Ministerie van Infrastructuur en Milieu

Netherlands national report on Black Carbon and Methane emissions

Submission to the Arctic Council Secretariat

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Table of contents

Introduction

For tackling climate change and protecting the ecosystems of the Arctic, reducing black carbon and methane emissions is of key importance. Therefore, the Netherlands welcomes and supports the Arctic Council's initiatives on black carbon and methane emission reductions. Especially in the light of the ambitious climate agreement achieved in Paris in November 2015, we believe we have a shared responsibility to reduce our emissions to mitigate the effects of climate change all over the world. As an observer state to the Arctic Council, the Netherlands wishes to engage with Arctic States on this important issue. We are therefore pleased to share our data with the Arctic Council through the submission of this report.

The Netherlands currently reports its black carbon emissions to the United Nations Economic Commission for Europe (UNECE) and its greenhouse gas emissions and mitigation activities, including methane to the United Nations Framework Convention on Climate Change (UNFCCC). The report delivers on the reporting requirements on black carbon and methane, as part of the CCAC Marrakech Communiqué.

This report is submitted and drafted by the Netherlands Ministry for Infrastructure and the Environment in cooperation with the National Institute of Public Health and the Environment and the National Enterprise Agency.

1 Current black carbon emissions and future projections

Black carbon (BC) emissions are calculated in The Netherlands annually within the Dutch Emission Inventory, which is a partnership between different organizations. These data are reported to the Convention on Long-Range Transboundary Air Pollution (CLRTAP) adopted under the auspices of the Economic Commission for Europe of the United Nations (UNECE). The accessory annual Informative Inventory Report (IIR) is based on data from the national Pollutant Release and Transfer Register (PRTR) and contains descriptions of methods, data sources, QA/QC activities carried out and a trend analysis.

For 2015, it has been estimated that 3232 tonnes of black carbon were emitted in The Netherlands. Transport accounts for 59,1% of these emissions, with light duty vehicles (22%) and passenger cars (16,4%) as the main contributors. Non-industrial sources account for 32,3% of total black carbon emissions. These emissions come mainly from domestic use (e.g. wood combustion in fireplaces), as well as from the diesel machinery used in agriculture (tractors) and construction. Industrial sources account for only 8,5% of BC emissions in The Netherlands.

Table 1: Calculated Black Carbon emissions in The Netherlands by sector (2015)

Sector	BC (tonnes)	% of total
Industrial sources	**276**	**8,5**
Iron and steel production	17	0,5
Petroleum refining	8	0,2
Mobile combustion in manufacturing industries and construction	252	7,8
Transport	**1909**	**59,1**
International aviation	17	0,5
Road transport: Passenger cars	529	16,4
Road transport: Light duty vehicles	710	22,0
Road transport: Heavy duty vehicles and buses	231	7,2
Road transport: Mopeds and motorcycles	21	0,6
Railways	26	0,8
International inland waterways	217	6,7
National navigation (shipping)	158	4,9
Non-industrial sources	**1042**	**32,3**
Commercial/institutional: Mobile	63	2,0
Residential: Stationary	669	20,7
Agriculture/Forestry/Fishing: Off-road vehicles and other machinery	231	7,2
Agriculture/Forestry/Fishing: National fishing	53	1,6
Other, mobile	26	0,8
TOTAL	3232	100

Calculated black carbon emissions have decreased by 75% in 2015 compared to 1990, from 13082 to 3232 tonnes (see Figure 1).

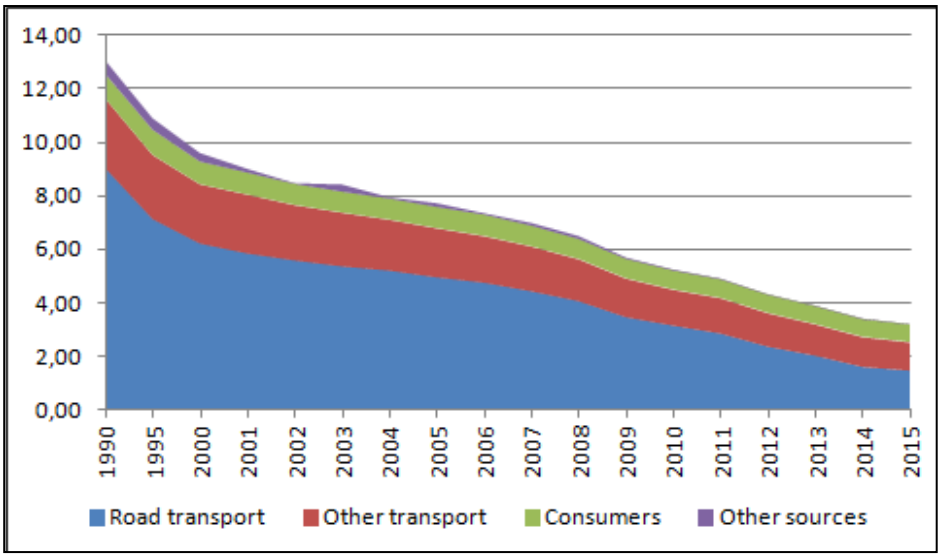

Figure 1: Sectoral breakout of black carbon emissions (kT) from 1990-2015

There are currently no projections available for black carbon emissions in The Netherlands. However, the IIR 2017 does contain emission projections for PM2.5. This provides an indication of future BC emissions. These emission projections consist of an update of air pollutant projections as presented in the National Energy Outlook (NEO) study by Schoots & Hammingh (2015). PM2.5 emissions are expected to decrease to approximately 10 kT in 2030 (-23% from 2015 until 2030). There are little differences between the two policy scenarios, "existing measures" and "with additional measures", which were investigated.

2 Current methane emissions and future projections

Data on methane emissions are included in the National Communication which is required under the United Nations Framework Convention on Climate Change. Total methane emissions have decreased by over 41% in the past decennia, from 1293 kT in 1990 to 760 kT in 2015 (Figure 2).

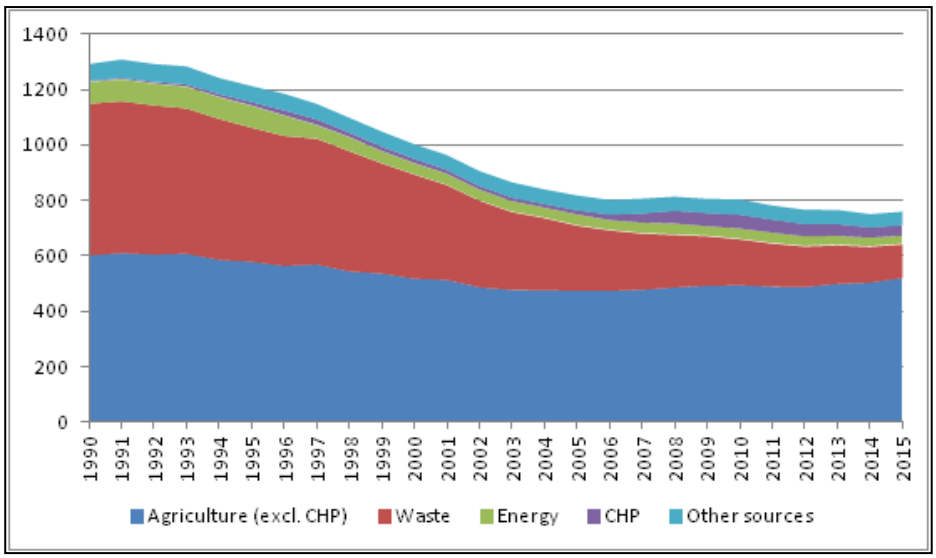

Figure 2: Sectoral breakout of methane emissions (kT) from 1990-2015

Agriculture is the main source of methane emissions in the Netherlands, contributing to 69% of total emissions in 2015. Methane emissions from agriculture fell by approximately 19% between 1990 and 2012, but increased afterwards. These emissions stem from enteric fermentation and manure management and exclude combined heat and power (CHP) or cogeneration, which is the use of a heat engine or power station to generate electricity and useful heat at the same time. CHP is used amongst others in greenhouses, and contributed to 5% of methane emissions in the Netherlands in 2015. The second largest source of methane emissions in the Netherlands is waste disposal, representing 16% of emissions in 2015.

Recent emission projections for several greenhouse gases, including methane, are included in the Netherlands second biennial report to the UNFCCC (2015). Two different policy scenarios were taken into account: with only existing policy and including intended policy. In both scenarios, overall methane emissions are expected to decrease by another 10% by 2030, from 760 kT to 680 kT.

In both policy scenarios, methane emissions from agriculture are projected to increase slightly until 2020 and stabilize around 520 kT. This increase is due to the increase in milk production of around 25% since 2015, as a consequence of the abolition of milk quotas. The 'wet Verantwoorde groei melkveehouderij' (Responsible Growth of Dairy Farming Act) will temper the growth somewhat. Further, the rise in methane emissions from dairy cattle will partly be cancelled out by the decrease in the number of young cows as dairy cattle now have a longer productive life. Lastly, the Subsidy Scheme for Renewable Energy Production (SDE+) scheme will increase co-fermentation of manure. This reduces methane emissions from manure storage, as the manure is not stored for long.

Methane emissions from waste have fallen substantially in the past, from 572 kT in 1990 to 136 kT in 2015, and are expected to continue to fall to 48 kT 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 is getting smaller and smaller.

3 Summary of national actions by sector

3.1 Black carbon emission mitigation actions

Transport
Transport is the main source of BC emissions in The Netherlands, accounting for 59,1% of total BC emissions. Among all types of transport, road transport is the main contributor (table 1).

Nevertheless, BC emissions from road transport have decreased by 83% between 1990 and 2015. This decrease can mainly be attributed to the introduction of increasingly stringent European emission standards for new road vehicles. For example, diesel particulate filters (DPFs) are required to comply with the Euro 5 PM emission standard, which entered into force at the start of 2011. DPFs entered the Dutch market much earlier though, helped by a subsidy that was instated by the Dutch government in 2005. In 2007, more than 60% of new diesel passenger cars was already equipped with a DPF. Since 2008, the share of new diesel passenger cars with a DPF has been above 90%.

For light duty vehicles, emissions have decreased due to both the market penetration of diesel-powered light-duty trucks with a DPF in combination with the stabilisation of the amount of vehicle kilometres driven since 2005. Emissions from heavy duty vehicles have also declined due to EU emission legislation.

Emissions from shipping and inland waterways have decreased by 32% between 1990 and 2015. This can be attributed to sulphur free diesel fuels which were introduced 2009 in inland shipping in The Netherlands. Since the start of 2011, EU regulation requires all diesel fuel for inland navigation to be sulphur free. This also affects particulate matter emissions (including BC), as some of the sulphur in the fuel is emitted as particulate matter.

Other sources
Emission reductions in the iron and steel industry were mainly caused by the implementation of technical measures, such as the replacement of electrostatic filters. Further, standards have been set for installations by tightening up the extent of emission stocks of heating installations (BEES).

3.2 Methane emission mitigation actions

Agriculture
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. Measures which can contribute to reducing methane emissions from agriculture are:

- Measures related to cattle feed to reduce CH4 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 CH4. 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 cows held in the Member States

including the Netherlands. The EU milk quota have been abolished in 2015, which means an increase in the number of cattle in the country. At the moment phosphate rights define the limits of dairy farming.

Agrocovenant
The Agrocovenant 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-CO2 greenhouse gases like methane and nitrous oxide by 4.0 to 6.0 Mton (in CO2-equivalents).

Waste
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.

The Netherlands has initiated a government-wide programme for a Circular Economy. Its ambition is to realise, together with a variety of stakeholders, an (interim) objective of a 50% reduction in the use of primary raw materials (minerals, fossil and metals) by 2030. This will also contribute to a further reduction of waste.

Energy
Voluntary agreements with the oil, gas and aluminum industries to improve their energy efficiency has resulted in reductions in CH4 emissions.

Emission Requirements Combustion Installation Decree (BEMs)
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 Projects relevant for the Arctic

The Netherlands Polar Programme[1] is one of the cornerstones of the Dutch Polar Strategy 2016-2020. NWO, The Netherlands Organisation for Scientific Reserach, coordinates the implementation of this programme and funds scientific research into and in the polar regions. The programme has four priority areas: ice, climate and sea level rise; polar ecosystems; sustainable exploitation; and social, juridical and economic issues.

With this programme, the Netherlands fulfils its obligations as a Consultative Party under the Antarctica Treaty, and contributes to its commitment to actively take part in the Arctic Council, where it has observer status. The programme is highly respected internationally, both for its high quality as well as for the way in which the Dutch scientific community collaborates with policy makers to ensure science-informed policy development. The programme continues existing international collaboration efforts. There are currently two research stations, a mobile one on the UK base in Rothera (Antarctica) and one in Ny-Alesund on Spitsbergen (Svalbard).

[1] http://www.nwo.nl/en/research-and-results/programmes/Netherlands+Polar+Programme

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