



COMPLIANCE COMMITTEE

**CC/ERT/2019/21
5 September 2019**

**Report of the technical review of the seventh national communication
of Norway**

Note by the secretariat

The report of the technical review of the seventh national communication of Norway was published on 5 September 2018. For purposes of rule 10, paragraph 2, of the rules of procedure of the Compliance Committee (annex to decision 4/CMP.2, as amended by decisions 4/CMP.4 and 8/CMP.9), the report is considered received by the secretariat on the same date. This report, FCCC/IDR.7/NOR, contained in the annex to this note, is being forwarded to the Compliance Committee in accordance with section VI, paragraph 3, of the annex to decision 27/CMP.1.



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Report on the technical review of the seventh national communication of Norway

Parties included in Annex I to the Convention were requested by decision 9/CP.16 to submit their seventh national communication to the secretariat by 1 January 2018. According to decision 15/CMP.1, Parties included in Annex I to the Convention that are also Parties to the Kyoto Protocol are required to include in their national communications supplementary information under Article 7, paragraph 2, of the Kyoto Protocol. This report presents the results of the technical review of the seventh national communication and relevant supplementary information under the Kyoto Protocol of Norway, conducted by an expert review team in accordance with the “Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention” and the “Guidelines for review under Article 8 of the Kyoto Protocol”.

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Abbreviations and acronyms

AAU	assigned amount unit
BR	biennial report
CCS	carbon capture and storage
CER	certified emission reduction
CH ₄	methane
CO ₂	carbon dioxide
CO ₂ eq	carbon dioxide equivalent
CTF	common tabular format
EEA Agreement	Agreement on the European Economic Area
ERT	expert review team
ERU	emission reduction unit
EU	European Union
EUA	European Union Allowance
EU ETS	European Union Emissions Trading System
F-gas	fluorinated gas
GCF	Green Climate Fund
GDP	gross domestic product
GEF	Global Environment Facility
GHG	greenhouse gas
HFC	hydrofluorocarbon
IPCC	Intergovernmental Panel on Climate Change
IPPU	industrial processes and product use
LULUCF	land use, land-use change and forestry
NA	not applicable
NC	national communication
NE	not estimated
NF ₃	nitrogen trifluoride
NGO	non-governmental organization
NIR	national inventory report
NO	not occurring
NOK	Norwegian kroner
non-Annex I Party	Party not included in Annex I to the Convention
N ₂ O	nitrous oxide
OECD DAC	Development Assistance Committee of the Organisation for Economic Co-operation and Development
PaMs	policies and measures
PFC	perfluorocarbon
REDD-plus	In decision 1/CP.16, paragraph 70, the Conference of the Parties encouraged developing country Parties to contribute to mitigation actions in the forest sector by undertaking the following activities: reducing emissions from deforestation; reducing emissions from forest degradation; conservation of forest carbon stocks; sustainable management of forests; and enhancement of forest carbon stocks
reporting guidelines for supplementary information	“Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol, Part II: Reporting of supplementary information under Article 7, paragraph 2”
SF ₆	sulfur hexafluoride
UNFCCC reporting guidelines on NCs	“Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications”
WAM	‘with additional measures’
WEM	‘with measures’

I. Introduction and summary

A. Introduction

1. This is a report on the in-country technical review of the NC7 of Norway. The review was coordinated by the secretariat in accordance with the “Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention”, particularly “Part V: UNFCCC guidelines for the technical review of national communications from Parties included in Annex I to the Convention” (annex to decision 13/CP.20), and the “Guidelines for review under Article 8 of the Kyoto Protocol” (annex to decision 22/CMP.1 in conjunction with annex I to decision 4/CMP.11).¹

2. In accordance with the same decisions, a draft version of this report was transmitted to the Government of Norway, which provided comments that were considered and incorporated, as appropriate, into this final version of the report.

3. The review was conducted from 16 to 21 April 2018 in Oslo by the following team of nominated experts from the UNFCCC roster of experts: Mr. Manuel Estrada (Mexico), Mr. Ricardo Fernandez (European Union), Ms. Sayeda Khalil (Sudan), Ms. Eva Krtkova (Czechia) and Mr. Ioannis Sempos (Greece). Mr. Estrada and Mr. Sempos were the lead reviewers. The review was coordinated by Ms. Ruta Bubniene and Ms. Alma Jean (UNFCCC secretariat).

B. Summary

4. The ERT assessed the information reported in the NC7 of Norway against the UNFCCC reporting guidelines on NCs (decision 4/CP.5) and the reporting guidelines for supplementary information, in particular the supplementary information required under Article 7, paragraph 2, and on the minimization of adverse impacts under Article 3, paragraph 14, of the Kyoto Protocol (annex to decision 15/CMP.1 and annex III to decision 3/CMP.11). The ERT conducted a technical review in accordance with the “Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention” (decision 23/CP.19) and the “Guidelines for review under Article 8 of the Kyoto Protocol” (decision 22/CMP.1).

1. Timeliness

5. The NC7 was submitted on 29 January 2018, after the deadline of 1 January 2018 mandated by decision 9/CP.16. The ERT noted with concern the delay in the submission and recommended that Norway submit its next NC on time. Norway submitted a redesigned version of its NC7 on 18 April 2018, without changes to the context.

2. Completeness, transparency of reporting and adherence to the reporting guidelines

6. Issues and gaps identified by the ERT related to the reported information are presented in table 1. The information reported by Norway in its NC7, including the supplementary information under the Kyoto Protocol, mostly adheres to the UNFCCC reporting guidelines on NCs.

¹ At the time of the publication of this report, the Party had submitted its instrument of acceptance of the Doha Amendment; however, the amendment had not yet entered into force. The implementation of the provisions of the Doha Amendment is therefore considered in this report in the context of decision 1/CMP.8, paragraph 6, pending the entry into force of the amendment.

Table 1

Assessment of completeness and transparency of mandatory information reported by Norway in its seventh national communication, including supplementary information under the Kyoto Protocol

<i>Section of NC</i>	<i>Completeness</i>	<i>Transparency</i>	<i>Reference to description of recommendations</i>	<i>Supplementary information under the Kyoto Protocol</i>	<i>Completeness</i>	<i>Transparency</i>	<i>Reference to description of recommendations</i>
Executive summary	Complete	Transparent		National system	Complete	Transparent	
National circumstances	Complete	Transparent		National registry	Complete	Transparent	
GHG inventory	Complete	Transparent		Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17	Complete	Transparent	
PaMs	Complete	Transparent		PaMs in accordance with Article 2	Complete	Transparent	
Projections and the total effect of PaMs	Complete	Transparent		Domestic and regional programmes and/or arrangements and procedures	Complete	Transparent	
Vulnerability assessment, climate change impacts and adaptation measures	Complete	Transparent		Information under Article 10 ^a	Complete	Transparent	
Financial resources and transfer of technology	Mostly complete	Partially transparent	Issues 1–2 in table 14 and issues 1–4 in table 15	Financial resources	Complete	Transparent	
Research and systematic observation	Complete	Mostly transparent	Issue 1 in table 17	Minimization of adverse impacts in accordance with Article 3, paragraph 14	Complete	Transparent	
Education, training and public awareness	Complete	Transparent					

Note: A list of recommendations pertaining to the completeness and transparency issues identified in this table is included in chapter III below. Sectoral findings on completeness and transparency presented in the report identify and describe issues pertaining to both mandatory (“shall”) and non-mandatory (“should”) requirements, leading to recommendations and encouragements, respectively.

^a The assessment refers to information provided by the Party on the provisions contained in Article 4, paragraphs 3, 5 and 7, of the Convention reported under Article 10 of the Kyoto Protocol, which is relevant to Parties included in Annex II to the Convention only. Assessment of the information provided by the Party on the other provisions of Article 10 of the Kyoto Protocol is provided under the relevant substantive headings under the Convention, for example research and systematic observation.

3. Summary of reviewed supplementary information under the Kyoto Protocol

7. The supplementary information under Article 7, paragraph 2, of the Kyoto Protocol is incorporated in different sections of the NC7, and the supplementary information under Article 7, paragraph 1, of the Kyoto Protocol is reported in the NIR of the 2017 annual submission. Table 2 provides references to where the information is reported. The technical assessment of the information reported under Article 7, paragraphs 1 and 2, of the Kyoto Protocol is contained in the relevant sections of this report.

Table 2

Overview of supplementary information under the Kyoto Protocol reported by Norway

<i>Supplementary information</i>	<i>Reference to the section of the NC7</i>
National registry	3.3
National system	3.2
Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17	5.5
PaMs in accordance with Article 2	4.1.4
Domestic and regional programmes and/or legislative arrangements and enforcement and administrative procedures	4.2
Information under Article 10	5, 6, 8, 9
Financial resources	7
Minimization of adverse impacts in accordance with Article 3, paragraph 14	Reported in the NC7 (section 4.1.4) and the NIR of the Party's 2017 annual submission (section 15)

II. Technical review of the information reported in the seventh national communication, including the supplementary information under the Kyoto Protocol

A. Information on national circumstances and greenhouse gas emissions and removals

1. National circumstances relevant to greenhouse gas emissions and removals

(a) Technical assessment of the reported information

8. The national circumstances of Norway explain the relationship between its historic and future emission trends and the climate change policy agenda. The NC7 contains key data on legislation, population trends, geography and land use, climate and climate change, economic developments, energy, transport, the buildings sector, industry, trade, the services sector, agriculture, forestry, resource efficiency and wastewater. It also contains information on government structure, geographic profile and land use, population and urban profile, economic profile and industry, the petroleum sector, energy production and use, agriculture and forestry, fisheries and aquaculture, and manufacturing industries and construction.

9. Unlike most other countries, nearly all of Norway's electricity production is based on renewable sources (mostly hydropower), and the proportion of energy use accounted for by electricity is considerably higher than in most other countries. Since its NC6, the GDP and population of Norway have continued to grow, while GHG emissions have remained stable, ranging between 53 and 54 Mt CO₂ eq.

10. The overall responsibility for climate change policymaking lies with the Ministry of Climate and Environment, and a number of national and regional institutions are involved

in implementing these policies. The Ministry of Climate and Environment also operates the Norwegian Carbon Credit Procurement Program, while the Ministry of Finance is responsible for tax schemes. Local governments are responsible for implementing PaMs at the local level, for example through waste management, local planning and some transport measures.

11. The Norwegian Environment Agency under the Ministry of Climate and Environment implements governmental pollution and nature management policy, focusing on climate, hazardous substances, water and the marine environment, waste management, air quality and noise. The Agency manages and enforces the Pollution Control Act, the Product Control Act, the Greenhouse Gas Emissions Trading Act and the Nature Diversity Act, among others. The Norwegian Water Resources and Energy Directorate under the Ministry of Petroleum and Energy seeks to ensure integrated and environmentally sound management of the country's water resources and promotes efficient energy markets, cost-effective energy systems and efficient energy use.

12. The ERT noted that during the period 1990–2015 Norway's population and GDP increased by 22.3 and 81.9 per cent, respectively, while GHG emissions per GDP unit and GHG emissions per capita decreased by 42.7 and 14.8 per cent, respectively. Norway introduced a CO₂ tax as early as 1991, which has been supplemented by the participation of Norwegian installations in the EU ETS. The use of these economic instruments has contributed to the significant decline in Norway's GHG emission intensity.

13. The key driver for economic growth in Norway is the growth of the petroleum industry. Although the majority of petroleum industry activities occur offshore, there has been a marked decline in emissions in relation to the mainland (onshore) economy, where emissions per produced unit dropped by 3.1 per cent annually in the period 1990–2016. The use of the CO₂ tax or EU ETS quotas on emissions, resulting in higher energy costs, reinforced this decreasing emission trend. The petroleum industry is expected to remain important for the Norwegian economy in the future. It is also expected that a continuously stricter global climate policy and faster technological development changes will have an impact on the overall conditions for Norwegian business.

14. Norway has been part of the EU internal market through the EEA Agreement since 1994. The objective of the EEA Agreement is to strengthen trade and economic relations between the European Economic Area/European Free Trade Association States and the EU member States, with equal conditions of competition throughout the European Economic Area. The Agreement gives European Free Trade Association countries the opportunity to influence EU policymaking in areas of relevance to the internal market, including environmental policies. Therefore, some of the EU climate change directives and regulations have been transposed into Norwegian legislation.

15. Norway established a national emissions trading scheme in 2005. The scheme closely resembled the EU ETS and covered 11 per cent of the total Norwegian GHG emissions. Emissions already subject to the CO₂ tax were not included in the scheme. In 2008 Norway became part of the EU ETS, which broadened coverage to nearly 40 per cent of Norwegian GHG emissions. In addition to the sectors included in the EU ETS, Norway decided unilaterally to include from 1 July 2008 N₂O emissions from the production of nitric acid. The aviation sector was included within the scope of the EU ETS from 2012, and in 2013 the coverage of the EU ETS was further expanded, so that it now covers about 50 per cent of Norwegian GHG emissions.

16. Table 3 illustrates the national circumstances of Norway by providing some indicators relevant to emissions and removals.

Table 3

Indicators relevant to greenhouse gas emissions and removals for Norway for the period 1990–2015

<i>Indicator</i>	<i>Change (%)</i>						
	<i>1990</i>	<i>2000</i>	<i>2010</i>	<i>2014</i>	<i>2015</i>	<i>1990–2015</i>	<i>2014–2015</i>
GDP per capita (thousands 2011 USD using purchasing power parity)	42.83	58.07	62.27	63.29	63.67	48.7	0.6
GHG emissions without LULUCF per capita (t CO ₂ eq)	12.20	12.17	11.30	10.38	10.39	–14.8	0.1
GHG emissions without LULUCF per GDP unit (kg CO ₂ eq per 2011 USD using purchasing power parity)	0.28	0.21	0.18	0.16	0.16	–42.7	–0.5

Sources: (1) GHG emission data: Norway's 2017 GHG inventory submission, version 7.0; (2) population and GDP: World Bank, as at December 2017.

Note: The ratios per capita and per GDP unit are calculated relative to GHG emissions without LULUCF; the ratios are calculated using the exact (not rounded) values and may therefore differ from a ratio calculated with the rounded numbers provided in the table.

(b) Assessment of adherence to the reporting guidelines

17. The ERT assessed the information reported in the NC7 of Norway and identified an issue relating to transparency and adherence to the UNFCCC reporting guidelines on NCs. The finding is described in table 4.

Table 4

Finding on national circumstances relevant to greenhouse gas emissions and removals from the review of the seventh national communication of Norway

<i>No.</i>	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation or encouragement</i>
1	Reporting requirement specified in paragraph 8 Issue type: completeness Assessment: encouragement	Chapter 2 of the NC7 broadly explains the national circumstances of Norway, following the structure provided in the UNFCCC reporting guidelines on NCs. However, information on national circumstances related to waste (e.g. sources of waste, waste management practices) was not presented. During the review, Norway informed the ERT that the waste sector, with emissions of 1.3 Mt CO ₂ eq, accounted for 2.3 per cent of national GHG emissions in 2016. Most of the emissions from the waste sector originate from solid waste disposal on land. Economic growth, or growth in production and consumption, is the key driver behind the growing waste volume. Even though the total amount of waste generated is increasing, GHG emissions from the waste sector have generally decreased since 1990. This is due to the increase in material recycling and the ban issued in 2009 on disposing biodegradable waste to landfill. The central government authorities set the general framework, while municipalities and industry are responsible for waste collection and treatment. The ERT encourages Norway to include information on national circumstances relevant to the waste sector in its next NC.

Note: Paragraph number listed under reporting requirement refers to the relevant paragraph of the UNFCCC reporting guidelines on NCs. The reporting on the requirements not included in this table is considered to be complete, transparent and adhering to the UNFCCC reporting guidelines on NCs.

2. Information on greenhouse gas inventory arrangements, emissions, removals and trends

(a) Technical assessment of the reported information

18. Total GHG emissions² excluding emissions and removals from LULUCF increased by 3.0 per cent between 1990 and 2016, whereas total GHG emissions including net emissions or removals from LULUCF decreased by 30.1 per cent over the same period. Table 5 illustrates the emission trends by sector and by gas for Norway.

Table 5

Greenhouse gas emissions by sector and by gas for Norway for the period 1990–2016

	GHG emissions (kt CO ₂ eq)						Change (%)		Share (%)	
	1990 ^a	2000	2010	2014	2015	2016	1990–2016	2015–2016	1990	2016
<i>Sector</i>										
1. Energy	30 146.94	36 106.94	41 105.62	39 005.77	39 602.17	38 844.89	28.9	–1.9	58.3	73.0
A1. Energy industries	7 281.29	10 945.62	15 032.16	15 107.53	15 521.52	15 092.31	107.3	–2.8	14.1	28.3
A2. Manufacturing industries and construction	4 026.98	4 405.87	4 328.22	3 787.78	3 800.95	3 800.53	–5.6	0.0	7.8	7.1
A3. Transport	10 265.53	11 846.41	13 477.78	13 158.83	13 230.90	12 859.97	25.3	–2.8	19.9	24.2
A4. and A5. Other	5 097.94	4 037.08	4 565.74	3 606.46	3 524.45	3 707.57	–27.3	5.2	9.9	7.0
B. Fugitive emissions from fuels	3 475.19	4 862.64	3 604.92	3 301.16	3 482.38	3 373.87	–2.9	–3.1	6.7	6.3
C. CO ₂ transport and storage	NO	9.32	96.79	44.02	41.97	10.64	–	–74.6	–	0.0
2. IPPU	14 497.79	12 096.42	8 184.62	8 414.25	8 467.14	8 628.21	–40.5	1.9	28.0	16.2
3. Agriculture	4 808.84	4 573.56	4 335.71	4 447.11	4 491.12	4 518.29	–6.0	0.6	9.3	8.5
4. LULUCF	–10 364.36	–24 208.80	–26 435.54	–24 559.58	–23 768.80	–24 355.92	135.0	2.5	–	–
5. Waste	2 243.40	1 821.24	1 510.40	1 379.34	1 310.81	1 251.12	–44.2	–4.6	4.3	2.3
6. Other	NO	NO	NO	NO	NO	NO	–	–	–	–
<i>Gas^b</i>										
CO ₂	35 704.39	42 215.88	45 823.28	43 952.66	44 663.73	44 031.62	23.3	–1.4	69.1	82.7
CH ₄	5 788.38	5 672.57	5 353.07	5 269.61	5 163.02	5 078.84	–12.3	–1.6	11.2	9.5
N ₂ O	4 210.81	3 916.57	2 588.48	2 559.63	2 595.40	2 518.63	–40.2	–3.0	8.1	4.7
HFCs	0.04	383.27	1 064.54	1 235.58	1 232.90	1 363.61	–	10.6	0.0	2.6
PFCs	3 894.80	1 518.45	238.39	178.92	146.39	186.17	–95.2	27.2	7.5	0.3
SF ₆	2 098.54	891.41	68.59	50.07	69.79	63.64	–97.0	–8.8	4.1	0.1
NF ₃	NA, NO	NA, NO	NA, NO	NA, NO	NA, NO	NA, NO	–	–	–	–
Total GHG emissions without LULUCF	51 696.96	54 598.16	55 136.35	53 246.47	53 871.24	53 242.51	3.0	–1.2	–	–
Total GHG emissions with LULUCF	41 332.60	30 389.36	28 700.80	28 686.89	30 102.43	28 886.59	–30.1	–4.0	–	–

Source: GHG emission data: Norway's 2018 annual submission, version 1.0.

^a Figures for 1990 are different from the figures for 1990 in tables 9 and 10 since table 5 reflects the most recent GHG inventory submission, while tables 9 and 10 reflect the information reported in NC7.

^b Emissions by gas without LULUCF.

² In this report, the term “total GHG emissions” refers to the aggregated national GHG emissions expressed in terms of CO₂ eq excluding LULUCF, unless otherwise specified. Values in this paragraph are calculated on the basis of the Party's 2018 annual GHG inventory submission, version 1.0.

19. The increase in total emissions without LULUCF has been driven mainly by the strong economic and population growth that Norway has experienced since 1990 as well as by the expansion of oil and gas extraction and processing. These factors have led to increased use of fossil fuels, and consequently higher CO₂ emissions from the petroleum and transport sectors. The overall emission increase has been slowed, however, by the reduction in emissions from the waste sector (due to increased recycling, incineration of waste and recovery of landfill gas) and the industrial processes sector (due to the reduction of N₂O, PFC and SF₆ emissions as a result of technology improvements). A peak in total GHG emissions was attained in 2007, at 56,696.45 kt CO₂ eq, followed by a significant decrease in 2008 and 2009 (–7.2 per cent), partly caused by the international economic crisis.

20. Between 1990 and 2016, GHG emissions from the energy sector increased by 28.9 per cent (38,44.89 kt CO₂ eq). The trend in GHG emissions from fuel combustion showed notable increases in energy industries (in particular, oil and gas extraction) (by 107.3 per cent or 15,092.31 kt CO₂ eq) and transport (in particular, road traffic, civil aviation, coastal traffic and fishing) (by 25.3 per cent or 12,859.97 kt CO₂ eq). Emissions from electricity generation and heating residential and commercial buildings in the mainland economy are low, since electricity is based mainly on hydropower and therefore the use of oil for residential heating is reduced.

21. Between 1990 and 2016, GHG emissions from IPPU decreased by 40.5 per cent (8,628.21 kt CO₂ eq), owing mainly to non-CO₂ emission reductions: PFC emissions from aluminium production decreased as a result of technology improvements in the production process; SF₆ emissions from aluminium and magnesium foundries decreased as a result of the end of the production of primary magnesium in 2002 and of the casting of magnesium in 2006; and N₂O emissions from nitric acid production decreased as a result of abatement technology applied.

22. Between 1990 and 2016, GHG emissions from the agriculture sector decreased by 6.0 per cent (4,518.29 kt CO₂ eq), owing mainly to reduced liming activities, the reduced nitrogen content of the synthetic fertilizers used, and more concentrated and more effective milk production, which led to a reduction in the number of dairy cows.

23. The LULUCF sector was a net sink of 24,355.92 kt CO₂ eq in 2016; net GHG removals have increased by 135.0 per cent since 1990. The emission trend has been affected mainly by the high rates of forest planting after World War II, which has contributed significantly to the current high carbon sequestration by forest. Between 1990 and 2016, GHG emissions from the waste sector decreased by 44.2 per cent (1,251.12 kt CO₂ eq), owing mainly to increased recycling, incineration of waste and recovery and burning of landfill gas.

24. CO₂ emissions, which represented 82.7 per cent of total GHG emissions in 2016, increased by 23.3 per cent between 1990 and 2016. This is due mainly to increases in emissions from oil and gas extraction and from transport, in particular road transport, civil aviation, coastal traffic and fishing. In 2016, CH₄ emissions accounted for 9.5 per cent of total GHG emissions. During the period 1990–2016, total CH₄ emissions decreased by 12.3 per cent, primarily caused by decreased emissions from landfills (–49.53 per cent in 1990–2016), which more than compensated for the growth in emissions from the oil and gas industry. N₂O emissions in 2016 accounted for 4.7 per cent of total GHG emissions and show a generally decreasing trend until 2016 (by 40.2 per cent below the 1990 level), which is due mainly since 2005 to the reduction in emissions from nitric acid production.

25. Emissions of PFCs and SF₆ decreased by 95.2 per cent and 97.0 per cent, respectively, between 1990 and 2016, and together represented only 0.4 per cent of total GHG emissions in 2016. HFC emissions were insignificant in 1990 but had increased by 2016, representing 2.6 per cent of total GHG emissions. The increasing trend in HFC emissions is due to the substitution of ozone-depleting substances for HFCs in the refrigeration and air-conditioning sector.

26. The summary information provided on GHG emissions in the NC7 was consistent with the information reported in the Party's 2017 annual submission.

(b) Assessment of adherence to the reporting guidelines

27. The ERT assessed the information reported in the NC7 of Norway and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting guidelines on NCs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

3. National system for the estimation of anthropogenic emissions by sources and removals by sinks**(a) Technical assessment of the reported information**

28. Norway provided in the NC7 a description of how its national system for the estimation of anthropogenic emissions by sources and removals by sinks of all GHGs not controlled by the Montreal Protocol is performing the general and specific functions defined in the annex to decision 19/CMP.1. The description includes all the elements mandated by paragraph 30 of the annex to decision 15/CMP.1. The NC7 also contains a reference to the description of the national system provided in the NIR of the 2017 annual submission. The ERT took note of the review of the changes to the national system reflected in the report on the individual review of the 2017 annual submission of Norway.

(b) Assessment of adherence to the reporting guidelines

29. The ERT assessed the information reported in the NC7 of Norway and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting guidelines on NCs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

4. National registry**(a) Technical assessment of the reported information**

30. In the NC7 Norway provided information on how its national registry performs the functions in accordance with the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1 and complies with the requirements of the technical standards for data exchange between registry systems. The ERT took note of the review of the changes to the national registry reflected in the report on the individual review of the 2017 annual submission of Norway.

(b) Assessment of adherence to the reporting guidelines

31. The ERT assessed the information reported in the NC7 of Norway and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting guidelines on NCs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

B. Information on policies and measures and institutional arrangements**1. Domestic and regional programmes and/or legislative arrangements and procedures related to the Kyoto Protocol****(a) Technical assessment of the reported information**

32. Norway expects to be eligible to issue removal units from forest management under Article 3, paragraph 4, corresponding to 3.5 per cent of its total GHG emissions in 1990 or about 14 Mt for the entire second commitment period. The real increase in carbon stocks is expected to be much higher. Other selected activities under Article 3, paragraph 4 (cropland and grazing land management), are expected to yield limited contributions. The net changes in GHG emissions by sources and removals by sinks resulting from land-use change under Article 3, paragraph 3 (afforestation, reforestation and deforestation), measured as verifiable changes in carbon stocks in the commitment period, are accounted for in their entirety. Currently the contribution from deforestation is expected to outweigh all the

sequestration that can be accounted for under Article 3, paragraphs 3 and 4, so that the total contribution from LULUCF will be accounted as a low level of emissions.

33. Norway's climate targets for 2030 and 2050 are made legally binding in the new Climate Change Act, which was adopted in 2017.

34. Norway has legislative arrangements and administrative procedures in place to make information publicly accessible, such as the Environmental Information Act (see para. 134 below).

35. Norway has national legislative arrangements and administrative procedures in place that seek to ensure that the implementation of activities under Article 3, paragraph 3, forest management under Article 3, paragraph 4, and any elected activities under Article 3, paragraph 4, of the Kyoto Protocol also contribute to the conservation of biodiversity and the sustainable use of natural resources. Norway's Forestry Act was adopted by the Norwegian Parliament in 2005 and came into force in 2006. Its main objectives are to promote sustainable management of forest resources and to secure biological diversity, consideration for the landscape, outdoor recreation and the cultural values associated with the forest.

36. A regulation under the Forestry Act requires forest owners to set aside between 4 and 40 per cent of their revenue from harvested timber for the Forest Trust Fund, which aims to secure long-term investment in sustainable forestry. Tax relief is granted through the Forest Trust Fund, and economic support is provided for a similar range of activities supporting sustainable forestry and climate change mitigation.

(b) Assessment of adherence to the reporting guidelines

37. The ERT assessed the information reported in the NC7 of Norway and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting guidelines on NCs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

2. Policies and measures, including those in accordance with Article 2 of the Kyoto Protocol

(a) Technical assessment of the reported information

38. Norway provided information on its package of PaMs implemented, adopted and planned, by sector and by gas, in order to fulfil its commitments under the Convention and its Kyoto Protocol. Norway reported on its policy context and legal and institutional arrangements put in place to implement its commitments and to monitor and evaluate the effectiveness of its PaMs.

39. Norway provided detailed information on its current PaMs, many of which are new compared with those reported in its NC6. Norway also provided information on changes made since the NC6 to its institutional, legal, administrative and procedural arrangements for domestic compliance, monitoring, reporting, archiving of information and evaluation of the progress made towards its target. Although there have not been significant changes to these arrangements since the NC6, Norway adopted a new Climate Change Act in June 2017.

40. Norway has given priority to implementing the PaMs that will make the most significant contribution to its emission reduction efforts. It provided information on how it believes its PaMs are modifying longer-term trends in anthropogenic GHG emissions and removals in accordance with the objective of the Convention. During the review, Norway explained that, while its GHG emissions have increased since 1990, it has implemented PaMs that cover most of them. GHG emissions peaked in 2007 and have decreased since then, with projections showing that emissions will continue to decline. The Party explained that the CO₂ tax and the price of allowances under the EU ETS incentivize the reduction of GHG emissions in the economic sectors covered by those measures. The Party also explained that there are significant tax and user incentives to develop and implement emission-reducing technologies in sectors such as transportation and industry.

41. Norway periodically updates its PaMs to reduce higher levels of GHG emissions, and it provided information on the PaMs that have been discontinued since the NC6. These include the agreement with the aluminium industry, now covered under the EU ETS, measures for SF₆ reduction and the tax on waste disposal. For example, the voluntary agreements between the major aluminium producers and the Ministry of Climate and Environment to reduce PFC emissions, and the technology improvements and process control measures that resulted from those agreements, have already led to substantial reductions of PFC emissions per tonne aluminium produced. In 1990, PFC emissions equalled 4.48 kg CO₂ eq/t aluminium produced, compared with 0.70 and 0.12 kg CO₂ eq in 2007 and 2015, respectively. The aluminium industry has thus achieved important emission reductions through voluntary agreements. Since 2013, emissions from aluminium production have been covered by the EU ETS.

42. The overall national climate policy is decided by the Norwegian Parliament. While the Government implements and administers the most important PaMs (including economic instruments and direct regulations), local governments are responsible for implementing PaMs at the local level, such as those related to waste management, local planning and some transport measures.

43. Norway highlighted that CCS is one of the key priority areas for enhanced national climate action and that it considers it a key technology for reducing global GHG emissions. Research and technology development to make the technology economically viable is ongoing, not only in Norway but also internationally. The CCS projects for natural gas on the Sleipner, Gudrun and Snøhvit petroleum fields are the only CCS projects currently in operation in Europe and the only projects in the offshore industry. Moreover, the Technology Centre Mongstad is the world's largest facility for testing and improving CO₂ capture technologies. Norway collaborates with other countries through regional and international forums and provides funding for CCS projects abroad. Norway is currently supporting a CCS project in South Africa. Table 6 provides a summary of the reported information on the PaMs of Norway.

Table 6
Summary of information on policies and measures reported by Norway

<i>Sector</i>	<i>Key PaMs</i>	<i>Estimate of mitigation impact by 2020 (kt CO₂ eq)</i>	<i>Estimate of mitigation impact by 2030 (kt CO₂ eq)</i>
Policy framework and cross-sectoral measures	CO ₂ tax and EU ETS for onshore activities and Enova investment scheme	2 900–3 200	2 900–3 200
Energy use in the residential sector	Ban on use of mineral oils for heating of buildings	400	200–300
Transport	CO ₂ -dependent registration tax for new passenger cars, including special rules for plug-in hybrid cars	1 270–1 520	2 040–2 340
	Tax exemptions and other advantages for electric vehicles		
	Requirement for 6.25 per cent biofuels in fuel consumption for road transportation		
Petroleum	CO ₂ tax and EU ETS for offshore activities	7 000	7 000
IPPU	Incentives for N ₂ O reduction from nitric acid production	6 810–10 010	7 260–10 760
	Biocarbon use in cement and ferroalloys production		
	Tax and recycling schemes for HFCs		
	Revised F-gas regulation		
	Voluntary agreement with aluminium industry to reduce PFCs		

<i>Sector</i>	<i>Key PaMs</i>	<i>Estimate of mitigation impact by 2020 (kt CO₂ eq)</i>	<i>Estimate of mitigation impact by 2030 (kt CO₂ eq)</i>
Agriculture		NE	NE
LULUCF	Fertilization of forests	>0	270
Waste	Prohibition of disposal of biodegradable waste	571	786
	Requirement to collect landfill gas		

Note: The estimates of mitigation impact are estimates of emissions of CO₂ or CO₂ eq avoided in a given year as a result of the implementation of the mitigation actions.

(b) Policies and measures in the energy sector

44. **Energy supply.** It is worth highlighting that some of the most popular mitigation options globally, such as increasing renewable energy use and improving energy efficiency, have limited effect in Norway, as the share of renewable energy (mainly hydro) in the fuel mix is close to 100 per cent (see para. 9 above). Heating in the residential and commercial sectors is electricity based and therefore further significant mitigation effects are limited.

45. **Residential sector and energy use in industries.** The key policy in Norway contributing to mitigation action in the residential sector is the CO₂ tax, the building code, Enova and in 2020 the ban on using mineral oils for heating of buildings. The estimated effect is in the order of 400 kt CO₂ eq emission reduction by 2020. The effects of the other policy instruments are included elsewhere (in cross-sectoral PaMs of CO₂ tax and Enova). The key GHG emission mitigation policies for energy use in industries are the EU ETS, the CO₂ tax, the excise duty on mineral oils and Enova. The effect of these instruments is included in the aggregate for industries.

46. **Transport sector.** Norway has impressive incentives related to the deployment of electric vehicles. Electric vehicles are exempt from registration tax, road tax and value-added tax and have a reduced rate of the annual tax on motor vehicles. According to Norway's NC7 and BR3, electric vehicles can also come with additional benefits such as access to bus lanes, free toll passage, free car ferry crossings and free public parking. The number of electric vehicles is expected to increase to 50 per cent of total new passenger car sales by 2030.

47. The ERT noted that emissions from passenger cars have increased by almost 6 per cent since 1990. During the review the Party explained that passenger kilometres have increased even more than emissions from passenger cars, which indicates that emissions per passenger kilometre have decreased. The main reasons for this change noted by the Party are the improved fuel efficiency of newer conventional petrol and diesel vehicles, the shift from petrol to diesel cars and the biofuel blending obligation. The rapid increase in the percentage of electric vehicles, particularly in 2016 and 2017, also contributed to the lower emissions from passenger vehicles. In 2007, CO₂ emissions were included in the calculation of the registration tax. The reason for this was to reduce CO₂ emissions from new cars. From 2009 to 2017, the registration tax was shifted to place greater weight on CO₂ emissions. Norway estimated the combined mitigation effect of all transport-related PaMs to be in the range of 1.4–1.7 Mt CO₂ eq emission reduction by 2020.

48. The NC7 includes information on how Norway promotes and implements the decisions of the International Civil Aviation Organization and the International Maritime Organization to limit emissions from aviation and marine bunker fuels. For instance, one of Norway's climate measures is promoting battery-electric ferries through public procurement. More energy-efficient shipping technologies are also promoted via research and development programmes under the Research Council of Norway, Innovation Norway and Enova. For aviation, Norway supports the International Civil Aviation Organization General Assembly's decision to develop global market-based measures and intends to take part in the six-year voluntary phase of the market-based mechanism from 2021. Norway already participates in the EU ETS for aviation.

49. **Petroleum sector.** The petroleum sector is very important for the Norwegian economy and represents about 15 per cent of its GDP. Norway is the third-largest exporter of natural gas in the world, and almost all oil and gas produced by the Party is exported. The combined value of oil and gas represents about 50 per cent of the total value of Norway's exported goods.

50. Mitigation measures have been implemented in the petroleum sector. The CO₂ tax is levied on all combustion of natural gas, oil and diesel in petroleum operations on the Norwegian continental shelf and on CO₂ separated from petroleum and discharged to air in installations used for production or transportation of petroleum. In addition to the CO₂ tax, Norwegian installations in the petroleum industry are covered by the EU ETS under the same rules as those within the EU. Regulatory measures have contributed to mitigation actions, such as a ban on natural gas flaring in gas and oil extraction, which is only permitted for safety reasons. According to Norway's report, the CO₂ tax and the EU ETS had contributed to emission reductions of about 5 Mt CO₂ eq by 2010.

51. New or planned measures in the petroleum sector, such as the provision of power from the onshore electricity grid, energy-efficiency improvements and technological improvements, could raise the GHG mitigation effect of the petroleum sector to 7 Mt CO₂ eq by 2020 and 2030. For example, supplying power to offshore platforms from the onshore mostly renewable national grid will reduce GHG emissions from the offshore platforms.

(c) **Policies and measures in other sectors**

52. **Industrial processes.** Norway has been part of the EU ETS since 2008. Since the expansion in 2013, the EU ETS covers most emissions from this sector, including process-related emissions from cement, nitric acid, aluminium and ferroalloys production, as well as F-gases. Mitigation measures also include technology development and deployment. Before the introduction of the EU ETS, voluntary agreements between industry and the Norwegian Government were the main instruments. The key mitigation measures are the incentives for reducing N₂O emissions from nitric acid production, biocarbon use in cement and ferroalloys production, tax and recycling schemes for HFCs, the revised F-gas regulation and voluntary agreements with the aluminium industry to reduce PFCs. Norway estimated the combined mitigation effect of all PaMs reported under industry to be between 7 and 10.3 Mt CO₂ eq emission reduction by 2020.

53. **Agriculture.** Norway is implementing several mitigation measures for agriculture, although the effects, which could be considered relatively minor compared with those in other sectors, have not been estimated. Some of the implemented measures that would contribute to the achievement of the 2020 target include drainage of agricultural soils, delivery of manure for the production of biogas and grants for biogas projects. In addition, a climate and environment programme aiming to facilitate the achievement of the climate and environmental goals within the agricultural policy through research and information measures contributes to the development of knowledge in order to reduce GHG emissions at the farm level.

54. **LULUCF.** Norway is implementing PaMs in the LULUCF sector, although their relatively small emission reduction impact can be quantified at 270 kt CO₂ eq only by 2030. Measures aim at reducing deforestation and increasing afforestation, fertilization of forests and plant breeding. Norway is considering implementing new measures designed to maintain or increase the carbon stock of forests as well as measures allowing the replacement of more emission-intensive materials with wood and fossil energy with renewable bioenergy. Norway is currently discussing with the EU the new LULUCF legislation as a part of a dialogue on their joint fulfilment of the 2030 EU climate target.

55. **Waste management.** The key mitigation policies for waste management are the prohibition of the disposal of biodegradable waste and the requirement to collect landfill gas. Norway estimated the combined effect of these two mitigation measures at 0.6 Mt CO₂ eq emission reduction by 2020. It is worth noting that Norway and the EU have common legislation related to waste prevention, and the Party is also planning to implement the EU circular economy package.

(d) Minimization of adverse impacts in accordance with Article 2 and Article 3, paragraph 14, of the Kyoto Protocol

56. In the NC7 Norway reported information on how it strives to implement PaMs under Article 2 of the Kyoto Protocol in such a way as to minimize adverse effects, including the adverse effects of climate change and effects on international trade and social, environmental and economic impacts on other Parties, especially developing country Parties. In developing environmental, economic and energy policy, Norway follows the polluter pays principle and a market-based approach whereby prices reflect costs including externalities. As regards GHG emissions, costs of externalities are reflected in levies and by participation in the EU ETS.

57. Further information on how Norway strives to implement its commitments under Article 3, paragraph 14, of the Kyoto Protocol in such a way as to minimize adverse social, environmental and economic impacts on developing country Parties was reported in the Party's 2017 annual GHG inventory submission. The Party reported on cooperation on the development of technologies and assisting developing country Parties that are highly dependent on the export of fossil fuels in diversifying their economies.

58. Norway has had a national strategy for 'green competitiveness' since October 2017, with one of the priorities for enhanced national climate action being CCS. Norway has issued instructions for official studies and reports for ministries and their subordinate agencies to facilitate the assessment of the regulations, propositions and reports provided to the Norwegian Parliament. In addition, Norway has a legal framework for environmental impact assessment, which includes assessing the social and environmental impacts of planned strategies.

59. Norway has initiated Oil for Development cooperation with developing countries on fossil fuels. The initiative aims to respond to requests for assistance from developing countries in their efforts to manage petroleum resources in a way that generates economic growth and promotes the welfare of the whole population in an environmentally sound way. Furthermore, since 2007 Norway has been supporting initiatives fostering technology development and transfer as well as capacity-building efforts in developing countries to increase access to renewable energy and to reduce dependence on fossil fuels, thus enhancing their resilience to the social and economic effects of response measures taken.

(e) Assessment of adherence to the reporting guidelines

60. The ERT assessed the information reported in the NC7 of Norway and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting guidelines on NCs. The findings are described in table 7.

Table 7

Finding on policies and measures, including those in accordance with Article 2 of the Kyoto Protocol, from the review of the seventh national communication of Norway

No.	Reporting requirement, issue type and assessment	Description of the finding with recommendation or encouragement
1	Reporting requirement specified in paragraph 23 Issue type: transparency Assessment: encouragement	The description of the methods reported by the Party to estimate mitigation effects was transparent for the majority of the PaMs reported. However, the description of the methods was not transparent for the mitigation effects pertaining to the petroleum sector and the CO ₂ tax. During the review Norway provided additional information on the methodologies used for estimating mitigation effects. Norway explained that the estimated effect on mainland emissions of the CO ₂ tax was derived from an equilibrium analysis for 1990–1999 conducted by Statistics Norway (Brunvoll and Larsen, 2004). The effect of the CO ₂ tax for onshore activities in 1999 is estimated to be 0.8 Mt CO ₂ . This figure was first reported and discussed in the NC3 of Norway. Since 2002 the analysis has been supplemented by the estimated effect of changes in the coverage and rates of the CO ₂ tax. The partial changes were estimated using elasticities. The ERT encourages Norway to improve the description of the methods used to

No.	Reporting requirement, issue type and assessment	Description of the finding with recommendation or encouragement
		estimate the mitigation effects of PaMs in the petroleum sector and of the CO ₂ tax in its next NC.

Note: Paragraph number listed under reporting requirement refers to the relevant paragraph of the UNFCCC reporting guidelines on NCs. The reporting on the requirements not included in this table is considered to be complete, transparent and adhering to the UNFCCC reporting guidelines on NCs.

C. Projections and the total effect of policies and measures, including information on supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol

1. Projections overview, methodology and results

(a) Technical assessment of the reported information

61. Norway reported updated projections for 2020 and 2030 relative to actual inventory data for 2015 under the WEM scenario. The WEM scenario reported by Norway includes implemented PaMs as at the first quarter of 2017. As indicated in the NC7 and BR3, the WEM scenario reflects neither the effects of policies adopted after that time nor any planned measures, policies or political goals and ambitions.

62. The projections are presented on a sectoral basis, using the same sectoral categories as those used in the reporting on mitigation actions, and on a gas-by-gas basis for CO₂, CH₄, N₂O, PFCs, HFCs and SF₆ (treating PFCs and HFCs collectively in each case) for 1990–2030. The projections are also provided in an aggregated format for each sector as well as for a Party total using global warming potential values from the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Norway reported emission projections for indirect GHGs such as nitrogen oxides, ammonia, non-methane volatile organic compounds and sulfur oxides. Norway reported on factors and activities affecting emissions for each sector. Emission projections related to fuel sold to ships and aircraft engaged in international transport were reported separately and were not included in the totals.

(b) Methodology, assumptions and changes since the previous submission

63. The methodology used for the preparation of the projections for the energy-related emissions (except for the petroleum sector) is different from that used for the preparation of the emission projections for the BR2. Norway explained the methodologies and the changes made since the BR2, namely the use of a new macroeconomic SNOW model. As with the previous model, the SNOW model is a computable general equilibrium model. As for the BR2, the emission projections for the petroleum sector are based on information received from individual operators and estimates made by the Norwegian Petroleum Directorate; emissions from road traffic were projected using a spreadsheet model based on historical data from the *Handbook Emission Factors for Road Transport*; and projections of emissions other than CO₂ from the industrial processes, agriculture and waste sectors were based mainly on sector- and plant-specific information collected by the Norwegian Environment Agency.

64. Under the WEM scenario, the EUA price is projected to be NOK 57/t CO₂ by 2020 (about EUR 5.9/t) and NOK 85/t CO₂ by 2030 (about EUR 8.8/t). The ERT noted that the EUA prices reported in the BR3 of the EU were 120 and 300 per cent higher than the Norwegian estimations for 2020 and 2030, respectively. During the review Norway explained that the price of the future delivery of emission allowances under the EU ETS is in line with prices quoted in the futures market for such emission allowances. After 2020 it is assumed that the price of emission allowances under the EU ETS will increase by 4 per cent per year. The ERT considers that a comparison of the key assumptions applied by Norway compared with the EU on the evolution of EUA prices would enhance the transparency and understanding of the key underlying assumptions and emission trends.

65. Norway provided information in CTF table 5 on assumptions, methodologies, models and approaches used and on the key variables and assumptions used in the preparation of the projection scenarios. To explain the changes, Norway provided supporting documentation. Norway also provided information on sensitivity analyses.

66. To prepare its projections, Norway relied on the following key underlying assumptions: increasing GDP and population, decreasing oil prices until 2020 and increasing afterwards until 2030, decreasing gas prices, decreasing EUAs until 2020 and increasing afterwards until 2030, increasing electricity prices, decreasing domestic production of oil and gas, increasing share of electric and plug-in hybrid cars, decreasing emissions from new cars per kilometre driven on the basis of fossil energy carriers and increasing annual forest harvest rates. These variables and assumptions were reported in CTF table 5 and/or in the NC7 and the BR3. The assumptions were updated on the basis of the most recent economic developments known at the time of the preparation of the projections in 2017.

67. Under the WEM scenario, average annual GDP growth is estimated at 1.5 per cent for 2015–2020 and at 1.7 per cent for 2020–2030. Growth in the mainland economy, that is total GDP excluding petroleum activities and ocean transport, is estimated at 2.0 per cent for 2015–2020 and 2.2 per cent for 2020–2030. The high population growth rate since 2005 (about 1.2 per cent annually) is projected to come down somewhat. In 2015–2020 the population is estimated to increase by 1.0 per cent annually. For up to 2030 the growth rate is estimated 0.8 per cent. Oil and gas production in 2030 are projected to be at 86 per cent and 80 per cent, respectively, of the 2015 level.

68. Concerning road traffic emissions, it is assumed that the share of electric cars will increase to 50 per cent of new car sales by 2030. Sales of plug-in hybrid cars are estimated from 2030 to be about 20 per cent of new car sales. These assumptions imply that the share of new diesel and petrol cars (including non-plug-in hybrid cars) will decrease from about 70 per cent in 2016 to 30 per cent of new car sales by 2030. Traffic activity is assumed to trace population developments. Emissions from new cars per kilometre driven on the basis of fossil energy carriers are assumed to decline by about 1 per cent per year. Biofuel blending is assumed to remain at the current level of 6.25 per cent in real terms.

69. Sensitivity analyses were conducted for a number of important assumptions, such as population trends, oil and gas prices and different developments in the registration share of zero-emission cars. In the NC7 Norway reported on the basis of a study by Statistics Norway (Greaker and Rosnes, 2015) that CO₂ emissions could be around 6 per cent lower by 2030 if population growth were more in line with the EU average of about 2 per cent since 2005. In the same study, Statistics Norway estimated that a supply shock causing oil and gas prices to fall by 24 per cent could cause Norwegian CO₂ emissions to increase by 8 per cent by 2030. Lower prices of fossil fuels could cause emissions from the mainland to increase more than the fall in emissions due to lower production of oil and gas. An international setback causing Norwegian export prices, including for oil and gas, to decline by 25 per cent was estimated to potentially lead to the reduction of CO₂ emissions by 14 per cent by 2030. As concerns the projected development of the registration share of zero-emission cars, Norway calculated that if it develops such as to change the level in 2030 by for example 20 percentage points, to 30 per cent or 70 per cent, respectively, transport emissions that year could change by close to plus or minus 0.5 Mt CO₂ eq, respectively.

(c) Results of projections

70. The projected emission levels under the WEM scenario and information on the Kyoto Protocol target and the quantified economy-wide emission reduction target are presented in table 8 and the figure below.

Table 8
Summary of greenhouse gas emission projections for Norway

	GHG emissions (kt CO ₂ eq per year)	Changes in relation to base-year ^a level (%)	Changes in relation to 1990 level (%)
Kyoto Protocol base year ^b	51 921.771	NA	NA
Quantified emission limitation or reduction commitment under the Kyoto Protocol (2013–2020)	43 614.28	84.0	84.3
Quantified economy-wide emission reduction target under the Convention	NA ^c	30.0	30.0
Inventory data 1990 ^c	51 728.80	0.4	NA
Inventory data 2015 ^c	53 908.19	3.8	4.2
WEM projections for 2020 ^d	51 781.00	–0.3	0.1
WEM projections for 2030 ^d	48 286.00	–7.0	–6.7

Note: The projections are for GHG emissions without LULUCF.

^a “Base year” in this column refers to the base year used for the target under the Kyoto Protocol.

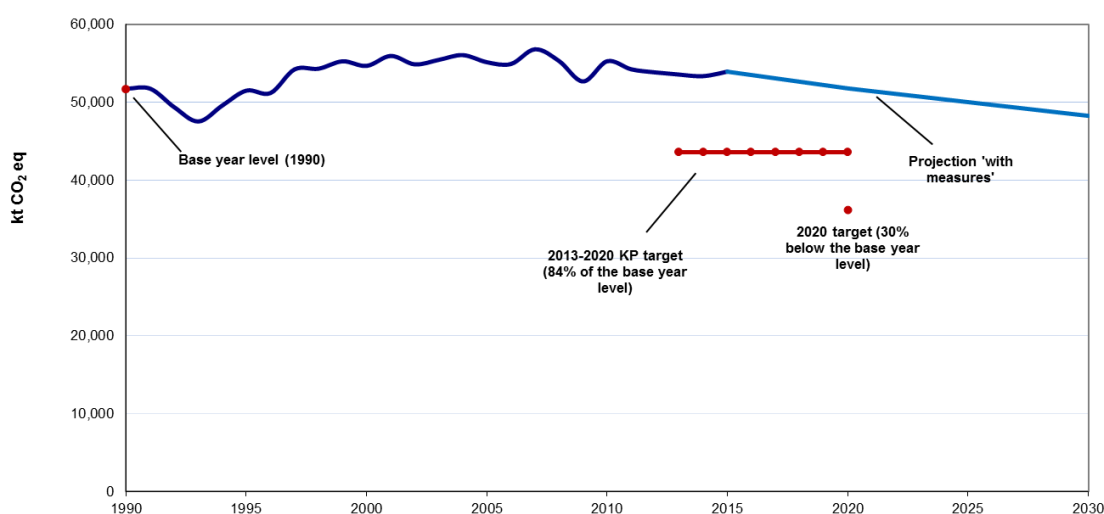
^b The Kyoto Protocol base-year level of emissions is provided in the initial review report, contained in document FCCC/IRR/2016/NOR.

^c The 30 per cent target under the Convention was made operational through the legally binding 2013–2020 second commitment period of the Kyoto Protocol.

^d From Norway’s 2017 inventory submission; the emissions are without LULUCF.

^e From Norway’s NC7 and/or BR3.

Greenhouse gas emission projections reported by Norway



Sources: (1) Data for the years 1990–2015: Norway’s 2017 annual inventory submission, version 7.0; total GHG emissions excluding LULUCF; (2) data for the years 2016–2030: Norway’s NC7 and BR3; total GHG emissions excluding LULUCF.

Abbreviation: KP = Kyoto Protocol.

71. Norway’s total GHG emissions excluding LULUCF are projected to be 51,781.00 and 48,286.00 kt CO₂ eq in 2020 and 2030, respectively, under the WEM scenario, which is an increase of 0.1 per cent and a decrease of 6.7 per cent, respectively, compared with the 1990 level. The 2020 projections suggest that Norway cannot be expected to achieve its 2020 target under the Convention without the acquisition of units from market-based mechanisms (see para. 90 below).

72. For the second commitment period of the Kyoto Protocol, Norway’s commitment is to limit average annual emissions to 84 per cent of the base-year emissions. According to the NC7 and the BR3, total GHG emissions excluding LULUCF for the period 2013–2020

are projected to be around 423.7 Mt CO₂ eq. The contribution from LULUCF is estimated to increase emissions by 1.1 Mt CO₂ eq. Therefore, the total GHG emissions with the contribution of LULUCF are estimated to be 75.9 Mt CO₂ eq higher than the AAUs of Norway for the period 2013–2020 (348.9 million AAUs). Norway plans to offset this gap using units acquired through participation in the EU ETS, the carry-over from the first commitment period of the Kyoto Protocol and the 60 million CERs from the Norwegian Carbon Credit Procurement Program.

73. Norway did not indicate in the NC7 the extent of the contribution of the EU ETS and the Norwegian Carbon Credit Procurement Program, separately, to the fulfilment of its commitments for 2013–2020, because the arrangement between Norway and the EU on how participation in the EU ETS will relate to Kyoto Protocol units in the second commitment period is still to be finalized (expected by the end of 2018). Therefore, Norway will be able in its next NC to report separately the contributions of the EU ETS and the carry-over from the first commitment period and the Norwegian Carbon Credit Procurement Program to bridge the gap between the initial AAUs for the second commitment period and projected emissions. The ERT considers that the inclusion of this information in the next NC will improve the transparency of the reporting on the use of market-based mechanisms.

74. The ERT noted that the decision about Norway's contribution of AAUs to cover EU ETS allowances will determine the extent of the need for CERs from the Carbon Credit Procurement Program to meet the Kyoto Protocol target for the second commitment period. The ERT estimated that, on one hand, if more than 53 per cent of AAUs (about 23 million/year) will be used to cover Norwegian participation in the EU ETS, then the 46 million CERs from existing contracts of the Norwegian Carbon Credit Procurement Program will not be enough to meet the Kyoto Protocol target for the second commitment period. In this example participation in the ETS would result in transfers of units from EU to Norway significantly lower than what happened for 2013–2020 (about 4 million/year). On the other hand, considering that the expected amount of EU ETS allowances attributed to Norwegian participation (excluding aviation) is about 18 million per year for the trading period 2013–2020, then by taking into account aviation under the EU ETS scheme, Norway's participation in the EU ETS could be around 45 per cent of AAUs. If 45 per cent of initial AAUs will be used to cover Norway's participation in the EU ETS, then 60 per cent of the 46 million CERs will be an excess and could be used by Norway for the overachievement of its Kyoto Protocol target. The arrangement for Norway's contribution of AAUs to cover EU ETS allowances still needs to be finalized.

75. Norway presented the WEM scenario by sector for 2020 and 2030, as summarized in table 9.

Table 9
Summary of greenhouse gas emission projections for Norway presented by sector

Sector	GHG emissions and removals (kt CO ₂ eq)			Change (%)	
	1990	2020	2030	1990–2020	1990–2030
		WEM	WEM	WEM	WEM
Energy (not including transport)	19 896.25	25 389.00	23 735.00	27.61	19.29
Transport	10 267.69	12 680.00	11 376.00	23.49	10.79
Industry/industrial processes	14 497.79	8 307.00	7 988.00	–42.7	–44.9
Agriculture	4 823.94	4 365.00	4 448.00	–9.5	–7.8
LULUCF	–10 449.36	–23 483.00	–21 287.00	124.7	103.7
Waste	2 243.12	1 040.00	741.00	–53.6	–67.0
Other (specify)					
Total GHG emissions without LULUCF	51 728.80	51 781.00	48 286.00	0.1	–6.7

Source: Norway's BR3 CTF table 6.

76. According to the projections reported for 2020 under the WEM scenario, the most significant emission reductions are expected to occur in the industrial processes, waste and agriculture sectors, amounting to 6,190.79 kt CO₂ eq (42.7 per cent), 1,203.12 kt CO₂ eq (53.6 per cent) and 458.94 kt CO₂ eq (9.5 per cent) between 1990 and 2020, respectively. The ERT noted that GHG emissions from the energy sector and the transport sector are projected to increase by 5,492.75 kt CO₂ eq (27.6 per cent) and 2,412.31 kt CO₂ eq (23.5 per cent) above the 1990 level by 2020, respectively, partly caused by the build-up of the petroleum sector in the 1990s and the high mainland economic and population growth. The pattern of projected emissions reported for 2030 under the same scenario changes from a declining trend of 0.79 per cent per year for the period 2015–2020 to a steeper declining trend of 1.35 per cent per year for the period 2020–2030. The emission path reflects, inter alia, the phase-out of oil-fired heating towards 2020, the closure of the gas-fired power plant at Mongstad and a slight reduction in emissions from petroleum activities after 2020. The effect of an estimated reduction in transport emissions as a result of more zero-emission vehicles being used only becomes significant after 2020. In 2030, emissions are estimated to be more than 5,622.19 kt CO₂ eq lower than in 2015 (10.4 per cent). The predominant part of the reduction is expected to come from non-EU ETS emissions, estimated to be reduced by 4,250.00 kt CO₂ eq in 2015–2030.

77. LULUCF net removals are projected to amount to 23,483.00 and 21,287.00 kt CO₂ eq in 2020 and 2030, respectively, under the WEM scenario, which is an increase in sink capacity of 124.7 per cent and 103.7 per cent, respectively, compared with the 1990 level. The projections for LULUCF have not been updated since 2014. According to the 2014 projections, net sequestration is expected to decline gradually as a result of the age structure and maturity of Norwegian forest. It is projected that the annual harvest rate will increase from approximately 10 million m³ today to around 12 million m³ by 2020 and nearly 13 million m³ by 2030.

78. Norway presented the WEM scenario by gas for 2020 and 2030, as summarized in table 10.

Table 10

Summary of greenhouse gas emission projections for Norway presented by gas

Gas	GHG emissions and removals (kt CO ₂ eq)			Change (%)	
	1990	2020	2030	1990–2020	1990–2030
		WEM	WEM	WEM	WEM
CO ₂	35 704.39	43 148.00	40 387.00	20.9	13.1
CH ₄	5 800.20	4 911.00	4 538.00	–15.3	–21.8
N ₂ O	4 230.83	2 527.00	2 506.00	–40.3	–40.78
HFCs	0.04	983.00	633.00	2 457 400.0	1 582 400.0
PFCs	3 894.80	155.00	163.00	–96.0	–95.8
SF ₆	2 098.54	57.00	59.00	–97.3	–97.2
NF ₃	NO	NO	NO	–	–
Total GHG emissions without LULUCF	51 728.80	51 781.00	48 286.00	0.1	–6.7

Source: Norway's BR3 CTF table 6.

79. For 2020 the most significant reductions are projected for PFCs, SF₆, N₂O and CH₄ emissions: 3,739.80 kt CO₂ eq (96.0 per cent), 2,041.54 kt CO₂ eq (97.3 per cent), 1,703.83 kt CO₂ eq (40.3 per cent) and 889.20 kt CO₂ eq (15.3 per cent) between 1990 and 2020, respectively. PFCs, SF₆ and N₂O emissions in 2020 are projected to remain at the 2015 emission level, while further reduction in CH₄ emissions by 2020 compared with the 2015 level is related to declining landfill emissions. Conversely, CO₂ emissions excluding LULUCF are expected to increase by 7,443.61 kt CO₂ eq (20.9 per cent) between 1990 and 2020.

80. For 2030, emissions of PFCs, SF₆ and N₂O are projected to be at similar to the 2020 level. A further reduction in CH₄ emissions compared with the 2020 level is projected at 373.00 kt CO₂ eq. CO₂ and HFC emissions are projected to decline by 2,761.00 kt CO₂ eq (6.4 per cent) and 350.00 kt CO₂ eq (35.6 per cent) between 2020 and 2030, respectively. The projected reduction in CO₂ emissions reflects the expected reduction in emissions from oil and gas extraction and the transport sector, while HFC emissions are estimated to decline after 2020 as a result of the introduction of the EU F-gas regulation in Norway.

81. The projections of GHG emissions in the NC7 are about 3 Mt CO₂ eq lower for 2020 and in excess of 4 Mt lower for 2030 than the reported projections in the BR2. Both CO₂ emissions and F-gas emissions, in particular HFCs, are contributing to this reduction. The main changes in the projections between the NC7 and the BR2 affected the estimates of non-EU ETS emissions, which have been reduced by 3 Mt CO₂ eq for 2030 compared with the BR2, owing mainly to updated assumptions on emissions from road transport and domestic fishing and fisheries. The primary cause of the reduction is that the observed take-up of electric vehicles and other low-emission cars in recent years is assumed to continue in the coming years and that further technological development and enhancement of PaMs over the last few years will cause emissions from domestic shipping and fisheries to continue declining after 2020. Moreover, the estimates of emissions from heating of buildings have been revised downwards by 0.75 Mt CO₂ eq for both 2020 and 2030, compared with previous projections, owing to the ban on the use of heating oil from 2020.

(d) Assessment of adherence to the reporting guidelines

82. The ERT assessed the information reported in the NC7 of Norway and identified issues relating to completeness as per the UNFCCC reporting guidelines on NCs. The ERT noted that the next NC could benefit from more diagrams illustrating GHG projections, for example, projections on a sectoral and gas-by-gas basis, as presented during the review, in response to the ERT request. Norway provided diagrams covering this requirement of the UNFCCC reporting guidelines on NCs. The findings are described in table 11.

Table 11

Findings on greenhouse gas emission projections reported in the seventh national communication of Norway

No.	Reporting requirement, issue type and assessment ^a	Description of the finding with recommendation or encouragement
1	Reporting requirement specified in paragraph 28 Issue type: completeness Assessment: encouragement	Norway did not report a WAM projection scenario in the NC7 encompassing planned PaMs and indicating the pathway to achieving its long-term targets for climate neutrality by 2030 and becoming a low-emission society by 2050. During the review, Norway, in response to the question by the ERT, noted that Norway does not have the WAM scenario due to uncertainties pertaining to the fact that any new PaMs are implemented only following a decision by the Parliament. The ERT reiterates the encouragement of the previous ERT for the Party to report, in its next NC, a WAM scenario, indicating the trajectory of GHG emissions and providing information about key factors and activities related to meeting its long-term targets.
2	Reporting requirement specified in paragraph 46 Issue: completeness Assessment: encouragement	Norway did not discuss in its NC7 either qualitatively or quantitatively the sensitivity of the following key assumptions reported in table A3-3 of the NC7: GDP, gross value added of petroleum activities, EU ETS allowance price, carbon tax price or electricity price. During the review, in response to an ERT request, Norway noted that no further analysis of those assumptions was carried out. The ERT encourages Norway to include qualitative and, where possible, quantitative analysis of the sensitivity of projections to underlying assumptions in its next NC.
3	Reporting requirement specified in paragraph 43 Issue type:	The ERT noted that Norway did not provide in the NC7 the following information on the SNOW model, which is used for the projection of emissions from the energy sector: a summary of the strengths and weaknesses of the model and an explanation of how the model accounts for any overlap or synergies that may exist between

No.	Reporting requirement, issue type and assessment ^a	Description of the finding with recommendation or encouragement
	completeness	different PaMs.
	Assessment: encouragement	<p>During the review, Norway explained that:</p> <p>(a) SNOW is a general model that simultaneously accounts for behavioural responses to a variety of policy instruments and other drivers. The model's relatively rich variety of policy variables will give synergies between PaMs when projecting emissions. However, the model only operates with, for example, average tax rates and does not capture the richness of all policy instruments (e.g. differentiation in vehicle registration tax);</p> <p>(b) One of the strengths of using an integrated macroeconomic and emission model like SNOW is that the model provides consistency between long-term economic forecasts and emission projections. The usual caveats of computable general equilibrium top-down approaches apply. One shortcoming of SNOW is its poor specification of new technologies (abatement options), but this is under development. Another shortcoming is the need for the outputs to be supplemented by the results from more disaggregated models and expert judgment.</p> <p>The ERT encourages Norway to provide information in its next NC about the strengths and weaknesses of the SNOW model, and an explanation of how the model accounts for any overlap or synergies that may exist between different PaMs.</p>
4	<p>Reporting requirement specified in paragraph 42</p> <p>Issue type: completeness</p> <p>Assessment: encouragement</p>	<p>The ERT noted that Norway did not report in the NC7 about the key assumptions and methodology applied for the projection of emissions from international marine and aviation to allow a reader to understand the models and approaches used to develop the projections.</p> <p>During the review, Norway explained that the projection of emissions from international marine and aviation is mainly a prolonging of the historical trend for 1990–2015. For aviation, using expert judgment, Norway estimated a decreasing growth in emissions compared with development in 1990–2015. For marine bunkers, the Party assumed a decreasing fall in consumption compared with in 1990–2015.</p> <p>The ERT encourages Norway to include information about the key assumptions and methodology applied for projecting emissions from international marine and aviation in its next NC.</p>

Note: The reporting on the requirements not included in this table is considered to be complete, transparent and adhering to the UNFCCC reporting guidelines on NCs.

^a Paragraph numbers listed under reporting requirement refer to the relevant paragraph of the UNFCCC reporting guidelines on NCs.

2. Assessment of the total effect of policies and measures

(a) Technical assessment of the reported information

83. In the NC7 Norway presented the estimated and expected total effect of implemented PaMs and an estimate of the total effect of its PaMs, in accordance with the WEM scenario, compared with a situation without such PaMs. Information is presented in terms of GHG emissions avoided or sequestered, by gas (on a CO₂ eq basis) and by sector, in 1995, 2000, 2005, 2010, 2015, 2020 and 2030.

84. Norway reported that the total effect of its implemented PaMs is estimated to be in the range of 19,500–23,300 kt CO₂ eq by 2020 and 21,300–25,700 kt CO₂ eq by 2030. Norway reported that the CO₂ tax is the single measure that will contribute most to the above-estimated reductions. According to the information reported in the NC7, PaMs implemented in the industrial processes sector (mainly affecting PFC, SF₆, HFC and N₂O emissions) will deliver the largest emission reductions, followed by PaMs implemented in the energy industries sector, related to petroleum activities, and the transport sector.

85. The ERT noted that the estimation of the effect of the implemented PaMs is sufficiently described in the PaMs chapter of the report, with the exception of the cross-sectoral effect of the CO₂ tax and the mitigation policies in the petroleum sector. During the review, Norway provided additional information explaining the estimation of the mitigation effect of the CO₂ tax (see table 7 above). Concerning the petroleum sector, Norway did not

apply a detailed estimation methodology but the estimation is based mainly on expert judgment, with the exception of the effect of CCS.

86. The ERT could not quantitatively assess the total effect of the mitigation policies in the petroleum sector since a detailed estimation methodology was not provided by Norway. However, the ERT acknowledges that the implemented and adopted policies in the sector, such as the CO₂ tax, the EU ETS, the ban on flaring, energy-efficiency measures and electrification, are having a significant mitigation effect on the national emissions. The ERT considers that the reporting of the time series of key performance indicators, such as CO₂ emissions associated with oil and gas production per production volume of gas and petroleum, would improve the transparency of the reporting on the mitigation effect of PaMs in the petroleum sector. Table 12 provides an overview of the total effect of PaMs as reported by Norway.

Table 12

Projected effects of Norway's implemented policies and measures by 2020 and 2030

Sector	2020	2030
	<i>Effect of implemented and adopted measures (kt CO₂ eq)</i>	<i>Effect of implemented and adopted measures (kt CO₂ eq)</i>
Cross-sectoral	2 900–3 200	2 900–3 200
Petroleum activity	7 200	7 100
Other energy (without transport)	400	200–300
Transport	1 400–1 700	2 400–2 900
Industrial processes	7 000–10 300	7 500–11 000
Agriculture	–	–
Land-use change and forestry	–	300
Waste management	600	800
Total	19 500–23 300	21 300–25 700

Source: Norway's NC7.

Note: The total effect of implemented and adopted PaMs was estimated in accordance with the WEM scenario compared with a situation without such PaMs.

(b) Assessment of adherence to the reporting guidelines

87. The ERT assessed the information reported in the NC7 of Norway and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting guidelines on NCs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

3. Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol

(a) Technical assessment of the reported information

88. In the NC7 Norway provided information on how its use of the mechanisms under Articles 6, 12 and 17 of the Kyoto Protocol is supplemental to domestic action. Norway considers that its use of the Kyoto Protocol mechanisms has been supplemental to domestic action since the emission level would have been higher than actual emissions in the absence of the domestic PaMs taken to mitigate climate change. Norway reported that it would be possible to assume a more ambitious target with access to mechanisms than without access to mechanisms.

89. More specifically, the estimation of the aggregate effect of mitigation PaMs indicates that in 2010 the emission level would have been 13–16 million t CO₂ eq higher than actual emissions, or 25–30 per cent of the 1990 emission level, and in 2020 19.5–23.3 Mt higher (41–45 per cent). By way of comparison, Norway indicated that the gap between its emissions and its commitment under Article 3, paragraph 1, was around 3.3 Mt per year

in the first commitment period and is estimated to be 9–10 Mt per year for the second commitment period, which was and will be covered by the inflow of AAUs through EUAs from other countries participating in the EU ETS and international credits. During the review, Norway explained that it does not have a quantitative national definition of supplementarity.

90. Mechanisms under the Kyoto Protocol will be used by Norway to meet its Kyoto Protocol target. The net contribution of units acquired through the mechanisms is estimated to be about 75 Mt for the 2013–2020 period. This includes the carry-over from the first commitment period of 2.25 million CERs and 0.74 million ERUs, along with 5.98 million AAUs that reflect the part of EU ETS installations' emissions in 2013 and 2014 for which it delivered first commitment period CERs and ERUs. LULUCF is projected to be a net source of about 1.1 Mt CO₂ eq. Concerning the Norwegian Carbon Credit Procurement Program, during the review Norway explained that by the time of the review around 54 million CERs of the targeted 60 million had been contracted, of which around 46 million are expected to be delivered. The final need for CERs to ensure compliance is yet to be determined.

91. During the review Norway provided additional information on the use of CERs by the Norwegian EU ETS operators. The limitations on the use of CERs by Norwegian installations are similar to those applied in the other countries participating in the EU ETS. The EU regulation on international credit entitlement (1123/2013) has been incorporated into the EEA Agreement and consequently applies to Norway.

92. According to the EU regulation, installations could carry over the unused part of their international credit entitlement for 2008–2012 into the 2013–2020 trading period. Norwegian installations that were covered by the EU ETS during the 2008–2012 trading period could use international credits up to a level of 15.7 per cent of their total emissions during the 2008–2012 trading period. Operators that received neither a free allocation nor an entitlement to use international credits in the period 2008–2012 are entitled to use international credits up to a maximum of 4.5 per cent of their verified emissions in the period 2013–2020. Aircraft operators are entitled to use international credits up to a maximum of 1.5 per cent of their verified emissions.

93. For 2013–2020, the remaining amount of credits that can be used by EU ETS operators in Norway accounts for about 6 Mt. This was almost fully utilized in 2013 and 2014 and forms the basis for Norway's carry-over of about 6 million AAUs from the first commitment period. The ERT noted that the inclusion in the next NC of the information presented during the review about the use of CERs and ERUs by EU ETS operators during the period 2013–2020 would increase the transparency of the reporting on supplementarity related to the Kyoto Protocol mechanisms.

(b) Assessment of adherence to the reporting guidelines

94. The ERT assessed the information reported in the NC7 of Norway and recognized that the reporting is complete and transparent. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

D. Provision of financial and technological support to developing country Parties, including information under Articles 10 and 11 of the Kyoto Protocol

95. Norway reported information on the provision of financial, technological and capacity-building support required under the Convention. Norway provided details on what "new and additional" support it has provided and clarified that in the absence of an internationally agreed definition of what constitutes "new and additional" resources, Norway is referring to the definition that climate financing should be considered "new and additional", particularly that climate financing should be considered "new and additional" if it exceeds the international development aid goal of 0.7 per cent of gross national income.

96. Norway reported the financial support that it has provided to non-Annex I Parties, distinguishing between support for mitigation and adaptation activities and recognizing the capacity-building elements of such support. It explained how it tracks finance for adaptation and mitigation using the Rio Markers. The Rio Markers allow an approximate quantification of financial flows that target climate-related objectives by means of a scoring system with three values (principal, significant and not targeted objectives).

97. The NC7 includes information on the national approach to tracking the provision of support, indicators, delivery mechanisms used and allocation channels tracked. Norway reported financial contributions related to the implementation of the Convention, including through multilateral institutions such as the GEF, the GCF and the IPCC, as well as other financial institutions that fund climate change adaptation, mitigation, capacity-building and technology cooperation programmes in developing countries.

98. Bilateral finance is channelled through NGOs, the private sector and the public sector. Norway included information on how it has refined its approach to tracking climate support and methodologies. In the NC7 Norway considered 40 per cent of the total support provided to adaptation and mitigation projects and programmes with significant climate objectives as climate finance, while in its BR2 it treated main and significant climate objectives as equal (i.e. considered 100 per cent of the support provided to such projects to be climate finance).

99. Norway further refined its reporting in the NC7 by excluding total core contributions to some multilateral organizations that were included in the BR2. In its NC7 Norway reported the imputed climate-related shares of its provision of core climate-relevant support to a selected number of multilateral organizations, estimated on the basis of the OECD DAC methodology for imputed multilateral shares. Not all multilateral organizations report data on the climate-relevant shares of their outflows from received core contributions, and the contributions to those organizations have been left out of the estimates in the NC7 (examples of excluded core contributions for 2015–2016 include those to the Consultative Group on International Agricultural Research (NOK 151 million), United Nations Environment Programme (NOK 145 million) and United Nations Development Programme (NOK 1,165 million)).

100. Norway described the methodology and underlying assumptions used for collecting and reporting information on financial support, including underlying assumptions and indicators. The methodology used for preparing information on international climate support is based on the OECD DAC reporting system, which utilizes the Rio Markers on climate change mitigation and adaptation. Using this system, Norway's climate finance is tracked by the Norwegian Agency for Development Cooperation using Norwegian Aid Statistics.

1. Financial resources, including under Article 11 of the Kyoto Protocol

(a) Technical assessment of the reported information

101. Norway reported information on the provision of financial support required under the Convention and its Kyoto Protocol, including on financial support provided, committed and pledged, allocation channels and annual contributions.

102. Norway indicated what “new and additional” financial resources it has provided, and clarified how it has determined such resources as being “new and additional” (see paragraph 97 above). In 2015 and 2016, Norway's official development assistance represented 1.05 per cent and 1.12 per cent of the country's gross national income, respectively, according to OECD DAC data.

103. Norway described how its resources effectively address the adaptation and mitigation needs of non-Annex I Parties. It also described how those resources assist non-Annex I Parties to mitigate and adapt to the adverse effects of climate change, facilitate economic and social response measures, and contribute to technology development and transfer and capacity-building related to mitigation and adaptation. Norway reported information scattered throughout the report (e.g. in sections 7.3 and 7.4.4 and to some extent in tables 7.4(a) and 7.4(b) and 7.5(a) and 7.5(b)) on the assistance that it has

provided to developing country Parties that are particularly vulnerable to the adverse effects of climate change to help them to meet the costs of adaptation to those adverse effects.

104. However, the ERT noted that section 7.3 of Norway's NC7 specifies only that Norwegian bilateral climate finance has the least developed countries as its main recipients (other than those benefited by the country's International Climate and Forest Initiative) and does not provide information on how Norwegian multilateral finance supports particularly vulnerable countries. The ERT also noted that the missing detailed information on the assistance provided for the purpose of assisting developing country Parties that are particularly vulnerable to the adverse effects of climate change could be partially found in other sections of the NC7 (see para. 104 above). For example, in section 7.4.4 of the NC7, it states that, in line with the mandate of the GCF, about half of Norway's support provided to the GCF will go towards adaptation to climate change in developing countries, with a floor of 50 per cent of the adaptation allocation for particularly vulnerable countries.

105. With regard to the most recent financial contributions aimed at enhancing the implementation of the Convention by developing countries, Norway reported that its climate finance has been allocated on the basis of priority areas, such as reducing emissions from deforestation and forest degradation, renewable energy and climate adaptation including risk reduction. Norway explained that, according to the guidance for the preparation and approval of Norwegian support, an assessment should be made of the relevance of the project or programme to the recipient country and/or cooperation partner's priorities and plans or of the project's relevance to the target group and the needs in the recipient country, aiming to ensure that the resources effectively address the needs of developing country Parties.

106. When relevant and possible, multiannual agreements are entered into to obtain better predictability of the flow of funds. The Norwegian Government's white paper to the Parliament *Common Responsibility for Common Future* (April 2017) established that Norway will continue to be at the forefront of efforts to safeguard climate and environment in line with developing countries' own plans. When multiannual agreements are not in place, Norway tries, to the extent possible, to provide funding annually for several years, and for larger programmes or funds it is a prerequisite that more donors are involved. This implies that if one donor cannot provide adequate funding one year, needs are covered by other donors in a dialogue with recipients on their plans and budgets and on possible funding from Norway. Table 13 includes some of the information reported by Norway on its provision of financial support.

Table 13

Summary of information on provision of financial support by Norway in 2013–2016

(Millions of United States dollars)

Allocation channel of public financial support	Year of disbursement			
	2013	2014	2015	2016
Official development assistance	5 581.36	5 085.94	4 277.66	4 380.08
Climate-specific contributions through multilateral channels, including:	243.50	440.90	185.42	132.57
Other multilateral climate change funds	2.60	0.30	76.85	9.132
Financial institutions, including regional development banks	90.10	265.50	30.58	52.77
United Nations bodies	150.80	175.1	77.98	70.66
Climate-specific contributions through bilateral, regional and other channels	1 026.11	526.34	354.50	290.50

Sources: (1) Query Wizard for International Development Statistics, available at <http://stats.oecd.org/qwids/>; (2) BR3 CTF tables and BR2 CTF tables for 2013–2014.

(b) Assessment of adherence to the reporting guidelines

107. The ERT assessed the information reported in the NC7 of Norway and identified issues relating to completeness and transparency. The findings are described in table 14.

Table 14

Findings on financial resources, including under Article 11 of the Kyoto Protocol, from the review of the seventh national communication of Norway

<i>No.</i>	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation or encouragement</i>
1	Reporting requirement specified in paragraph 51 Issue type: transparency Assessment: recommendation	Section 7.2.1 of the NC7 describes the contribution of Norway to the GEF, including table 3 of the UNFCCC reporting guidelines on NCs (table 7.1 of the NC7), and section 7.2.2 presents information on contributions to the GCF using the same table (table 7.2 of NC7). However, amounts in tables 7.1 and 7.2 are expressed in Norwegian kroner, while table 3 of the UNFCCC reporting guidelines on NCs requires reporting in United States dollars. In response to a question from the ERT, Norway stated that the data in tables 7.1 and 7.2 were presented in Norwegian kroner to correspond to the explanatory text. During the review Norway provided the ERT with versions of the tables including separate columns for amounts in United States dollars. The ERT recommends that Norway enhance the transparency of its reporting by providing data on its contributions to the GEF and the GCF in United States dollars, as required by table 3 of the UNFCCC reporting guidelines on NCs, in its next NC.
2	Reporting requirement specified in paragraph 52 Issue type: transparency Assessment: recommendation	Norway did not provide detailed information on the assistance provided for the purpose of assisting developing country Parties that are particularly vulnerable to the adverse effects of climate change in meeting the costs of adaptation to those adverse effects. Norway used BR3 CTF table 7(b) instead of table 5 of the UNFCCC reporting guidelines on NCs to report on its bilateral and regional financial contributions related to the implementation of the Convention. In response to a question from the ERT, Norway pointed out some examples of support provided to the most vulnerable countries reported in other sections of the NC7, for instance that provided to Ethiopia, Malawi and the United Republic of Tanzania mentioned in section 7.4.1 as well as the support provided to small island developing States through the International Renewable Energy Agency's Lighthouse Initiative and the Clinton Climate Initiative described in section 7.4.5. The ERT reiterates the recommendation from the previous review report that Norway enhance the transparency of its reporting on its assistance to developing countries for meeting the costs of adaptation by providing detailed information and by following the UNFCCC reporting guidelines on NCs more closely, including the use of table 5, in its next NC.
3	Reporting requirement specified in paragraph 53 Issue type: completeness Assessment: encouragement	In its NC7 Norway reported information on the financial support related to the implementation of the Convention provided through bilateral, regional and other multilateral channels using tables from the BR3 (CTF tables 7, 7(a) and 7(b)) instead of the tables 4 and 5 from the UNFCCC reporting guidelines on NCs. This issue was also pointed out in the previous review report. The ERT reiterates the encouragement from the previous review report that Norway follow the UNFCCC reporting guidelines on NCs more closely when reporting on any financial resources related to the implementation of the Convention provided through bilateral, regional and other multilateral channels, in particular by using tables 4 and 5 as per the UNFCCC reporting guidelines on NCs, for its next NC

Note: Paragraph numbers listed under reporting requirement refer to the relevant paragraphs of the UNFCCC reporting guidelines on NCs. The reporting on the requirements not included in this table is considered to be complete, transparent and adhering to the UNFCCC reporting guidelines on NCs.

2. Technology development and transfer, including information under Article 10 of the Kyoto Protocol

(a) Technical assessment of the reported information

108. Norway provided information on steps, measures and activities related to technology transfer, access and deployment benefiting developing countries, including information on activities undertaken by the public and private sectors.

(b) Assessment of adherence to the reporting guidelines

109. The ERT assessed the information reported in the NC7 of Norway and identified issues relating to completeness and adherence to the UNFCCC reporting guidelines on NCs. The findings are described in table 15.

Table 15

Findings on technology development and transfer, including information under Article 10 of the Kyoto Protocol, from the review of the seventh national communication of Norway

No.	Reporting requirement, issue type and assessment	Description of the finding with recommendation or encouragement
1	Reporting requirement specified in paragraph 54 Issue type: transparency Assessment: recommendation	<p>In section 7.5 of the NC7, Norway summarized its activities for supporting the transfer of technology. However, a clear distinction between public and private activities was not provided, mostly because there is no mention of activities undertaken by the private sector (although this information is provided to a certain degree in tabular format in BR3 table 8).</p> <p>In response to a question from the ERT, Norway indicated that information on private activities related to the promotion, facilitation and financing of the transfer of, or access to, environmentally sound technologies is contained in the BR3, for instance in section 6.5. The ERT noted that some relevant information is also provided in BR3 table 8, as it describes some measures and activities funded and carried out by private actors.</p> <p>The ERT reiterates the recommendation made by the previous ERT that Norway, when reporting on technology transfer activities, clearly distinguish between public and private activities related to the promotion, facilitation and financing of, or access to, environmentally sound technologies by transparently providing information on private sector activities in its next NC.</p>
2	Reporting requirement specified in paragraph 55 Issue type: transparency Assessment: recommendation	<p>Norway did not provide clear information required by the UNFCCC reporting guidelines on NCs on success and failure stories using table 6 of the UNFCCC reporting guidelines on NCs. The ERT noted that this information was scattered throughout the report and not presented and analysed as success and failure stories.</p> <p>During the review, and in response to a question raised by the ERT, Norway indicated that issues and examples related to technology transfer were presented in the report (for instance, in BR3 table 8). Norway provided some examples of success and failure stories in the answers to the other questions raised by the ERT during the review.</p> <p>The ERT reiterates the recommendation made by the previous ERT that Norway, when reporting on technology transfer activities, provide information as required in table 6 of the UNFCCC reporting guidelines on NCs, including success and failure stories, in its next NC.</p>
3	Reporting requirement specified in paragraph 55 Issue type: completeness Assessment: recommendation	<p>Norway did not report on its activities for financing access by developing countries to 'hard' or 'soft' environmentally sound technologies.</p> <p>In response to a question raised by the ERT, Norway explained that it does not have any method for differentiating between 'hard' and 'soft' technologies. Moreover, during the review Norway pointed out that many of the activities that it supports include a technology component and that this is often both 'soft' and 'hard' technology combined.</p> <p>The ERT reiterates the recommendation made by the previous ERT that Norway provide information on specific activities for financing access by developing countries to 'hard' or 'soft' environmentally sound technologies in its next NC.</p>
4	Reporting requirement	Norway's NC7 does not provide information on steps taken to support development and

No.	Reporting requirement, issue type and assessment	Description of the finding with recommendation or encouragement
specified in paragraph 56	Issue type: completeness Assessment: recommendation	<p>enhancement of endogenous capacities and technologies of developing countries.</p> <p>In response to a question from the ERT, Norway pointed out that many of the activities that it supports and that are reported in the NC7 enhance endogenous capacities and technologies of developing countries. For example, Norway supports the rights of indigenous peoples and forest-dependent communities to manage tropical forests through the Norwegian Government's International Climate and Forest Initiative, in the order of USD 100 million between 2016 and 2020. Moreover, Norway supports activities such as a training programme on territorial management based on traditional knowledge in Colombia, and skills and equipment to prevent large-scale fires within indigenous territories in Brazil. Several projects are targeting youth with the aim of reactivating traditional knowledge and cultural pride. Norway also supports the full and effective participation of indigenous peoples and local communities in the proceedings of the UNFCCC. A platform to enable such participation was established by decision 1/CP.21. Through the Nordic Council of Ministers, Norway has supported a workshop to clarify governance options for the platform.</p> <p>The ERT recommends that Norway report in its next NC relevant information in accordance with the UNFCCC reporting guidelines on NCs with regard to specific steps taken to support development and enhancement of endogenous capacities and technologies of developing countries.</p>

Note: Paragraph numbers listed under reporting requirement refer to the relevant paragraphs of the UNFCCC reporting guidelines on NCs. The reporting on the requirements not included in this table is considered to be complete, transparent and adhering to the UNFCCC reporting guidelines on NCs.

E. Vulnerability assessment, climate change impacts and adaptation measures

1. Technical assessment of the reported information

110. In the NC7 Norway provided the required information on the expected impacts of climate change in the country; the adaptation policies covering regional, sectoral and cross-sectoral vulnerabilities and considerations; and an outline of the action taken to implement Article 4, paragraph 1(b) and (e), of the Convention with regard to adaptation. Norway provided a description of climate change vulnerability and impacts for both the mainland and Arctic regions and highlighted the adaptation response actions taken and planned at the national, regional and local level. Climate change adaptation is integrated into relevant policies, legislation, strategies and action plans within and across relevant sectors.

111. For the Norwegian mainland, Norway identified three vulnerable areas: (1) nature and ecosystems, (2) business and industry, and (3) human life and health. While the first two areas are identified as the most vulnerable, according to Norway it is difficult to assess and predict the impacts on the third area. Norway considers adaptation a complex and interdisciplinary issue that demands a cross-sectoral approach. In 2007 an interministerial working group was appointed to promote coordination and dialogue in the work specific to national climate adaptation. The importance of adaptation to Norway is manifested in the establishment of a national system for monitoring, reporting and evaluation to ensure that responsible actors within the public and private sectors report on their progress in implementing adaptation.

112. While the Party identified the three most vulnerable areas referred to above, adaptation measures in the following vulnerable areas were identified through policy instruments and legislation, either undertaken or planned: (1) nature and ecosystems: ecosystem-based management systems, integrated marine management plans, national plan for restoration of wetlands, and comprehensive and cross-sectoral planning under the water regulations; (2) infrastructure and buildings: national transport plan, strategies for civil security in transport, action plan for civil protection and a white paper on good buildings for better society; (3) agriculture and industry: climate-smart agriculture, plant breeding and seed production, warning service for pest infestation and a strategy for protection of soils; and (4) human health and life: the Norwegian Public Health Act, the annual white paper on

health and care services and a white paper on outdoor recreation. Norway reported on monitoring programmes, coastal monitoring of flora and fauna, ocean acidification and terrestrial observations and initiatives to facilitate risk reduction and natural hazard management, such as civil protection and emergency planning, urban storm water management, and management of floods, landslides and avalanches, and sea level rise.

113. Norway described climate change vulnerability and impacts in relation to the Arctic region of Norway and identified biodiversity and natural ecosystems and society as the most vulnerable areas in the Arctic. The adaptation measures for biodiversity and natural ecosystems are outlined in Norway's *National Biodiversity Action Plan* (2015–2016) and include the assessment of adaptation measures in Arctic lands in the 2016 *Norwegian Polar Institute Report*. The adaptation measures for society are included in the same report and include the Arctic region. The Conservation of Arctic Flora and Fauna published *State of the Arctic Marine Biodiversity* in 2017, which contains available knowledge and monitoring data on a specific set of marine ecosystem components and provides an overview of detectable changes in biodiversity in different Arctic regions.

114. Impetus has been given to addressing national adaptation matters in 2013–2017 with the establishment of an interministerial working group on adaptation (2007); the publication of the official *Norwegian Report: Adapting to Climate Change* (2010); and the adoption of the first white paper on climate change in 2013 *Climate Change Adaptation in Norway*.

115. Norway reported on legislation relevant to adaptation, such as the Climate Change Act and the Planning and Building Act with the Environmental Impact Assessment Act, which ensures that climate change vulnerability is included in environmental impact assessments. These initiatives provide further direction to the public and private sectors on their roles and on enhancing preparedness for climate change.

116. The key findings of the research programmes related to adaptation include several indicators of impacts of climate change in Svalbard and an ecosystem-based monitoring programme for land ecosystems in the Norwegian Arctic. Norway's methodology was based on the IPCC and United Nations Environment Programme *Handbook on Methods for Climate Change Impact Assessment and Adaptation Strategies*. The significant socioeconomic value of research has influenced the willingness of the Norwegian Government to invest in research infrastructure and undertake projects and fieldwork in Svalbard and on ecosystem services and resilience in the context of adaptation. The findings support the adaptive capacity of species and ecosystems, the natural environment as a buffer against negative impacts of climate change and ecosystem-based management. One of the findings of the Adaptation Actions for a Changing Arctic project is that it is increasingly important to recognize ecosystem services and resilience in the context of adaptation. Table 16 summarizes the information on vulnerability and adaptation to climate change presented in the NC7 of Norway.

Table 16

Summary of information on vulnerability and adaptation to climate change reported by Norway

Vulnerable area	Examples/comments/adaptation measures reported
Nature and ecosystems	<p><i>Vulnerability:</i> Nature and ecosystems are vulnerable to increases in both temperature and precipitation. The manifested impacts include: for terrestrial ecosystems, earlier arrival of migrating birds, earlier sexual maturation of some animals, earlier budding and pollen production, longer and warmer growing season, and melting of permafrost; for freshwater ecosystems, increased erosion rates along riverbanks, increased transport of particulate matter, leaching of nutrients and a longer ice-free season; and for marine ecosystems, acidification affecting the precipitation of calcium carbonate. Higher temperatures could also result in the northward migration of species.</p> <p><i>Adaptation:</i> Evaluating adaptive capacity of species and ecosystems; undertaking relevant research related to the environment and climate change adaptation (2016–2021); developing a height and terrain model that will improve the understanding of climate change impacts (for example in applications related to flooding, landslides, avalanches and inundation from storm</p>

Vulnerable area	Examples/comments/adaptation measures reported
Human life and health	<p>surges and sea level rise).</p> <p><i>Vulnerability:</i> Increasing frequency and severity of extreme weather events such as floods, storms and drought, which have impacts on human life and health, material assets, critical infrastructure (buildings, water and sewage), food security, drinking water, communicable diseases, the economy and human suffering.</p> <p><i>Adaptation:</i> A national risk and vulnerability report (2006–2009) as a basis for following up on cross-sectoral social security work; from 2012 to 2017, a methodology evolved that will enable analyses of extreme events and their threats; a white paper on outdoor recreation, which outlines consequences of climate change and adaptation; legislation and policy instruments outlining adaptation strategies such as the Norwegian Public Health Act; white papers on health and care services and risk in a safe and secure society.</p>
Business and industry	<p><i>Vulnerability:</i> Activities that are dependent on natural resources, such as agriculture and forestry, fishing and aquaculture are the most vulnerable, owing to both higher temperatures and precipitation. The impacts across these sectors include pest infestation and proliferation of non-native organisms, which can reduce productivity and cause reduction in fish stocks, eutrophication, sedimentation and algal bloom within the spawning grounds. Petroleum facilities and the insurance industry are also vulnerable to sea level rise and storm surges resulting from extreme events, which could cause damage to or limit the use of petroleum facilities and increase the need for insurance policies.</p> <p><i>Adaptation:</i> A number of policy documents outline adaptation measures and strategies: the white paper on climate change adaptation outlines a national strategy for adaptation measures; introduction of smart agriculture in 2017; ecosystem-based management tools and integrated marine management plans; strategy for sectoral work on climate adaptation; monitoring system of climate change; research and update of plans and assessment of adaptation; comprehensive knowledge aimed to produce information on the role of oceans in the climate change system; construction of onshore petroleum facilities on higher ground and insurance of public compensation schemes.</p>
Arctic region	<p><i>Vulnerability:</i> Marine ecosystems and biodiversity in the Arctic are vulnerable to increased temperatures, which reduce sea ice thickness and change the timing of the ice melt. Impacts include changes in Arctic species, increasing oceanic algal blooms and altered food webs and breeding grounds. Terrestrial ecosystems are affected by increased temperatures, changes in precipitation and snow cover and thawing permafrost. This results in changes to species distribution and habitats, increasing accessibility in arctic areas that can lead to unsustainable harvesting, infrastructure development and spread of invasive alien species, among others. Society and tourism activities are vulnerable due to the increased risk of landslides, avalanches, floods, more frequent and severe weather events, sea level rise and storm surges and coastal erosion, which can result in instability of buildings and infrastructure.</p> <p><i>Adaptation:</i> Measures for ecosystems are outlined in two reports by the Arctic Council and the Norwegian Polar Institute; strengthening of instruments to safeguard threatened species and habitats; development of management plans and guidelines for protected areas, including adaptation of management practices and cruise operators, respectively; development of an emergency management tool; implementation of an action plan and arctic invasive alien species strategy; guidelines for land-use planning and support to local authorities in Svalbard in management related to floods, landslides and avalanches.</p>

117. Norway reported in its NC7 on cooperation with non-Annex I Parties in preparation for adaptation, such as financial, technological and capacity-building. International adaptation activities include providing support to some developing countries to strengthen their capacities and to establish meteorological monitoring systems. Examples of bilateral cooperation with developing countries on adaptation include support provided to Ethiopia and Malawi for agriculture and food security and to enhance their meteorological stations, including support for research and studies. During the review Norway elaborated on adaptation activities and programmes such as the Climate and Environmental Strategy (2016–2018) and ongoing work with the International Civil Aviation Organization and Airports Council International.

2. Assessment of adherence to the reporting guidelines

118. The ERT assessed the information reported in the NC7 of Norway and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting guidelines on NCs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

F. Research and systematic observation

1. Technical assessment of the reported information

119. Norway provided information on research and systematic observation, including research plans, programmes and models developed for systematic observation. Norway also provided some information on the identification of barriers to free and open international exchange of data and information.

120. Norway identified its most recent white paper on research *Long-term Plan for Research and Higher Education* (2014–2015). It outlines a framework for how the Government will reinforce research and education to meet challenges and seize opportunities in society in the period 2015–2024. In its Climate Policy (2016–2017), Norway emphasized the development of knowledge through research and innovation to combat climate change. The increase in financial allocations to 1 per cent of GDP demonstrates the national significance of research and development. The Government plans to increase financial allocations to research and higher education in six long-term priority areas: (1) sea and oceans; (2) climate, environment and clean energy; (3) public sector, renewal, better and more effective welfare, health and care services; (4) enabling technologies; (5) innovative and adaptable industry; and (6) world-leading academic groups.

121. The importance of research is further demonstrated by the formation of the Research Council of Norway, which is identified as a national, strategic and funding agency for research and innovation activities. In 2016 it received its largest budget increase. It supports basic, strategic and applied research, in addition to research for innovation and technology, which covers all disciplines. Its main strategy for 2015–2020, research for innovation and sustainability, sets out guidelines for its activities for 2015–2020.

122. Norway identified research and innovation programmes under the Research Council of Norway that focus on specific areas, such as the large-scale programme on climate research, KLIMAFORSK, which is identified as the Research Council's most important funding instrument for achieving wide-ranging, high-quality Norwegian climate research and will provide new, future-oriented knowledge of national and international significance. Its three broad research fields are natural and anthropogenic climate change, impacts of climate change on nature and society, and transition to a low-emission society and adaptation to climate change.

123. Some of the other key research programmes include the energy research programme, ENERGIX, which focuses on renewable energy, efficiency, systems and policies related to energy; the CCS research programme, CLIMIT, which is aimed at accelerating the commercialization of CCS; the polar research programme, POLARPROG, which is the most important funding instrument for achieving wide-ranging, high-quality Norwegian polar research, and for marine research, MARINFORSK, focusing on oceans and ocean-related areas. Norway provided information on mitigation technologies such as the Research Council's, with Enova's support, innovation and technology development of low-emission and environmental technologies and climate research. Norway also identified research, development and demonstration on energy and petroleum, which is one of the Norwegian Government's priorities. The Research Council is responsible for managing most of the public funding available for research, a responsibility which is shared with other bodies such as Enova, Innovation Norway and Gassnova.

124. The Norwegian Environment Agency is responsible for the management and funding of a number of environmental monitoring programmes in areas related to meteorological and atmospheric, oceanographic, terrestrial and space-based observations.

In terms of activities related to systematic observation, Norway reported on national plans, programmes and support for ground- and space-based climate observing systems, including satellite and non-satellite climate observation. Norway also reported on challenges related to the maintenance of a consistent and comprehensive observation system. Norway has developed national policies contributing to global systems and data management, such as long-term monitoring programmes of several glaciers on the Norwegian mainland performed by the Norwegian Water Resources and Energy Directorate.

125. Several environmental monitoring programmes are assigned to research institutions, such as monitoring GHG emissions, ozone layer thickness, ultraviolet radiation levels, aerosols and other air pollutants. Other monitoring programmes that relate to climate change include coastal monitoring of flora and fauna and ocean acidification and terrestrial observation. During the review Norway provided information on the state-of-the-art facilities of the Norwegian Meteorological Institute and shared information on other national research highlights, such as implementation of integrated forecasting tools, quality control and databases established. In relation to the Global Observing System, Norway established and implements the Global Sea Level Observing System and the Global Navigation Satellite System.

126. The NC7 reflects some actions taken to support capacity-building and the establishment and maintenance of observation systems and related data and monitoring systems in developing countries. Observation systems developed include geographic observation systems, terrestrial systems and meteorological and atmospheric observation systems and models for monitoring sectors, such as forest models and a riverine monitoring system. Norway provided funding for scientists from developing countries working on global climate change research. It provided developing countries with technological and capacity-building support to build their capacity to reduce GHG emissions and adapt to climate change through the North–South Cooperation 2017–2024 between the Norwegian Meteorological Institute and national meteorological and hydrological services in Bangladesh, Myanmar and Viet Nam. There is also collaboration with the Asian Disaster Preparedness Centre through the North–South Cooperation 2017–2024. Norway has focused on capacity-building at the organizational and individual level, emphasizing forecasting and its verification, climate services and ocean modelling, as well as strengthening early warning systems as part of national prevention plans to prevent disasters due to extreme weather.

2. Assessment of adherence to the reporting guidelines

127. The ERT assessed the information reported in the NC7 of Norway and identified issues relating to transparency in relation to the UNFCCC reporting guidelines on NCs. The findings are described in table 17.

Table 17

Findings on research and systematic observation from the review of the seventh national communication of Norway

No.	Reporting requirement, issue type and assessment	Description of the finding with recommendation or encouragement
1	Reporting requirement specified in paragraph 58	Information was not clearly provided in the NC7 on actions taken to support capacity-building related to research and systematic observation in developing countries.
	Issue type: transparency	During the review, Norway presented further clarifying information on action taken to support capacity-building of developing countries.
	Assessment: recommendation	The ERT recommends that Norway provide such further information on research and systematic observation related to capacity-building in developing countries in its next NC.
2	Reporting requirement specified in paragraph 62	Information on barriers to the free and open international exchange of data and action taken to overcome such barriers was not clearly provided in the NC7.
	Issue type:	During the review, Norway provided some further clarifying information on data shared internationally and acknowledged challenges in overcoming barriers such as

No.	Reporting requirement, issue type and assessment	Description of the finding with recommendation or encouragement
	transparency	formal restrictions on data access, the unwillingness of scientists to share data and incompatible methods and sampling tools.
	Assessment: encouragement	The ERT encourages Norway to provide further information on opportunities for and barriers to the open international exchange of data and information and to report on action taken to overcome barriers in its next NC.

Note: Paragraph numbers listed under reporting requirement refer to the relevant paragraph of the UNFCCC reporting guidelines on NCs. The reporting on the requirements not included in this table is considered to be complete, transparent and adhering to the UNFCCC reporting guidelines on NCs.

G. Education, training and public awareness

1. Technical assessment of the reported information

128. In the NC7 Norway provided information on its actions relating to education, training and public awareness at the domestic level, including on the general policy on education, training and public awareness, primary, secondary and higher education, public information campaigns, training programmes, education materials, resource or information centres, the involvement of the public and non-governmental organizations and its participation in international activities. Norway has built up the system in primary, secondary and higher education that integrates sustainable, environmental and climate education.

129. An example of climate education in Norway is the participatory 2009 Sustainable Backpack initiative of the Ministry of Education and Research and the Ministry of Climate and Environment. The aim is to enhance the integration of sustainable development into mainstream education at schools. It has been developed in close cooperation with NGOs. Extensive support material has been developed to give teachers the best possible guidelines for their work in this area, in particular through the Norwegian Environmental Education Network.

130. To facilitate public involvement in climate change policy implementation and to build the capacity of NGOs, Norway continues to provide annual financial support for the operations of a number of national NGOs. This support allows NGOs to be represented in the official Norwegian delegation to United Nations climate change negotiations and at the United Nations Environment Programme Board meetings.

131. Public access to environmental information and public participation in decision-making have been regulated since 2004. The Environmental Information Act (2004) aims to ensure public access to environmental information. Further, the Freedom of Information Act (2009) provides for the right of public access to the documents held by public authorities and public commitments. Any person may apply to get access to documents held by the authorities.

132. To enhance the dissemination of information on the environment and climate in Norway, the Ministry of Climate and Environment has assigned the State of the Environment Norway³ to provide the public with the latest information about the state and development of the environment in Norway online. The information is updated every six months.

133. Proposals for laws and regulations are subject to open public hearings. In 2014 the Ministry of Climate and Environment established a multi-stakeholder climate council to provide advice related to climate policies. The council includes representatives of business, labour organizations, environmental NGOs, local government and the research community. The public was broadly involved in the debates on the recently adopted Climate Change Act of Norway, which specifies the goal of a low-emission society by 2050, among others.

³ See <http://www.miljostatus.no>.

2. Assessment of adherence to the reporting guidelines

134. The ERT assessed the information reported in the NC7 of Norway and identified issues relating to transparency and adherence to the UNFCCC reporting guidelines on NCs. The findings are described in table 18.

Table 18

Findings on education, training and public awareness from the review of the seventh national communication of Norway

No.	Reporting requirement, issue type and assessment	Description of the finding with recommendation or encouragement
1	Reporting requirement specified in paragraph 65 Issue type: transparency Assessment: encouragement	The NC7 does not include information on the extent of public participation in the preparation of NCs. This issue was noted by the previous ERT. During the review, Norway clarified that the public and NGOs are consulted during the preparation of relevant legal acts (e.g. the Climate Change Act, adopted in 2017). However, since NCs are only a description of the situation, policies and instruments related to climate change, the public is not involved in their preparation. The ERT reiterates the encouragement of the previous ERT for Norway to include relevant information in its next NC.
2	Reporting requirement specified in paragraph 66 Issue type: transparency Assessment: encouragement	Norway did not report on higher education in chapter 9 of the NC on education, training and public awareness. Norway did however present information on the long-term plan for research and higher education 2015–2024 in chapter 8 of the NC on research and systematic observation. During the review, in response to the question raised by the ERT, Norway acknowledge this issue. The ERT encourages Norway to include the information presented in the section of the NC on research and systematic observation related to higher education also in chapter 9 of the NC or to reference in chapter 9 the information provided in the section on research and systematic observation.

Note: Paragraph number listed under reporting requirement refers to the relevant paragraph of the UNFCCC reporting guidelines on NCs. The reporting on the requirements not included in this table is considered to be complete, transparent and adhering to the UNFCCC reporting guidelines on NCs.

III. Conclusions and recommendations

135. The ERT conducted a technical review of the information reported in the NC7 of Norway in accordance with the UNFCCC review guidelines on NCs and the “Guidelines for review under Article 8 of the Kyoto Protocol”. The ERT concludes that the reported information mostly adheres to the UNFCCC reporting guidelines on NCs and the reporting guidelines for supplementary information, in particular the supplementary information required under Article 7, paragraph 2, and on the minimization of adverse impacts under Article 3, paragraph 14, of the Kyoto Protocol. The NC7 provides an overview of the national climate policy of Norway.

136. The information provided in the NC7 includes all elements of the supplementary information under Article 7 of the Kyoto Protocol. Supplementary information under Article 7, paragraph 1, of the Kyoto Protocol on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol was provided by Norway in its 2017 annual GHG inventory submission.

137. Norway’s total GHG emissions excluding LULUCF covered by its quantified economy-wide emission reduction target were estimated to be 3.0 per cent above its 1990 level, whereas total GHG emissions including LULUCF were 30.1 per cent below its 1990 level in 2016. Emission increases have been driven by the strong economic and population growth that Norway has experienced since 1990 as well as by the expansion of oil and gas extraction and processing. These factors have led to increased use of fossil fuels and consequently higher CO₂ emissions from the petroleum and transport sectors. The overall

emission increase has been slowed, however, by the reduction in emissions from the waste sector (due to increased recycling, incineration of waste and recovery of landfill gas) and the industrial processes sector (due to the reduction of N₂O, PFCs and SF₆ as a result of technology improvements).

138. Norway's new Climate Change Act (2017) has the overarching objective of promoting the long-term climate-friendly transformation of Norway's economy. Norway has targets and commitments linked to the decarbonization of the economy, whose achievement is based on a combination of the use of economic instruments and technological innovation. National climate-related medium- and long-term targets for 2020, 2030 and 2050 include reducing GHG emissions by 30 per cent by 2020 under the Convention; reducing GHG emissions by 16 per cent compared with the base-year level in the second commitment period of the Kyoto Protocol; reducing GHG emissions by at least 40 per cent by 2030 under the Paris Agreement; achieving climate neutrality by 2030; and becoming a low-emission society by 2050.

139. Norway has a unique system of economic instruments combined with technological development that delivers mitigation effects in all sectors of the economy. The mitigation actions with the most significant mitigation impact are those in the petroleum, transport and industrial processes sectors, including the CO₂ tax, the EU ETS, the Enova investment scheme, the CO₂ registration tax for new passenger cars, tax exemptions for electric vehicles and the requirement to use 6.3 per cent biofuels in transport fuel. Mitigation measures in industry also have large mitigation impacts, namely the reduction of N₂O from nitric acid production, biocarbon use in cement production, tax and recycling schemes for HFCs, the revised F-gas regulation and the reduction of PFCs in the aluminium industry. Measures in the residential, agriculture, LULUCF and waste sectors have smaller GHG emission reduction impacts projected for 2020 and 2030.

140. The GHG emission projections provided by Norway are under a WEM scenario, where emissions are projected to be 0.1 per cent above the 1990 level by 2020. On the basis of the reported information, the ERT concluded that Norway cannot achieve its emission reduction target on the basis of domestic mitigation actions alone, although the aggregate effect of mitigation actions by 2020 is estimated to be 21.3–25.7 Mt CO₂ eq. However, Norway has in place arrangements (i.e. participation in the EU ETS and the Norwegian Carbon Credit Procurement Program) that, according to the results of the projections, are sufficient to put Norway in a position to achieve its target under the Convention and its Kyoto Protocol.

141. The projections indicate that Norway's GHG emissions, with the contribution of LULUCF, are estimated to be 75.9 Mt CO₂ eq higher than the AAUs of Norway for the period 2013–2020. Norway plans to offset this gap using units acquired through participation in the EU ETS (net inflow of EUAs from other countries participating in the EU ETS), the carry-over from the first commitment period and the Norwegian Carbon Credit Procurement Program.

142. The NC7 contains information on how the Party's use of the mechanisms under Articles 6, 12 and 17 of the Kyoto Protocol is supplemental to domestic action. Norway does not have a quantitative national definition of supplementarity. Norway considers that its use of the Kyoto Protocol mechanisms has been supplemental to domestic action since the emission level would have been higher than actual emissions in the absence of the domestic PaMs taken to mitigate climate change. Norway is planning to make use of the Kyoto Protocol mechanisms to meet its Kyoto Protocol target.

143. Norway has continued to provide climate financing to developing countries. It has reduced the level of its financial support by 50.2 per cent (from USD 851 million in 2012 to USD 423.07 million in 2016) since the NC6, and its public financial support in 2015 and 2016 totalled USD 539.93 and 423.07 million, respectively. The biggest share of financial support went to mitigation, in particular related to general environmental protection (mainly REDD-plus), agriculture and energy generation, distribution and efficiency, as well as to renewable sources and disaster prevention and preparedness, among others. While continuing technology transfer for mitigation, Norway focused on renewable energy, energy access and efficiency through a number of mechanisms and initiatives, such as the

Technology Mechanism, the Private Finance Advisory Network, the Clean Energy Ministerial and Mission Innovation. Norway's support for technology transfer related to adaptation has covered other sectors and areas, such as agriculture, food security, health and water.

144. Norway's vulnerability assessment focuses on nature and ecosystems, human life and health, and business and industry for mainland Norway and on biodiversity and natural ecosystems and society for the Arctic region. The impacts on these vulnerable areas underscore the changes in and implications of increased temperature, sea level rise and changes in rainfall and wind speed. Norway has focused on climate change adaptation since 2013 and implements relevant adaptation measures at the national and municipal level, mainly through key legislation and policy instruments, including at the sectoral level. Among others, these include the Climate Change Act (June 2017), the Planning and Building Act with the Environmental Impact Assessment Regulation and a white paper *Climate Change Adaptation in Norway* (2013), which outline adaptation measures and strategies.

145. Norway undertakes extensive research and systematic observation in six long-term priority areas, including climate, environment and clean energy. The national importance of research is demonstrated by the Government's increase in its allocation of funding by 1 per cent of GDP. Through its dedicated Research Council of Norway, with clearly outlined objectives in its research innovation and sustainability strategy, Norway participates extensively in international cooperation on research and development and education with many countries around the world. Climate research is conducted by KLIMAFORSK, which is the most important funding instrument of the Research Council and will provide new, future-oriented knowledge of national and international significance.

146. Norway has implemented a wealth of measures across the spectrum of the education system. The broader part of the curriculum with key objectives for the respect of nature and sustainability in primary and secondary education was introduced. Norway has in place a long-term plan for research and higher education (2015–2024), which outlines a framework for how the Government will reinforce research and education, including that related to climate change. The Sustainable Backpack initiative is one innovative action implemented in Norwegian schools in close cooperation with NGOs. NGOs and the public have the opportunity to consult on the preparation of legal acts on climate change and the environment, most recently the Climate Change Act (2017).

147. In the course of the review, the ERT formulated the following recommendations for Norway to improve its adherence to the UNFCCC reporting guidelines on NCs and its reporting of supplementary information under the Kyoto Protocol:⁴

- (a) To improve the completeness of its reporting by:
 - (i) Providing information on specific activities for financing access by developing countries to 'hard' or 'soft' environmentally sound technologies (see table 15, issue 3);
 - (ii) Providing information on specific steps taken to support development and enhancement of endogenous capacities and technologies of developing countries (see table 15, issue 4);
- (b) To improve the transparency of its reporting by:
 - (i) Providing data on its contributions to the GEF and the GCF in United States dollars as required by table 3 of the UNFCCC reporting guidelines on NCs (see table 14, issue 1);
 - (ii) Providing more detailed information on Norway's provision of assistance to developing countries for meeting the costs of adaptation, and including table 5 of the UNFCCC reporting guidelines on NCs, in its next NC (see table 14, issue 2);

⁴ The recommendations are given in full in the relevant sections of this report.

- (iii) Providing clearer information distinguishing between public and private activities related to the promotion, facilitation and financing of, or access to, environmentally sound technologies by transparently providing information on private sector activities in its next NC. (see table 15, issue 1);
- (iv) Providing clear information on success and failure stories on technology transfer activities (see table 15, issue 2);
- (v) Providing information on action taken to support capacity-building of developing countries in research and systematic observation (see table 17, issue 1);
- (c) To improve the timeliness of its reporting by submitting its next NC on time (see para. 5 above).

IV. Questions of implementation

148. During the review the ERT assessed the NC7, including the supplementary information provided under Article 7, paragraph 2, of the Kyoto Protocol, and reviewed the information on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol with regard to timeliness, completeness, transparency and adherence to the UNFCCC reporting guidelines on NCs. No question of implementation was raised by the ERT during the review.

Annex

Documents and information used during the review

A. Reference documents

2017 GHG inventory submission of Norway. Available at http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/10116.php.

2018 GHG inventory submission of Norway. Available at <https://unfccc.int/process-and-meetings/transparency-and-reporting/reporting-and-review-under-the-convention/greenhouse-gas-inventories-annex-i-parties/national-inventory-submissions-2018>.

BR3 of Norway. Available at https://unfccc.int/sites/default/files/resource/321045_Norway-NC7-BR3-2-Norways_seventh_national_communication.pdf.

BR3 CTF tables of Norway. Available at https://unfccc.int/sites/default/files/resource/43726015_Norway-BR3-NC7-1-nor_2018_v1.0%20%281%29.xlsx.

“Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications”. FCCC/CP/1999/7. Available at <http://unfccc.int/resource/docs/cop5/07.pdf>.

“Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol”. Annex to decision 15/CMP.1. Available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a02.pdf>.

“Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol”. Annex III to decision 3/CMP.11. Available at <http://unfccc.int/resource/docs/2015/cmp11/eng/08a01.pdf>.

“Guidelines for review under Article 8 of the Kyoto Protocol”. Annex to decision 22/CMP.1. Available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a03.pdf>.

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Report of the technical review of the second biennial report of Norway. FCCC/TRR.2/NOR. Available at <https://unfccc.int/sites/default/files/resource/docs/2016/trr/nor.pdf>.

Report on the technical review of the sixth national communication of Norway. FCCC/IDR.6/NOR. Available at <https://unfccc.int/sites/default/files/resource/docs/2015/idr/nor06.pdf>.

Revisions to the guidelines for review under Article 8 of the Kyoto Protocol. Annex I to decision 4/CMP.11. Available at <http://unfccc.int/resource/docs/2015/cmp11/eng/08a01.pdf>.

“UNFCCC biennial reporting guidelines for developed country Parties”. Annex I to decision 2/CP.17. Available at <http://unfccc.int/resource/docs/2011/cop17/eng/09a01.pdf>.

Other

Brunvoll A and Larsen BM. 2004. Greenhouse gas emissions in Norway: do carbon taxes work? *Energy Policy*. 32(4): pp.493–505.

Greaker M and Rosnes O. 2015. Robuste norske klimamålsetninger. *Samfunnsøkonomen*. 1-2015: pp.67–77.

B. Additional information provided by the Party

Responses to questions during the review were received from Ms. Ane Rostrup Gabrielsen and Mr. Peer Stiansen (Ministry of Climate and Environment), Mr. Hans Kolshus (Norwegian Environment Agency) and Ms. Sollie (Ministry of Finance), including additional material. The following documents¹ were provided by Norway and referenced in the report:

Handbook Emission Factors for Road Transport (HBEFA).

<http://www.hbefa.net/e/index.html>.

Norwegian Ministry of Foreign Affairs, Meld. St. 24 (2016–2017) Report to the Storting (white paper). Common Responsibility for Common Future. The Sustainable Development Goals and Norway's Development Policy.

<https://www.regjeringen.no/contentassets/217f38f99edf45c498befc04b7ef1f7e/en-gb/pdfs/stm201620170024000engpdfs.pdf>.

¹ Reproduced as received from the Party.