,043,168.00	1,384,075.30	Provided	ODA	Grant	Adaptation	Energy, Agriculture
Burundi /	231,600.00	307,286.88	Provided	ODA	Grant	Mitigation	

Recipient country/ region/project/programme	Total amount		Status	Funding source	Financial instrument	Type of support	Sector
	Climate-specific						
	European euro - EUR	USD					
2014							
Ethiopia /	8,808,005.00	11,686,461.03	Provided	ODA	Grant	Adaptation	
Ethiopia /	966,467.00	1,282,308.42	Provided	ODA	Grant	Cross-cutting	
Ghana /	1,909,660.00	2,533,736.89	Provided	ODA	Grant	Adaptation	Agriculture, Forestry, Cross-cutting
Ghana /	2,613,768.00	3,467,947.38	Provided	ODA	Grant	Mitigation	
Great Lakes Region /	1,939,907.00	2,573,868.61	Provided	ODA	Grant	Adaptation	
Kenya /	6,700,687.00	8,890,471.51	Provided	ODA	Grant	Adaptation	Water and sanitation, Other (Biodiversity)
Kenya /	935,263.00	1,240,906.95	Provided	ODA	Grant	Mitigation	
Mali /	4,211,108.00	4,316,971.73	Provided	ODA	Grant	Adaptation	Energy, Cross-cutting
Mozambique /	3,077,405.00	4,083,100.95	Provided	ODA	Grant	Mitigation	Energy
Mozambique /	10,461,396.00	13,880,180.21	Provided	ODA	Grant	Adaptation	
Rwanda /	7,754,923.00	10,289,231.84	Provided	ODA	Grant	Adaptation	Energy, Cross-cutting
Senegal /	1,000,314.00	1,327,216.62	Provided	ODA	Grant	Mitigation	
Senegal /	400,000.00	530,720.00	Provided	ODA	Grant	Adaptation	
South Sudan /	1,746,164.00	2,316,810.40	Provided	ODA	Grant	Adaptation	Water and sanitation
Uganda /	5,419,235.00	7,190,241.00	Provided	ODA	Grant	Adaptation	Energy
Uganda /	84,009.00	111,463.14	Provided	ODA	Grant	Mitigation	
Regional Africa /	2,253,022.00	2,989,309.59	Provided	ODA	Grant	Adaptation	Energy, Agriculture, Forestry, Water and sanitation
Regional Africa /	17,083,200.00	22,665,989.76	Provided	ODA	Grant	Mitigation	
Regional Africa /	4,174,798.00	5,539,121.99	Provided	ODA	Grant	Cross-cutting	
Afghanistan /	3,800,000.00	5,041,840.00	Provided	ODA	Grant	Adaptation	
Bangladesh /	12,480,357.00	16,558,937.67	Provided	ODA	Grant	Adaptation	
Bangladesh /	425,600.00	564,686.08	Provided	ODA	Grant	Cross-cutting	
Indonesia /	1,410,734.00	1,871,761.87	Provided	ODA	Grant	Adaptation	Energy, Agriculture, Water and sanitation, Cross-cutting
Indonesia /	711,170.00	943,580.36	Provided	ODA	Grant	Mitigation	
Indonesia /	347,079.00	460,504.42	Provided	ODA	Grant	Cross-cutting	
Palestinion Authority	66,880.00	88,736.38	Provided	ODA	Grant	Mitigation	
Pakistan /	664,300.00	881,393.24	Provided	ODA	Grant	Mitigation	
Yemen /	894,547.00	1,186,884.96	Provided	ODA	Grant	Adaptation	
Regional Asia /	2,432,000.00	3,226,777.60	Provided	ODA	Grant	Adaptation	Energy
Regional Asia /	146,000.00	193,712.80	Provided	ODA	Grant	Mitigation	
Bolivi /	166,919.00	221,468.13	Provided	ODA	Grant	Adaptation	
Brazil /	712.00	944.68	Provided	ODA	Grant	Cross-cutting	Forestry, Cross-cutting

Recipient country/ region/project/programme	Total amount		Status	Funding source	Financial instrument	Type of support	Sector
	Climate-specific						
	European euro - EUR	USD					
2014							
Colombia /	858,269.00	1,138,751.31	Provided	ODA	Grant	Adaptation	Agriculture, Forestry, Cross-cutting
Colombia /	211,834.00	281,061.35	Provided	ODA	Grant	Mitigation	
Surinam /	463,571.00	615,066.00	Provided	ODA	Grant	Cross-cutting	Forestry, Cross-cutting
Regional Latin America /	344,465.00	457,036.16	Provided	ODA	Grant	Cross-cutting	Forestry, Water and sanitation

exchange rate 1 Euro/USD: 1.33

Table 6.6: CTF table 7(b) (2014): Provision of public financial support: contribution through bilateral, regional and other channels in 2014.

6.4 Provision of technological development and transfer support

Support for technological development and transfer is an important element of the Dutch climate finance expenditures. The private sector and several knowledge institutes are partners in providing this support. The combined innovative and financial strengths of these parties are essential to meet the challenges of climate change together with the government. An example of the strong interaction is the close collaboration with Dutch FMO (Dutch Development Bank) in what is known as the Global Innovation Lab for Climate Finance. FMO developed an innovative climate fund, which was judged to be the best proposal out of 90 different ideas that were analysed by the Innovation Lab.

The Netherlands Enterprise Agency has various climate-relevant programmes to support sustainable economic growth in developing countries and emerging markets. These programmes focus on innovative investment projects, transfer of technology, and knowledge and skills in social and economic sectors. The main programmes are listed in Table 6.7 and are summarised below. Climate-relevant topics are also indicated for each fund.

Measures and activities related to technology transfer	Recipient country and/or region	Targeted area	Sector	Source of the funding for technology transfer	Activities undertaken by	Status	Additional information
Private Sector Investment Programme	Worldwide	Mitigation	Energy Agricultu re	Public	Private	Impleme nted	Cooperation between Dutch companies and local companies
Facility for Sustainable Entrepreneurship and Food Security	Worldwide	Adaptation	agricultur e	Public	Public and Private	Impleme nted	Public-private partnerships in the field of food security and private sector development,
Sustainable Water Fund	Worldwide	Adaptation	Water and sanitation	Public	Public and Private	Impleme nted	Public-Private Partnership facility in the field of water and sanitation
Dutch Risk Reduction Team	Worldwide	Mitigation and	Water and	Public	Public and Private	Impleme nted	Swift response team to advise governments on

Measures and activities related to technology transfer	Recipient country and/or region	Targeted area	Sector	Source of the funding for technology transfer	Activities undertaken by	Status	Additional information
		Adaptation	sanitation				water safety issues
EnDev	Worldwide	Mitigation	Energy	Public and Private	Public	Implemented	Access to local renewable energy
National Geothermal Capacity Building	Indonesia	Mitigation	Energy	Public	Public	Implemented	Knowledge transfer on geothermal energy
Energy Sector Management Assistance Programme	Worldwide	Mitigation	Energy	Public and Private	public	Implemented	Knowledge transfer on geothermal energy

Table 6.7: CTF Table 8 : Provision of technological development and transfer support.

Private Sector Investment Programme or PSI
Mentioned in first Biennial Report, PSI is a Dutch government programme that supports innovative investment projects in emerging markets in Africa, Asia, Central and Eastern Europe and Latin America. A PSI project is an investment project, implemented by a Dutch or foreign company in cooperation with a local company in one of the eligible developing countries. Supported projects include climate-relevant initiatives such as renewable electricity production, biofuel production and crop improvement.

The Facility for Sustainable Entrepreneurship and Food Security (FDOV)
This facility encourages public-private partnerships in the field of food security and private sector development in developing countries. Essentially, this means that government bodies, industry and non-governmental organisations (NGOs) or knowledge institutions form a collaborative venture with the Ministry of Foreign Affairs and, in return, can be eligible for a grant. The overall objective is to improve the food security situation and to strengthen the private sector in developing countries, in the best interests of the overall population. Given the increased understanding of the effects of climate change, also for food security, contribution to climate smart agriculture is one of the evaluation criteria of the facility.

The Sustainable Water Fund
This fund is a public-private partnership facility in the field of water and sanitation, which aims to contribute to water safety and water reliability in developing countries. The Fund facilitates new initiatives for cooperation with private parties. A wide array of parties within the water sector has been involved, through the Netherlands Water Partnership (NWP) and the Dutch Ministry of Economic Affairs, and participated in consultations with NGOs, business, knowledge institutes and government agencies. Themes include climate-relevant topics such as efficient water usage, safe deltas and improved basin management.

Dutch Risk Reduction Team
Climate change will increase water-related risks. The Netherlands is renowned for its expertise on water management and risk prevention, and we aim to make this knowledge available to other countries. This is why the Dutch government together with the Dutch water sector founded our Risk Reduction Team (DRR team). The DRR team is able to cover the entire disaster management cycle from mitigation, preparedness and response to recovery. For instance, when a country has been struck by severe flooding and the first

emergency relief workers have gone, the need for advice on how to build a sustainable and safer water future arises. To meet these needs with a swift response, the DRR team of experts advises governments on how to resolve urgent water issues related to flood risks, water pollution and water supply, to prevent disasters or to rebuild after water-related disasters.

Energising Development Partnership Programme
Mentioned in the first Biennial Report, EnDev contributes to making local, renewable energy accessible in 24 developing countries to mainly rural and peri-urban populations, social institutions, and small and medium-sized enterprises in Africa, Asia and Latin America. This is done by establishing economically sustainable energy solutions and distribution schemes, mainly for rural communities. More detailed information on the technogy cooperation projects withing EnDev is available at Endev website[40].

Geothermal Alliance (National Geothermal Capacity Building Programme), Indonesia (EUR 0.71 million in 2014)
Indonesia has geothermic potential at various locations, adding up to 27,000 MW. In 2008, only 1,052 MW (5%) was being used. A challenge for achieving their geothermal goals is the lack of knowledge and capacity at the provincial governments and knowledge institutes about assessing the geothermal potential and planning and developing geothermal production. The goal of this public-private partnership is to develop and strengthen the structure of human resources development, needed to provide manpower for the development and implementation of the planned geothermal energy capacity in Indonesia.

DME Energy Sector Management Assistance Programme ESMAP (2011-2014), Worldwide (EUR 5.32 million in 2014)
ESMAP supports, among other things, geothermal energy capacity and resource risk mitigation through South-South cooperation (support for targeted research, design and preparation, capacity development and knowledge dissemination). The Netherlands has specific expertise on how to improve the success rate of geothermal test drilling and how to mitigate geothermal resource risks. Through a trilateral approach it will also build upon the experience of countries with a track record in geothermal development (Indonesia, Kenya, Philippines and Turkey) that are open to share lessons with peer countries in the South.

6.5 Provision of capacity building support

The Netherlands reported in its first Biennial Report that capacity-building and institutional strengthening is one of the selection criteria in its assessments of projects and programmes. This policy was continued during 2013-2014. In total, the Netherlands supported almost 170 different climate-relevant programmes and projects that included capacity building activities. Table 6.8 gives a selection of relevant projects and programmes and some example projects and programmes are summarised below.

Examples:
1.The Netherlands continued to support the Climate and Development Knowledge Network (CDKN) (EUR 2.07 million in 2014, total Dutch contribution of EUR 18 million in 2009 - 2017), which helps developing countries to mitigate and manage climate change while simultaneously achieving their objectives of poverty reduction and human development. The network offers government leaders and other decision-makers a combination of technical assistance, research and knowledge-sharing services that responds to their domestic needs for planning, financing and delivering climate compatible development. CDKN offers a demand-led approach whereby decision-makers determine the kind of

[40] http://endev.info/content/Main_Page and then selecting a country

support they need and CDKN helps to align it with the broader context of development policies and planning.

In the period under review, CDKN conducted training courses for hundreds of negotiators from poor and vulnerable countries to strengthen their familiarity with the UNFCCC negotiating structure, governance and processes and to help them to participate effectively in negotiations.

In 2013, CDKN supported Kenya's Horticultural Crops Development Authority and the Kenya Flower Council with the development of accounting and management standards for greenhouse gas emissions, energy efficiency and water use. The toolkit that was developed helps individual farms to track resource use, and it also helps the Kenya Flower Council to collect and analyse data for the sector as a whole.

2. In 2013-2014, the Netherlands continued its support for Partners for Resilience (PFR), a partnership of the Netherlands Red Cross, CARE Netherlands, Cordaid, the Red Cross Climate Centre and Wetlands International. PFR contributes to the resilience of communities by integrating climate change adaptation, ecosystem management and restoration into disaster risk reduction. This approach helps communities to strengthen their capacities to reduce the impact of disasters. In 2014, half a million people in 9 countries were made more resilient to climate change hazards. For example, 84,000 Ethiopian farmers learned small-scale irrigation and soil conservation methods.

3. Risk management programme Beni (EUR 0.17 million in 2014)
The Netherlands contributes to this World Bank programme, whose goal is to reduce flood vulnerability – in terms of lives, production, environmental and cultural heritage. The "Flood Risk Management in the Beni - Living with Water" programme includes the following six components to focus on long-term flood prevention: (1) system of coordination, (2) early warning system, (3) land management, (4) prevention plans and risk management, (5) improved hydro-agricultural production systems, (6) ecosystem conservation through SEAs and EIAs. Overall, the project will help reduce the number of flood-prone households by 30% in targeted municipalities and will benefit 1,426,000 people, 52% of whom are women.

Table 6.8: CTF Table 9 : Provision of capacity-building support.

Recipient country/region	Targeted area	Programme or project title	Description of programme or project
Latin America and the Cribbean, Africa, Asia Pacific	Mitigation	Climate and Development Knowledge Network (DCKN)	Helps developing countries to mitigate and manage climate change while simultaneously achieving their objectives of poverty reduction and human development
Ethiopia, Guatemala, India, Indonesia, Kenya, Mali, Nicaragua, the Philippines and Uganda	Adaptation	Partners for Resilience (PFR)	A partnership of the Netherlands Red Cross, CARE Netherlands, Cordaid, the Red Cross Climate Centre and Wetlands International. PFR contributes to the resilience of communities by integrating climate change adaptation, ecosystem management and restoration into disaster risk reduction
Beni, Bolivia	Adaptation	Risk management programme	The Netherlands is one of the donors to the World Bank programme, whose goal is to reduce flood vulnerability
Ethiopia	Adaptation	Agricultural Growth Program	The Netherlands is one of the donors to the Ethiopian Agricultural Growth Programme and focuses on capacity building for scaling up of evidence-based practices in agricultural production, taking into account resilience for climate change
Mozambique	Adaptation	Zambezi Valley Agency	Project focused on the sustainable and inclusive development of the Zambezi Valley
Bangladesh	Adaptation	SaFaL Food Security	Sustainable Agriculture, Food Security and Linkages (SaFaL) programme in the south west of Bangladesh.

Recipient country/region	Targeted area	Programme or project title	Description of programme or project
			SaFaL aims to trigger and facilitate bio and ecosystem-based economic development making farmers better agricultural entrepreneurs
Ghana	Adaptation	CORIP-GHANA	Programme focused on the improvement of the cocoa sector in Ghana, including adaption to climate change
Ethiopia, Senegal, Uganda, Burkina Faso, Kenya, United Republic of Tanzania	Mitigation	African Biogas Partnership Program – ABPP	The African Biogas Partnership Program (ABPP) builds a commercial biogas sector in six African countries. Since its start in 2009, 15,000 biogas installations have been constructed, providing households with clean energy, organic fertilizer, and a safer and healthier living environment
Africa	Mitigation	PPIAF Climate Change Agenda 2011-2013	The PPIAF (Public-Private Infrastructure Advisory Facility) is a multi-donor fund of the World Bank, which offers technical assistance to developing countries in preparation of infrastructure development through public-private partnerships. PPIAF focuses the creation of an enabling environment for infrastructure development by the private sector. Dutch support to PIAFF is channelled through the 'Integrating Climate Change Agenda with Public Private Partnerships Programme'. Infrastructure is a necessary condition for economic growth. It unlocks international and regional markets, saves time and means for business, contributes to self-reliance, rise in production as well as improvement of welfare.
Bolivia	Adaptation	VIVIR CON EL AGUA – Management of flood risks in the Beni	The main problem in Beni area are the annual floods caused by intense rainfall in the basins of local rivers, the Andean basins of the Chapare and Yungas and large-scale flooding that occurs in the years of El Niño and La Niña.
Africa, Middle East and North Africa, Asia Pacific, Latin America and the Caribbean, LDCs, SIDS	Adaptation	DMH/HH WW/ISDR	ISDR aims to improve political and financial attention to Disaster Risk Reduction (DRR). Eventually, this will contribute to the Hyogo Framework of Action (HFA, which was designed in the UN after the 2004 tsunami). DRR is supposed to be integrated in policy and local institutions should be encouraged to focus on disaster management. DDR should be an integral aspect of national response to disasters and reconstruction.
Latin America and the Caribbean, Asia Pacific, Africa, Bangladesh, Benin, Bolivia, Burkina Faso, Burundi, Cambodia, Ethiopia, Ghana, Honduras, Indonesia, Kenya, Liberia, Madagascar, Malawi, Mali, Mozambique, Nepal, Nicaragua, Peru, Rwanda, Senegal, Uganda, Viet Nam, United Republic of Tanzania	Mitigation	ENDEV - Energising Development: connecting millions to energy services.	The main goal of EnDev is to provide energy access for poor households, social institutions and small and medium enterprises. This must be renewable energy (wind, solar, biomass, hydropower) and it should enhance the livelihoods and, where possible, the income of the poor people targeted by the projects. In addition to improved livelihoods, better health is also an important impact of the EnDev projects. Every year, an estimated 500,000 women worldwide die because of air pollution and fire accidents as a consequence of indoor wood cooking. The use of improved cooking stoves with chimneys provided by EnDev can help significantly reduce this number

Recipient country/region	Targeted area	Programme or project title	Description of programme or project
Bolivia	Adaptation	Apoyo al Plan Estratégico Institucional de la Fundación Amigos de la Naturaleza (PEI-FAN)	The FAN (Friends of Nature Foundation) project focuses on the management of protected areas for biodiversity conservation and the generation of scientific research and legislation with respect to biodiversity. The project stimulates communal and municipal reinforcement for biodiversity conservation in relation to the effects of climate change. The implementation is based on the development and examination of instruments for spatial management of protected areas, mitigation and adaptation and the role of institutions on three levels: national, departmental and municipal. The project also strives to offer a platform for flexible service to further the implementation of national biodiversity strategies.
Viet Nam	Adaptation	Ho Chi Min City Flood and Inundation Management Project	Vietnam is one of the most disaster-prone countries in the world and together with coastal typhoons flood is the natural disaster that causes most suffering. Not surprisingly the areas most prone to these disasters are some of the poorest parts of the country. Some solutions have already been implemented or are currently implemented, such as a drainage project, environmental sanitation programme and the flood control programme supported by the Government of Vietnam (with support of JICA, World Bank and ADB). However, further measures and assistance are urgently required. Dutch expertise on water is useful, as the Netherlands is a country with a vast experience in flood management. Implementation of the project should contribute to alleviating flooding and inundation problems of HCMC through an integrated approach for flood and inundation management and by strengthening the technical and management capabilities of the Ho Chi Min City Steering Centre of Flood Control Programme and relevant Vietnamese agencies.
Mali	Adaptation	PASARC/NEF	Make significant progress in reducing poverty and hunger by targeting 100,000 people, spread over 14,300 households in 200 communities in the Mopti region. Additionally, the programme will strengthen the capacity of communities to address the sources of conflict and promote reconciliation between different ethnic groups, emphasizing stability and social cohesion. The investment fund aims to ensure better food security through enhanced water management efficiency and other measures that increase the resilient to climate change of the population.
Viet Nam	Adaptation	Flood Management and Mitigation Programme	The Flood Management and Mitigation Programme (FMMP) builds on the Mekong River Commission's (MRC) Flood Management and Mitigation Strategy Implementation Programme (FMMSIP). The FMMP provides support through technical assistance, training and capacity building to identify flood risks in time and provide and install warning mechanisms.

Recipient country/region	Targeted area	Programme or project title	Description of programme or project
Benin, Brazil, Congo, Egypt, Ethiopia, India, Indonesia, Kenya, Mali, Mozambique, Pakistan, Rwanda, Sudan	Adaptation	UNDP Cap-Net Phase 3	Cap-Net is UNDP's global network to strengthen capacity building at the local level towards sustainable management and development of water resources and improved access to water supply and sanitation. Better resource and service management will result in a more sustainable use of increasingly scarce water resources, a reduction in water pollution, more productive water use, prevention of conflicts over water access and improved health.
Afghanistan	Adaptation	ICARDA	ICARDA contributes to economic growth and poverty alleviation in dry regions through sustainable increase in agricultural production. The main target group are the 'resource poor' who have insufficient means for their daily living, who are dependent on agriculture and herding of cattle and are vulnerable to food insecurity. Through research and technological development ICARDA contributes to agricultural productivity, an increase in the average income from agriculture and cattle herding and the sustainable use of natural resources.
Indonesia	Adaptation	Joint Cooperation Program Hydro Climate (JCP)	The Joint Cooperation Programme is part of the 'Water Mondiaal' Programme within the framwork of the Dutch National Water Plan (2010-2015), within which Dutch expertise on water is transferred abroad. Indonesia is one of the five delta areas that take part in this collaboration. The JCP stimulates the sustainable development of agriculture, fisheries, forestry, sanitation, water management and coast protection. JCP emphasizes the need to take climate change into account in national, regional and global political-economic framework, to secure sustainable socio-economic development.
LDCs	Adaptation	Contribution to the Least Developed Countries Fund for Climate Change	The goal of the Least Developed Countries Fund (LDCF) is to support the Least Developed Countries (LDC's) to become climate resilient by integrating adaptation measures in development policies, plans, programmes, projects and actions. The LDCF was established to address the special needs of the Least Developed Countries (LDCs) under the Climate Convention. The LDCF was tasked with financing the preparation and implementation of National Adaptation Programs of Action (NAPAs). NAPAs use existing information to identify a country's priorities for adaptation actions. Consistent with the NAPAs, the LDCF focuses on reducing the vulnerability of those sectors and resources that are central to development and livelihoods, such as water; agriculture and food security; health; disaster risk management and prevention; infrastructure; and fragile ecosystems. NAPA implementation projects under LDCF are designed entirely in accordance with country priorities and executed by national stakeholders, and involving active participation of vulnerable communities.
Africa, Middle East and North Africa, Asia Pacific, Latin America and the Caribbean, LDCs, SIDS	Adaptation	World Resources Institute (WRI)	The Dutch government supports WRI's work on international climate change issues. WRI's climate programme affects international climate policy to a large extent. 8 countries are using the National Adaptation Capacity framework as part of their adaptation plans.

Table 6.8: CTF Table 9 : Provision of capacity-building support.

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GLOSSARY

CHEMICAL COMPOUNDS

C	Carbon
CH_4	Methane
CO	Carbon monoxide
CO_2	Carbon dioxide
CO_2-eq.	Carbon dioxide equivalent (in this report using a GWP-100)
HFCs	Hydrofluorocarbons
HCFCs	Hydrochlorofluorocarbons
HCFC22	Hydrochlorofluorocarbons
NMVOC	Non-Methane Volatile Organic Compounds
NF_3	Nitrogentrifluorides
N_2O	Nitrous oxide
NO_x	Nitrogen oxides (NO and NO_2), expressed as NO_2
PFCs	Perfluorocarbons
SF_6	Sulphur hexafluoride
SO_2	Sulphur dioxide

UNITS

Gg	Giga gramme (10^9 gramme = kton)
GJ	Giga Joule (10^9 Joule)
g/km	gram per lilometer
ha	hectare
kton	kilo ton (= 1,000 metric ton = 1 Kton)
km/h	kilometre per hour
kW	kilo Watt (1000 Watt)
kWh	kilo Watt hour
mg/km	milligrams per kilometer
mld	1,000 million
mln	million
Mton	Mega ton (= 1,000,000 metric ton = 1 Tg)
MW	MegaWatt
Nm^3	Normal cubic metre (volume of gas at 10^5 Pa and 20°C)
Pg	Peta gramme (10^{15} gramme)
PJ	Peta Joule (10^{15} Joule)
TJ	Tera Joule (10^{12} Joule)
Tg	Tera gramme (10^{12} gramme= Mton)
US$	US Dollar
USD	US Dollar
€	Euro
EUR	Euro

ABBREVIATONS

A

ABPP	The African Biogas Partnership Program
ADB	Asian Development Bank
AEA	Annual Emission Allocation
AER	Annual Environmetal Reports
AfrDB	African Development Bank
AsDB	Asian Development Bank
AR	Afforestation / Reforestation
AR2	2nd IPCC Assessment Report
AR4	4th IPCC Assessment Report

B

BEA	Borgingscommissie Energie Akkoord (Standing Committee to the Agreement on Energy for Sustainable Growth
BEES(/A)	Order governing combustion plants emission requirements (Besluit Emissie-Eisen Stookinstallaties)
BEMS	Emission Requirements Combustion Installation Decree
BLOW	Intergovernmental Wind Energy Agreement
BR	Biennial Report

C

CBS	Netherlands Statistics (Centraal Bureau voor de Statistiek)
CCPM	Common and Coordinated Policies and Measures (of EU)
CCS	Carbon Capture and Storage
CDKN	Climate and Development Knowledge Network
CDM	Clean Development Mechanism
CER	Certified Emission Reductions Unit
CHP	Combined Heat and Power (= WKK)
CMP	Conference of Membership (parties) of the (Kyoto) Protocol
CP	Conference of Parties
CRF	Common Reporting Format
CTF	Common Tabular Format

D

D	Deforestation
DAC	Development Assistance Committee
DCKN	Climate and Development Knowledge Network
DRR	Dutch Risk Reduction (Team)
DSM	Dutch State Mines

E

EB	Energie Belastingafspraken
EBG	Energie Besparingssysteem in de Glastuinbouw
EBRD	European Bank for Reconstruction and Development
EC	European Commission/European Community
ECN	Netherlands Energy Research Centre (Energie Centrum Nederland)
EDF	European Development Fund
EED	Energy Efficiency Directive
EF	Emission Factor
EFISCEN	European Forest Information Scenario Model
EIA	Energie Investerings Aftrek (Energy Investment Allowance)
EnDev	Energising Development Partnership Program
ENINA	Task Force on Energy, Industry and Waste Management
EPA	Energie Prestatie Advies (Energy Performance Assesment)
EPBD	Energy Performance of Buildings Directive
EPC	Energy performance coefficient
EPK	Energie Prestatie Keurmerk (Periodical Energy Performance Assesment)
EPN	Energy performance Standard (Energie Prestatie Norm)
ER	Emissions Registration
ERU	Emission Reduction Unit
ESD	Effort Sharing Decision
ESMAP	Energy Sector Management Assistance Programme
ETS	Emission Trading Scheme
EU	European Union
EUA	European Union Allowance Unit
EU-ETS	European Union Greenhouse Gas Emission Trading System
EUR	Euro's
EUTL	European Union Transaction Log
EZ	Ministry of Economic Affairs (Ministerie van Economische Zaken)

F

FAN	Friends of Nature Foundation
F-gases	Fluorinated greenhouse gases (HFCs, PFCs, SF_6)
FAO	Food and Agriculture Organisation of the United Nations
FCPF	The Forest Carbon Partnership Facility
FDOV	Facility for Sustainable Entrepreneurship and Food Security
FM	Forest Management
FMMP	The Flood Management and Mitigation Programme
FMRL	Forest Management Reference level

G

GEF	Global Environmental Fund
GHG	Green House Gas
GPS	Global Positioning System
GWP	Global Warming Potential

H

HCMC	Ho Chi Min City
HNT	Het Nieuwe Telen (The Next Generation Cultivation)

I

IBRD	International Bank for Reconstruction and Development
ICSID	International Centre for Settlement of Disputes
IDA	International Development Association
IDB	Interamerican Development Bank
IFAD	International Fund for Agricultural Development
IFC	International Finance Corporation
I&M	Ministry of Infrastructure and the Environment (Ministerie van Infrastructuur en Milieu)
IMO	International Maritime Organisation
IOC	Intergovernmental Oceanographic Commission of UNESCO
IPCC	Intergovernmental Panel on Climate Change
IVDM	Institute for Sustainable Mobility

J

JI	Joint Implementation
JCP	Joint Cooperation Program Hydro Climate

K

KEI	Kenniscentrum Energie Internationaal
KP	Kyoto Protocol

L

LDC	Least Developed Countries
LDCF	Least Developed Countries Fund
LEE	Long-Term Agreement on Energy Efficiency for ETS companies (= MEE)
LEI	Agricultural Economics Institute (Landbouw Economisch Instituut)
LNV	Ministry of Agriculture, Nature and food quality (former ministry now EZ)
LTA	Long-Term Agreement (= MJA)
LULUCF	Land-use, Land-Use Change and Forestry

M

MEWAT	Taskforce on Water
MEE	Long-term Agreement Energy Efficiency for ETS companies (= LEE)
MEP	Environmentally Friendly Electricity Production Programme
MIA	Milieu Investeringsaftrek
MIGA	Multilateral Invetsmen Gurantee Agency
MJA	Long Term Agreement (= LTA) (Meerjaren afspraak)
MRC	Mekong River Commission'
MS	Member State (s)

N

NA	Not Applicable
NAPA	National Adaptation Programs of Action
NEV	Nationale Energie Verkenning (Nathionals Energy Outlook)
NGO	Non-Governmental Organisation
NIE	National Inventory Entity (Single National Entity under Kyoto Protocol)
NL Agengy	Agentschap NL
NIR	National Inventory Report
NWP	Netherlands Water Partnership

O

ODA	Official Development Assistance
OECD	Organisation for Economic Co-operation and Development
OOF	Other Official Flows

P

PaMs	Policies and measures
PBL	Netherlands Environmental Assessment Agency
PCF	Protocol Carbon Funds
PEI	Plan Estratégico Institucional
PFR	Partners for Resilience
PMR	Partnership for Market Readiness
PPIAF	Public-Private Infrastructure Advisory Facility
PRTR	Pollutant Release and Transfer Register
PSI	Private Sector Investments

Q

QA	Quality Assurance
QC	Quality Control

R

REB	Regulatory Energy Tax
REDD	Reducing Emissions from Deforestation and Forest Degradation
REB	The Regulatory Energy Tax
RED	Renewable Energy Directive
RDE	Real Driving Emissions
RICE	Commision Regulation International Credit Entitlements
RIVM	National Institute of Public Health and the Environment (Rijksinstituut voor Volksgezondheid en Milieu)
ROB	Reduction Programme for non-CO_2 greenhouse gases (Reductieprogramma Overige Broeikasgassen)
RVO	Rijksdienst voor Ondernemend Nederland (Netherlands Enterprise Agency)

S

SAFAL	Sustainable Agriculture, Food Security and Linkages Programme
SDE+	Stimulation of Sustainable Energy Production (Stimulering Duurzame Energieproductie)
SER	Sociaal economische Raad (Social Economic Counsel)
SGEI	Services of General Economic Interest
SIDS	Small Island Developing States
SLOK	Stimulating Local Climate Initiatives (Stimulering Lokale en Regionale Klimaatinitiatieven)
SRON	Space Research Organisation Netherlands
STEP	Subsidy scheme for improving energy efficiency in social housing

T

TNO	Netherlands Organisation for Applied Scientific Research

U

UN	United Nations
UNCCD	United Nations Convention to Combat Desertification in tose countries experiencing Serious drought and/or desertification particularly in Africa
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNISDR	United Nations Office for Disaster Risk Reduction
USD	United States Dollar

V

VAMIL	Arbitrary Depreciation of Environmental Investments
VROM	(Ministry of Housing, Spatial Planning and the Environment (Ministerie van Volkshuisvesting, Ruimtelijke Ordening en Milieubeheer):in 2010 a merger took place with the Ministry of V&W. The new name is: Ministry of Infrastructure and the Environment (IenM)
VWS	Ministry of Health, Welfare and Sport

W

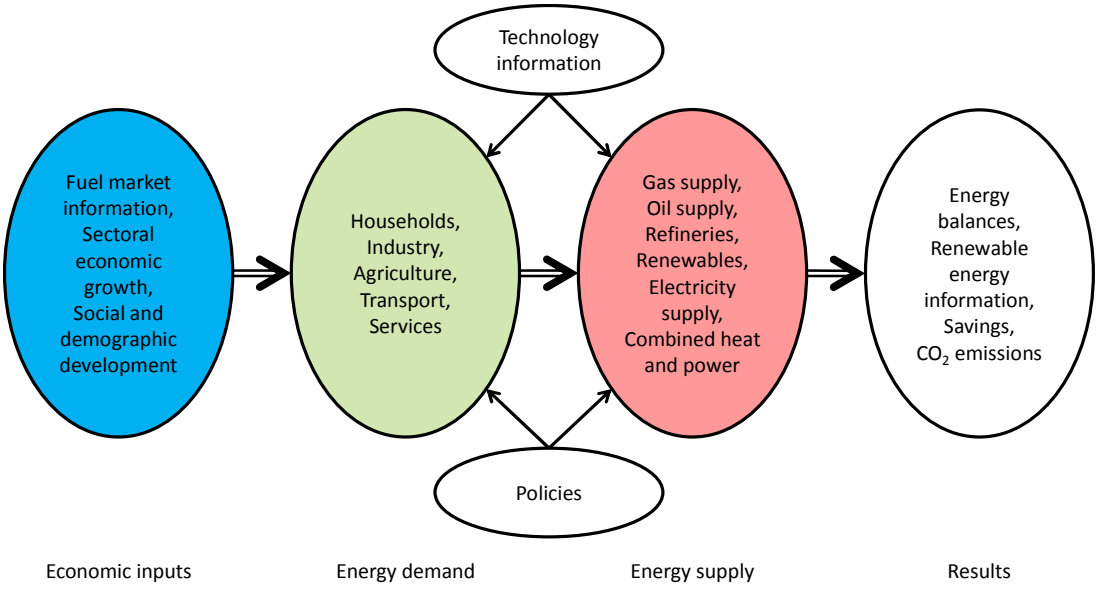
WAM	With Additional Measures
WEM	With Existing Measures
WESP	Task force on Consumers and other sources of emissions
WFP	World Food Programme
WKK	Warmte Kracht Koppeling (Combined Heat and Power, CHP)

ANNEX 1 MODELLING SYSTEM FOR PROJECTIONS

This annex briefly describes the modelling system for projections (source: ECN, National Energy Outlook Modelling System). More information will be provided in background reports to the annual NEV, including updates where applicable.

National Energy Outlook Modelling System

For over 20 years, ECN has been developing the National Energy Outlook Modelling System (NEOMS) for Energy projections and policy evaluations. NEOMS enables 12 energy models of ECN to exchange data and produce consistent and detailed results.

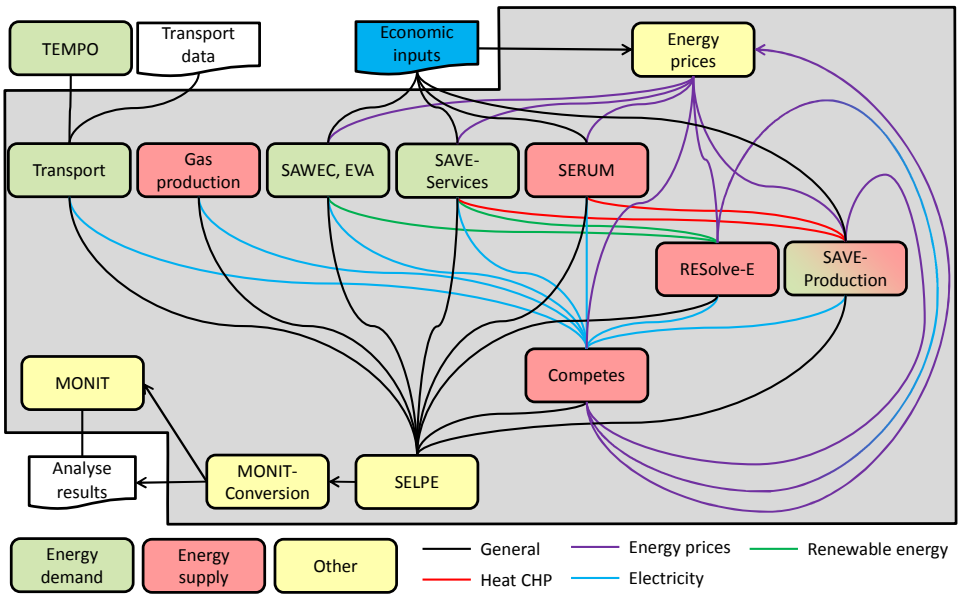


NEOMS enables ECN to calculate the energy use and the corresponding emissions for the Dutch energy system and for individual sectors. Detailed results include energy demand, supply, emissions, technology uptake, investments, costs, prices, policy impacts. The total system includes about 22 sub-sectors with all relevant technologies and fuels per sub-sector. Their CO2 emissions are also calculated.

The NEOMS models currently cover the following sectors and their corresponding models:

- **Energy demand**
  - Industry and agriculture (SAVE-Production),
  - Service sector (SAVE-Services),
  - Households (SAWEC and EVA),
  - Transport (TEMPO and/or external inputs).
- **Energy supply**
  - Combined heat and power (SAVE-Production),
  - Electricity supply (Competes),
  - Refineries and oil supply (SERUM),
  - Renewables (RESolve-E),
  - Gas supply (Gas production).

The outputs of all the separate models are combined in a model of the total energy sector (SELPE) in which the validity and consistency of the energy system as a whole is verified. Ultimately, all the results feed into MONIT-Conversion, a tool which calculates the energy savings per sector and produces aggregated results for all kinds of analyses, for example for the presentation tool MONIT.



Energy demand

SAVE-Production (industry, agriculture and CHP)
SAVE-Production is a simulation model that calculates the energy demand of industry and agricultural sectors and the sectoral implementation of combined heat and power generation. The future energy demand is calculated based on the economic growth per subsector and measures taken.

SAVE-Services (service sector)
SAVE-Services is a simulation model for the services sector. Based on the economic growth per subsector and the measures taken, the model calculates the future gas and electricity demand.

SAWEC (households)
SAWEC is a simulation model for households that calculates the building-related energy use of houses, for example natural gas, electricity, district heating and oil products. Based on a stock database, SAWEC calculates the effects of all kinds of measures. The model can accurately simulate historic energy-related trends dating back to 1985 and uses the same algorithm to project future developments towards 2040.

EVA (households)
EVA uses a detailed stock database to calculate the national electricity use of household appliances, yielding prognoses up to 2020. EVA offers a detailed view on the impact of changes in the penetration of appliances and autonomous or policy driven changes in energy consumption.

Transport
The transport model is a tool to incorporate the results of the ECN model TEMPO and externally provided data into the databases of NEOMS. This enables the other models to use these data for their calculations.

Energy Supply

Competes (electricity supply)
Competes is used to calculate the centralised electricity production.
Based on the Dutch sectoral electricity demand, hourly electricity production from intermittent renewables and sectoral implementation of combined heat and power, the remaining demand is covered by Competes, taking into account the merit order of the supply curve of centralised electricity generators and electricity trade with the neighbouring countries. Competes also provides the commodity prices for electricity.

SERUM (refineries and oil supply)
SERUM is an optimization model for the Dutch oil refining sector. Based on expectations about the demand for oil products, environmental measures and crude properties, SERUM calculates the required crude intake, the required refining configuration and the energy use for the whole process. Based on energy use and energy carriers, emission developments are calculated.

RESolve-E (renewables)
The aim of the RESolve-E model is to provide data about the total renewable energy production (excluding biofuels). For the renewable energy production that is eligible to receive a subsidy via the SDE subsidy scheme, the SDE budget constitutes a ceiling for the total production. Because renewable energy can contribute to realising the energy performance coefficient standards for new buildings, the renewable energy production of SAWEC and SAVE-Services serve as input for RESolve-E.

Gas production (gas supply)
In this model, the supply of natural gas is calculated based on the availability of natural gas in the 'Groningen' gas field, and the other onshore as well as the offshore fields. Exogenous assumptions are made about the volume for gas storage and export. If demand exceeds this production, natural gas will be imported. The model calculates the amount of energy needed for production, storage and transport as well as losses in the grid.

Other models and tools in NEOMS

Energy prices
The energy prices tool provides electricity and gas prices for the different sectors as defined in NEOMS. These data can be used by the NEOMS models.

SELPE (validity and consistency check)
SELPE is an optimisation model that is used to model the entire Dutch energy sector. Most of the constraints are set by the above-mentioned models. The aim of this model is to check the feasibility and consistency of the outcomes of the other models, for example verifying that the total electricity demand does not exceed the electricity supply.

MONIT-Conversion (aggregation tool)
The output of the SELPE model is very detailed. MONIT-Conversion can aggregate its results into any format needed by the user. The output is made available to MONIT, and can also be made available to external parties. Another function of this tool is to calculate the energy efficiency indicators.

MONIT (presentation tool)
This tool is used to present the combined results of the models in such a way that they can be used in all kinds of reports, together with historic data. Some of the results are also available on the Internet (http://monitweb.energie.nl/).

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