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Report on the technical review of the third biennial report of Norway

Developed country Parties were requested by decision 2/CP.17 to submit their third biennial report to the secretariat by 1 January 2018. This report presents the results of the technical review of the third biennial report 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".

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Abbreviations and acronyms

AAU	assigned amount unit
AR4	Fourth Assessment Report of the Intergovernmental Panel on Climate Change
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
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
NO	not occurring
NOK	Norwegian kroner
non-Annex I Party	Party not included in Annex I to the Convention
N_2O	nitrous oxide
OECD	Organisation for Economic Co-operation and Development
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
SF_6	sulfur hexafluoride
UNFCCC reporting guidelines on BRs	"UNFCCC biennial reporting guidelines for developed country Parties"
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 BR3[1] of Norway. The review was organized 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 IV: UNFCCC guidelines for the technical review of biennial reports from Parties included in Annex I to the Convention" (annex to decision 13/CP.20).

2. In accordance with the same decision, 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 conducted a technical review of the information reported in the BR3 of Norway in accordance with the UNFCCC reporting guidelines on BRs (annex I to decision 2/CP.17).

1. Timeliness

5. The BR3 was submitted on 29 January 2018, after the deadline of 1 January 2018 mandated by decision 2/CP.17. The CTF tables were also submitted on 29 January 2018. Norway did not inform the secretariat about its difficulties with making a timely submission in accordance with decision 13/CP.20 and decision 22/CMP.1. The ERT noted with concern the delay in the submission and recommended that Norway submit its next BR on time. Norway submitted a redesigned version of its BR3 on 18 April 2018, without changes to the context, and resubmitted its BR3 CTF tables with editorial corrections to table 4.

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 BR3 mostly adheres to the UNFCCC reporting guidelines on BRs.

Table 1

Summary of completeness and transparency of mandatory information reported by Norway in its third biennial report

Section of BR	*Completeness*	*Transparency*	*Reference to description of recommendations*
GHG emissions and trends	Complete	Transparent	
Assumptions, conditions and methodologies related to the attainment of the quantified economy-wide emission reduction target	Complete	Mostly transparent	Issue 1 in table 3

[1] The BR submission comprises the text of the report and the CTF tables, which are both subject to the technical review.

Section of BR	*Completeness*	*Transparency*	*Reference to description of recommendations*
Progress in achievement of targets	Complete	Transparent	
Provision of support to developing country Parties	Mostly complete	Mostly transparent	Issues 1 and 3 in table 13

Notes: 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.

II. Technical review of the information reported in the third biennial report

A. Information on greenhouse gas emissions and removals related to the quantified economy-wide emission reduction

1. Technical assessment of the reported information

7. Total GHG emissions[2] excluding emissions and removals from LULUCF were 3.0 per cent higher 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 2 illustrates the emission trends by sector and by gas for Norway.

Table 2
Greenhouse gas emissions by sector and by gas for Norway for the period 1990–2016

	GHG emissions (kt CO_2 eq)						*Change (%)*		*Share (%)*	
	1990	*2000*	*2010*	*2014*	*2015*	*2016*	*1990–2016*	*2015–2016*	*1990*	*2016*
Sector										
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

[2] In this report, the term "total GHG emissions" refers to the aggregated national GHG emissions expressed in terms of CO_2 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.

	GHG emissions (kt CO_2 eq)						*Change (%)*		*Share (%)*	
	1990	*2000*	*2010*	*2014*	*2015*	*2016*	*1990–2016*	*2015–2016*	*1990*	*2016*
6. Other	NO	NO	NO	NO	NO	NO	–	–	–	–
Gas[a]										
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_2O	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 GHG inventory submission, version 1.0.

[a] Emissions by gas without LULUCF.

8. The development 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 CO_2 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 N_2O, PFC and SF_6 emissions as a result of technology improvements). A peak in total GHG emissions was attained in 2007, at 56,696.45 kt CO_2 eq, followed by a significant decrease in 2008 and 2009 (−7.2 per cent), partly caused by the international economic crisis.

9. The Norwegian Environment Agency, Statistics Norway and the Norwegian Institute of Bioeconomy Research are the institutions involved in the national GHG inventory system and work together to fulfil the requirements of the national system. The changes in the arrangements since the BR2, as described in the BR3, include the revision of the preparation plan for the Norwegian GHG emission inventory and of the timeline for cooperation between the institutions of the national system due to the revision of the common reporting format tool by the UNFCCC.

2. Assessment of adherence to the reporting guidelines

10. The ERT assessed the information reported in the BR3 of Norway and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting guidelines on BRs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

B. Assumptions, conditions and methodologies related to the quantified economy-wide emission reduction target and related assumptions, conditions and methodologies

1. Technical assessment of the reported information

11. For Norway the Convention entered into force on 21 March 1994. Under the Convention Norway committed to reducing its GHG emissions by 30 per cent below the 1990 level by 2020. The target includes all GHGs included in the "Guidelines for the

preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual greenhouse gas inventories", namely CO_2, CH_4, N_2O, HFCs, PFCs, SF_6 and NF_3. It also includes all IPCC sources and sectors included in the annual GHG inventory. The global warming potential values used are from the AR4. Emissions and removals from the LULUCF sector are included in the target and accounted using an activity-based approach. Norway reported that it plans to make use of market-based mechanisms to achieve its target (see chapter II.B.1 below).

12. In its BR3 Norway reported that the 30 per cent target under the Convention was made operational through the legally binding 2013–2020 second commitment period of the Kyoto Protocol. During this period, average GHG emissions should not exceed 84 per cent of the 1990 level. Norway ratified this commitment in the Doha Amendment on 12 June 2014. Norway reported that compliance with its Kyoto Protocol commitment implies that the 30 per cent emission reduction target for 2020 under the Convention will also be achieved. The 30 per cent target under the Convention was made operational through the legally binding 2013–2020 second commitment period of the Kyoto Protocol. During this period, average GHG emissions should not exceed 84 per cent of the 1990 level. In absolute terms, this means that Norway, with a contribution from the Kyoto mechanisms, has to account for Kyoto units corresponding to a reduction from 51,728.80 kt CO_2 eq (in the base year) to on average 43,614.28 kt CO_2 eq in the period 2013–2020.

13. The relationship between the two targets is explained in Norway's submission and presentation to the Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol of May 2012.[3] Norway considers the targets under the Kyoto Protocol and under the Convention to be equivalent. It defined the relationship between the two targets on the basis of historical GHG emissions for 1990–2010 as reported in its 2012 annual submission. The 2020 target under the Convention corresponds to a linear declining emission trajectory starting from the 2010 level to a 30 per cent reduction of emissions by 2020 compared with the 1990 level. The emission reductions required to achieve this trajectory for the period 2013–2020 are equal to the reductions that correspond to an average 16 per cent reduction compared with the 1990 level over the years 2013–2020, which is the Party's Kyoto Protocol target for the second commitment period. During the review, Norway explained that it is committed to covering any remaining emissions gap pursuant to the effects of domestic PaMs to its 16 per cent reduction commitment under the Kyoto Protocol for 2013–2020 through the use of the flexible Kyoto Protocol mechanisms.

14. In its BR3 Norway reported information on the net contribution from LULUCF activities under Article 3, paragraph 3, of the Kyoto Protocol related to afforestation, reforestation, deforestation and forest management. Norway elected to include emissions and removals from the voluntary activities of cropland management and grazing land management under Article 3, paragraph 4. Norway will account for all activities under Article 3, paragraphs 3 and 4, at the end of the commitment period.

15. Norway reported that it will use market-based mechanisms under the second commitment period of the Kyoto Protocol for the achievement of its quantified economy-wide reduction target under the Convention. The net contribution of units acquired through the mechanisms could reach 75 Mt for the whole 2013–2020 period, which excludes possible contributions from LULUCF activities under Article 3, paragraphs 3 and 4, and includes the units acquired through participation in the EU ETS, the carry-over from the first to the second commitment period, and the Norwegian Carbon Credit Procurement Program. Norway reported in the BR3 that the carry-over from the first commitment period includes 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 they delivered first commitment period CERs and ERUs. Concerning the Norwegian Carbon Credit Procurement Program, during the review Norway explained that by the time of the review approximately 54 million CERs had been contracted, of which approximately 46 million are expected to be delivered, and about 20 million are already transferred to the relevant state holding accounts. The final need for CERs for compliance has yet to be determined.

[3] Available at http://unfccc.int/resource/docs/2012/awg17/eng/misc01.pdf and http://unfccc.int/files/meetings/ad_hoc_working_groups/kp/application/pdf/awgkp_norway_ppt.pdf, respectively.

16. Norway has targets and commitments towards the decarbonization of the economy, whose achievement is based on a combination of using economic instruments and technological innovation. Besides its 2020 targets under the Convention and the second commitment period of the Kyoto Protocol referred to in paragraph 15 above, Norway reported on the following goals:[4]

(a) To reduce emissions by at least 40 per cent by 2030;

(b) To achieve climate neutrality by 2030;

(c) To become a low-emission society by 2050.

17. Norway has, through its nationally determined contribution, committed to a conditional target of at least 40 per cent emission reduction by 2030 compared with the 1990 level. Norway's nationally determined contribution is economy wide, covering all sectors and GHGs. The 2030 target has been established by law in the Norwegian Climate Change Act. Norway's intention is to fulfil this target jointly with the EU. If it is not possible to achieve joint fulfilment with the EU, the target of reducing emissions by at least 40 per cent by 2030 compared with the 1990 level will still be Norway's nationally determined contribution. The target is conditional upon the availability of flexible mechanisms under the Paris Agreement and on Norway being credited for its participation in the EU ETS so that this counts towards the fulfilment of its commitments.

18. In connection with the ratification of the Paris Agreement, the Norwegian Parliament asked the Government to work on the basis that Norway will achieve climate neutrality by 2030. During the review, Norway explained that from 2030 onward GHG emissions in Norway will be compensated for by equivalent emission reductions outside Norway. This goal was set by the Norwegian Parliament, which did not specify how the LULUCF sector should be accounted. The target assumes the availability of flexible mechanisms, and in the event that such mechanisms are not available, Norway is not likely to be able to achieve the goal.

19. In June 2017, the Norwegian Parliament adopted the Climate Change Act, which established Norway's aim of becoming a low-emission society by 2050, achieving 80–95 per cent GHG emission reduction compared with the 1990 level. As a small open economy, Norway is dependent on a similar shift in other countries. During the review, Norway clarified that, when assessing progress towards the target, the effect of its participation in the EU ETS should be taken into account.

2. Assessment of adherence to the reporting guidelines

20. The ERT assessed the information reported in the BR3 of Norway and identified an issue relating to transparency and adherence to the UNFCCC reporting guidelines on NCs. The finding is described in table 3.

Table 3
Finding on the quantified economy-wide emission reduction target from the review of the third biennial report of Norway

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation*
1	Reporting requirement specified in paragraph 5 Issue type: transparency Assessment: recommendation	Information on the possible scale of contribution of units from each market-based mechanism in relation to the Convention target was not provided in CTF table 2(e). In its NC7 and BR3 Norway provided a description of its 2020 target under the Convention and its consistency with the Kyoto Protocol target. Norway estimated how many Kyoto Protocol units will be needed to cover the gap for the years 2013–2020. It reported that both AAUs and CERs will be used. However, the estimate is not split between the possible scales of contribution of each different type of unit (CERs, AAUs from the EU ETS, and carry-over units from the first commitment period of the Kyoto Protocol).

[4] More detailed information on these targets is presented in chapter II.B.C below.

No.	Reporting requirement, issue type and assessment	Description of the finding with recommendation
		During the review, Norway confirmed that any gap in emission level between the targets will be covered through the use of units from the EU ETS and the Norwegian Carbon Credit Procurement Program. Regarding the net transfer of AAUs, Norway explained that some parameters for the second commitment period are only expected to be decided through an amendment to the European registry regulation late in 2018. The ERT acknowledges there is an ongoing comitology process between the participants in the EU ETS to develop rules for relationships between EUAs and AAUs for 2013–2020 through the registry regulation and that more transparency cannot be provided until this process is concluded, which is expected in late 2018. Therefore, the ERT recommends that Norway provide a transparent description of the outcome of this process in its next BR, including the scale of contribution for each source of international units and/or allowances from market-based mechanisms expected to be used for the attainment of its economy-wide target.

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

C. Progress made towards the achievement of the quantified economy-wide emission reduction target

1. Mitigation actions and their effects

(a) Technical assessment of the reported information

21. 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.

22. Norway provided detailed information on its current PaMs, many of which are new compared with those reported in its BR2. Norway also provided information on changes made since the BR1 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 (see para. 19 above).

23. Norway reported on its self-assessment of compliance with its emission reduction target and national rules for taking action against non-compliance. For example, Norway's environmental legislation includes provisions for enforcing different obligations and decisions made in accordance with the law, including the Pollution Control Act, the Greenhouse Gas Emissions Trading Act and the Climate Change Act.

24. Norway has a unique system of economic instruments combined with technological development that delivers mitigation effects in all sectors of the economy. From 2013, more than 80 per cent of domestic greenhouse gas emissions are either covered by the EU ETS or subject to a CO_2 tax or other taxes aimed towards reducing GHG emissions. According to the BR3, the average price of Norwegian GHG emissions is estimated at NOK 340 (EUR 30) per t CO_2 eq. Emissions from agriculture is the largest sector except for emissions from CO_2. For two sectors, petroleum and aviation, the two key economic instruments CO_2 tax and the EU ETS are combined. Following the recommendation of the Green Tax Commission in 2014, these instruments will remain until the price of emission allowances under the EU ETS equals the price of polluting outside the EU ETS. Only then will the CO_2 tax level be reduced in line with the increase in the emission allowance price. Currently the cumulative effect of the two instruments is estimated, as the incentives to

reduce emissions are the same for both the CO_2 tax and the EU ETS, although the price signal is different for EU ETS allowances (NOK 50) and CO_2 tax (NOK 450).

25. Another key instrument is the financial support provided by the State-owned company Enova, which provides funding to reduce GHG emissions and increase innovation for energy and climate projects and plays a key role in the development of Norway's future energy system and the transition to a low-emission society. The combined mitigation effect of the EU ETS and the CO_2 tax for onshore activities and the Enova investment scheme is expected to amount to between 2.9 and 3.2 Mt CO_2 eq by 2020. In addition, the CO_2 tax, EU ETS and other policy instruments have reduced emissions offshore by 7.0 Mt CO_2 eq.

26. Norway highlighted that CCS is one of the key priority areas for enhanced national climate action and that Norway considers CCS 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 CO_2 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 4 provides a summary of the reported information on the PaMs of Norway.

Table 4
Summary of information on policies and measures reported by Norway

Sector	*Key PaMs*	*Estimate of mitigation impact by 2020 (kt CO_2 eq)*	*Estimate of mitigation impact by 2030 (kt CO_2 eq)*
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 households	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_2O 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		
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 CO_2 or CO_2 eq avoided in a given year as a result of the implementation of the mitigation actions.

(b) Policies and measures in the energy sector

27. **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. Heating in the residential and commercial sectors is electricity based and therefore further significant mitigation effects are limited.

28. **Residential sector and energy use in industries**. The key policy in Norway contributing to mitigation action in the residential sector is the CO_2 tax, the building code, Enova and effective in 2020 the ban on the use of mineral oils for heating of buildings. The estimated effect of the ban is in the order of 400 kt CO_2 eq emission reduction by 2020. The effects of the other policy instruments are included elsewhere (cross-sectoral CO_2 tax and Enova). The key GHG emission mitigation policies for energy use in industries are the EU ETS, the CO_2 tax, the excise duty on mineral oils and Enova. The effect of these instruments is included in the aggregate for industries.

29. **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.

30. 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 faster than emissions from passenger cars, which indicates that emissions per passenger kilometre have decreased. The Party noted that the main reasons for this performance 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, has also contributed to the lower emissions from passenger vehicles. Since 2007 the car registration tax includes a CO_2-emissions component. The purpose of this measure was to reduce CO_2 emissions from new cars. Between 2009 and 2017, the registration tax was shifted to place greater weight on CO_2 emissions. Norway estimated the combined mitigation effect of all transport-related PaMs to be in the range of 1.4–1.7 Mt CO_2 eq emission reduction by 2020.

31. The BR3 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.

32. **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.

33. Some mitigation measures have been implemented in the petroleum sector. The CO_2 tax is levied on all combustion of natural gas, oil and diesel in petroleum operations on the Norwegian continental shelf and on CO_2 separated from petroleum and discharged to air in installations used for production or transportation of petroleum. In addition to the CO_2 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 BR3, the CO_2 tax and the EU ETS had contributed to emission reductions of about 5 Mt CO_2 eq by 2010 for offshore activities.

34. 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 CO_2 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

35. **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 its inclusion in the EU ETS, voluntary agreements between industry and the Norwegian Government were the main instruments. The key mitigation measures are the incentives for reducing N_2O 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 CO_2 eq emission reduction by 2020.

36. **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.

37. **LULUCF**. Norway is implementing PaMs in the LULUCF sector, although their relatively small emission reduction impact can be quantified at 270 kt CO_2 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 part of a dialogue on their joint fulfilment of the 2030 EU climate target.

38. **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 CO_2 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) Response measures

39. Norway reported on the assessment of the economic and social consequences of its response measures. It formulates its environmental, economic and energy policies on the basis of the polluter pays principle and has a market-based approach whereby prices reflect costs including externalities. Costs of externalities of GHG emissions are reflected in levies and by participation in the EU ETS.

40. 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.

41. 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. Estimates of emission reductions and removals and the use of units from market-based mechanisms and land use, land-use change and forestry.

(e) Technical assessment of the reported information

42. On its use of units from LULUCF activities, according to CTF table 4(a)II, emissions from deforestation under Article 3, paragraph 3, and emissions from cropland management and grazing land management under Article 3, paragraph 4, are for the time being higher than the removals from afforestation and reforestation under Article 3, paragraph 3, and forest management under Article 3, paragraph 4. Therefore, Norway reported in CTF tables 4 and 4(a) that in 2014, 2015 and 2016 the LULUCF sector was a net source accounting for 10.00 kt CO_2 eq, 300.00 kt CO_2 eq and 140.00 kt CO_2 eq, respectively.

43. Norway reported that it intends to use units from market-based mechanisms under the Kyoto Protocol for meeting its 2020 emission reduction target. However, as reported in the NC7, Norway's accounting for the whole 2013–2020 period is likely to occur in 2022–2023, and consequently no units have been retired or cancelled pursuant to the commitment under the Kyoto Protocol.

44. In CTF table 4(b) Norway presented estimates of the net use of units from the Kyoto Protocol mechanisms based on GHG inventory estimates for 2013–2016. The use of market-based mechanisms in 2014, 2015 and 2016 was estimated to account for 9,700.00, 10,600.00 and 9,900.00 kt CO_2 eq, respectively. Table 5 illustrates Norway's total GHG emissions, the contribution of LULUCF and the use of units from market-based mechanisms necessary to achieve its target.

Table 5
Summary of information on the use of units from market-based mechanisms and land use, land-use change and forestry by Norway to achieve its target

Year	*Emissions excluding LULUCF (kt CO_2 eq)*	*Contribution of LULUCF (kt CO_2 eq)*	*Emissions including contribution of LULUCF (kt CO_2 eq)*	*Use of units from market-based mechanisms (kt CO_2 eq)*
Base year	51 728.79	NA	NA	NA
2010	NA	NA	NA	NA
2011	NA	NA	NA	NA
2012	NA	NA	NA	NA
2013	53 527.82	1 00.00	54 527.82	10 000.00
2014	53 331.41	10.00	53 341.41	9 700.00
2015	53 908.19	300.00	54 208.19	10 600.00
2016	53 400.00	140.00	53 540.00	9 900.00

Sources: Norway's BR3 and CTF tables 1, 4, 4(a)I, 4(a)II and 4(b).

45. In assessing the Party's progress towards the achievement of its 2020 target, the ERT noted that Norway's emission reduction target under the Convention is 30 per cent below the 1990 level (see para. 13 above). This target was made operational through the Party's quantified emission limitation or reduction commitment of 84 per cent of the base-year emissions for 2013–2020, as defined in the Doha Amendment to the Kyoto Protocol. In 2016 Norway's annual total GHG emissions excluding LULUCF equalled 53,400.00 kt

CO_2 eq, or 3.2 per cent above the base-year level; the contribution of LULUCF was estimated to increase emissions by 140.00 kt CO_2 eq and the use of market-based mechanisms accounted for 9,900 kt CO_2 eq.

46. The ERT noted that Norway has in place PaMs that have a significant mitigation effect and that Norway cannot achieve its emission reduction target with domestic mitigation actions alone. However, Norway has in place arrangements to procure the required units from flexible mechanisms through participation in the EU ETS, the carry-over of Kyoto Protocol units from the first to the second commitment period and the acquisition of CERs through the Norwegian Carbon Credit Procurement Program. With the use of flexible mechanisms, according to the results of the projections. Norway could achieve its 2020 targets under the Convention and its Kyoto Protocol.

(f) Assessment of adherence to the reporting guidelines

47. The ERT assessed the information reported in the BR3 of Norway and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting guidelines on BRs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

2. Projections overview, methodology and results

(a) Technical assessment of the reported information

48. 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 BR3, the WEM scenario reflects neither the effects of policies adopted after that time nor any planned measures, policies or political goals and ambitions.

49. 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 CO_2, CH_4, N_2O, PFCs, HFCs and SF_6 (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 AR4. 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

50. 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 CO_2 from the industrial processes, agriculture and waste sectors were based mainly on sector- and plant-specific information collected by the Norwegian Environment Agency.

51. Under the WEM scenario, the EUA price is projected to be NOK 57/t CO_2 by 2020 (about EUR 5.9/t CO_2) and NOK 85/t CO_2 by 2030 (about EUR 8.8/t CO_2). 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.

52. 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.

53. 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 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.

54. 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.

55. Concerning road traffic emissions, it is assumed that the share of electric cars will increase to 20 per cent of new car sales by 2030. Sales of plug-in hybrid cars are estimated for 2030 at 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.

56. 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 CO_2 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 CO_2 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 CO_2 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 CO_2 eq, respectively.

(c) Results of projections

57. 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 6 and the figure below.

Table 6
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	84.00	84.31
Quantified economy-wide emission reduction target under the Convention [c]	NA	NA	30.00
Inventory data 1990[d]	51 728.80	0.37	NA
Inventory data 2015 [d]	53 908.19	3.83	4.21
WEM projections for 2020[e]	51 781.00	–0.27	0.10
WEM projections for 2030[e]	48 286.00	–7.00	–6.66

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.

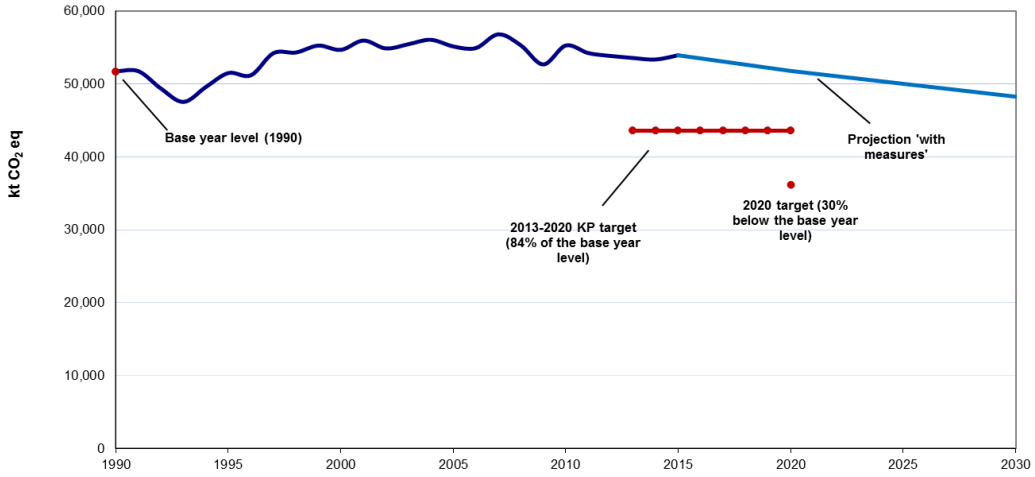
[b] The Kyoto Protocol base-year level of emissions is provided in the initial review report, contained in document FCCC/IRR/2016/NOR.

[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.

58. Norway's total GHG emissions excluding LULUCF are projected to be 51,781.00 and 48,286.00 kt CO_2 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. 15 above).

59. 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 CO_2 eq. The contribution from LULUCF is estimated to increase emissions by 1.1 Mt CO_2 eq. Therefore, the total GHG emissions with the

contribution of LULUCF are estimated to be 75.9 Mt CO_2 eq higher than the AAUs of Norway for the period 2013–2020 (348.9 million AAUs). Norway plans to offset this gap by reducing domestic emissions and by using units acquired through participation in the EU ETS, the carry-over from the first commitment period of the Kyoto Protocol and CERs from the Norwegian Carbon Credit Procurement Program.

60. Norway did not indicate in the BR3 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 BR 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 BR will improve the transparency of the reporting on the use of market-based mechanisms.

61. 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 case the participation in the ETS would result in significantly lower net transfers to Norway than in 2008–2012, or about 4 million AAUs/year. On the other hand, considering that the expected amount of EU ETS allowances attributed to Norwegian participation (excluding aviation) could be about 18 Mt per year for the trading period 2013–2020, then by taking into account aviation under the EU ETS scheme, Norway's contribution of AAUs to back the EU ETS allowances could be around 45 per cent of AAUs. If 45 per cent of 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. Norway presented the WEM scenario by sector for 2020 and 2030, as summarized in table 7.

Table 7
Summary of greenhouse gas emission projections for Norway presented by sector

	GHG emissions and removals (kt CO_2 eq)			*Change (%)*	
	1990	*2020*	*2030*	*1990–2020*	*1990–2030*
Sector		*WEM*	*WEM*	*WEM*	*WEM*
Energy (not including transport)	19 896.25	25 389.00	23 735.00	27.6	19.3
Transport	10 267.69	12 680.00	11 376.00	23.5	10.8
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.

62. 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 CO_2 eq (42.7 per cent), 1,203.12 kt CO_2 eq (53.6 per cent) and 458.94 kt CO_2 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 CO_2 eq (27.6 per cent) and 2,412.31 kt CO_2 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 CO_2 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 CO_2 eq in 2015–2030.

63. LULUCF net removals are projected to amount to 23,483.00 and 21,287.00 kt CO_2 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 m^3 today to around 12 million m^3 by 2020 and nearly 13 million m^3 by 2030.

64. Norway presented the WEM scenario by gas for 2020 and 2030, as summarized in table 8.

Table 8
Summary of greenhouse gas emission projections for Norway presented by gas

	GHG emissions and removals (kt CO_2 eq)			*Change (%)*	
		2020	*2030*	*1990–2020*	*1990–2030*
Gas	*1990*	*WEM*	*WEM*	*WEM*	*WEM*
CO_2	35 704.39	43 148.00	40 387.00	20.85	13.11
CH_4	5 800.20	4 911.00	4 538.00	–15.33	–21.76
N_2O	4 230.83	2 527.00	2 506.00	–40.27	–40.77
HFCs	0.04	983.00	633.00	2 457 400.00	1 582 400.00
PFCs	3 894.80	155.00	163.00	–96.0	–95.81
SF_6	2 098.54	57.00	59.00	–97.28	–97.19
NF_3	NO	NO	NO	–	
Total GHG emissions without LULUCF	**51 728.80**	**51 781.00**	**48 286.00**	**0.10**	**-6.67**

Source: Norway's BR3 CTF table 6.

65. For 2020 the most significant reductions are projected for PFCs, SF_6, N_2O and CH_4 emissions: 3,739.80 kt CO_2 eq (96.0 per cent), 2,041.54 kt CO_2 eq (97.3 per cent), 1,703.83 kt CO_2 eq (40.3 per cent) and 889.20 kt CO_2 eq (15.3 per cent) between 1990 and 2020, respectively. PFCs, SF_6 and N_2O emissions in 2020 are projected to remain at the 2015 emission level, while further reduction in CH_4 emissions by 2020 compared with the 2015 level is related to declining landfill emissions. Conversely, CO_2 emissions excluding LULUCF are expected to increase by 7,443.61 kt CO_2 eq (20.9 per cent) between 1990 and 2020.

66. For 2030, emissions of PFCs, SF_6 and N_2O are projected to be at similar to the 2020 level. A further reduction in CH_4 emissions compared with the 2020 level is projected at 373.00 kt CO_2 eq. CO_2 and HFC emissions are projected to decline by 2,761.00 kt CO_2 eq (6.4 per cent) and 350.00 kt CO_2 eq (35.6 per cent) between 2020 and 2030, respectively.

The projected reduction in CO_2 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.

67. The projections of GHG emissions in the BR3 are about 3 Mt CO_2 eq lower for 2020 and in excess of 4 Mt lower for 2030 than the reported projections in the BR2. Both CO_2 emissions and F-gas emissions, in particular HFCs, are contributing to this reduction. The main changes in the projections between the BR3 and the BR2 affected the estimates of non-EU ETS emissions, which have been reduced by 3 Mt CO_2 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 downward by 0.75 Mt CO_2 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

68. The ERT assessed the information reported in the BR3 of Norway and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting guidelines on BRs. The ERT noted that the next BR 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 9.

Table 9
Findings on greenhouse gas emission projections reported in the third biennial report of Norway

No.	*Reporting requirement, issue type and assessment*	*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 BR3 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. The ERT reiterates the encouragement of the previous ERT for the Party to report, in its next BR, 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 BR3 either qualitatively or quantitatively the sensitivity of the following key assumptions reported in table A3-3 of the NC7 or CTF table 5: 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 all key underlying assumptions in its next BR.
3	Reporting requirement specified in paragraph 43 Issue type: completeness Assessment: encouragement	The ERT noted that Norway did not provide in the BR3 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 different PaMs. During the review, Norway explained that: (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

No.	Reporting requirement, issue type and assessment	Description of the finding with recommendation or encouragement
		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); (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. The ERT encourages Norway to provide information in its next BR about the strengths and weaknesses of the model, and an explanation of how the model accounts for any overlap or synergies that may exist between different PaMs.
4	Reporting requirement specified in paragraph 42 Issue type: completeness Assessment: encouragement	The ERT noted that Norway did not report in the BR3 about the key assumptions and methodology applied for the projection of emissions from international marine and aviation. 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. 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/BR.

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

3. Assessment of the total effect of policies and measures

(a) Technical assessment of the reported information

69. 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 CO_2 eq basis), in 1995, 2000, 2005, 2010, 2015, 2020 and 2030. It also presented relevant information on factors and activities for each sector for 1990–2030.

70. Norway reported that the total effect of its implemented PaMs is estimated to be in the range of 19,500–23,300 kt CO_2 eq by 2020 and 21,300–25,700 kt CO_2 eq by 2030. Norway reported that the CO_2 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, SF_6, HFC and N_2O emissions) will deliver the largest emission reductions, followed by PaMs implemented in the energy industries sector, related to petroleum activities, and the transport sector.

71. 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 CO_2 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 CO_2 tax. 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.

72. 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 CO_2 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 CO_2 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 10 provides an overview of the total effect of PaMs as reported by Norway.

Table 10
Projected effects of Norway's implemented policies and measures by 2020 and 2030

	2020		*2030*	
Sector	*Effect of implemented and adopted measures (kt CO_2 eq)*	*Effect of planned measures (kt CO_2 eq)*	*Effect of implemented and adopted measures (kt CO_2 eq)*	*Effect of planned measures (kt CO_2 eq)*
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

73. 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.

D. Provision of financial, technological and capacity-building support to developing country Parties

1. Approach and methodologies used to track support provided to Parties not included in Annex I to the Convention

(a) Technical assessment of the reported information

74. 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.

75. 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).

76. The BR3 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.

77. 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 BR3 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).

78. Norway further refined its reporting in the BR3 by excluding total core contributions to some multilateral organizations that were included in the BR2. In its BR3 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 BR3 (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)).

79. 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.

(b) Assessment of adherence to the reporting guidelines

80. The ERT assessed the information reported in the BR3 of Norway and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting guidelines on BRs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

2. Financial resources

(a) Technical assessment of the reported information

81. 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.

82. Norway indicated what "new and additional" financial resources it has provided pursuant to Article 54, paragraph 3, of the Convention, and clarified how it has determined such resources as being "new and additional". 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.

83. 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 section 6.1 of its BR and sections 7.3 and 7.4.4 of NC7, which are indirectly referenced to in section 6.1 of the BR) 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.

84. However, the ERT noted that section 7.3 of Norway's NC7 (referred to in BR3) 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. 72 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.

85. 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.

86. When relevant and possible, multiannual agreements are entered into to obtain better predictability of the flow of funds. The Norwegian Government's April 2017 white paper to the Parliament *Common Responsibility for Common Future* 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 11 includes some of the information reported by Norway on its provision of financial support.

Table 11
Summary of information on provision of financial support by Norway in 2015–2016
(Millions of United States dollars)

	Year of disbursement			
Allocation channel of public financial support	*2013*	*2014*	*2015*	*2016*
Official development assistance[a]	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

[a] *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.

87. Between 2015 and 2016, Norway's climate-specific public financial support decreased by USD 116.85 million (a 21.6 per cent reduction from USD 539.93 million in 2015 to USD 423.07 million in 2016). In percentage terms, this reduction affected mainly cross-cutting activities (for which funding decreased by 44.5 per cent in 2015–2016) as well as those labelled as "other" (contributions to multilateral organizations targeted at several categories of support (i.e. adaptation, mitigation, cross-cutting) (24.7 per cent) and adaptation (21.7 per cent). In absolute terms, the reduction affected mainly "other" activities (a decrease of around USD 42.05 million), mitigation activities (USD 41.43 million) and cross-cutting activities (USD 25.84 million).

88. In response to a question from the ERT during the review, Norway explained that the decrease in climate finance in 2016 was for a number of reasons, including that Norway, as well as many other donor countries, experienced significant strain on its development budget as a consequence of the refugee crisis and increased budget allocation for humanitarian purposes. This led to a reprioritization of its remaining budget for official development assistance, including budget cuts and the restructuring of the international energy programme. Norway pointed out that the funding for the international energy programme has increased since 2016 and that the Norwegian Parliament white paper referred to in paragraph 87 above committed to increase Norway's provision of climate finance.

89. During 2015–2016 Norway placed a particular focus on REDD-plus in Brazil, on global activities in a variety of sectors and on Peru through a partnership with Germany to support Peru's efforts in reducing GHG emissions from deforestation and forest degradation in the Peruvian Amazon, for which it allocated USD 226.08 million, USD 102.06 million and USD 54.70 million, respectively. The ERT noted that Norway reported in CTF table 7(b) its bilateral support allocated to non-Annex I Parties in 2015 and 2016. Information on financial support from the public sector provided through multilateral and bilateral channels and the allocation of that support by priority is presented in table 12.

Table 12
Summary of information on channels of financial support used in 2015–2016 by Norway
(Millions of United States dollars)

Allocation channel of public financial support	*Year of disbursement*				*Share (%)*	
	2015	*2016*	*Difference*	*Change (%)*	*2015*	*2016*
Support through bilateral and multilateral channels allocated for:						
Mitigation	277 167 534.68	235 734 035.34	–41 433 499	–14.9	51.3	55.7
Adaptation	34 703 373.60	27 178 252.04	–7 525 122	–21.7	6.4	6.4
Cross-cutting	58 046 618.40	32 200 916.79	–25 845 702	–44.5	10.8	7.6
Other	170 013 932.04	127 962 607.18	–42 051 325	–24.7	31.5	30.2
Total	**539 931 459**	**423 075 811**	**–116 855 647**	**–21.6**	**100.0**	**100.0**
Detailed information by type of channel						
Multilateral channels						
Mitigation	9 387 547.58	4 608 315.00	–4 779 233	–50.9	5.1	3.5
Adaptation	0	0	–	–	–	–
Cross-cutting	6 026 291.26	0	–	–	3.2	–
Other	170 013 932.04	127 962 607.18	–42 051 325	–24.7	91.7	96.5
Total	**185 427 771**	**132 570 922**	**–52 856 849**	**–28.5**	**100.0**	**100.0**
Bilateral channels						
Mitigation	267 779 987	231 125 720	–36 654 267	–13.7	75.5	79.6
Adaptation	34 703 374	27 178 252	–7 525 122	–21.7	9.8	9.4
Cross-cutting	52 020 327	32 200 917	–19 819 410	–38.1	14.7	11.1
Other	0	0	–	–	–	–
Total	**354 503 688**	**290 504 889**	**–63 998 799**	**–18.1**	**100.0**	**100.0**

Allocation channel of public financial support	*Year of disbursement*				*Share (%)*	
	2015	*2016*	*Difference*	*Change (%)*	*2015*	*2016*
Multilateral compared with bilateral channels						
Multilateral	185 427 771	132 570 922	–52 856 849	–28.5	34.3	31.3
Bilateral	354 503 687.84	290 504 889.17	–63 998 799	–18.1	65.7	68.7
Total	**539 931 459**	**423 075 811**	**–116 855 647**	**–21.6**	**100.0**	**100.0**

Source: BR3 CTF tables 7, 7(a) and 7(b) of Norway.

90. The BR3 includes detailed information on the financial support provided though multilateral, bilateral and regional channels in 2015 and 2016. More specifically, Norway contributed through multilateral channels, as reported in the BR3 and in CTF table 7(a), USD 185.42 and 132.57 million in 2015 and 2016, respectively. The contributions were made to specialized multilateral climate change funds, such as the GEF, the GCF, the Nordic Development Fund, the Strategic Climate Fund, the Global Green Growth Institute and the Multilateral Fund for the Implementation of the Montreal Protocol. Norway also provided finance through multilateral financial institutions such as the World Bank, the International Finance Corporation, the African Development Bank, the Asian Development Bank, the European Bank for Reconstruction and Development and the Inter-American Development Bank. The BR3 and CTF table 7(b) also include detailed information on the total bilateral financial support provided though channels in 2015 and 2016 (USD 354.50 and 290.50 million, respectively).

91. The BR3 provides information on the types of support provided. In terms of the focus of public financial support, as reported in CTF table 7 for 2015, the shares of the total public financial support allocated for mitigation, adaptation, cross-cutting projects and other activities were 51.3, 6.4, 10.8 and 31.5 per cent, respectively. In addition, 34.3 per cent of the total public financial support was allocated through multilateral channels and 65.7 per cent through bilateral, regional and other channels. In 2016, the shares of total public financial support allocated for mitigation, adaptation, cross-cutting projects and other activities were 55.7, 6.4, 7.6 and 30.2 per cent, respectively. Furthermore, 31.3 per cent of the total public financial support was allocated through multilateral channels and 68.7 per cent through bilateral, regional and other channels.

92. The ERT noted that in 2015 the majority of the financial contributions made through multilateral channels were allocated to general environmental protection, agriculture and energy generation, distribution and efficiency. Some funds were allocated to activities that are cross-cutting across mitigation and adaptation, as reported in CTF table 7(a). The corresponding allocations for 2016 were directed mostly to general environmental protection, agriculture, energy generation from renewable sources, disaster prevention and preparedness, energy generation distribution and efficiency, and heating, cooling and energy distribution.

93. Regarding the sectoral distribution of bilateral support, in 2015 Norway focused its resources most frequently on activities associated with general environmental protection, agriculture, energy generation from renewable sources, government and civil society, and energy generation, distribution and efficiency. Norway's International Climate and Forest Initiative constitutes by far the largest part of Norway's mitigation assistance. In 2016 the focus remained almost identical, with the exception of more allocation to disaster prevention and preparedness activities compared with the allocation to energy generation, distribution and efficiency.

94. CTF tables 7(a) and 7(b) include information on the types of financial instrument used in the provision of assistance to developing countries, which include grants, equity, loans and others. The ERT noted that the grants provided in 2015 and 2016 accounted for most of the total public bilateral financial support (90.3 per cent and 89.65 per cent, respectively).

95. In the BR3 Norway provided examples that show that private finance is mobilized for the export of goods, technologies and services in the energy sector. It reported a few examples of how it uses public funds to promote the provision of private sector financial support to developing countries by providing investments in the private sector in

developing countries through equity, indirect equity (funds), loans and guarantees. These instruments were provided through investment vehicles financed 50 per cent by private sources and 50 per cent by Norfund, Norway's development finance institution.

96. Norway noted that, in addition to mobilization by public development finance, other types of public finance also mobilize the provision of private climate finance to developing countries. For example, the governmental entity Norwegian Export Credit Guarantee Agency and State entity Export Credit Norway facilitate export financing through guarantees and loans for exporters, buyers and banks.

97. Norway reported on the challenges in collecting information and reporting on private financial flows leveraged by bilateral climate finance for mitigation and adaptation activities in developing countries, including the challenge of separating private from official finance (as co-financers often have mixed ownership of private, public and multilateral owners) as well as the difficulty of attributing amounts of mobilized private finance among public contributors to prevent double counting, particularly when complex instruments are used and combined.

98. Norway continues to work towards implementing the OECD tracking methods that OECD DAC is conducting together with the OECD Research Collaborative on tracking private climate finance. Given the challenges referred to in paragraph 87 above, currently Norway is only able to present examples of private finance mobilized by Norfund, the Norwegian Export Credit Guarantee Agency and Export Credit Norway, without attempting to attribute mobilized amounts between public contributors.

(b) Assessment of adherence to the reporting guidelines

99. The ERT assessed the information reported in the BR3 of Norway and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting guidelines on BRs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

3. Technology development and transfer

(a) Technical assessment of the reported information

100. 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.

101. The ERT took note of the information provided in CTF table 8 on recipient countries, target areas, measures and focus sectors of technology transfer programmes. Norway supports technology transfer through a number of mechanisms and initiatives, such as the Technology Mechanism, the Private Finance Advisory Network, the Clean Energy Ministerial and Mission Innovation. It also participates actively in a range of regional and international initiatives related to CCS, such as the North Sea Basin Task Force, the World Bank Carbon Capture and Storage Trust Fund, the European Technology Platform for Zero Emission Fossil Fuel Power Plants and the Carbon Sequestration Leadership Forum. Norway is also working with international organizations like the International Energy Agency.

102. Norway has participated in the European Commission's cooperation with China on CCS, the Near Zero Emission Coal initiative, and has supported the South African CCS centre for many years, as well as feasibility studies on CCS for new power plants in Mozambique. Norway's support for technology transfer has covered other sectors and areas, such as agriculture, food security, health and water, among others, usually with a focus on adaptation. This support has been provided through, for instance, the Global Framework for Climate Services, the Consultative Group on International Agricultural Research and the Global Crop Diversity Trust on crop wild relatives and through NGOs, the Food and Agriculture Organization of the United Nations, the World Food Programme, the International Fund for Agricultural Development and national and regional institutions.

103. The ERT noted that Norway reported on the steps it has taken to promote, facilitate and finance the transfer and deployment of climate-friendly technologies, including those referred to in paragraph 102 above. Norway provided information on steps taken to promote, facilitate and finance the transfer of technology to developing countries and to build their capacity in order to facilitate implementation of Article 10 of the Kyoto Protocol.

(b) Assessment of adherence to the reporting guidelines

104. The ERT assessed the information reported in the BR3 of Norway and identified issues relating to completeness and transparency. The findings are described in table 13.

Table 13
Findings on technology development and transfer from the review of the third biennial report of Norway

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
1	Reporting requirement specified in paragraph 21 Issue type: completeness Assessment: recommendation	The information provided in BR3 offers an overview of measures taken by Norway to promote, facilitate and finance the transfer of, access to and deployment of climate-friendly technology for the benefit of non-Annex I Parties. However, no specific information on how Norway supports the development and enhancement of endogenous capacities and technologies of such Parties was provided. The ERT noted that this issue was raised in the two previous review reports 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 BR3 enhance endogenous capacities and technologies of developing countries. The ERT recommends that Norway, in its next BR, improve the completeness of its reporting by providing information on the measures that support the development and enhancement of endogenous capacities and technologies in section 6.6 of the BR or by cross-referencing the relevant section of the NC.
2	Reporting requirement specified in paragraph 21 Issue type: transparency Assessment: encouragement	Norway did not provide clear information on success and failure stories related to technology transfer. The ERT noted that this information was scattered throughout the report and not presented and analysed as success and failure stories. 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. The ERT reiterates the encouragement of the previous ERT for Norway to report on success and failure stories related to technology transfer as referred to in paragraph 21 of the UNFCCC reporting guidelines on BRs in its next BR.
3	Reporting requirement specified in paragraph 22 Issue type: transparency Assessment: recommendation	BR3 table 8 provides information on activities implemented or planned in 2015 and 2016, which is also presented in textual format in section 7.5 of the NC7. However, some of the activities reported were started before 2015 (i.e. before the reporting period corresponding to the BR3). In response to a question from the ERT, Norway pointed out that many programmes financed in 2015 and 2016 had started up earlier than the reporting period and that this information was included to make the presentation more complete. The ERT recommends that Norway transparently provide information on measures and activities related to technology transfer implemented or planned since its previous NC or BR, in its next BR, by including in CTF table 8 only programmes that were planned, transitioned from planned to implemented or directly started implementation during the reporting period.

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

4. Capacity-building

(a) Technical assessment of the reported information

105. In the BR3 and CTF table 9 Norway supplied information on how it has provided capacity-building support for mitigation, adaptation and technology that responds to the existing and emerging needs identified by non-Annex I Parties, specifying that capacity-building is part of most of the activities supported through bilateral support. Norway described individual measures and activities related to capacity-building support in textual and tabular format.

106. The capacity-building support provided by Norway focuses on REDD-plus, renewable energy, CCS, vulnerability assessment and adaptation strategies, and sustainable agricultural practices. Examples include the support that Norway has provided to the United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries, the Forest Investment Program, the Forest Carbon Partnership Facility, the BioCarbon Fund Initiative for Sustainable Forest Landscapes, the Norwegian Clean Energy for Development Initiative, Norwegian Energy Partners, the Clean Energy Ministerial, the Carbon Sequestration Leadership Forum and the Consultative Group on International Agricultural Research, among others.

107. Norway reported that it has supported climate-related capacity development activities relating to adaptation (mostly sustainable agriculture, research), mitigation (mostly REDD-plus, renewable energy, energy efficiency, energy access), technology development and transfer (mostly clean energy, CCS) and other sectors. Norway also reported that it has responded to the existing and emerging capacity-building needs of non-Annex I Parties by carrying out an assessment of the relevance of the project or programme to the recipient country and/or cooperation partners' priorities and plans, in accordance with the guidance for the preparation and approval of Norwegian support. If the cooperation partner is not the authorities of the grant recipient country, the guidance underlines that it might be relevant to assess the project's relevance to the target group and the needs in the recipient country. This procedure is also mandatory for capacity-building support.

(b) Assessment of adherence to the reporting guidelines

108. The ERT assessed the information reported in the BR3 of Norway and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting guidelines on BRs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

III. Conclusions and recommendations

109. The ERT conducted a technical review of the information reported in the BR3 and CTF tables of Norway in accordance with the UNFCCC reporting guidelines on BRs. The ERT concludes that the reported information mostly adheres to the UNFCCC reporting guidelines on BRs and provides an overview of emissions and removals related to the Party's quantified economy-wide emission reduction target; assumptions, conditions and methodologies related to the attainment of the target; progress made by Norway in achieving its target; and the Party's provision of support to developing country Parties.

110. 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 CO_2 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 N_2O, PFCs and SF_6 as a result of technology improvements).

111. Under the Convention Norway committed itself to achieving a quantified economy-wide emission reduction target of 30 per cent below the 1990 level by 2020. The target covers CO_2, CH_4, N_2O, HFCs, PFCs, SF_6 and NF_3, expressed using global warming potential values from the AR4, and covers all sources and sectors included in the annual GHG inventory. Emissions and removals from the LULUCF sector are included in the target. Norway reported that it plans to make use of market-based mechanisms to achieve its target. The 30 per cent target under the Convention was made operational through the legally binding 2013–2020 second commitment period of the Kyoto Protocol. During this period, average GHG emissions should not exceed 84 per cent of the 1990 level. In absolute terms, this means that Norway has to account for Kyoto units corresponding to a reduction from 51,728.80 kt CO_2 eq (in the base year) to an average of 43,614.28 kt CO_2 eq in 2013–2020.

112. 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.

113. 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 and transport and industrial sectors, including the CO_2 tax, the EU ETS, the Enova investment scheme, the CO_2 registration tax for new passenger cars, tax exemptions for electric vehicles, and the requirement to use 6.25 per cent biofuels in transport fuel. Mitigation measures in industry also have large mitigation impacts, namely the reduction of N_2O 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.

114. For 2015 Norway reported in CTF table 4 annual total GHG emissions excluding LULUCF of 53,908.19 kt CO_2 eq, which is 4.2 per cent above the 1990 level. Norway intends to use units from market-based mechanisms and to account for the contribution of LULUCF in achieving its target.

115. 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 CO_2 eq.

116. The projections indicate that Norway's GHG emissions, with the contribution of LULUCF, are estimated to be 75.9 Mt CO_2 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. The ERT noted that the contribution from LULUCF is estimated to increase emissions by 1.1 Mt CO_2 eq in 2013–2020.

117. Norway has in place institutional and procedural arrangements for participation in the EU ETS and the Norwegian Carbon Credit Procurement Program, by which the gap to achieving its targets under the Convention and its Kyoto Protocol is expected to be covered. However, the extent of the contribution of the EU ETS to the fulfilment of the Party's commitments for 2013–2020 is not clear yet as the arrangement between Norway and the

EU on the management of units under the EU ETS and units in the second commitment period of the Kyoto Protocol is ongoing, to be finalized by the end of 2018. The expected delivery of CERs from existing contracts of the Norwegian Carbon Credit Procurement Program is around 46 million.

118. Norway continues to provide climate financing to developing countries. It has reduced the level of its financial support since the BR2 by 56.2 per cent; its public financial support in 2015 and 2016 totalled USD 539.93 million and 423.07 million, respectively. In those years, Norway provided more support for mitigation than for adaptation. The biggest share of financial support went 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.

119. Norway supports technology transfer for mitigation through renewable energy, energy access and efficiency. This is carried out through a number of mechanisms and initiatives, such as the Technology Mechanism, the Private Finance Advisory Network, the Clean Energy Ministerial and Mission Innovation. It also participates actively in a range of regional and international initiatives related to CCS and works with international organizations such as the International Energy Agency. Norway's provision of support for technology transfer has also covered other sectors and areas, such as agriculture, food security, health and water, among others, usually with a focus on adaptation. Capacity-building activities are part of most of the programmes and initiatives supported by Norway, such as the United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries, the Norwegian Clean Energy for Development Initiative, Norwegian Energy Partners, the International Centre for Hydropower and the Conservation Agricultural Regional Program.

120. In the course of the review, the ERT formulated the following recommendations for Norway to improve its adherence to the UNFCCC reporting guidelines on BRs in its next BR:[5]

(a) To improve the completeness of its reporting by providing information on the measures that support the development and enhancement of endogenous capacities and technologies in section 6.6 of the BR (see table 13, issue 1);

(b) To improve the transparency of its reporting by:

(i) Providing the scale of contribution for each source of international units and/or allowances from market-based mechanisms expected to be used for the attainment of its economy-wide emission reduction target, in its next BR (see table 3, issue 1);

(ii) Providing clear information on measures and activities related to technology transfer implemented or planned since its previous NC or BR, including in CTF table 8 only programmes that were planned, transitioned from planned to implemented or directly started implementation during the reporting period (see table 13, issue 3);

(c) To improve the timeliness of its reporting by submitting its next BR on time (see para. 6 above).

1.

[5] The recommendations are given in full in the relevant chapters of this report.

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.

"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". Annex to decision 13/CP.20. Available at http://unfccc.int/resource/docs/2014/cop20/eng/10a03.pdf.

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

Report on the individual review of the annual submission of Norway submitted in 2016. FCCC/ARR/2016/NOR. Available at http://unfccc.int/resource/docs/2017/arr/nor.pdf.

Report on the review of the report to facilitate the calculation of the assigned amount for the second commitment period of the Kyoto Protocol of Norway. FCCC/IRR/2016/NOR. Available at https://unfccc.int/resource/docs/2017/irr/nor.pdf.

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

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 documents[1] were provided by Norway and referenced in the report:

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

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.