



NATIONAL REPORT BY NORWAY – SEPTEMBER 2015

Enhanced Black Carbon and Methane Emissions
Reductions – an Arctic Council Framework for
Action

1 September 2015

Norway's 2015 National Submission to Arctic Council

The report includes

- Emissions 1990-2013 and projections of black carbon and methane
- Description of the projections
- Summary of National Actions, National Action Plans, or Summary Mitigation Strategies by sector

1. Black carbon emissions

Norway reported emissions of black carbon (BC) for 1990-2013 and projections for 2020, 2025 and 2030 to in the 2015 report to CLRTAP. The reports are found here

Historical BC emissions 1990-2013

http://cdr.eionet.europa.eu/no/un/CLRTAP/colqv0ipg/envvn26zg/Annex_1_Norway_2015_V1.0.xls/manage_document

Projections of BC

http://cdr.eionet.europa.eu/no/un/CLRTAP/colqv0ipg/envvqfs_a/Annex_IV_Projections_reporting_NORWAY_ver_2_22042015.xls/manage_document

Assumptions for the projections of methane and BC

See chapter 9 projections in the Informative Inventory Report (IIR) 2015 Norway

http://cdr.eionet.europa.eu/no/un/CLRTAP/colqv0ipg/envvqfs_a/IIR_Norway_2015.pdf/manage_document

2. Methane emissions

The methane emissions for 1990-2013 is attached and so is projections for 2020 and 2030. The figures is reported in IPCC format. The emissions is preliminary since Norway has not yet submitted the 2015 report to UNFCCC due to that the reporting tool CRF Reporter have not been ready for use.

3. Summary of National Actions, National Action Plans, or Summary Mitigation Strategies by sector

In 2013, the Norwegian Environment Agency, on behalf of the Ministry of the Environment, published a Draft National Action Plan for Short-lived Climate Forcers

(<http://www.miljodirektoratet.no/en/Publications/2014/March-2014/Summary-of-proposed-action-plan-for-Norwegian-emissions-of-shortlived-climate-forcers/>). The objective of the plan was to provide an integrated assessment of climate, health and environmental effects of Norwegian emissions of SLCPs and the co-emitted cooling components organic carbon (OC) and sulphur dioxide (SO₂).

At the time, the basis of scientific knowledge was very immature and developed in parallel with work on the action plan. A great deal of the work therefore consisted of monitoring the research front and developing methods, emission inventories, projections, modelling of the climate effects and valuation of the health effects of the various components, as well as assessment of uncertainties.

The report also included an identification and analysis of 18 possible measures, as well as various emission reduction strategies. The objective of this part of the report was to identify and assess measures targeting short-lived climate pollutants (not typical CO₂ measures which also reduce SLCPs). Most of the identified measures targeted BC and CH₄ in the following five sectors: residential heating, transport, agriculture, petroleum, industry, or HFCs in products. Other sectors either had small emissions, or instruments had recently been implemented. For example, Norway already has a ban on landfill. For the petroleum sector, we identified several knowledge gaps that we are currently working on filling in order to assess additional measures in this sector (<http://www.miljodirektoratet.no/no/Publikasjoner/2015/Januar1/Assessment-of-flare-strategies-techniques-for-reduction-of-flaring-and-associated-emissions-emission-factors-and-methods-for-determination-of-emissions-to-air-from-flaring/>).

Currently, Norway is also working on analysing the short-term climate effect of measures targeting the Kyoto gases. The measures to be analysed are those identified in a sector-by-sector mitigation analysis of Norway's transition to a low-carbon society, using the emission reductions the IPCC identifies as necessary to achieve the two-degree target in its Fifth Assessment Report (<http://www.miljodirektoratet.no/no/Publikasjoner/2015/Juni/Kunnskapsgrunnlag-for-lavutslippsutvikling/> (In Norwegian)) and the report on the knowledgebase for low carbon transition in Norway (<http://www.miljodirektoratet.no/no/Publikasjoner/2014/Desember-2014/Knowledge-base-for-low-carbon-transition-in-Norway/>).

1 September 2015

Norway's 2015 National Submission to Arctic Council

The report includes

- Emissions 1990-2013 and projections of black carbon and methane
- Description of the projections
- Summary of National Actions, National Action Plans, or Summary Mitigation Strategies by sector

1. Black carbon emissions

Norway reported emissions of black carbon (BC) for 1990-2013 and projections for 2020, 2025 and 2030 to in the 2015 report to CLRTAP. The reports are found here

Historical BC emissions 1990-2013

http://cdr.eionet.europa.eu/no/un/CLRTAP/colqv0ipg/envvn26zg/Annex_1_Norway_2015_V1.0.xls/manage_document

Projections of BC

http://cdr.eionet.europa.eu/no/un/CLRTAP/colqv0ipg/envvqfs_a/Annex_IV_Projections_reporting_NORWAY_ver_2_22042015.xls/manage_document

Assumptions for the projections of methane and BC

See chapter 9 projections in the Informative Inventory Report (IIR) 2015 Norway

http://cdr.eionet.europa.eu/no/un/CLRTAP/colqv0ipg/envvqfs_a/IIR_Norway_2015.pdf/manage_document

2. Methane emissions

The methane emissions for 1990-2013 is attached and so is projections for 2020 and 2030. The figures is reported in IPCC format. The emissions is preliminary since Norway has not yet submitted the 2015 report to UNFCCC due to that the reporting tool CRF Reporter have not been ready for use.

3. Summary of National Actions, National Action Plans, or Summary Mitigation Strategies by sector

In 2013, the Norwegian Environment Agency, on behalf of the Ministry of the Environment, published a Draft National Action Plan for Short-lived Climate Forcers

(<http://www.miljodirektoratet.no/en/Publications/2014/March-2014/Summary-of-proposed-action-plan-for-Norwegian-emissions-of-shortlived-climate-forcers/>). The objective of the plan was to provide an integrated assessment of climate, health and environmental effects of Norwegian emissions of SLCPs and the co-emitted cooling components organic carbon (OC) and sulphur dioxide (SO₂).

At the time, the basis of scientific knowledge was very immature and developed in parallel with work on the action plan. A great deal of the work therefore consisted of monitoring the research front and developing methods, emission inventories, projections, modelling of the climate effects and valuation of the health effects of the various components, as well as assessment of uncertainties.

The report also included an identification and analysis of 18 possible measures, as well as various emission reduction strategies. The objective of this part of the report was to identify and assess measures targeting short-lived climate pollutants (not typical CO₂ measures which also reduce SLCPs). Most of the identified measures targeted BC and CH₄ in the following five sectors: residential heating, transport, agriculture, petroleum, industry, or HFCs in products. Other sectors either had small emissions, or instruments had recently been implemented. For example, Norway already has a ban on landfill. For the petroleum sector, we identified several knowledge gaps that we are currently working on filling in order to assess additional measures in this sector (<http://www.miljodirektoratet.no/no/Publikasjoner/2015/Januar1/Assessment-of-flare-strategies-techniques-for-reduction-of-flaring-and-associated-emissions-emission-factors-and-methods-for-determination-of-emissions-to-air-from-flaring/>).

Currently, Norway is also working on analysing the short-term climate effect of measures targeting the Kyoto gases. The measures to be analysed are those identified in a sector-by-sector mitigation analysis of Norway's transition to a low-carbon society, using the emission reductions the IPCC identifies as necessary to achieve the two-degree target in its Fifth Assessment Report (<http://www.miljodirektoratet.no/no/Publikasjoner/2015/Juni/Kunnskapsgrunnlag-for-lavutslippsutvikling/> (In Norwegian)) and the report on the knowledgebase for low carbon transition in Norway (<http://www.miljodirektoratet.no/no/Publikasjoner/2014/Desember-2014/Knowledge-base-for-low-carbon-transition-in-Norway/>).

Methane emissions reported to the Arctic Council

September 1 2015

Preliminary data

million tonne CO2 equivalents

GWP=25

	1990	1991	1992	1993	1994	1995	1996
Total Energy	0,920	0,945	1,044	1,168	1,209	1,179	1,223
- Public Electricity and Heat production	0,004	0,004	0,004	0,004	0,004	0,004	0,004
- Petroleum Refining	0,001	0,001	0,001	0,001	0,001	0,001	0,001
- Oil and gas production ¹	0,049	0,052	0,057	0,059	0,061	0,061	0,066
- Manufacturing Industry and Construction	0,011	0,010	0,010	0,011	0,012	0,012	0,013
- Transport	0,091	0,087	0,083	0,083	0,079	0,076	0,071
- Other sectors (1A4)	0,176	0,159	0,155	0,174	0,185	0,180	0,193
- Other sectors (1A5)	0,001	0,001	0,001	0,001	0,001	0,000	0,001
- Fugitives	0,588	0,632	0,734	0,837	0,867	0,845	0,875
Industrial Processes	0,012	0,010	0,011	0,011	0,011	0,012	0,012
Agriculture	3,160	3,155	3,180	3,137	3,186	3,178	3,215
Waste	2,182	2,158	2,132	2,113	2,094	2,052	2,002
<i>Total</i>	6,273	6,269	6,367	6,428	6,500	6,421	6,451

1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
1,306	1,238	1,203	1,332	1,450	1,394	1,474	1,507	1,382	1,292	1,451	1,361	1,347	1,396	1,316
0,004	0,005	0,005	0,006	0,006	0,007	0,008	0,008	0,009	0,009	0,012	0,012	0,022	0,025	0,022
0,001	0,001	0,001	0,001	0,000	0,001	0,001	0,000	0,000	0,001	0,001	0,001	0,001	0,000	0,000
0,071	0,067	0,062	0,072	0,080	0,083	0,089	0,093	0,092	0,087	0,089	0,095	0,092	0,094	0,091
0,014	0,013	0,014	0,013	0,013	0,013	0,014	0,013	0,014	0,014	0,014	0,014	0,013	0,017	0,019
0,068	0,063	0,060	0,056	0,051	0,047	0,049	0,050	0,049	0,047	0,074	0,080	0,085	0,091	0,095
0,198	0,190	0,194	0,197	0,205	0,232	0,232	0,218	0,218	0,218	0,214	0,213	0,218	0,243	0,216
0,001	0,000	0,000	0,000	0,001	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,002	0,002
0,949	0,899	0,867	0,988	1,093	1,012	1,082	1,124	1,000	0,916	1,046	0,946	0,915	0,923	0,871
0,018	0,023	0,022	0,021	0,024	0,025	0,022	0,020	0,021	0,020	0,016	0,020	0,018	0,020	0,021
3,175	3,185	3,270	3,124	3,087	3,071	3,125	3,040	3,027	2,965	2,937	2,909	2,822	2,815	2,757
1,954	1,812	1,682	1,739	1,673	1,588	1,578	1,563	1,477	1,496	1,475	1,415	1,428	1,405	1,392
6,452	6,258	6,176	6,215	6,233	6,078	6,199	6,130	5,906	5,773	5,879	5,705	5,615	5,636	5,486

2012	2013	2020	2030
1,298	1,354	1,420	1,309
0,018	0,019	0,016	0,016
0,000	0,000	0,023	0,022
0,093	0,087	0,102	0,090
0,016	0,017	0,024	0,025
0,127	0,149	0,025	0,023
0,224	0,184	0,108	0,103
0,002	0,003		
0,817	0,895	1,122	1,029
0,021	0,019	0,237	0,261
2,747	2,753	2,738	2,768
1,343	1,302	0,933	0,668
5,408	5,428	5,328	5,006