Environmental accounts of the Netherlands

Greenhouse gas emissions by Dutch economic activities

07 08 09
10 11
12
13 14

Statistics Netherlands

Explanation of symbols

.	data not available
*	provisional figure
**	revised provisional figure (but not definite)
x	publication prohibited (confidential figure)
–	nil
–	(between two figures) inclusive
0 (0.0)	less than half of unit concerned
empty cell	not applicable
2011–2012	2011 to 2012 inclusive
2011/2012	average for 2011 up to and including 2012
2011/'12	crop year, financial year, school year etc. beginning in 2011 and ending in 2012
2009/'10–2011/'12	crop year, financial year, etc. 2009/'10 to 2011/'12 inclusive

Due to rounding, some totals may not correspond with the sum of the separate figures.

Publisher
Statistics Netherlands
Henri Faasdreef 312
2492 JP The Hague

Prepress
Statistics Netherlands
Grafimedia

Cover
Teldesign, Rotterdam

Information
Telephone +31 88 570 70 70
Telefax +31 70 337 59 94
Via contact form:
www.cbs.nl/information

Where to order
E-mail: verkoop@cbs.nl
Telefax +31 45 570 62 68

Internet
www.cbs.nl

ISSN:

© Statistics Netherlands,
The Hague/Heerlen, 2012.
Reproduction is permitted,
provided Statistics Netherlands is quoted as source.

1.1 Greenhouse gas emissions according to different frameworks

Climate change is one of the major global challenges of our time. There is abundant scientific evidence that the emission of greenhouse gases caused by economic activities contributes to climate change (e.g. IPCC, 2007; PBL, 2010). Accelerating emissions of carbon dioxide, methane, and other greenhouse gases since the beginning of the 20th century have increased the average global temperature by about 0.8°C and altered global precipitation patterns (IPCC, 2007). Combustion of fossil fuels, deforestation, but also specific agricultural activities and industrial processes are the main drivers of the increased emission of greenhouse gasses. Enhanced concentrations of greenhouse gasses in the atmosphere will increase global temperatures by radiative forcing. Likewise, climate change has a direct impact on all kinds of economic processes. These impacts may be positive or negative, but it is expected that the overall impact will be primarily negative. In order to design effective mitigation policies, one must have a good conception of the economic driving forces of climate change. The *air emission accounts* can be used to analyse the environmental implications in terms of greenhouse gas emissions, of production and consumption patterns. Because of their compatibility with the national accounts, greenhouse gas data can be directly linked to the economic drivers of global warming.

There are several frameworks for estimating the greenhouse gas emissions for a country, yielding different results. Well-known are the emissions reported to the UNFCCC (United National Framework Convention on Climate Change) in particular under the Kyoto Protocol, but also environment statistics as well as the air emission accounts provide independent greenhouse gas estimates. The differences are not the result of disputes about the accuracy of the estimates themselves, but arise from different interpretations of what has to be counted. The inclusion or exclusion of certain elements depends on the concepts and definitions that underlie these frameworks. The estimates differ in their possible applications for analysis and policy making.

In this paragraph we explain the above mentioned frameworks and their resulting estimates. A bridge table (see table 1.1.1) provides insight in the relations between these different conceptions.

1.1.1 Bridge table for greenhouse gases

	1990	1995	2000	2005	2009	2010*	2011*
	Mton CO_2-eq.						
1. Stationary sources[1)]	187	195	183	182	173	185	170
2. Mobile sources on Dutch territory	34	36	40	42	42	42	42
3. Mobile sources according to IPCC	31	34	38	39	38	38	39
4. Short cyclic CO_2	6	6	8	10	12	13	13
5. Total, IPCC (excl. LULUCF) = 1 + 3 - 4	**213**	**223**	**213**	**211**	**199**	**210**	**196**
6. Land Use, Land-Use Change and Forestry (LULUCF)	3	3	3	3	3	3	3
7. Total, IPCC (incl. LULUCF) = 5 + 6 (Kyoto-protocol)	**217**	**226**	**216**	**214**	**202**	**213**	**199**
8. Actual emissions in the Netherlands = 1 + 2	**221**	**231**	**223**	**224**	**215**	**226**	**212**
9. Residents abroad	14	20	24	24	24	24	25
10. Non-residents in the Netherlands	5	5	6	7	6	6	6
11. Total emissions by residents = 8 + 9 - 10	**230**	**246**	**242**	**241**	**232**	**244**	**230**

[1)] Stationairy sources are inclusive short-cyclic CO_2.

1. Greenhouse gas emissions according to the IPCC regulation

The IPCC (Intergovernmental Panel on Climate Change) has drawn up specific guidelines to estimate and report on national inventories of anthropogenic greenhouse gas emissions and removals (IPCC, 1996). "Anthropogenic" refers to greenhouse gas emissions and removals that are a direct result of human activities or are the result of natural processes that have been affected by human activities. In general the IPCC records all emissions that occur on the Dutch territory, with a few specificities. Emissions originating from the so-called short cyclic carbon cycle, such as the combustion of biomass and emission from biochemical processes, are left aside in the IPCC calculations. It is assumed that these emissions do not structurally contribute to higher greenhouse gas concentrations in the atmosphere. The emissions by road traffic are calculated according to the total domestic deliveries of motor fuels, regardless of the nationality of the user of the motor fuel or the location where the use takes place. For air transport and shipping only emissions caused in domestic transport are considered. A complicating factor is that distinction between international and domestic travel is based on destination of the travel, with the result that emissions from a ship sailing around the world and therefore traversing international waters, count as domestic travel if the destination is a national port. Emissions related to bunkering of airplanes and ships are mentioned in the IPCC reports as a memorandum item, but are not included in the targets of the Kyoto Protocol.

The IPCC guidelines include not only sources but also sinks – that is emissions absorbed by nature for instance through carbon sequestration, whereas these are excluded from air emission accounts and environment statistics. However, not all emissions absorbed by nature are included, only those that occur on so-called managed lands including managed forests which are areas under human influence. Emissions and sinks due to land-use changes are also taken into account[1)].

2. Greenhouse gas emissions within the Dutch territory

Statistics Netherlands annually publishes the actual greenhouse gas emission for the Netherlands. These are greenhouse gas emissions that actually take place within the Dutch territory. In contrast to the IPCC guidelines, all emissions by mobile sources that occur within the Dutch territory are accounted for, regardless of where the fuels are purchased. Also short cyclic carbon emissions are included in the actual emissions. With regard to international transport (inland shipping, seagoing vessels, air transport), only those emissions are included that occur within the national territory. The actual emissions are used as input for several modelling and scenario analyses, and are the basis for the calculation of the air emission accounts.

3. Greenhouse gas emissions by the Dutch economy

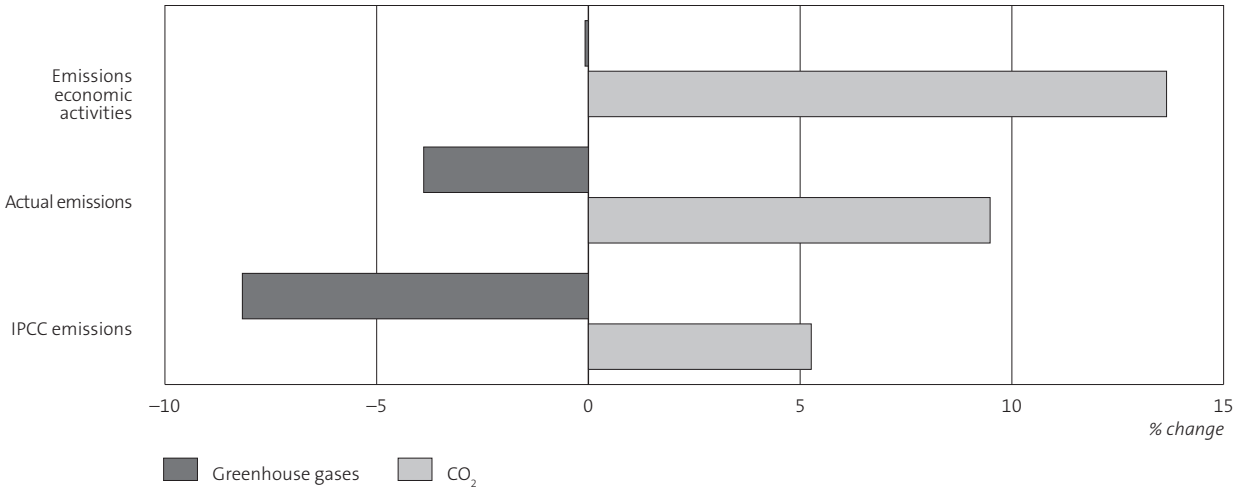
Besides the actual emissions, Statistics Netherlands also annually publishes the total greenhouse gas emissions by economic activities, which are calculated according to the national accounting principles. These include all emissions caused by the residents of a country, regardless where the emissions take place. For stationary emission sources the resident principle will generally converge with emission data as recorded in the emission inventories. For mobile sources, however, substantial differences may occur. Transport activities by residents, like road transport, shipping and air transport, and related emissions to

1) In the IPCC reports the category Land use, land use change and forestry (LULUCF) includes the total emissions and sinks for CO_2 from land use and forestry activities (IPCC, 1996). The category is either a net source if biomass harvest/destruction exceeds regrowth in the inventory year, or a net sink if regrowth exceeds harvest/destruction.

air may also occur abroad. Likewise, non-residents may cause pollution within the Dutch territory. The greenhouse gas emissions caused by Dutch economic activities are thus equal to the actual emissions plus emissions caused by residents abroad minus emissions caused by non-residents on the Dutch national territory.

The total greenhouse gas emissions by the economy provide an important indicator for the environmental pressure caused by Dutch economic activities. The emissions can be compared directly with all sorts of macro-economic parameters from the national accounts, such as GDP, total employment etc. at the national level, but also for different industries. In addition, they can be used for all kind of environmental–economic analysis and modelling, such as decomposition analysis but also the calculation of the emission trade balance and the carbon footprint.

1.1.2 Change in CO_2 and greenhouse gas emissions between 1990 and 2011 according to different frameworks



Source: Statistics Netherlands.

IPCC emissions decrease, emissions by economic activities increase

The total greenhouse gas emissions for the Netherlands according to the guidelines of the IPCC were equal to 196 Mton CO_2 equivalents in 2011[2)]. This is 8 percent below the emission level in 1990, the base year for the Kyoto Protocol. The CO_2 emissions, however, increased by 5 percent during this period, which was less than the reductions in emissions of all other greenhouse gases (CH_4, N_2O, F-gases). These developments put the Netherlands on course to realise its Kyoto targets (see below). The emissions of greenhouse gases generated by the Dutch economy were equal to 230 Mton in 2011 which is approximately the same level as in 1990. These differences are primarily due to the omission of emissions by international transport which is only partly included in the Kyoto figures. Precisely in this period, international transport grew rapidly in the Netherlands, pushing up greenhouse gas emissions. Also, emissions from short-cyclic CO_2, for example the combustion of waste, have increased rapidly in this period. Finally, the actual greenhouse gas emissions in the Dutch territory have decreased since 1990 (–4 percent). Accordingly, the IPCC emission data presents the largest decrease in emissions.

2) Excluding LULUCF

Emission data and the Dutch climate policy

The aim of the Dutch climate policy is to meet its obligation for emission reductions as stipulated in the Kyoto Protocol and to achieve further emission reductions for the medium-long period as has been agreed on within the European Union. For the Netherlands, the Kyoto target was set at a 6 percent emission reduction for the period 2008–2012 with respect to 1990, the base year for the Kyoto Protocol. This means that on average the Netherlands may emit 200 Mton CO_2 eq. each year, which is 1001 Mton for the entire period. As four of the five years have passed, 810 billion CO_2 equivalents have already been emitted. In 2012, therefore, emissions have to remain below 191 billion CO_2 equivalents to meet the target. However, to meet its Kyoto target, the Netherlands may also make use of the three flexible Kyoto mechanisms, namely emission trading, Joint Implementation (JI) and Clean Development Mechanism (CDM).

In 2007 the European Council already adopted a long-term climate objective, in which the EU strives to reduce the average global temperature increase to 2 °C compared to pre-industrial levels (EC, 2007). To implement this objective, the European Council decided to realize an emission reduction in 2020 of at least 20 percent compared to 1990. The Netherlands has a binding national target to reduce emissions by 16 percent in 2020 in sectors not covered by the EU-ETS, such as transport, housing, agriculture and waste. The contribution to a global and broad (post-Kyoto) climate agreement of the EU will be 30 percent, provided that other developed countries contribute comparable emission reductions and economically more advanced developing countries contribute adequately according to their responsibilities and capabilities. In addition, the European Council formulated goals for energy saving (20 percent of the estimated use in 2020), renewable energy (20 percent of the final use of the EU in 2020) and bio fuels (minimum of 10 percent of the total fuel consumption in 2020).

The Dutch climate policy and emission targets are primarily based on the emissions as calculated by the IPCC guidelines. These emissions, however, do not provide a complete picture of all emissions related to Dutch (economic) activities. Particularly, emissions caused by Dutch transport activities are largely excluded, as only a small part is included in the IPCC emissions. Furthermore, an alternative to the frameworks presented here, which are all based on emissions inherent in production, is to calculate the emissions that are required to satisfy Dutch consumption.

1.2 Greenhouse gas emissions from production

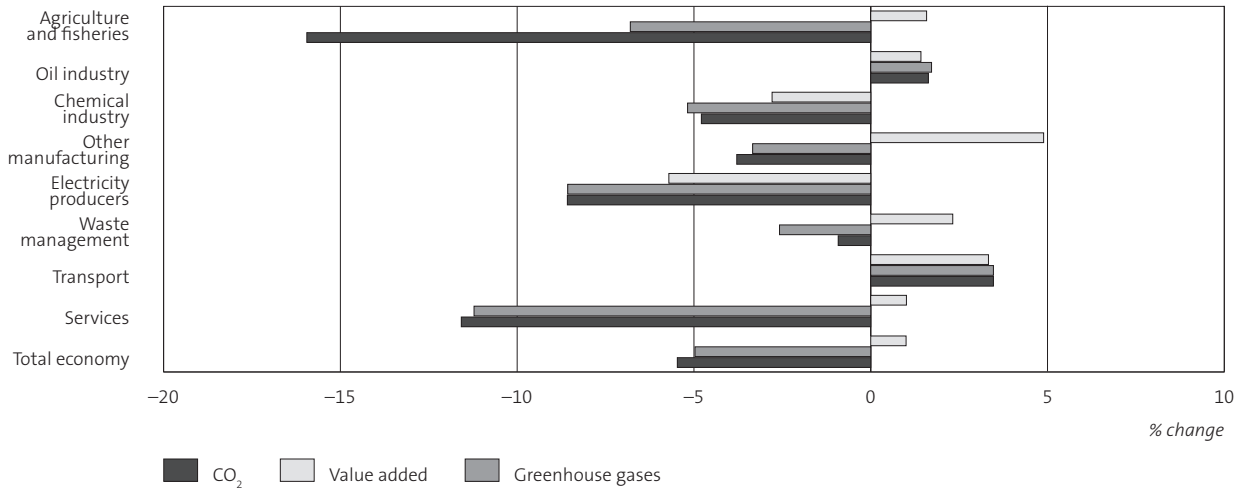
The air emission accounts provide information about the contribution of the economy to climate change and the activities in which these emissions occur, so that the 'hotspots' in the production patterns can be identified. In addition, due to the compatibility with the national accounts framework, the greenhouse gas emissions can be directly linked to the output of the economic activities, so that the environmental performance of different industries can be compared by looking at decoupling, or by calculating emission intensities (eco-efficiency).

Sharp decrease in greenhouse gas emissions by industries

The total greenhouse gas emissions by industries equalled 191.3 Mton CO_2 eq. in 2011, which was 4.9 percent lower than in the previous year[3]. CO_2 emission even decreased by 5.4 percent. The sharp decrease is caused mainly by a dip in energy consumption due the mild winter and the start of economic stagnation which was felt by some of the emission intensive industries. Emissions of methane decreased by 2 percent, while emissions of nitrous oxide increased by 1 percent.

Greenhouse gas emissions in agriculture fell by 7 percent, mainly because less natural gas was combusted in horticulture. Methane emissions from cattle remained stable. In manufacturing, the start of the economic crisis had its effect on emission levels. Emissions decreased in most industries, particularly in the chemical industry, due to lower production levels. Demand for petrochemicals fell, particularly in the second half of 2011. On the other hand, emissions rose in the basic metal industry and the refineries, where the production processes are also very emission intensive. Energy companies produced less as more electricity was imported. As a result CO_2 emissions fell by 9 percent. Waste management produced less greenhouse gas emissions, although CO_2 emissions from waste incineration increased. Methane emissions from land fill sites fell by 7 percent. They have been falling for several years because less waste is deposited in landfill sites and historic emissions from existing sites are lessening. The increased emissions in the transport sector closely follow the larger transport activities. Particularly, emissions for inland shipping and air transport increased. Emissions fell in the service sectors as less natural gas was combusted to heat offices.

1.2.1 Change in value added, greenhouse gas and CO_2 emissions, 2010–2011



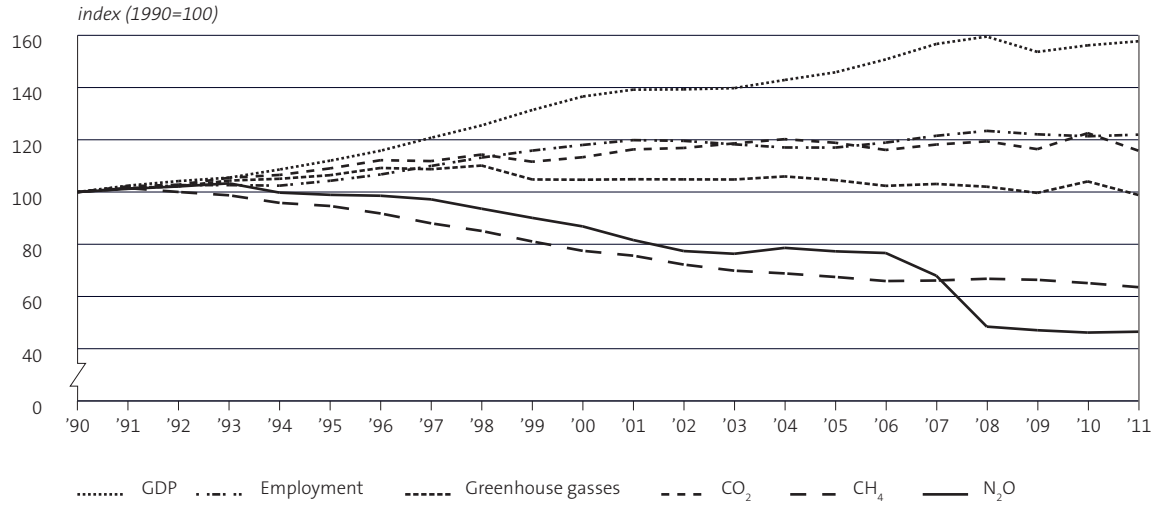
Source: Statistics Netherlands.

[3] The total emissions by the economy, which includes emissions by households, equalled 230.1 Mton CO_2 eq. (see also paragraph 1.1), which is 5.6 percent lower than in 2010.

Emission intensity decreased in 2011

In 2011 the economy expanded by 1 percent, whereas greenhouse gas emissions fell by 5 percent. The emission intensity for greenhouse gasses, which is an important measure of the environmental pressure caused by economic activities, improved. The main reason is the mild winter of 2011, in which less energy was used for heating offices and greenhouses in horticulture. This caused less CO_2 emissions per unit value added. In manufacturing, the emission intensity improved, except in the manufacture of chemicals and energy supply.

1.2.2 Volume change GDP, employment and greenhouse gas emissions by industries



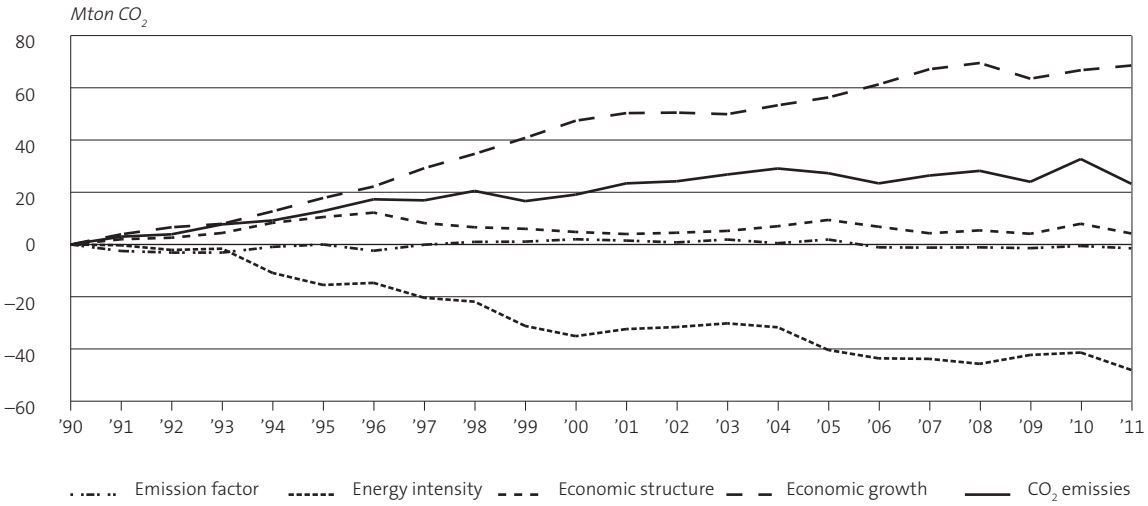
Source: Statistics Netherlands.

In the rather long period of 1990–2011, economic growth exceeded greenhouse gas emissions by far. While the economy grew at a rate of 58 percent and employment by 22 percent, the emissions of greenhouse gases by industries have decreased by 1 percent. This is the first time in 21 years that we observe absolute decoupling in the Netherlands with respect to the 1990 emission levels. Absolute decoupling here means lower emissions than in 1990 despite economic growth. For CO_2 emissions, there is still only relative decoupling, i.e. the emission rate increases by less than the GDP growth rate.

More efficient energy use unable to stop the increase in CO_2 emissions

The change in the level of CO_2 emissions by economic activities in the period 1990–2011 can be explained by different factors. First of all, economic growth may have led to more CO_2 emissions. A change in the energy mix (the energy products used in the production process) may also have influenced emission levels. The economic structure may have changed, for example due to a change in the input-output relations of the intermediate use, or a change in composition of the final demand for products and services. Finally, eco-efficiency improvements of the production process may have decreased CO_2 emissions. Structural decomposition analysis allows us to account in detail for the factors underlying the changes in emissions.

1.2.3 Structural decomposition analysis of CO_2 emissions



Source: Statistics Netherlands.

Economic growth clearly has been the driving force behind the increase in CO_2 emissions, which were only partially negated by an increase in efficiency (energy intensity effect). Emissions in 2011 would have been about 48 percent higher than in 1990 if there had been no change in efficiency and structure. The improvement of the energy intensity (energy saving) has reduced the increase in CO_2 emissions. Structural changes in the economy or changes in the mix of energy products clearly had less effect on the total change in emissions. The decrease in emissions between 2010 and 2011 was the result of a lower energy intensity.

Higher share of service industries contributes to decoupling emissions and economic growth

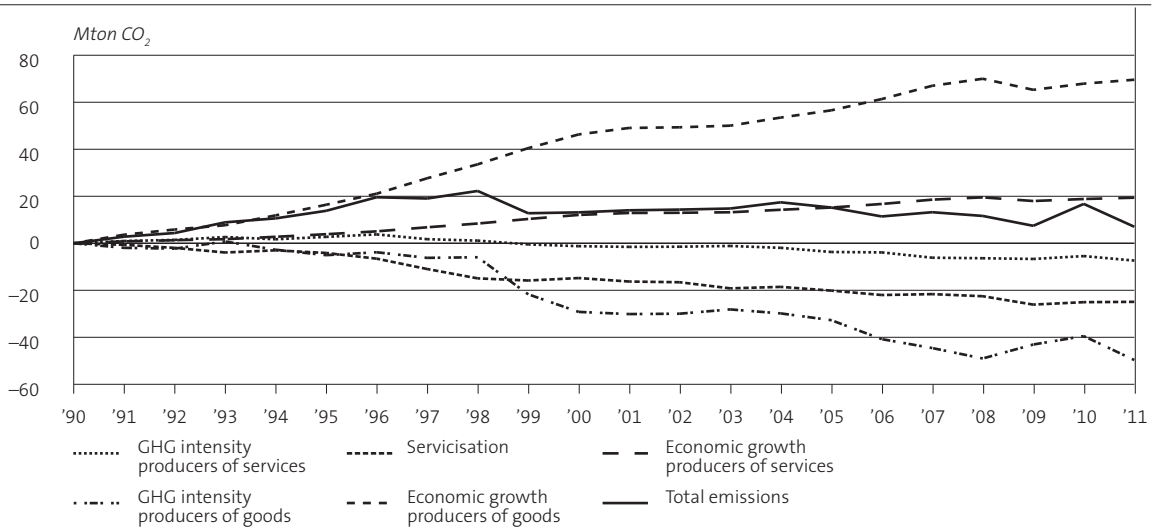
Servicisation, which is the increase in the share service industries have in the total economy, has been a key structural economic development of the past decades in many developing economies. In the Netherlands, the service industries grew faster than manufacturing, construction and agriculture. The share of the services sector in total value added rose from 67 percent in 1990 to 75 percent in 2011.

The shift to a more service-based economy also affects the emission of greenhouse gases. Since the production of services tends to be much less emission-intensive than the production of goods, the rise in the share of services has caused the economy as a whole to become less emission-intensive. The effect of servicisation can be determined by calculating what greenhouse gas emissions would have been if the share of services in the economy would have remained stable. If the share of services in the economy had not increased since 1990, the greenhouse gas emissions in 2011 would have been 13 percent higher (all other factors equal).

Servicisation roughly explains one third of the decoupling between greenhouse gas emissions and economic growth in the period 1990–2011. The remainder we can attribute to the more environmentally efficient production of goods, primarily by agriculture and the chemical industry. Efficiency in the services sector has hardly contributed to the decoupling. This is mainly because the transport sector largely determines the total greenhouse gas emissions of the service sectors, being responsible for about half of its greenhouse gas emissions. Its large share and rapid growth in recent years, plus its relatively minor gain in environmental efficiency means the transport sector has increased emission intensity within the overall

services sector. The other service industries have a significantly lower emission intensity, which has improved compared to 1990.

1.2.4 Decomposition analysis greenhouse gas emissions, effect of servicisation



Source: Statistics Netherlands.

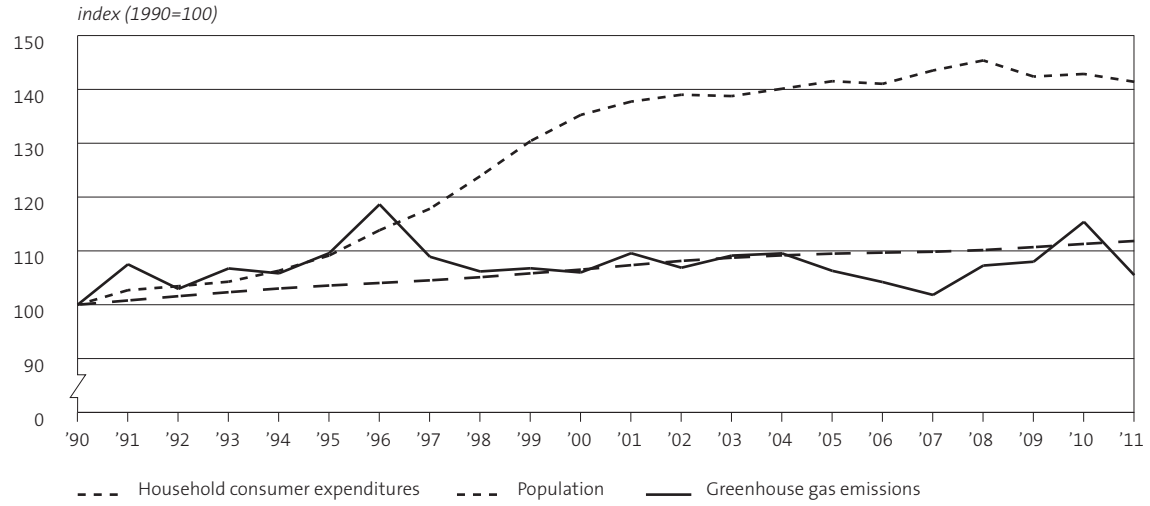
1.3 Greenhouse gas emissions from household activities

Households directly contribute to the emission of greenhouse gasses by consuming energy products for heating, cooking and generating warm water, and by using motor fuels for driving. The air emission accounts provide information on the level of these emissions. In this paragraph we present the developments in the direct emissions by households and the underlying causes.

In 2011 direct greenhouse gas emissions from households declined by 8.6 percent with respect to 2010. The main reason for the drop in emissions was lower natural gas consumption for space heating (-7 percent) due to the mild winter. The CO_2 emitted by cars rose by 1 percent in 2011. Compared to industries, households cause minor direct emissions of greenhouse gases other than CO_2, such as CH_4 (methane) and N_2O (nitrous oxide). CH_4 emissions fell by almost 13 percent due to lower natural gas consumption and more efficient combustion techniques of boilers.

Dutch households were responsible for 38.6 Mton of greenhouse gas emissions in 2011, which is 17 percent of the total emissions by economic activities. The development of these emissions can be compared directly with population growth or consumer expenditures. It turns out that the population and final consumption by households are growing faster than the emissions.

1.3.1 Change in direct greenhouse gas emissions by households, population and household consumer expenditure

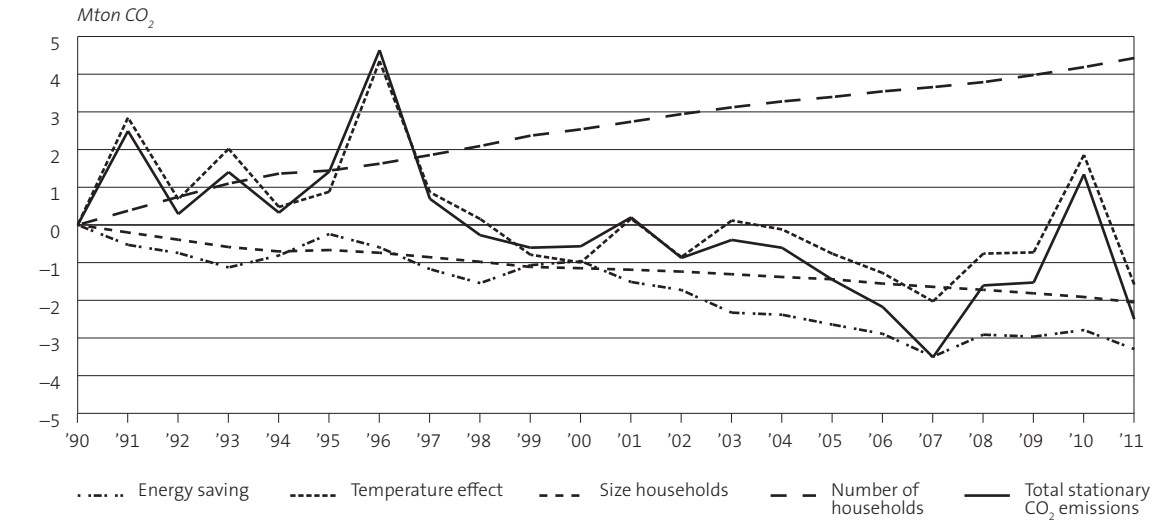


Source: Statistics Netherlands.

Effect energy saving by households on emissions stabilising

CO_2 emissions produced by households in and around the home have fallen by 17 percent since 1990. These so-called emissions from stationary sources originate for the most part from the combustion of natural gas for space heating, production of warm water and cooking (93 percent). Emissions from wood stoves and fireplaces are responsible for 6 percent. The causes for the decrease in emission levels for stationary sources can be further analysed by decomposition analysis. The changes in emissions can be decomposed into several factors, including the number of households, the average size of households, the effect of the average temperature and an energy saving effect.

1.3.2 Decomposition analysis for CO_2 emission by households (stationary sources)



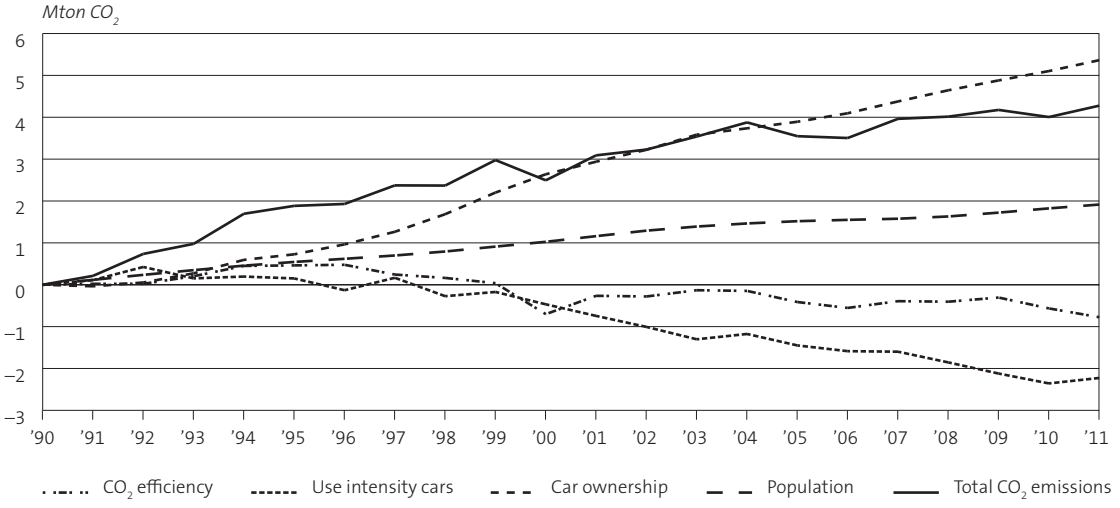
Source: Statistics Netherlands.

The gradual increase in the number of households caused a 4.4 Mton increase in the level of CO_2 emissions. All other factors had a lowering effect on the emissions. The weather conditions (average temperature) have a dominant effect particularly in years when winters are relatively cold, such as 1996 and 2010, when emissions peaked as more natural gas was combusted for heating. Overall, the average temperature had an increasing effect on emissions in the 1990s and a decreasing effect in the decade of 2000–2010. Policymakers are probably most interested in the effect of the energy saving that can be deduced from this analysis. It was responsible for an emission cut of 3.3 Mton between 1990 en 2011. Better home isolation and high efficiency boilers resulted in a 16 percent CO_2 reduction, which is on average 0.8 percent a year. The effects of energy saving were primarily realised after 2000. However, not much progress has been made since 2007.

Increased car ownership raises CO_2 emissions

CO_2 emissions due to the use of road vehicles by households increased by 29 percent on 1990. The causes for the increase in emission levels for mobile sources can be further analysed by decomposition analysis. The changes in emissions can be decomposed into several factors, including population growth, car ownership, traffic intensity (number of kilometres driven per car) and a CO_2 efficiency effect (emissions per kilometre). The impact of the population increase has been a 13 percent rise in emissions on 1990 (all other factors being stable). However, the main contributor to higher CO_2 emissions is the increase in car ownership, with an upward effect of 37 percent (all other factors being stable). In 1990 there were three cars per ten Dutch inhabitants, in 2012 this had risen to four in ten. The effect is partially offset by the fact people drive their cars less (lower mileage). More households now own a second car, used mainly for short trips. Strikingly, CO_2 emissions per kilometre travelled has not changed much in 21 years. Since 2009, an improvement in the CO_2 efficiency can be observed. The average CO_2 emissions per vehicle kilometre from new passenger cars in the Netherlands have fallen sharply in the past three years. This is partly due to European standards, which have led to more fuel efficient cars on the market. The demand for fuel-efficient cars has risen under the influence of Dutch tax measures.

1.3.3 Decomposition analysis for CO_2 emission by households (mobile sources)



Source: Statistics Netherlands.

1.4 CO_2 emissions on quarterly basis

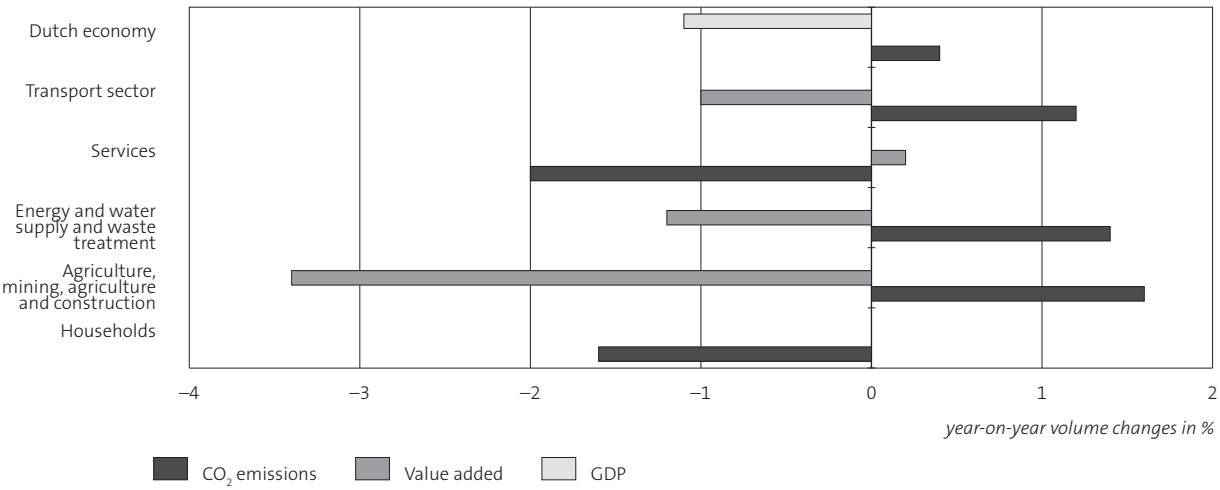
Accurate and timely measurements of the amount and the origin of the emitted greenhouse gasses are essential to help governments achieve their objectives. Data on national greenhouse gas emissions (national emission inventory and environmental accounts) usually become available nine months after the end of the year under review. Quarterly based CO_2 emission data could serve as a short term indicator for policymakers and researchers to assess how the greenhouse gas emissions change in response to economic growth or decline, as carbon dioxide is the most important anthropogenic greenhouse gas. In 2011 Statistics Netherlands started publishing quarterly CO_2 emissions 45 days after the end of a quarter, at the same moment as the first quarterly GDP estimate is published. The quarterly CO_2 emissions are compatible with the national accounts and can be linked directly to economic output, allowing the comparison of the environmental performance of different industries.

Slight rise in CO_2 emissions in the first quarter of 2012

Although the Dutch economy shrank by 1.1 percent, CO_2 emissions rose by 0.4 percent in the first quarter of 2012 compared to the same quarter of 2011[4]. February was very cold, while January and March were mild. So on balance the weather hardly played a role in the CO_2 calculation. The service industries and households used about the same amount of natural gas for space heating as in the first quarter of 2011 and therefore emitted about the same amount of CO_2.

The economic slowdown was mainly caused by a lower production of the construction industry. Construction is a relatively emission-extensive activity, especially in comparison with the very emission-

1.4.1 Change in CO_2 emissions and economic development, first quarter of 2012



Source: Statistics Netherlands.

[4] According to the second estimate of Statistics Netherlands, the Dutch economy shrank 0.8 percent in the first quarter of 2012. This second estimate of economic growth is 0.3 percent higher than the first estimate of 15 May 2012.

intensive chemical and oil industry. So developments in construction have relatively little impact on emissions. A major reason for the increase in CO_2 emissions was the economic recovery of the chemical and oil industry, where production increased again. This increase in production coincided with an increase in emissions. The chemical sector is largely dependent on demands from abroad. The manufacturers of basic chemical products exported more than the first quarter of 2011.

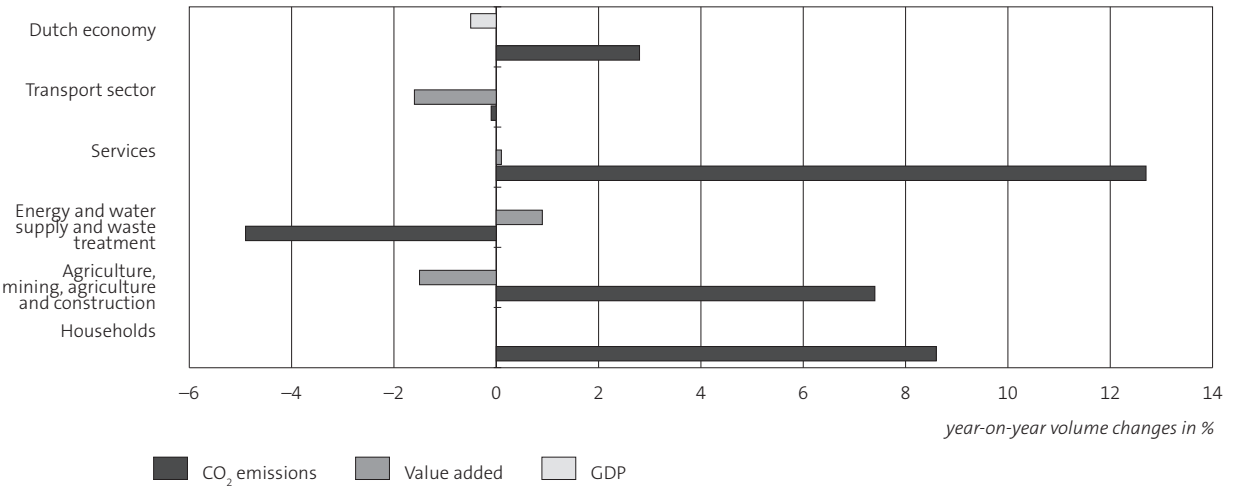
The energy companies produced slightly less electricity. Electricity generation is associated with high CO_2 emissions. According to initial calculations energy use fell in the first quarter compared to the same quarter of 2011. Relatively more coal and blast furnace gas was used and less natural gas. Coal and blast furnace combustion causes relatively more emissions than the combustion of natural gas. The consumption of electricity in the Netherlands increased. More electricity was imported, which may create additional emissions abroad.

In the transport sector CO_2 emissions rose while the value added fell. Profits were under pressure from high fuel prices. The picture is varied in the transport sector. Production decreased for road transport, but increased for water transport. In air transport activities increased, but the high price of jet fuel had a negative effect on the development of value added.

Despite economic decline also rise in CO_2 emissions in second quarter of 2012

In the second quarter of 2012 2.8 percent more CO_2 was emitted by the Dutch economy than the same quarter a year earlier. The economy shrank in the second quarter by 0.5 percent. Emissions from energy producers, water companies and waste treatment decreased with 5 percent. Energy companies have produced much less electricity as more electricity was imported. The fuel mix for producing electricity, according to initial calculations deteriorated compared to the same quarter last year, resulting in the release of more emissions. Relatively, more coal and less natural gas was used.

1.4.2 Change in CO_2 emissions and economic development, second quarter of 2012



Source: Statistics Netherlands.

A major reason for the increase in CO_2 emissions in manufacturing is the economic recovery of the chemical and oil industry. Production of these two very emission-intensive industries has grown over the past two quarters. The increase in production in the chemical and oil industries coincided with an increase in emissions. The chemical industry is largely dependent on demand from abroad. The manufactures of basic chemical products have exported more than the same quarter a year earlier. In the transport sector CO_2 emissions and added value decreased. Production of road transport and inland shipping decreased, while sea transport increased. In aviation transport performances increased slightly.

The month April was relatively cold. The service industries and households have combusted more natural gas for space heating than a year earlier and therefore emitted more CO_2. Without the weather effect the 2.8 percent increase in emissions from the total Dutch economy would change into a 1.3 percent decrease.