COMPLIANCE COMMITTEE **CC/ERT/ARR/2017/13**
28 March 2017

Report of the individual review of the annual submission of Norway submitted in 2015

Note by the secretariat

The report of the individual review of the annual submission of Norway submitted in 2015 was published on 28 March 2017. For purposes of rule 10, paragraph 2, of the rules of procedure of the Compliance Committee (annex to decision 4/CMP.2, as amended by decisions 4/CMP.4 and 8/CMP.9), the report is considered received by the secretariat on the same date. This report, FCCC/ARR/2015/NOR, contained in the annex to this note, is being forwarded to the Compliance Committee in accordance with section VI, paragraph 3, of the annex to decision 27/CMP.1.

United Nations

FCCC/ARR/2015/NOR

Framework Convention on Climate Change

Distr.: General
27 March 2017

English only

Report on the individual review of the annual submission of Norway submitted in 2015*

Note by the expert review team

Summary

Each Party included in Annex I to the Convention must submit an annual greenhouse gas (GHG) inventory covering emissions and removals of GHG emissions for all years from the base year (or period) to two years before the inventory due date (decision 24/CP.19). Parties included in Annex I to the Convention that are Parties to the Kyoto Protocol are also required to report supplementary information required under Article 7, paragraph 1, of the Kyoto Protocol, with the inventory submission due under the Convention. This report presents the results of the individual inventory review of the 2015 annual submission of Norway, conducted by an expert review team in accordance with the "Guidelines for review under Article 8 of the Kyoto Protocol". The review took place from 29 August to 3 September 2016 in Bonn, Germany.

* In the symbol for this document, 2015 refers to the year in which the inventory was submitted, not to the year of publication.

GE.17-04719(E)

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Contents

I. Introduction[1]

1. This report covers the review of the 2015 annual submission of Norway organized by the UNFCCC secretariat, in accordance with the "Guidelines for review under Article 8 of the Kyoto Protocol" (decision 22/CMP.1, as revised by decision 4/CMP.11) (hereinafter referred to as the Article 8 review guidelines). As indicated in the Article 8 review guidelines, this review process also encompasses the review under the Convention, as described in 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" (hereinafter referred to as the UNFCCC review guidelines) and particularly part III, "UNFCCC guidelines for the technical review of greenhouse gas inventories from Parties included in Annex I to the Convention". The review took place from 29 August to 3 September 2016 in Bonn, Germany, and was coordinated by Ms. Lisa Hanle and Ms. Claudia do Valle (UNFCCC secretariat). Table 1 provides information on the composition of the expert review team (ERT) that conducted the review of Norway.

Table 1
Composition of the expert review team that conducted the review of Norway

Area of expertise	*Name*	*Party*
Generalist	Ms. Olia Glade	New Zealand
	Mr. Mauro Meirelles de Oliveira Santos	Brazil
Energy	Mr. Graham Anderson	Germany
	Ms. Veronika Ginzburg	Russian Federation
	Ms. Cuimei Ma	China
	Mr. Haakon Marold	Australia
IPPU	Ms. Siriluk Chiarakorn	Thailand
	Mr. Predrag Novosel	Montenegro
	Mr. Alexander Valencia	Colombia
Agriculture	Mr. Amnat Chidthaisong	Thailand
	Mr. Sorin Deaconu	Romania
	Ms. Lilian Portillo	Paraguay
LULUCF	Ms. Bridget Veronica Fraser	New Zealand
	Mr. Doru Leonard Irimie	Romania
	Mr. Stanley John Wapot	Vanuatu
Waste	Ms. Violeta Hristova	Bulgaria

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

Area of expertise	*Name*	*Party*
	Mr. Igor Ristovski	The former Yugoslav Republic of Macedonia
Lead reviewers	Ms. Olia Glade	
	Mr. Mauro Meirelles de Oliveira Santos	

Abbreviations: IPPU = industrial processes and product use, LULUCF = land use, land-use change and forestry.

2. This report contains findings based on the assessment by the ERT of the 2015 annual submission against the Article 8 review guidelines. The ERT has made recommendations to resolve those findings related to issues,[2] including issues related to problems.[3] Other findings, and, if applicable, the ERT's encouragements to resolve them, are also included.

3. A draft version of this report was communicated to the Government of Norway, which provided comments that were considered and incorporated, as appropriate, into this final version of the report.

4. Annex I shows annual greenhouse gas emissions for Norway, including totals excluding and including the land use, land-use change and forestry sector, indirect carbon dioxide emissions and emissions by gas and by sector. Annex I also contains background data related to emissions and removals from activities under Article 3, paragraph 3, forest management under Article 3, paragraph 4, and additional activities under Article 3, paragraph 4, of the Kyoto Protocol, if elected, by gas, sector and activity for Norway.

5. Information to be included in the compilation and accounting database can be found in annex II to this document.

6. The ERT notes that Norway's 2015 annual submission was delayed, consistent with decision 6/CMP.9, paragraph 4. As a result, the review of the 2015 annual submission is being held in conjunction with the review of the 2016 annual submission, in accordance with decision 10/CMP.11, paragraph 1. To the extent that identical information is presented in both annual submissions, the ERT has reviewed this information only once, and, as appropriate, has replicated the findings below in both the 2015 and the 2016 annual review reports.

II. Summary and general assessment of the 2015 annual submission

7. Table 2 provides the ERT's assessment of the annual submission with respect to the tasks undertaken during the review. Further information on the issues identified, as well as additional findings, may be found in tables 3 and 5 below.

[2] Issues are defined in decision 13/CP.20, annex, paragraph 81.

[3] Problems are defined in decision 22/CMP.1, annex, paragraphs 68 and 69, as revised by decision 4/CMP.11.

Table 2
Summary of review results and general assessment of the inventory of Norway

Assessment			*Issue or problem ID#(s) in tables 3 and/or 5*[a]
Dates of submission	Original submission: 6 January 2016 (NIR), 15 April 2016, version 4 (CRF tables), 14 April 2015 (SEF tables)		
	Revised submission: 17 October 2016, version 6 (CRF tables)		
	The values from the latest submission are used in this report		
Review format	Centralized		
Application of the requirements of the UNFCCC Annex I inventory reporting guidelines and Wetlands Supplement (if applicable)	Have any issues been identified in the following areas:		
	1. Identification of key categories	Yes	G.20
	2. Selection and use of methodologies and assumptions	Yes	W.9
	3. Development and selection of emission factors	No	
	4. Collection and selection of activity data	Yes	E.4, E.24, A.9
	5. Reporting of recalculations	No	
	6. Reporting of a consistent time series	Yes	W.3
	7. Reporting of uncertainties, including methodologies	Yes	G.6
	8. QA/QC	QA/QC procedures were assessed in the context of the national system (see below)	
	9. Missing categories/completeness[b]	Yes	E.23, I.9, I.10, I.11, W.3
	10. Application of corrections to the inventory	No	
Significance threshold	For categories reported as insignificant, has the Party provided sufficient information showing that the likely level of emissions meets the criteria in paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines?	No	G.18, W.11
Description of trends	Did the ERT conclude that the description in the NIR of the trends for the different gases and sectors is reasonable?	Yes	
Supplementary information under the Kyoto Protocol	Have any issues been identified in the following areas:		
	1. National system:		
	(a) The overall organization of the national system, including the effectiveness and reliability of the institutional, procedural and legal arrangements	No	
	(b) Performance of the national system functions	No	
	2. National registry:		

Assessment			*Issue or problem ID#(s) in tables 3 and/or 5*[a]
	(a) Overall functioning of the national registry	No	
	(b) Performance of the functions of the national registry and the technical standards for data exchange	No	
	3. ERUs, CERs, AAUs and RMUs and on information on discrepancies reported in accordance with decision 15/CMP.1, annex, chapter I.E, taking into consideration any findings or recommendations contained in the SIAR	No	
	4. Matters related to Article 3, paragraph 14, of the Kyoto Protocol, specifically problems related to the transparency, completeness or timeliness of reporting on the Party's activities related to the priority actions listed in decision 15/CMP.1, annex, paragraph 24, including any changes since the previous annual submission	No	
	5. LULUCF activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol:		
	(a) Reporting in accordance with the requirements of decision 2/CMP.8, annex II, paragraphs 1–5	No	
	(b) The Party has demonstrated methodological consistency between the reference level and reporting on forest management in accordance with decision 2/CMP.7, annex, paragraph 14	Yes	KL.1, KL.2
	(c) The Party has reported information in accordance with decision 6/CMP.9	No	
	(d) The Party plans to apply the provisions for natural disturbances to afforestation and reforestation	No	
	(e) The Party plans to apply the provisions for natural disturbances to forest management	No	
	(f) Country-specific information has been reported to support provisions for natural disturbances, in accordance with decision 2/CMP.7, annex, paragraphs 33 and 34	NA	
	(g) Other issues	No	
CPR	Was the CPR reported in accordance with the annex to decision 18/CP.7, the annex to decision 11/CMP.1 and decision 1/CMP.8, paragraph 18?	Yes	
Adjustments	Has the ERT applied an adjustment under Article 5, paragraph 2, of the Kyoto Protocol?	No	
Response from the Party during	Has the Party provided the ERT with responses to the questions raised, including the data and information	Yes	

Assessment			*Issue or problem ID#(s) in tables 3 and/or 5*[a]
the review	necessary for the assessment of conformity with the UNFCCC Annex I inventory reporting guidelines and any further guidance adopted by the Conference of the Parties?		
Recommendation for an exceptional in-country review	On the basis of the issues identified, does the ERT recommend that the next[c] review be conducted as an in-country review?	No	
Question of implementation	Did the ERT list a question of implementation?	No	

Abbreviations: AAU = assigned amount unit, CER = certified emission reduction, CPR = commitment period reserve, CRF = common reporting format, ERT = expert review team, ERU = emission reduction unit, LULUCF = land use, land-use change and forestry, NA = not applicable, NIR = national inventory report, QA/QC = quality assurance/quality control, RMU = removal unit, SEF = standard electronic format, SIAR = standard independent assessment report, UNFCCC Annex I inventory reporting guidelines = "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", Wetlands Supplement = *2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands*.

[a] The ERT identified additional issues in all sectors that are not specifically listed in table 2 but are included in table 3 and/or 5.

[b] Missing categories, for which methods are provided in the *2006 IPCC Guidelines for National Greenhouse Gas Inventories*, may affect completeness and are listed in annex III to this document.

[c] Owing to the timing of the review of the 2015 annual submission, "next" in this context refers to the review of the 2017 annual submission.

III. Status of implementation of issues and/or problems raised in the previous review report

8. Table 3 compiles all the recommendations made in the previous review report, published on 13 May 2015. For each issue and/or problem, the ERT specified whether it believes the issue and/or problem has been resolved by the conclusion of the review of the 2015 annual submission and provided the rationale for its determination, taking into consideration the publication date of the previous review report and national circumstances.

Table 3
Status of implementation of issues and/or problems raised in the previous review report of Norway

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
General			
G.1	QA/QC and verification (12, 2014) Adherence to the UNFCCC Annex I inventory reporting guidelines	Ensure that sufficient time and resources are made available for QC activities	Resolved. Important improvements have been noted by the ERT. Statistics Norway and the Norwegian Environment Agency have a project aimed directly at evaluating and improving QC routines (see table 5, ID# G.16)
G.2	QA/QC and verification	Review the QA/QC procedures in place	Resolved. During the review, the Party indicated

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
	(12, 2014) Adherence to the UNFCCC Annex I inventory reporting guidelines		that the QA/QC programme was reviewed in conjunction with the implementation of the 2006 IPCC Guidelines
G.3	QA/QC and verification (12, 2014) Adherence to the UNFCCC Annex I inventory reporting guidelines	Consider whether a QC manager overseeing QC activities for the compilation and reporting of the whole inventory would be beneficial	Resolved. A QC manager oversees the QC activities
G.4	Uncertainty analysis (table 4, 2014) Transparency*	Provide documentation on the country-specific uncertainty values for AD in the energy sector	Resolved. Documentation was provided in annex II to the NIR
G.5	Uncertainty analysis (table 4, 2014) Adherence to the UNFCCC Annex I inventory reporting guidelines	Provide a justification as to why the differences in the reference and sectoral approaches are not reflected in the uncertainty estimates	Resolved. Norway indicated in its NIR (chapter 3.6.2) that the problem results from the figures for oil production and exports, which are large compared with the amounts consumed within the country. Essentially, the low uncertainty estimates are linked to domestic consumption, for which data are readily available, and not to the figures for oil production and exports
G.6	Uncertainty analysis (table 4, 2014) Adherence to the UNFCCC Annex I inventory reporting guidelines	Update the trend uncertainty analysis annually and report on it in the NIR	Not resolved. Table 10.2 of the 2015 NIR indicates that this was not done in 2015
G.7	Inventory management (16, 2014) (13, 2013) (40, 2012) Transparency*	Develop a physical and electronic library for documentation and ensure that all necessary information on country-specific methods, disaggregated EFs, parameters and AD are fully documented	Addressing. According to table 10.2 of the 2015 NIR, this was not implemented. The ERT notes that work was under way as a physical and electronic library for documentation is now in place (since 2016) with full access for all employees in

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
			the Norwegian Environment Agency, as well as partial access for other stakeholders
G.8	Follow-up to previous reviews (107, 2014) Adherence to the UNFCCC Annex I inventory reporting guidelines	Where recommendations cannot be fully implemented, provide an update on progress of implementation in the NIR	Resolved. Progress on the implementation of recommendations is documented in chapter 10 of the NIR
G.9	Kyoto Protocol units (93, 2014) Adherence to the UNFCCC Annex I inventory reporting guidelines	Include up-to-date holding and transaction information as required by decision 13/CMP.1, annex, paragraph 47(b), (e) and (j)	Resolved. The 2015 SIAR confirms that the information has been provided since the 2014 NIR
G.10	National system (100, 2014) Adherence to the UNFCCC Annex I inventory reporting guidelines	Report in the annual submission any change(s) in the national system	Resolved. Changes in the national system are documented in the NIR (p.484 and annex V)
G.11	National system (100, 2014) Adherence to the UNFCCC Annex I inventory reporting guidelines	Improve QC procedures to ensure that all information reported in the NIR related to changes in the national system is up to date	Resolved. The ERT observed improvements in the QC procedures
G.12	National registry (102, 2014) Adherence to the UNFCCC Annex I inventory reporting guidelines	Include annex A (updated diagram of the database structure) and annex B (test results) in the annual submission and improve QC procedures to ensure that the annual submission includes all relevant annexes	Resolved. Chapter 14 and annex VII (SEF and registry changes) refer to annexes A, B and H, but were not included in the NIR because they are provided through the UNFCCC portal as part of the mandatory submission on the national registry
Energy			
E.1	1. General (energy sector) – all fuels – CH_4 and N_2O (21, 2014) (19, 2013)	Report the CH_4 and N_2O EFs in energy units in the NIR	Not resolved. Some EFs continue to be reported only on the basis of weight (e.g. in the NIR, tables 3.8 and 3.9, the CH_4 and N_2O EFs

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
	Transparency*		for wood waste and wood briquettes are reported in kg CH_4/t fuel and kg N_2O/t fuel)
E.2	Fuel combustion – reference approach – all fuels – CO_2 (26, 2014) Consistency*	Continue work to analyse the reasons for the differences between the reference and sectoral approaches	Addressing. Although progress has been made, large differences still remain (see table 5, ID# E.16)
E.3	Fuel combustion – reference approach – liquid and gaseous fuels – CO_2 (26, 2014) (24, 2013) Accuracy*	Improve the accuracy of the data collection procedures for liquid and gaseous fuels	Resolved. The NIR (chapter 3.6.2) states that Statistics Norway suggested a number of improvements in the energy statistics. Improvements were made in the 2015 submission as revised export figures on crude oil from 2013 onwards in the EU ETS were published in November 2015
E.4	Fuel combustion – reference approach – solid fuels CO_2 (26, 2014) Accuracy*	Improve the data collection procedures for solid fuels (coal and coke oven coke)	Not resolved. Statistics Norway plans to implement a revised energy balance system in 2017 for reporting in the 2018 submission (see table 5, ID# E.17)
E.5	Comparison with international data – all fuels – CO_2 (26, 2014) Accuracy*	Continue the work to analyse the reasons for the differences between the inventory and IEA statistics	Not resolved. Statistics Norway plans to implement a revised energy balance system in 2017 (see table 5, ID# E.18)
E.6	Feedstocks, reductants and other non-energy use of fuels – liquid fuels – CO_2 (29, 2014) Transparency*	Document in the NIR the approach used to estimate CO_2, CH_4 and N_2O emissions from feedstocks and non-energy use of lubricants, gasoline, residual fuel oil and gas/diesel oil for the entire time series and report in CRF table 1.A(d) where the emissions are included	Addressing. Documentation is provided in the NIR (sections 3.2.11 and 4.5.1), except for non-energy uses other than lubricants
E.7	Feedstocks, reductants and other non-energy use of fuels – liquid fuels – CO_2 (29, 2014) Adherence to the UNFCCC Annex I	Improve QC procedures to ensure the consistency of the information reported on feedstocks, reductants and non-energy use in different CRF tables	Not resolved. Statistics Norway plans to implement a revised energy balance system in 2017 and improvements in the application of QC procedures implemented are postponed until after

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
	inventory reporting guidelines		Statistics Norway has completed its revisions (see table 5, ID# E.20)
E.8	Feedstocks, reductants and other non-energy use of fuels – liquid, solid and gaseous fuels – CO_2 (30, 2014) (27, 2013) (60, 2012) Adherence to the UNFCCC Annex I inventory reporting guidelines	Review and revise the reporting in CRF table 1.A(d) and improve QC procedures to ensure the consistency of the reporting	Not resolved. Statistics Norway plans to implement a revised energy balance system in 2017 and improvements are postponed until after Statistics Norway has completed its revisions
E.9	Feedstocks, reductants and other non-energy use of fuels – solid, liquid and gaseous fuels – CO_2 (30, 2014) (27, 2013) (60, 2012) Transparency*	Provide in the NIR, for fuels for which the fraction of carbon stored is smaller than 1.00, balances showing that all non-energy use of fuels is accounted for under the IPPU sector	Not resolved. The information was not provided in the NIR. During the review, the Party indicated that this information will be included in the 2017 NIR
E.10	1.A.1.a Public electricity and heat production – gaseous fuels – CO_2 (31, 2014) Transparency*	Explain in the NIR the reason for the observed inter-annual fluctuations in the CO_2 IEF for natural gas	Not resolved. The explanation was not provided in the NIR. During the review, the Party indicated that this information will be included in the 2017 NIR
E.11	1.A.1.a Public electricity and heat production – solid fuels – CO_2 (32, 2014) Accuracy*	Explain in the NIR the reason for the observed inter-annual changes in the CO_2 IEF for solid fuels, and the use of an EF that is below the IPCC default value	Not resolved. The explanation was not provided in the NIR. During the review, the Party indicated that this information will be included in the 2017 NIR
E.12	1.A.2.c Chemicals – solid fuels – CO_2 (33, 2014) Transparency*	Explain in the NIR the reason why the CO_2 IEF for solid fuels in the subcategory chemicals is the highest of all reporting Parties	Not resolved. The explanation was not provided in the NIR. During the review, the Party indicated that this information will be included

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
			in the 2017 NIR
E.13	1.A.3.b Road transportation – liquid and gaseous fuels – CH_4 and N_2O (34, 2014) Transparency*	Conduct an assessment of the data quality of the fuel consumption estimates derived using the bottom-up model	Resolved. Information was provided in the NIR (section 3.2.5.5), which outlines the results of the assessment
E.14	1.A.3.b Road transportation – liquid and gaseous fuels – CH_4 and N_2O (34, 2014) (40, 2013) Transparency*	Scale the bottom-up estimates to match fuel sales, if appropriate	Resolved. Information was provided in the NIR (section 3.2.5.5), which outlines the results of the assessment. It has been determined that there is no need to scale the bottom-up data as they are of appropriate quality and there is no reason to believe driving lengths are underestimated
E.15	1.B.2 Oil and natural gas and other – liquid and gaseous fuels – CO_2 and CH_4 (35, 2014) Comparability*	Review the use of notation keys for AD for the subcategories oil exploration and for natural gas exploration, transmission, distribution and other leakage at industrial plants and power stations	Not resolved. During the review, the Party indicated that this review has not yet been conducted
IPPU			
I.1	2.A.4 Other process uses of carbonates – CO_2 (48, 2014) Transparency*	Elaborate a mass balance of the limestone and dolomite used in the country, including imports, exports and details of the various uses	Resolved. The mass balance of limestone and dolomite use was included in the NIR (tables 4.3 and 4.4, respectively) (see table 5, ID# I.25)
I.2	2.A.4 Other process uses of carbonates – CO_2 (49, 2014) Transparency*	Provide information in the NIR to justify the trend in the CO_2 IEF between 1996 and 2012	Resolved. The explanation was included in the NIR (p.207)
I.3	2.A.4.b Other uses of soda ash – CO_2 (55, 2014) Transparency*	Explain in the NIR the methodology and data sources used to prepare the revised estimates	Resolved. In 2015, Norway used the methodology from the 2006 IPCC Guidelines for calculating emissions from soda ash use. The details of the methodology and AD were provided in

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
			the NIR (p.208)
I.4	2.A.4.b Other uses of soda ash – CO_2 (55, 2014) Accuracy*	Improve QC procedures to rectify errors in AD and EFs	Resolved. The EF for soda ash use (from the 2006 IPCC Guidelines) and the mass balance of soda ash use (NIR table 4.5) were correctly provided in the NIR, suggesting that QC procedures have been improved
I.5	2.A.4.b Other uses of soda ash – CO_2 (56, 2014) Accuracy*	Correct the incorrect reference in the NIR for the value of the EF for soda ash use and improve the QC procedures for the inventory to avoid such errors	Resolved. The EF for soda ash use (default EF from the 2006 IPCC Guidelines) was correctly provided in the NIR (p.208), suggesting that QC procedures have been improved
I.6	2.B.1 Ammonia production – CO_2 (39, 2014) Transparency	Recalculate emissions for the years 2002–2004 to address inter-annual fluctuations observed in the CO_2 IEF and AD, provide information in the NIR on the mix of gases used in the production process, and, to the extent possible, further investigate the reasons for inter-annual changes in the IEF and AD	Resolved. Norway has recalculated the emissions for 2002–2004 and provided explanations for the variations from 1998 to 1999 and from 1999 to 2000 in the NIR (p.214)
I.7	2.C.3 Aluminium production – CO_2 (40, 2014) Transparency*	Justify the change in the CO_2 IEF between 2010 and 2011	Resolved. The explanation of the changes in the CO_2 IEF from 2009 to 2010 and from 2010 to 2011 was provided in the NIR (p.240)
I.8	2.F. Product uses as substitutes for ozone-depleting substances – HFCs (45, 2014) Transparency*	Provide in the NIR more transparent information for foam blowing, fire extinguishers, aerosols/MDIs and solvents in order to demonstrate the accuracy of the reported emissions	Resolved. Norway provided the information for foam blowing, fire extinguishers, aerosols/MDIs and solvents in the NIR (p.272) see table 5, ID# I.21)
I.9	2.F.1 Refrigeration and air conditioning – PFCs (41, 2014) Completeness*	Either estimate PFC emissions from refrigeration for 2009–2012 or justify that "NO" is the appropriate notation key for actual emissions of PFCs	Not resolved. Norway reported a small value for PFC emissions for 2010–2014 but emissions for 2009 were reported as "NO" without any explanation in the NIR (p.268)
I.10	2.F.1.a Commercial refrigeration –	Investigate whether the reported amounts of HFC-143 in commercial refrigeration in 2005 and 2006 and of HFC-134 in commercial refrigeration in 2004 and 2008 are	Not resolved. This issue is not discussed in the 2015 NIR. The ERT notes that

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
	HFCs (42, 2014) Completeness*	misclassifications or if they are real uses, and correct the information and the data accordingly	this issue is first addressed in the 2016 NIR (p.250)
I.11	2.F.1.a Commercial refrigeration – HFCs (42, 2014) (49, 2013) Completeness*	Either justify that "NO" is the appropriate notation key for HFC-134 or estimate HFC-134 emissions from filling new manufactured products for 2008 and onwards	Addressing. Norway explained in the NIR (chapter 4.7) that "NO" is the appropriate notation key for the years since 2008 because HFC-134 is not used regularly in Norway, but is imported to be used in equipment testing. The ERT believes that this issue should be considered further in future reviews to confirm that there is no underestimation of emissions
Agriculture			
A.1	3. General (agriculture) – (59, 2014) Transparency*	Provide additional information in the NIR on the method used to estimate the number of heifers for replacement	Resolved. The heifer population is directly recorded by the Cow Recording Systems and this data set was used directly in the inventory (NIR, p.289)
A.2	3. General (agriculture) – (59, 2014) Transparency*	Include in table 6.5 of the NIR the key calculation parameters for cattle less than one year old	Not resolved. Details of all parameters for estimating CH_4 emissions from growing cattle were provided during the review but are not yet provided in the NIR (see table 5, ID# A.10)
A.3	3. General (agriculture) – (61, 2014) (70, 2013) Transparency*	Improve the QC of the CRF tables and the NIR, specifically addressing the following issues: (1) correct the animal waste allocations in CRF table 4.B(a); (2) report the average N excretion in CRF table 4.B(b) and climate allocation in CRF table 4.B(a) for "other livestock"; and (3) correct the NH_3 EFs for "other livestock"	Resolved. Information in the CRF tables has been revised/corrected and the correct NH_3 EFs for "other livestock" were provided in the NIR, table 5.17
A.4	3.A.4 Other livestock – CH_4 (66, 2014) (73, 2013) Transparency*	Review the enteric fermentation EF for poultry, ensuring that the country-specific EF is appropriately documented	Resolved. Norway used country-specific EFs (0.02 kg CH_4/head/year for hens in the NIR, table 5.8, p.296) The source for these country-specific EFs is provided in the 2015 NIR

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
			(p.296) (Svihus, 2015).[c] The CH_4 emissions from enteric fermentation from poultry in Norway have been reviewed and revised by a national expert from the Norwegian University for Life Sciences and the results from this review and the EFs are provided in Svihus (2015)
A.5	3.B Manure management – N_2O (60, 2014) (73, 2013) Transparency*	Improve the description of the nitrogen flow model	Resolved. An overview of nitrogen flow is given in figure 5.1 and the description of nitrogen flow is provided in the 2015 NIR (pp.285 and 286)
A.6	3.B.2 Sheep – CH_4 (69, 2014) Accuracy*	Explore the possibility of applying a tier 2 method to estimate the manure management CH_4 emissions from sheep	Resolved. The Party has explored the possibility, but there are no national volatile solids and maximum methane-producing capacity factors for sheep (see table 5, ID# A.11)
A.7	3.D Direct and indirect N_2O emissions from agricultural soils – N_2O (67, 2014) (75, 2013) Transparency*	Provide information in the NIR to support the selection of the average $Frac_{GASF}$ used by Norway	Resolved. Information is provided in the NIR (annex IX)
LULUCF			
L.1	4. General (LULUCF) – (74, 2014) Adherence to the UNFCCC Annex I inventory reporting guidelines	Use notation keys consistent with the UNFCCC Annex I inventory reporting guidelines to improve the comparability and transparency of the inventory	Addressing. There is still inconsistent use of the notation keys in the 2015 submission (see table 5, ID#s L.3 and L.4)
Waste			
W.1	5.A Solid waste disposal on land – CH_4 (80, 2014) (87, 2013) (137, 2012)	Include the information on the amount of waste deposited in SWDS categorized by type of waste during the period 1945–2012	Not resolved. The amount of waste deposited in SWDS categorized by type of waste is not presented for industrial SWDS

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
	Transparency*		
W.2	5.C Incineration and open burning of waste – CO_2 (82, 2014) (94, 2013) (149, 2012) Transparency*	Transparently provide information on AD for waste incineration in the NIR	Not resolved. Information on the amount of hospital waste incinerated between 1990 and 2012 was presented in the NIR, but information on AD from cremation was not
W.3	5.D.2 Industrial wastewater – CO_2, CH_4 and N_2O (78, 2014) (92, 2013) Completeness*	Implement the planned improvement to include emissions from the combustion of CH_4 recovered from wastewater treatment plants and used in the pulp and paper industry for years beyond 2009–2012 in order to improve time-series consistency	Addressing. The NIR (table 10.6, p.459) stated that part of the recovery of CH_4 from industrial wastewater (pulp and paper) is included in the energy balance, but not all recovery is included. It is planned that the data will be included in the energy balance and CRF table 5.D in the 2017 NIR. The ERT believes that this issue should be considered further in future reviews to confirm there is not an underestimation of emissions
KP-LULUCF			
		There were no recommendations related to KP-LULUCF in the previous review report	

Abbreviations: AD = activity data, CRF = common reporting format, EF = emission factor, ERT = expert review team, $Frac_{GASF}$ = fraction of synthetic fertilizer N that volatilizes as NH_3 and NOx, kg N volatilized, IEA = International Energy Agency, IEF = implied emission factor, IPCC = Intergovernmental Panel on Climate Change, IPPU = industrial processes and product use, KP-LULUCF = LULUCF emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, LULUCF = land use, land-use change and forestry, MDIs = metered dose inhalers, NIR = national inventory report, NO = not occurring, QA/QC = quality assurance/quality control, SIAR = standard independent assessment report, SWDS = solid waste disposal sites, UNFCCC Annex I inventory reporting guidelines = "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", 2006 IPCC Guidelines = *2006 IPCC Guidelines for National Greenhouse Gas Inventories*.

[a] References in parentheses are to the paragraph(s) and the year(s) of the previous review report(s) where the issue was raised. Issues are further classified as defined in decision 13/CP.20, annex, paragraph 81. In the review of the supplementary information reported in accordance with Article 7, paragraph 1, of the Kyoto Protocol, the ERT has applied the classification in decision 22/CMP.1, annex, paragraph 69, in conjunction with decision 4/CMP.11.

[b] An asterisk is included next to each issue type for all issues that are also problems, as defined in decision 22/CMP.1, annex, paragraphs 68 and 69, including those that lead to an adjustment or a question of implementation.

[c] Svihus, Birger. 2015. *Production of methane from enteric fermentation in poultry in Norway*. Norwegian University of Life Sciences.

IV. Issues identified in three successive reviews and not addressed by the Party

9. In accordance with paragraph 83 of the UNFCCC review guidelines, the ERT noted that the issues included in table 4 have been identified in three successive reviews, including the review of the 2015 annual submission of Norway, and have not been addressed by the Party.

Table 4
Issues identified in three successive reviews and not addressed by Norway

ID#[a]	*Previous recommendation for the issue identified*	*Number of successive reviews issue not addressed*
General		
	No such general issues were identified	
Energy		
E.1	Report the CH_4 and N_2O EFs in energy units in the NIR	3 (2012–2015)
E.8	Review and revise the reporting in CRF table 1.A(d) and improve QC procedures to ensure the consistency of the reporting	4 (2012–2015)
E.9	Provide in the NIR, for fuels for which the fraction of carbon stored is smaller than 1.00, balances showing that all non-energy use of fuels is accounted for under the IPPU sector	4 (2012–2015)
IPPU		
I.11*	Either justify that "NO" is the appropriate notation key for HFC-134 or estimate HFC-134 emissions from filling new manufactured products for 2008 and onwards	3 (2013–2015)
Agriculture		
A.4	No such issues for the agriculture sector were identified	
LULUCF		
	No such issues for the LULUCF sector were identified	
Waste		
W.1	Include information on the amount of waste deposited in SWDS categorized by type of waste	4 (2012–2015)
W.2	Transparently provide information on AD for waste incineration in the NIR	4 (2012–2015)
W.3	Implement the planned improvement to include emissions from the combustion of CH_4 recovered from wastewater treatment plants and used in the pulp and paper industry for years beyond 2009–2012 in order to improve time-series consistency	3 (2013–2015)

ID#[a]	*Previous recommendation for the issue identified*	*Number of successive reviews issue not addressed*
KP-LULUCF		
	No such issues for KP-LULUCF activities were identified	

Abbreviations: AD = activity data, CRF = common reporting format, EF = emission factor, IPPU = industrial processes and product use, KP-LULUCF = LULUCF emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, LULUCF = land use, land-use change and forestry, NIR = national inventory report, NO = not occurring, QC = quality control, SWDS = solid waste disposal sites.

[a] An asterisk is included after any issue ID# where the underlying issue is related to accuracy or completeness of a key category, a missing category or a potential key category, as indicated in decision 13/CP.20, annex, paragraph 83.

V. Additional findings made during the 2015 technical review

10. Table 5 contains findings made by the ERT during the technical review of the 2015 annual submission of Norway that are additional to those identified in table 3 above.

Table 5
Additional findings made during the 2015 technical review of the annual submission of Norway[a]

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is the finding an issue[b] and/or a problem[c]? If yes, classify by type*
General			
G.13	QA/QC and verification	The ERT noted that page 11 of the NIR indicates that three institutions (the Norwegian Environment Agency (NEA), Statistics Norway and the Norwegian Institute of Bioeconomy Research) annually prepare a QA/QC report. However, figure 1.1 of the NIR suggests that only NEA is responsible for QA. During the review, Norway confirmed that the responsibility for QA does not rest solely on NEA, as shown in NIR figure 1.1, although NEA is responsible for undertaking more in-depth procedures The ERT recommends that Norway update NIR figure 1.1 on "Overview of institutional responsibilities and cooperation" in order to give an accurate picture of QA responsibilities	Yes. Transparency
G.14	QA/QC and verification	The NIR (annex V, p.26) presents information that data from all plants included in the EU ETS are reviewed once every three years by NEA. It was not clear to the ERT whether this was a double verification procedure, since within the EU ETS itself all company reports should have third-party verification. During the review, Norway indicated that the text in the NIR had not been updated, and reflects Norway's procedures during the previous phase of the EU ETS, before independent third-party verification was introduced in Norway. The Party further noted that it does, however, conduct audits at about 10 EU ETS installations each year The ERT recommends that Norway update the information in the NIR regarding government audits of facilities included in the EU ETS	Yes. Transparency
G.15	QA/QC and verification	In the LULUCF chapter of the NIR, the ERT noted that for the AD Norway uses the unit Mg (megagram), instead of t (metric tonne), as indicated in the 2006 IPCC Guidelines and as used in the CRF tables. The ERT encourages Norway to use the correct unit for mass – in terms of "t" or "kt" – in the NIR	Not an issue
G.16	QA/QC and verification	The ERT found that the NIR (p.12 and annex V, p.24) was not clear regarding who is performing QA activities. During the review, Norway provided more information on the QA procedures and how they are performed by people other than those involved in the original calculations of the inventory. Specifically, the Party noted that there are two different QA routines: the inventory team performs QA on data collected by other institutions (i.e. QA on input data); and QA performed by reviewers not involved in preparing the inventory refers to the QA of the inventory itself. The Party further noted that it has a project aimed at improving the QC routines of the inventory (excluding LULUCF) and that annex V to the NIR will be	Not an issue

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is the finding an issue[b] and/or a problem[c]? If yes, classify by type*
		revised as a result of this project. The ERT finds that such procedures are in line with the 2006 IPCC Guidelines and that they should be better documented in the NIR	
		The ERT encourages Norway to transparently describe in the NIR the results of the project aimed at improving the QC routines	
G.17	Inventory management	The NIR (p.14) describes an improved process of archiving inventory data, supporting data and inventory records in place at Statistics Norway. During the review, the Party clarified that the improvements referenced were undertaken in 2010 and that no further improvements were made for the latest submission	Yes. Transparency*
		The ERT recommends that Norway remove from the NIR the outdated reference to the improvements made to archiving procedures	
G.18	Significance threshold	The NIR 2015 (p.33) indicates that 2013 emissions are used to calculate the insignificance thresholds, although the text reflects values from the 2012 submission. During the review, Norway acknowledged the errors in reporting and that the text had not been updated, but noted that the values used did not impact its final assessment of insignificance, because the categories are well below the thresholds	Yes. Completeness*
		The ERT recommends that Norway accurately assess whether a category is insignificant in accordance with the procedures set out in decision 24/CP.19, annex I, paragraph 37(b), using the national totals in the latest annual submission, without LULUCF and including indirect CO_2 emissions	
G.19	NIR	The ERT found that there is an inversion in the NIR between chapters 8 and 9, as compared to the suggested NIR outline in the appendix to decision 24/CP.19	Not an issue
		The ERT encourages Norway to follow the suggested outline of chapters, as contained in the appendix to the UNFCCC Annex I inventory reporting guidelines	
G.20	Key category analysis	The key category analysis tables presented in the NIR (annex I) do not show a column with the cumulative contribution to the inventory uncertainty, as recommended in the 2006 IPCC Guidelines when conducting approach 2. Furthermore, in this sense, approach 2 is named “tier 2” in the NIR as opposed to “approach 2”	Yes. Adherence to UNFCCC Annex I inventory reporting guidelines
		The ERT recommends that Norway report its key category analysis in accordance with the 2006 IPCC Guidelines (volume 1, table 4.9), and use the appropriate term “approach” instead of “tier” to report the key category analysis in a transparent way	

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is the finding an issue[b] and/or a problem[c]? If yes, classify by type*
G.21	Uncertainty analysis	During the review, the ERT asked Norway about how it uses the uncertainty analysis to improve the inventory. In response, Norway provided information that the categories with high uncertainties have been evaluated for improvement The ERT encourages Norway to use the results of the key category analysis (approach 2), which takes into account the level/trend and uncertainty of each category, to check for possible improvements in reducing uncertainty, and not only the uncertainty itself	Not an issue
G.22	Kyoto Protocol units	The ERT noted that, based on the submission of revised emission estimates by Norway in response to the list of potential problems and further questions raised by the ERT, the CPR for Norway changed. During the review, Norway provided an updated CPR, calculated as 90% of the assigned amount and eight times the most recently reviewed inventory. The ERT noted that the CPR was not calculated correctly. Regarding the calculation of 90% of the assigned amount, the Party's reported value (314 022 871 t CO_2 eq) was rounded too early in the calculation; rounding should be done on the final calculated value only. The ERT calculated the CPR based on 90% of the assigned amount to 314 022 874 t CO_2 eq. Regarding the calculation of eight times the mostly recently reviewed inventory, the ERT notes that Norway calculated this value based on the 2014 annual submission (422 057 920 t CO_2 eq), but that the most recently reviewed inventory at the time of publication of this annual report will be for the year 2014, as contained in the 2016 submission The ERT encourages Norway to include the most recent submission in its consideration of the calculation of the CPR	Not an issue
G.23	Other	The ERT questioned whether all indirect N_2O emissions are reported as memo items in the Norwegian inventory, because there is a statement in the 2015 NIR (chapter 8) that indirect emissions of N_2O from NO_X and NH_3 from energy, IPPU and agriculture are included in the inventory. During the review, Norway confirmed that indirect N_2O emissions from CRF table 6 (regarding only the energy and IPPU sectors) are reported in the memo items and that the statement in the NIR was not correct The ERT recommends that Norway provide a transparent description of the reporting of indirect N_2O emissions in the NIR (and that only indirect N_2O emissions from energy and IPPU are included in the memo items and agriculture is treated differently)	Yes. Transparency*
Energy			
E.16	Fuel combustion – reference approach	As described in ID# E.2 (table 3, above), Norway has continued to analyse the reasons for the differences between the reference and sectoral approaches. Although progress has been made	Yes. Accuracy*

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is the finding an issue[b] and/or a problem[c]? If yes, classify by type*
	all fuels – CO_2	in explaining the differences, large differences still remain. In response to a question from the ERT about reducing the apparent differences between the reference and sectoral approaches, as reported in CRF table 1.A(c), the Party stated that Statistics Norway suggested a number of improvements in the energy statistics which are currently under implementation The ERT recommends that Norway continue to implement improvements to reduce the differences between the reference and the sectoral approaches and provide in the NIR a detailed account of the measures that have been undertaken	
E.17	Fuel combustion – reference approach – solid fuels – CO_2	As described in ID# E.4 (table 3, above), Statistics Norway plans to implement a revised energy balance system in 2017, the results of which are expected to be reflected in the 2018 annual submission The ERT recommends that Norway report on the time frame and progress of the revised energy balance system in the 2017 submission, highlighting the resulting reduction in statistical differences for solid fuels	Yes. Transparency*
E.18	Comparison with international data – all fuels – CO_2, CH_4 and N_2O	The ERT found that a comparison of data provided by Norway with international data (IEA) reveals many differences (e.g. apparent consumption of crude oil (the value in the CRF tables is 19.0% higher), total exports of gasoline (including motor, jet and aviation) (the value in the CRF tables is 253.3% higher), and imports of LPG (the value in the CRF tables is 73.5% higher)). During the review, the Party explained that Statistics Norway has a large project on a new technical approach for the energy balance system, intended to be compatible with the IEA reporting, which will result in a strong link between the energy balance and the IEA reporting. The study for the energy balance has not yet been completed. It is expected to be finalized and tested in 2016 and implemented in 2017 The ERT recommends that the Party transparently describe the technical solution that aims to improve the consistency between the energy balance and the IEA reporting, including providing any preliminary results in the 2017 submission, and then improve the alignment of the energy balance and the IEA reporting for the 2018 submission	Yes. Comparability*
E.19	Comparison with international data – liquid fuels – CO_2	The ERT found discrepancies between CRF tables 1.D and 1.A(b): for jet kerosene (international aviation bunkers) from 2005 onwards (16.79 TJ or 0.1% in 2013) and for residual fuel oil (international marine bunkers) for 2013 (527.54 TJ or 6.0%). During the review, the Party responded to a question from the ERT by stating that the methods for allocating jet kerosene to domestic and international air traffic are currently under revision, and new data will be reported in the NIR	Yes. Comparability*

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is the finding an issue[b] and/or a problem[c]? If yes, classify by type
		The ERT recommends that the Party finalize the revision of methods for the allocation of jet kerosene to domestic and international consumption and report consistent data for residual fuel oil and gas/diesel oil used for international bunkers in the 2017 submission	
E.20	Feedstocks, reductants and other non-energy use of fuels – liquid fuels – CO_2	In response to questions from the ERT about previous recommendations to improve QC procedures to ensure the consistency of the information reported on feedstocks, reductants and non-energy use of fuels in different CRF tables (see ID# E.7 in table 3, above), the Party responded that Statistics Norway plans to implement a revised energy balance system in 2017. According to this plan, the revision will be reflected in the 2018 annual submission	Yes. Transparency*
		The ERT recommends that Norway report on the time frame and progress of the revised energy balance system, including any improvements in the consistency of the information on feedstocks, reductants and non-energy use of fuels reported in the CRF tables	
E.21	International bunkers and multilateral operations – liquid fuels – CO_2	The ERT found an inconsistency in jet kerosene consumption reported in CRF table 1.D in 2014 (21 161.58 TJ) and CRF table 1.A(b) (21 144.52 TJ with a conversion factor of 43.1 TJ/Mg) (see ID# E.19 above), and that there may be an issue with the methodology for allocation between international and domestic activity. During the review, the Party clarified that it is revising this with the aim of an improved alignment with the reference approach	Yes. Accuracy*
		The ERT recommends that the Party continue its investigations to determine whether there are any issues with allocation between international and domestic activity at the reference level, and improve the alignment of its reporting between CRF tables 1.A(b) and 1.D	
E.22	1.B.1.a Coal mining and handling – solid fuels – CO_2 and CH_4	The ERT requested that Norway provide estimates of emissions from a 2008 fire in a coal mine; a fire that is referenced in the NIR (p.140) and which resulted in lower coal production in 2008 and 2009. During the review, Norway confirmed that emissions from this mine were not estimated because, shortly after the fire started, the mine was filled with water and hence there were no significant emissions. The ERT notes that assuming negligible emissions for such a mine would be consistent with the 2006 IPCC Guidelines (volume 2, chapter 4, p.4.23) which notes that it is good practice to include mines that are known to be fully flooded in databases and other records, but such mines should be assigned an emission of zero as the emissions from such mines are negligible	Yes. Transparency*
		The ERT recommends that Norway provide information in the NIR to demonstrate that the mine referred to by the Party was fully flooded as a result of a fire in 2008 and that the assumption of zero emissions for this mine is consistent with IPCC good practice	
E.23	1.A.2.f Non-	The ERT noted that between 1994 and 2001 there was a constant ratio between the CO_2, CH_4	Yes.

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is the finding an issue[b] and/or a problem[c]? If yes, classify by type*
	metallic minerals – biomass – CO_2, CH_4 and N_2O	and N_2O IEFs (the values were: 110.77 t/TJ, 30 kg/TJ and 4.00 kg/TJ, respectively). Since 2000, the CO_2 IEF has stayed constant at 110.77, while the CH_4 and N_2O IEFs began to fluctuate, often with large inter-annual changes (e.g. for CH_4, by 54.3% for 2003/2004 and 55.2% for 2004/2005). During the review, Norway explained that biomass consumption in this subcategory is mainly for fuel at cement plants, comprising several waste fractions and charcoal. However, emissions of CH_4 and N_2O from charcoal were included but CO_2 emissions from charcoal were not estimated. Furthermore, consumption of charcoal was not included in the AD. During the review, Norway stated that these omissions, which explain the IEF trends, will be corrected in the 2017 NIR The ERT recommends that Norway report AD and CO_2 emissions from charcoal consumption in the CRF tables, and include in its NIR documentation and explanations	Completeness*
E.24	1.A.3.b Road transportation – liquid fuels – CH_4 and N_2O	Norway has adopted the Handbook Emission Factors for Road Transport (HBEFA) road transport emissions model for estimating CH_4 and N_2O emissions from road transportation. The HBEFA model treats the issue of expected low emissions of CH_4 from LPG consumption in cars (1.A.3.b.i), and CH_4 and N_2O emissions from LNG consumption in heavy duty trucks and buses (1.A.3.b.iii) by reporting the CH_4 and N_2O emission estimates as "NO". In response to a question raised by the ERT during the review week, Norway provided unofficial estimates using the default EFs from the 2006 IPCC Guidelines (62 kg/TJ for CH_4 and 0.2 kg/TJ for N_2O). The unofficial estimates provided by the Party during the review week showed an underestimation of CH_4 emissions from LPG consumption in road transportation – cars, and an underestimation of CH_4 and N_2O emissions from LNG consumption in heavy duty trucks and buses in the original submission, and therefore the ERT included this issue in the list of potential problems and further questions raised by the ERT. In response to this list, Norway provided revised estimates for CH_4 emissions from LPG in the subcategory 1.A.3.b.i (0.01 kt CH_4) and revised CH_4 and N_2O emissions from compressed natural gas in the subcategory 1.A.3.b.iii (0.05 kt CH_4 and 0.002 kt N_2O) in line with the ERT recommendations and the ERT considers the potential problem resolved In assessing the Party's response to the list of potential problems, the ERT noted that LPG consumption in road transportation was estimated using a flat time series using a single data point for AD from 2007 (161.35 TJ). Although the ERT accepts that the Party resolved the issue as described in the Saturday Paper, the ERT recommends that the Party derive updated AD representative of annual consumption of LPG in road transportation in order to confirm that there is not an underestimation of emissions. Alternatively, the ERT recommends that the Party demonstrate that the current approach of keeping AD flat does not lead to an	Yes. Accuracy*

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is the finding an issue[b] and/or a problem[c]? If yes, classify by type
		underestimation of emissions in 2013	
E.25	1.A.3.c Railways – solid fuels – CO_2, CH_4 and N_2O	The ERT noted that the AD and CO_2, CH_4 and N_2O emissions for solid fuels used in railways have been held constant between 1990 and 2014. CO_2 emissions were 0.35 kt CO_2 eq, while CH_4 emissions were 0.00004 kt CH_4 and N_2O emissions were 0.000006 kt N_2O. During the review, Norway indicated that coal in railways is only used in some museum railways. Based on information from these railways, an estimate of annual coal consumption was calculated several years ago and because the activity for these railways varies little between years, the calculated emissions are very modest and the Party deems the current methodological approach acceptable. The ERT accepts the Party's response and concludes that the base-year emissions are not affected by this assumption The ERT encourages the Party to monitor for changes in the consumption of coal by museum railways and update the AD, where appropriate	Not an issue
E.26	1.A.3.d Domestic navigation – gaseous fuels and 1.A.5.b Mobile – gaseous fuels – N_2O	Norway reported CO_2 and CH_4 emissions from gaseous fuels (natural gas) consumption for the subcategories 1.A.3.d (domestic navigation) and 1.A.5.b (mobile military (ships)) but reported "NO" for N_2O emissions. During the review, Norway confirmed that N_2O emissions are not calculated for gas-fuelled ships in either subcategory 1.A.3.d or 1.A.5.b. The ERT concluded that this may result in a potential underestimation of N_2O emissions for 2014 and included this issue in the list of potential problems and further questions raised by the ERT. In response to this list, Norway provided revised estimates in line with the ERT recommendations (N_2O emissions from subcategory 1.A.3.d in 2014 were 0.01 kt N_2O and from subcategory 1.A.5.b were 0.0003 kt N_2O in 2014) and the methodology, AD and EFs applied were transparently documented in the Party's response The ERT recommends that Norway include in the NIR the methods and data used to estimate N_2O emissions from navigation with LNG-fuelled ships	Yes. Transparency*
E.27	1.A.3.e.i Pipeline transport – gaseous fuels – CO_2 CH_4 and N_2O	According to the 2006 IPCC Guidelines, emissions from pipeline transport are to be reported under pipeline transport (other transportation). However, Norway reports the notation key "IE" in this category, and CO_2, CH_4 and N_2O emissions from pipeline transport are reported under energy industries. During the review, Norway explained that this is due to the electricity generation being undertaken in conjunction with natural gas transmission, making it difficult to properly attribute emissions The ERT recommends that the Party describe in the NIR the reasons why it has determined that reporting CO_2, CH_4 and N_2O emissions from pipeline transport under energy industries	YesTransparency*

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is the finding an issue[b] and/or a problem[c]? If yes, classify by type*
		leads to a more accurate estimate for Norway	
		The ERT encourages Norway to report CO_2, CH_4 and N_2O emissions from pipeline transport separately from electricity generation and under the category pipeline transport (other transportation)	
E.28	1.A.5.b Mobile – liquid fuels – CO_2, CH_4 and N_2O	Norway reports emissions from lubricants used in two-stroke engines beginning in the 2015 annual submission. The trend in the CO_2, CH_4 and N_2O IEF shows a unique pattern over the time series. For example, the CO_2 IEF is constant at 73.33 t/TJ for the period 1990–1993. From 1993 to 1994, it then increased by 5.1% (to 77.06 t/TJ). It then increased gradually (approximately 0.1%/year) until 2011. There is then a drop of 6.7% in 2011/2012 back to the original 1990 value. The same trend is seen for CH_4 and N_2O. Overall, between 1990 and 2013, CO_2 emissions declined by 53.8% (from 6.13 kt CO_2 to 2.83 kt CO_2). During the review, Norway indicated that the observed trend is likely to be caused by the time series of "oxidized during use" (ODU) factors, as well as the mix of sold lubricants. The Party further indicated that it will include a more thorough description of this issue in the 2017 submission	Yes. Transparency*
		The ERT recommends that the Party include a description of ODU factors used in the estimation of emissions of lubricants used in two-stroke engines to explain the trends in the CO_2, CH_4 and N_2O IEFs	
E.29	1.B.2 Oil and natural gas and other emissions from energy production – gaseous fuels – general	The ERT identified inconsistencies between the notation keys used for AD and those used for emissions. Specifically, for oil exploration and natural gas exploration and processing, AD are reported as "NE", while CO_2 and CH_4 emissions are reported as "IE". For natural gas transmission, storage and distribution, AD are reported as "NE" while CO_2 and CH_4 emissions are reported as "NO", and finally for other (natural gas) AD are reported as "NO" but CO_2 and CH_4 emissions are reported (11.70 kt $CO_2$and 2.08 kt CH_4, respectively). During the review, Norway responded that it will look into this issue for the 2017 submission	Yes. Transparency*
		The ERT recommends that Norway investigate and ensure the appropriate use of notation keys for the subcategories under category 1.B.2, specifically that there is a logical relationship between the AD reported and the emissions. As part of this investigation, the ERT recommends that Norway check that the notation keys used in the NIR (table 3.28) also match the data and notation keys used in the corresponding categories in the CRF tables	
E.30	1.B.2 Oil and natural gas and other emissions from energy	In response to a question from the ERT regarding the use of notation keys for AD for the subcategories oil exploration and natural gas exploration, transmission, distribution and other leakage at industrial plants and power stations (see ID# E.29 above), the Party stated that it will consider including AD in the 2017 NIR even where no emissions are reported (e.g.	Yes. Transparency*

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is the finding an issue[b] and/or a problem[c]? If yes, classify by type
	production – gaseous and liquid fuels – CO_2 and CH_4	number of wells drilled in subcategories1.B.2.a.1 and 1.B.2.b.1) for the time series The ERT recommends that Norway implement the planned improvement to include AD for the subcategories where no emissions are reported because they are reported elsewhere (e.g. number of wells drilled in subcategories 1.B.2.a.1 and 1.B.2.b.1)	
E.31	1.B.2 Oil and natural gas and other – gaseous fuels – CO_2 and CH_4	The ERT noted that, in numerous cases, Norway uses the notation keys "IE" and "NE" for emissions and AD, respectively, for this category. Where "IE" is used, the NIR (annex X) lists where the emissions are ultimately reported. During the review, Norway stated that, at oil and gas fields, energy production results in emissions from combustion for energy purposes and emissions from venting and flaring. Emissions from the first activity are reported in the energy sector (1.A.1.c) and emissions from venting and flaring are reported in subcategory 1.B.2.c The ERT recommends that Norway report emissions at the level of data entry in CRF table 1.B.2, providing AD and CO_2 and CH_4 emission estimates (or notation keys) for all subcategories, as appropriate	Yes. Comparability*
E.32	1.B.2.b Natural gas – gaseous fuels – CO_2 and CH_4	The ERT noted that the methodology and EFs used to estimate fugitive CH_4 emissions from natural gas distribution are not consistent with the 2006 IPCC Guidelines, but rather are based on the Revised 1996 IPCC Guidelines and using Norway's domestic distribution pipeline length and EFs from Austria. During the review week, the Party provided unofficial revised estimates of fugitive CH_4 emissions that were significantly higher than the original submission, suggesting that the original CH_4 emissions were underestimated for 2014. The unofficial revised CH_4 estimates submitted during the review week were based on the volume of utility sales, in accordance with the 2006 IPCC Guidelines (volume 2, tables 4.2.4 and 4.2.7). The Party observed that this submission of revised estimates during the review week was likely to be an overestimation, because of the introduction of new equipment and materials; however, more detailed information could not be obtained within the review week. The Party did not provide estimates for CO_2 emissions in the original submission or in the unofficial revised estimates Based on the information provided during the review, the ERT concluded that there was a potential underestimation of CO_2 and CH_4 emissions in 2014 in the original submission and included this issue in the list of potential problems and further questions raised by the ERT. In response to this list, Norway provided revised estimates on 17 October 2016 for CH_4 emissions based on the default EF from the 2006 IPCC Guidelines (0.0011 Gg per 10^6 m^3 of utility sales) along with a justification that CO_2 emissions are reported as "IE" (these	Yes. Transparency*

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is the finding an issue[b] and/or a problem[c]? If yes, classify by type*
		emissions were included in the combustion emissions under category 1.A already in the original submission). The ERT agreed with the revised CH_4 emissions (0.69 kt CH_4 in 2013) and concludes that the potential CO_2 and CH_4 underestimations have been resolved	
		The ERT recommends that Norway include in its NIR relevant details describing the methods, data and EFs used to estimate fugitive emissions of CH_4 from natural gas distribution. The ERT further recommends that Norway separately report CO_2 emissions from natural gas distribution. If this is not possible, the ERT recommends that the Party report the notation key "IE" as indicated by the Party during the review and provide the justification for reporting "IE", along with information on where those emissions are included	
E.33	1.C.1 Transport of CO_2 – gaseous fuels – CO_2	The ERT noted that Norway reported the AD and emissions associated with equipment-level leaks from transport of CO_2 as "NO". During the review, the ERT asked the Party to provide a justification for the reporting of "NO". In response to a question from the ERT, the Party indicated that, generally, CCS facilities are integrated units with no external transport. However, the Party noted that at Hammerfest LNG there is a pipeline from mainland Norway to an offshore reservoir and that transport in this pipeline should be considered for inclusion in the subcategory 1.C.1.a. Based on the information provided during the review, the ERT concluded that there may be an underestimation of CO_2 emissions in 2013 and included this issue in the list of potential problems and further questions raised by the ERT	Yes. Transparency*
		In response to this list, Norway reported revised AD for the subcategory 1.C.1.a (468.81 kt CO_2 was transported in 2013), and confirmed that fugitive CO_2 emissions associated with transport are estimated to be "NO", based on monitoring of the pipeline and injection well and Norway specifically described the monitoring activities occurring at pipelines (including continuous pressure monitoring, acoustic deep water survey and visual inspection). The ERT accepts the Party's response	
		The ERT recommends that Norway provide, in the NIR, the details of the monitoring undertaken to demonstrate that there are no fugitive emissions associated with pipeline transport of CO_2	
E.34	1.C.2 Injection and storage – gaseous fuels – CO_2	The ERT noted that the AD in CRF table 1.C for storage are reported as a value identical to injection. According to the 2006 IPCC Guidelines, CO_2 storage presents a closing stock of stored CO_2, which is a cumulative value over the life of a CCS project. This is not the case with injection, which should be reported as an annual value according to the 2006 IPCC Guidelines. Therefore, the AD for CO_2 storage and injection are unlikely to be identical values. Norway indicated during the review that CO_2 emissions from injection are reported as	Yes. Transparency*

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is the finding an issue[b] and/or a problem[c]? If yes, classify by type
		"IE" and included in CRF table 1.B.2.b. However, the ERT was unable to determine the actual amount of CO_2 injected and stored because of a lack of transparency in the reporting of the AD, and consequently the ERT could not determine whether the correct amount of emissions are reported in CRF table 1.B.2.b. Therefore, the ERT found that this lack of transparency could result in a potential underestimation of emissions and included this issue in the list of potential problems and further questions raised by the ERT during the review week. In response to this list, Norway submitted estimates for diffuse CO_2 emissions from injection equipment at two CCS facilities (1.21 kt CO_2 in 2013). In addition, Norway described the method used to estimate emissions from injection, specifically from pressurized equipment, compressor leakage, tight gas and shutdown activities. The ERT accepts the Party's response The ERT recommends that Norway describe in the NIR the method used to estimate diffuse CO_2 emissions from injection and storage at the two CCS facilities and report in the NIR the trends for the underlying data	
E.35	1.C.2 Injection and storage – gaseous fuels – CO_2	Norway reported fugitive CO_2 emissions from storage formations as "IE", but the ERT noted that these emissions were characterized by Norway as resulting from venting and flaring at the production facilities and not from fugitive emissions from the geological formation itself. The ERT noted that, in accordance with the 2006 IPCC Guidelines, CO_2 emissions reported under storage should be those resulting from the formation itself. The Party acknowledged this interpretation and indicated that, in this case, the notation key "IE" should be replaced with "NO", as no leaks from the geological storage formation have been detected The ERT recommends that the Party apply the correct notation key to report fugitive CO_2 emissions from the geological storage formation (i.e. change "IE" to "NO" if Norway continues to detect that there are no leaks from the formation)	Yes. Adherence to UNFCCC Annex I inventory reporting guidelines
IPPU			
I.12	2.A.3 Glass production – CO_2	In the 2015 NIR (p.206) Norway reported the EFs used for glass production (0.41492 t CO_2/t soda ash, 0.477 t CO_2/t limestone and 0.44 t CO_2/t dolomite). The ERT noted that the provided EFs for limestone and dolomite were incorrect because the EFs provided for limestone and dolomite were reversed. During the review, Norway agreed to correct the EFs for limestone and dolomite in the next submission The ERT recommends that Norway report in the NIR the correct EFs for limestone and dolomite use for category 2.A.3	Yes. Adherence to UNFCCC Annex I inventory reporting guidelines

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is the finding an issue[b] and/or a problem[c]? If yes, classify by type*
I.13	2.A.4 Other process uses of carbonates – CO_2	The ERT noted that, although AD and CO_2 emission data are provided in CRF table 2(I).A-H (12.45 kt carbonates consumed and 61.83 kt CO_2, respectively, for 2013), there were no AD and EFs for non-metallurgical magnesium production provided in the NIR (p.209). During the review, Norway provided the AD and EFs for dolomite and limestone consumption. In addition, the ERT noted that the value for the AD (12.45 kt carbonates consumed) was incorrect; however, this had already been corrected in the 2016 annual submission to 124.49 kt carbonates consumed for 2013 The ERT recommends that Norway report in the NIR the amount of limestone and dolomite consumption, along with the relevant EFs used for estimating CO_2 emissions from non-metallurgical magnesium production	Yes. Transparency*
I.14	2.A.4 Other process uses of carbonates – CO_2	The Party reported CO_2 emissions from lightweight expanded clay aggregate (LECA) production and sulphuric acid neutralization in the category other (other process uses of carbonates). This category is mentioned as a key category. However, the ERT noted that the details of the method applied, AD and EFs were not provided clearly in the NIR, and that the AD in CRF table 2(I).A-H are reported as "NE". According to the NIR (p.210), an EF of 0.48 t/t dolomite was applied. During the review, Norway provided the background AD for limestone and dolomite consumption used for the calculation of emissions from both LECA production and sulphuric acid neutralization, separately, for the entire time series as well as the corrected EFs for limestone and dolomite. The EFs for dolomite for 2012–2014 are 0.480 t/t, 0.466 t/t, 0.469 t/t, respectively The ERT recommends that Norway provide in the NIR the AD and the corrected EFs used for estimating emissions from LECA production and sulphuric acid neutralization	Yes. Transparency*
I.15	2.A.4 Other process uses of carbonates – CO_2	In the Party's response to a request for the underlying data used to estimate CO_2 emissions from LECA production and sulphuric acid neutralization (see ID# I.14, above), the ERT noted that the emissions from other (other process uses of carbonates) calculated by the Party during the review (21.81 kt CO_2) are slightly lower than those reported in CRF table 2(I).A-H (24.66 kt CO_2). Norway explained that the LECA producer that is still in production also reports some minor emissions from the use of clay and these are included in the CRF tables of the inventory. However, the ERT noted that this explanation was not provided in the NIR The ERT recommends that Norway describe clearly in the NIR the calculation of emissions from LECA production, including emissions from the use of clay	Yes. Transparency*
I.16	2.B.5 Carbide	The ERT noted that there appears to be a step change in CO_2 emissions between 2002 and 2003. During this period, production of calcium carbide ceased and emissions from silicon	Yes.

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is the finding an issue[b] and/or a problem[c]? If yes, classify by type
	production – CO_2	carbide declined by 41.9% (from 166.91 kt CO_2 in 2002 to 96.92 kt CO_2 in 2003). Overall, between 1990 and 2013, emissions from silicon carbide declined by 78.7%. During the review, Norway explained that a step change in CO_2 emissions between 2002 and 2003 is due to the decrease in the production of silicon carbide	Transparency*
		The ERT recommends that Norway provide an explanation in the NIR to describe the trends observed in CO_2 emissions from carbide production, including the large decrease in CO_2 emissions between 2002 and 2003, which was identified to be the result of a decrease in the production of silicon carbide	
I.17	2.B.8 Petrochemical and carbon black production – CO_2 and CH_4	Norway reported "NE" for the AD for the subcategories ethylene (2.B.8.b) and ethylene dichloride and vinyl chloride monomer (2.B.8.c), but reported CO_2 and CH_4 emissions for both subcategories in 2013 (32.43 kt CO_2 and 0.07 kt CH_4 for ethylene and 11.13 kt CO_2 and 0.04 kt CH_4 for ethylene dichloride and vinyl chloride monomer). During the review, Norway clarified that the NIR describes the AD for subcategory 2.B.8.b as combustion of natural gas in the flare and diffuse emissions of CH_4 and NMVOCs and for subcategory 2.B.8.c as amounts of dangerous waste being recycled to sulphuric acid and diffuse emissions of CH_4 and NMVOCs	Yes. Transparency*
		The ERT recommends that Norway report more information on the AD for subcategory 2.B.8.c in the NIR	
I.18	2.C.2 Ferroalloys production – CO_2	The ERT noticed that the amount of dolomite consumed as a flux in 2014 decreased dramatically, from 35 kt dolomite in 2013 to 3 kt dolomite in 2014 (see NIR table 4.3). During the review, Norway explained that the amount of dolomite in 2013 is not correct because it includes almost 29 kt dolomite that is in fact pellets of iron ore and not dolomite. When this is corrected, the total amount of dolomite in 2013 is about 6 kt dolomite (this does not affect the reported emissions), down from 34 kt dolomite in 2012. The reduction to about 3 kt dolomite in 2014 is due to the lower use of dolomite at two plants in 2014. The ERT considers that Norway reported the emissions correctly even though the Party reported incorrect AD information in the NIR (table 4.3)	Yes. Accuracy*
		The ERT recommends that Norway correct the amount of dolomite used for 2013 in the NIR (table 4.3) and provide an explanation in the NIR regarding the decline in the amount of dolomite used for ferroalloys production between 2012 (34 kt dolomite) and 2013 (to be corrected to 6 kt dolomite)	
I.19	2.C.4 Magnesium	In CRF table 2(II)B-Hs1, Norway reports the AD for SF_6 used in magnesium production as "NE", but the emissions are reported as "NO". During the review, Norway explained that	Yes.

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is the finding an issue[b] and/or a problem[c]? If yes, classify by type*
	production – SF_6	magnesium production stopped in 2006 and that there have been no AD or emissions from this category since 2007. The Party indicated that the notation key "NE" for the AD (amount of magnesium produced) should be corrected to "NO" in CRF table 2(II).B-H The ERT recommends that Norway change the notation key for the amount of magnesium produced for 2007–2014 from "NE" to "NO" in CRF table 2(II).B-Hs1	Transparency*
I.20	2.C.6 Zinc production – CO_2	The ERT noted that Norway estimates CO_2 emissions from zinc production (5.22 kt CO_2 in 2013) but reports the AD as "NE" in CRF table 2(I)A-Hs2. AD are not provided in the NIR. During the review, Norway provided the AD and EFs for calculating CO_2 emissions from zinc production. However, the ERT identified that the EFs in the table provided during the review (0.02–0.04 t CO_2/t zinc produced) are much lower than the default EF from the 2006 IPCC Guidelines (1.72 t CO_2/t zinc produced). Norway explained that the reason for the comparatively low EF is that the plant uses an electrolytic process and the 2006 IPCC Guidelines (p.4.78) state that this does not result in non-energy CO_2 emissions. The ERT considered that the methodology used by Norway is in line with the 2006 IPCC Guidelines The ERT recommends that Norway provide in its NIR a detailed explanation of the methodology used for estimating CO_2 emissions from zinc production, including the use of the electrolytic production process	Yes. Transparency*
I.21	2.F. Product uses as substitutes for ozone-depleting substances – HFCs	Norway stated in the NIR (p.271) that, for confidentiality reasons, emissions from the subcategories 2.F.2 (foam blowing), 2.F.3 (fire extinguishers), 2.F.4 (aerosols/metered dose inhalers (MDIs)) and 2.F.5 (solvents) are reported using the notation key "IE" and aggregated under the subcategory 2.F.6. The ERT noted that, in CRF table 2(II), the F-gas emissions from these applications were reported using the notation key "C" ("confidential"). During the review, Norway agreed to correct the notation key from "C" to "IE" in the next submission The ERT recommends that Norway change the notation keys in CRF table 2(II) for subcategories 2.F.2 (foam blowing), 2.F.3 (fire extinguishers), 2.F.4 (MDIs) and 2.F.5 (solvents) from "C" to "IE" and supply the reasons for changes in a cell comment in the CRF Reporter so that CRF table 9 shows that these emissions are included under the subcategory 2.F.6 to protect confidential information	Yes. Comparability*
I.22	2.F.1 Refrigeration and air conditioning – HFCs	The ERT noted that the product life factor for HFC-134a used in mobile air conditioning decreased from 100% in 1990 to 10% in 2013. The factor in the base year (100%) is higher than the default product life factor for mobile air conditioning (10–20%) from the 2006 IPCC Guidelines. During the review, Norway explained that the decrease of the product life factor for HFC-134a is caused by the fact that there is no manufacturing of new cars in Norway.	Yes. Transparency*

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is the finding an issue[b] and/or a problem[c]? If yes, classify by type
		Thus, the total amount of chemicals imported in bulk every year is assumed to be equal to the amount needed for refilling. The ERT accepts this response as a rationale for the observed trend; however, it notes that there is no such explanation provided in the NIR The ERT recommends that Norway explain in the NIR the reason for the decrease of the product life factor for HFC-134a from 100% in the base year to a lower value in recent years	
I.23	2.F.6 Other applications (product uses as substitutes for ozone-depleting substances) – HFCs	The ERT noted that there is a significant inter-annual fluctuation in the quantity of HFCs filled into new manufactured products between 2012 (3 443.99 t) and 2013 (0.46 t). Given these values, the ERT considers that there could be a data entry problem for 2013 and noted that there is no corresponding discussion of this trend in the NIR. During the review, Norway explained that the inter-annual fluctuation in the quantity of HFCs filled into new manufactured products between 2012 and 2013 is due to the drop in the amount of gas in 2013, which is based on reported figures from a major manufacturer. The ERT accepted the Party's rationale, as stocks from the previous year could have been used; however, the ERT notes that this fluctuation is very large The ERT recommends that the Party contact the manufacturer in question and confirm that the observed decline in the quantity of HFCs filled into new manufactured products is accurate. The ERT further recommends that Norway provide the results of this communication with the manufacturer, along with an explanation in the NIR, if appropriate, confirming that the inter-annual fluctuation in the quantity of HFCs filled into new manufactured products between 2012 and 2014 is due to the drop in the amount of HFCs in 2013 as reported from that major manufacturer	Yes. Transparency*
I.24	2.G.1 Electrical equipment – SF_6	The ERT noted that SF_6 emissions, and therefore the IEF (product manufacturing factor) from manufacturing (subcategory 2.G.1), were reported as "IE" in CRF table 2(II).B-H. During the review, Norway explained that the emissions from manufacturing are included in the emissions from stocks in order to protect confidential information The ERT recommends that Norway explain in CRF table 9 and in the NIR that SF_6 emissions from manufacturing have been included in the emissions from stock to protect confidential information	Yes. Transparency*
I.25	2.H Other (industrial processes and product use) – CO_2	Norway reports CO_2 emissions from pulp and paper (9.86 kt CO_2 in 2013) but no AD (the cells are greyed out in the CRF tables). During the review, the Party explained that emissions are estimated based on AD multiplied by an EF, with AD referring to the amount of limestone consumed. The Party also submitted information on the amount of limestone used for calculating the emissions from pulp and paper for the entire time series. The ERT considered	Yes. Transparency*

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is the finding an issue[b] and/or a problem[c]? If yes, classify by type*
		that the provided AD and EF used are consistent with the emissions reported in CRF table 2(I).A-H The ERT recommends that Norway include the amount of limestone used to calculate the CO_2 emissions from pulp and paper in NIR table 4.4 (total balance of limestone)	
Agriculture			
A.8	3. General (agriculture) – CH_4 and N_2O	The ERT noted that there are differences in swine population between those data provided by FAO (851 058 head) and those included in the Norwegian inventory (562 889 head) for 2013. During the review, the Party confirmed that the "small pig" population was not included in the estimate of enteric fermentation or manure management. In addition, the Party also mentioned that emissions from grown boar for breeding are not included in the current inventory because of the small population of such animals and the lack of country-specific excretion factors. The ERT concluded that there was a potential underestimation of emissions from enteric fermentation (category 3.A – CH_4) and manure management (category 3.B – CH_4 and N_2O) in small pigs and grown boar for breeding, and in managed soils (subcategories 3.D.a – N_2O and 3.D.b – N_2O) and therefore included this issue in the list of potential problems and further questions raised by the ERT during the review week. In response to this list, Norway provided the estimated emissions for all categories and for the entire time series 1990–2013, as recommended by the ERT. The ERT considered that the estimates are in line with the methodology in the 2006 IPCC Guidelines and therefore accepted the estimates provided by the Party. The results of these revised estimates are an increase in total emissions of 11.39 kt CO_2 eq in 2013 The ERT recommends that the Party provide documentation in the NIR to support the methods, AD, EFs and assumptions used to estimate CH_4 and N_2O emissions from small pigs and grown boar in categories 3.A, 3.B and 3.D	Yes. Transparency*
A.9	3.A.1 Cattle – CH_4	The ERT noted that there are large difference in the cattle population when comparing the data reported in Norway's inventory with the data reported by FAO. These differences become larger starting in 2008, and in 2014 the cattle population reported in Norway's inventory is 10% lower (780 269 head) than that of FAO (853 655 head). During the review, Norway explained that, for beef cows, FAO uses the population as of one of the registration dates (July), while the Norwegian inventory uses an average of the two registration dates (July and December). For dairy cows, FAO uses counted animals registered in Norway's production subsidies, while the Norwegian inventory uses animal years from the cow recording system (corrected for non-members). Norway indicates that the cow recording	Yes. Accuracy*

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is the finding an issue[b] and/or a problem[c]? If yes, classify by type
		system is preferred because it estimates the number in animal years, and the excretion factors are estimated for animal years with regard to dairy cows. For young cattle, FAO uses counted animals from the production subsidies registered at one specific date, while the Norwegian inventory uses slaughter statistics for finishing categories and the cow recording system for heifers for breeding. Norway explained that the data sources it currently uses are preferred because the excretion factors require the age and weight of the animals, and these are obtainable only from the above-mentioned sources. The slaughter statistics are also considered to be very accurate according to the Party. According to the cow recording system, about 1–3% of all animals for slaughter die of other causes or are slaughtered on farms. With information about slaughter age, estimated animal years of these categories are thus far more accurate than counting the animals at one or two dates during the year. Although the ERT finds that the explanation provided by Norway is reasonable, it does not fully explain the increasing differences in cattle numbers observed between these two data sets (especially between 2008 and 2013) or the reason for the higher population values reported in the Norwegian inventory compared with those reported by FAO To increase the transparency and ensure accuracy, the ERT recommends that Norway provide detailed information on how cattle populations used in the Norwegian inventory are estimated and demonstrate that the data sources used in the inventory are the most appropriate national data sources, in particular taking into consideration that different population values are reported by FAO	
A.10	3.A.1 Cattle – CH_4	Emissions from enteric fermentation in growing cattle were mainly calculated from four subcategories based on slaughter time (finished heifers less than one year old, finished heifers greater than one year old, finished bulls less than one year old and finished bulls greater than one year old) as well as heifers for breeding. To estimate emissions, Norway applied a tier 2 methodology including the use of a country-specific CH_4 EF, adjusted for carcass weights and slaughter time. The total emissions for growing cattle, as reported in CRF table 3.A is 28.00 kt CH_4 for 2013. The ERT could not reproduce the emissions calculation because of the lack of transparency of the applied parameters. During the review, Norway provided additional parameters to enable the ERT to reproduce the emission values in CRF table 3.A. The ERT reiterates the concerns raised in the previous review (see ID# A.2 in table 3, above) that Norway lacks transparency in its reporting despite reiterated recommendations regarding enteric fermentation The ERT recommends that Norway improve the transparency of its reporting by incorporating the following information in the NIR: slaughter weight, slaughter age, gross energy and the methane conversion factor for finished heifers less than one year old, finished	Yes. Transparency*

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is the finding an issue[b] and/or a problem[c]? If yes, classify by type*
		heifers greater than one year old, finished bulls less than one year old, finished bulls greater than one year old and heifers for breeding	
A.11	3.B.2 Sheep – CH_4	Recognizing the Party's efforts to explore the possibility of undertaking a tier 2 method to estimate CH_4 emissions from manure management from sheep (see table 3, ID# A.6), the ERT encourages the Party to consider changing the methodology used for this non-key category to a tier 2 method	Not an issue
LULUCF			
L.2	4.A.2 Land converted to forest land – CO_2	The ERT found that the NIR is not transparent regarding the nature of the conversions of land areas from settlements to forest land, which has exhibited an increasing trend since 1990 (0.60 kha between 1989 and 1990 and 0.97 kha between 2012 and 2013). During the review, Norway explained that there are many areas of settlements that have been converted to forest land in Norway and these can be divided roughly into four groups: power lines; roads; extraction (gravel, sand and mining); and other	Yes. Transparency*
		The ERT recommends that Norway provide in the NIR a clear explanation of the reasons for lands being converted from settlements to forest land	
L.3	4.B.2 Land converted to cropland – CO_2	The ERT noted that CRF table 4.B has blank cells for carbon stock change from other land converted to cropland for the entire time series. In the 2014 annual submission, the notation key "NO" was used for the carbon stock change for all pools	Yes. Transparency*
		The ERT recommends that Norway use either a notation key or a value to complete all cells in CRF table 4.B related to the estimation of carbon stock change and emissions from other land converted to cropland for the entire time series and include an explanation in the NIR	
L.4	4.F.2 Land converted to other land – CO_2	The ERT noted that CRF table 4.F is blank for carbon stock change for all pools under forest land converted to other land and cropland converted to other land. In the 2014 annual submission, these changes were reported as "NO"	Yes. Transparency*
		The ERT recommends that Norway use either a notation key or a value to complete all cells in CRF table 4.F related to the estimation of carbon stock change and emissions from forest land and cropland converted to other land for the entire time series and include an explanation in the NIR	
L.5	4.G Harvested wood products –	AD are reported in CRF table 4.G for 1990–2013, but the table is blank for years prior to 1990. The ERT noted that AD for the production of harvested wood products are required to be reported from 1960 onwards. During the review, Norway confirmed that it has data back to	Yes. Transparency*

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is the finding an issue[b] and/or a problem[c]? If yes, classify by type*
	CO_2	1961	
		The ERT recommends that Norway complete CRF table 4.G and the additional information box on factors used to convert from product units to carbon. The ERT notes that Parties can do this by setting a custom node year within the data entry screen for harvested wood products in the CRF Reporter software	
Waste			
W.4	5.A.1 Managed waste disposal sites – CH_4	The ERT notes that, in the 2016 NIR (table 7.3), Norway reports 0.5 for the DOCf, which is consistent with the default value in the 2006 IPCC Guidelines, assuming that the SWDS environment is anaerobic and the DOC includes lignin. However, in CRF table 5.A the notation key "NO" is reported for the DOCf. During the review, Norway explained that only DOC default values from the IPCC model have been used and that this is indicated in a cell comment in CRF table 5.A	Yes. Transparency*
		The ERT recommends that Norway improve the transparency of its reporting and present all parameters used for the calculation of emissions from solid waste disposal sites, including DOCf, in both the NIR and CRF table 5.A	
W.5	5.A.1 Managed waste disposal sites – CH_4	The ERT noted that the NIR does not present data for industrial solid waste disposal (e.g. amounts deposited in SWDS, composition of industrial waste, values of DOC and fossil carbon content). During the review, Norway provided the ERT with the spreadsheets containing the calculations used to apply the FOD waste model. Furthermore, Norway explained that the waste streams are quantified based on three different characteristics: material type, source of origin and treatment. In 2011, the statistics on waste from manufacturing industries (2008) were published based on a wide-ranging sample survey. The statistics are part of the waste accounts which are the input data to the FOD waste model. Emissions from this waste stream are included in the amount deposited at municipal solid waste disposal sites. In addition, up to the mid-1990s, large amounts of wood-containing waste from manufacturing (sludge, bark and wood) were deposited at industrial disposal sites every year. Norway used the same FOD waste model as for other waste deposited	Yes. Transparency*
		The ERT recommends that Norway improve the transparency of its reporting and present in the NIR the industrial solid waste disposal data used in the calculation model	
W.6	5.A.1 Managed waste disposal sites – CH_4	The ERT noted that, according to the NIR, the EFs used in the Norwegian FOD waste model are IPCC default values for Northern Europe. In NIR table 7.3 "Variables used in the calculations of methane from landfills", the DOC (Mg/Mg) for wood is reported as 0.400.	Yes. Adherence to UNFCCC Annex I inventory reporting

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is the finding an issue[b] and/or a problem[c]? If yes, classify by type*
		However, the default DOC content of wet waste for wood is 43% (table 2.4, 2006 IPCC Guidelines). During the review, Norway informed the ERT that NIR table 7.3 contains a mistake (the value used in the inventory for DOC for wood is 0.43 and not 0.4), which will be corrected in the next submission	guidelines
		The ERT recommends that Norway correct the DOC value for wood in the NIR	
W.7	5.B.2 Anaerobic digestion at biogas facilities – CH_4	CH_4 emissions from anaerobic digestion at biogas facilities are estimated based on the amount of waste treated at biogas facilities multiplied by the IPCC default EF of 1 g CH_4/kg waste treated. Information on which weight basis (wet or dry) the CH_4 EFs and the amount of waste treated were determined was not presented in the NIR. During the review, Norway informed the ERT that the amount of waste treated at biogas facilities and the default EF is on a wet weight basis	Yes. Transparency*
		The ERT recommends that Norway present in the NIR information regarding the weight basis (wet or dry) of the CH_4 EF and the amount of waste treated at biogas facilities	
W.8	5.D Wastewater treatment and discharge – CH_4 and N_2O	The ERT noted that in CRF table 5.D the notation key "NE" is used for total organic product (kt DC/year) for domestic, industrial and other wastewater. Nevertheless, in the NIR it is stated that biochemical oxygen demand and COD data are available and used to estimate emissions. During the review, Norway explained that these data will be reported in CRF table 5.D in the next submission	Yes. Transparency*
		The ERT recommends that Norway present total organic product data in the NIR and in CRF table 5.D	
W.9	5.D.2 Industrial wastewater – CH_4	The ERT noted that in CRF table 5.D the amount of CH_4 for energy recovery is reported as "IE" with a note that emissions are reported under category 1.A.2 (manufacturing industries and construction). However, in accordance with the 2006 IPCC Guidelines, the amount of CH_4 that is flared or recovered for energy use should be subtracted from total emissions. The ERT found that relevant information on whether CH_4 recovery was subtracted from total emissions was not presented in the 2015 NIR (chapter 7.6). During the review, Norway explained that two installations report CH_4 emissions recovered and flared to NEA. The ERT considers that, since COD from these two installations is included in the former calculation, and the related recovered and flared CH_4 emissions are not clearly subtracted from total emissions, these emissions might be double counted – in the waste sector and in the energy sector. Norway acknowledged this possibility	Yes. Accuracy*
		The ERT recommends that Norway investigate this possible double counting and describe the	

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is the finding an issue[b] and/or a problem[c]? If yes, classify by type*
		outcome of the investigation in the NIR. In addition, the ERT recommends that Norway apply equation 6.4 in the 2006 IPCC Guidelines to estimate CH_4 emissions from industrial wastewater, considering that the amount of CH_4 that is flared or recovered for energy use should be subtracted from total emissions	
W.10	5.D.1 Domestic wastewater – CO_2 and CH_4	Norway estimates the amount of CH_4 flared and the amount of CH_4 for energy recovery for all years in the time series, except 1990. For 1990, the amount of CH_4 for energy recovery is reported as "NO" and the amount of CH_4 flared is reported as "NE". During the review, Norway explained that this activity did not occur in 1990 and the notation key for the amount of CH_4 flared will be changed from "NE" to "NO" for 1990 in the 2017 annual submission	Yes. Comparability*
		The ERT recommends that Norway use the appropriate notation key for the amount of CH_4 flared in 1990	
W.11	5.D.2 Industrial wastewater – N_2O	Norway used the notation key "NE" for N_2O emissions from industrial wastewater, a possible source of nitrogen into sewers, but did not provide any information on the expected value of emissions in order to demonstrate that they are insignificant. During the review, Norway provided such information in the form of a comparison with other European countries	Yes. Transparency*
		The ERT recommends that Norway provide in the NIR information consistent with decision 24/CP.19, annex I, paragraph 37(b), to demonstrate the insignificance of this source, to improve the transparency of the reporting	
KP-LULUCF			
KL.1	Forest management – CO_2	The ERT noted that Norway reported the FMRL in CRF table 4(KP-1)B.1.1 to be –11 370 kt CO_2 eq/year. The ERT notes that footnote 9 to the accounting table indicates that the FMRL is to be as inscribed in the appendix to the annex to decision 2/CMP.7, which is –11 400 kt CO_2 eq/year	Yes. Accuracy*
		The ERT recommends that the Party report in its CRF table the FMRL in accordance with footnote 9, applying any technical corrections, as necessary, in accordance with decision 2/CMP.7, annex, paragraphs 14 and 15	
KL.2	Forest management – CO_2	In its original submission of 15 April 2016, Norway reported a technical correction of –1 175.90 kt CO_2 eq/year in CRF table 4(KP-1)B.1.1 and in the NIR (p.478). In response to the list of potential problems and further questions raised by the ERT (see ID#s E.24, E.26, E.32, E.33, E.34 and A.8 above), Norway submitted revised emission estimates for 2013 and 2014. In its revised submission of 17 October 2016, in CRF	Yes. Accuracy*

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is the finding an issue[b] and/or a problem[c]? If yes, classify by type*
		background table 4(KP-1)B.1.1, Norway reported the technical correction to be –1 641.05 kt CO_2 eq. The ERT notes that this value is the same as that reported by Norway in the original 2016 annual submission. However, the ERT further notes that there was an error in the calculation of the technical correction (see FCCC/ARR/2016/NOR, table 5, ID# KL.2). Based on the information provided in the 2016 NIR, the ERT calculates the technical correction for the 2015 submission to be –1 611.04 kt CO_2 eq The ERT recommends that Norway ensure that the technical correction is correctly calculated as compared to the FMRL as contained in the annex to decision 2/CMP.7	

Abbreviations: AD = activity data, C = confidential, CCS = carbon dioxide capture and storage, COD = chemical oxygen demand, CPR = commitment period reserve, CRF = common reporting format, DC = degradable organic component, DOC = degradable organic carbon, DOCf = fraction of DOC that can decompose, EF = emission factor, ERT = expert review team, EU ETS = European Union Emissions Trading System, F-gases = fluorinated gases, FAO = Food and Agriculture Organization of the United Nations, FMRL = forest management reference level, FOD = first-order decay, GHG = greenhouse gas, IE = included elsewhere, IEA = International Energy Agency, IEF = implied emission factor, IPCC = Intergovernmental Panel on Climate Change, IPPU = industrial processes and product use, KP-LULUCF = LULUCF emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, LECA = lightweight expanded clay aggregate, LNG = liquefied natural gas, LPG = liquefied petroleum gas, LULUCF = land use, land-use change and forestry, MDIs = metered dose inhalers, NE = not estimated, NIR = national inventory report, NMVOC = non-methane volatile organic compound, NO = not occurring, QA/QA = quality assurance/quality control, Revised 1996 IPCC Guidelines = *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*, SWDS = solid waste disposal sites, UNFCCC Annex I inventory reporting guidelines = "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", 2006 IPCC Guidelines = *2006 IPCC Guidelines for National Greenhouse Gas Inventorie*s.

[a] The review of the 2015 GHG annual submission is being held in conjunction with the review of the 2016 annual submission, in accordance with decision 10/CMP.11, paragraph 1. The ERT has reviewed both the 2015 and the 2016 inventory submission, and in accordance with the conclusions from the 13th meeting of greenhouse gas inventory lead reviewers (para. 9), has started with the review of the 2016 submission. This table includes all findings that are relevant for both the 2015 and the 2016 annual submission (i.e. this table excludes findings that, although they may have been relevant for the 2015 annual submission, had already been resolved in the 2016 annual submission).

[b] Recommendations are related to issues as defined in decision 13/CP.20, annex, paragraph 81, or problems as identified in decision 22/CMP.1, annex, paragraph 69, identified by the ERT during the review. Encouragements are made to the Party to address all findings not related to such issues.

[c] An asterisk is included next to each issue type that is also a problem, as defined in decision 22/CMP.1, annex, paragraphs 68 and 69, including those that lead to an adjustment or a question of implementation.

VI. Application of adjustments

11. The ERT has not identified the need to apply any adjustments to the 2015 annual submission of Norway.

VII. Accounting quantities for activities under Article 3, paragraph 3, and, if any, activities under Article 3, paragraph 4, of the Kyoto Protocol

12. Norway has elected commitment period accounting and therefore the issuance and cancellation of units for activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol are not applicable for the 2015 review.

VIII. Questions of implementation

13. No questions of implementation were identified by the ERT during the review.

Annex I

Overview of greenhouse gas emissions and removals for Norway for submission year 2015 and data and information on activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol

1. Tables 6–9 provide an overview of total greenhouse gas emissions and removals as submitted by the Party.

Table 6
Total greenhouse gas emissions for Norway, base year[a]–2013[b]
(kt CO_2 eq)

	Total GHG emissions excluding indirect CO_2 emissions		*Total GHG emissions including indirect CO_2 emissions[c]*		*Land-use change (Article 3.7 bis as contained in the Doha Amendment)[d]*	*KP-LULUCF activities (Article 3.3 of the Kyoto Protocol)[e]*	*KP-LULUCF activities (Article 3.4 of the Kyoto Protocol)*	
	Total including LULUCF	*Total excluding LULUCF*	*Total including LULUCF*	*Total excluding LULUCF*			*CM, GM, RV, WDR*	*FM*
FMRL								–11 400[f]
Base year	41 451.11	51 921.77	41 451.11	51 921.77	NA		1 855.18	
1990	41 451.11	51 921.77	41 451.11	51 921.77				
1995	37 779.51	51 411.15	37 779.51	51 411.15				
2000	31 311.06	54 883.38	31 311.06	54 883.38				
2010	29 428.47	55 299.10	29 428.47	55 299.10				
2011	26 973.52	54 308.64	26 973.52	54 308.64				
2012	27 813.13	53 872.31	27 813.13	53 872.31				
2013	27 243.06	53 585.63	27 243.06	53 585.63		1 957.06	1 961.39	–30 679.93

Abbreviations: CM = cropland management, FM = forest management, FMRL = forest management reference level, GHG = greenhouse gas, GM = grazing land management, KP-LULUCF = LULUCF emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, LULUCF = land use, land-use change and forestry, NA = not applicable, RV = revegetation, WDR = wetland drainage and rewetting.

[a] "Base year" refers to the base year under the Kyoto Protocol, which is 1990 for all gases except NF_3, for which the base year is 2000. The base year for cropland management, grazing land management and revegetation under Article 3, paragraph 4, of the Kyoto Protocol is 1990. For activities under Article 3, paragraph 3, of the Kyoto Protocol and forest management under Article 3, paragraph 4, only the inventory years of the commitment period must be reported.

[b] Emissions/removals reported in the sector other (sector 6) are not included in total GHG emissions.

[c] The Party has not reported indirect CO_2 emissions in common reporting format table 6.

[d] The value reported in this column refers to 1990.

[e] Activities under Article 3, paragraph 3, of the Kyoto Protocol, namely afforestation and reforestation and deforestation.

[f] Norway reported an incorrect value for the FMRL in its accounting table (see table 5, ID# KL.1). The value contained in this table is as included in the appendix to decision 2/CMP.7.

Table 7
Greenhouse gas emissions by gas for Norway, excluding land use, land-use change and forestry, 1990–2013[a]
(kt CO_2 eq)

	CO_2[b]	*CH_4*	*N_2O*	*HFCs*	*PFCs*	*Unspecified mix of HFCs and PFCs*	*SF_6*	*NF_3*
1990	35 694.82	6 032.68	4 200.89	0.04	3 894.80	NA, NO	2 098.54	NA, NO
1995	38 464.91	6 147.24	3 812.83	92.30	2 314.05	NA, NO	579.82	NA, NO
2000	42 194.62	5 966.44	3 928.86	383.59	1 518.4	NA, NO	891.41	NA, NO
2010	45 833.89	5 522.61	2 567.69	1 064.60	238.39	NA, NO	71.91	NA, NO
2011	44 946.87	5 377.99	2 557.33	1 105.89	262.64	NA, NO	57.92	NA, NO
2012	44 553.97	5 344.42	2 574.90	1 140.97	200.51	NA, NO	57.55	NA, NO
2013	44 309.06	5 341.83	2 537.99	1 155.10	181.04	NA, NO	60.62	NA, NO
Per cent change 1990–2013	**24.1**	**–11.5**	**–39.6**	**2 631 280.8**	**–95.4**	**NA**	**–97.1**	**NA**

Abbreviations: NA = not applicable, NO = not occurring.
[a] Emissions/removals reported in the sector other (sector 6) are not included in total greenhouse gas emissions.
[b] Norway did not report indirect CO_2 emissions in common reporting format table 6.

Table 8
Greenhouse gas emissions by sector for Norway, 1990–2013[a, b]
(kt CO_2 eq)

	Energy	*IPPU*	*Agriculture*	*LULUCF*	*Waste*	*Other*[c]
1990	30 166.71	14 494.44	4 963.12	–10 470.66	2 297.50	–
1995	32 741.26	11 600.82	4 888.51	–13 631.64	2 180.56	–
2000	36 122.07	12 081.56	4 807.05	–23 572.31	1 872.70	–
2010	41 120.40	8 200.70	4 408.10	–25 870.63	1 569.90	–
2011	40 167.22	8 194.77	4 393.12	–27 335.12	1 553.53	–
2012	39 721.76	8 197.04	4 402.84	–26 059.18	1 550.67	–
2013	39 356.61	8 277.28	4 431.84	–26 342.57	1 519.90	–
Per cent change 1990–2013	**30.5**	**–42.9**	**–10.7**	**151.6**	**–33.8**	**NA**

Abbreviations: IPPU = industrial processes and product use, LULUCF = land use, land-use change and forestry, NA = not applicable.

[a] Emissions/removals reported in the sector other (sector 6) are not included in total greenhouse gas emissions.

[b] Norway did not report indirect CO_2 emissions in common reporting format table 6.

[c] These cells were blank in the 2015 submission. In previous annual submissions, this sector was reported as "NA".

Table 9

Greenhouse gas emissions/removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol by activity, base year[a, b]–2013, for Norway

(kt CO_2 eq)

	Article 3.7 bis as contained in the Doha Amendment[c]	*Article 3.3 of the Kyoto Protocol*		*Forest management and elected Article 3.4 activities of the Kyoto Protocol*				
	Land-use change	*Afforestation and reforestation*	*Deforestation*	*Forest management*	*Cropland management*	*Grazing land management*	*Revegetation*	*Wetland drainage and rewetting*
FMRL				–11 400[d]				
Technical correction				–1 611.04[e]				
Base year	NA				1 773.34	81.84	NA	NA
2013		–476.30	2 433.36	–30 679.93	1 885.99	75.41	NA	NA
Per cent change Base year–2013					**6.4**	**–7.9**	**NA**	**NA**

Abbreviations: FMRL = forest management reference level, NA = not applicable.

[a] "Base year" refers to the base year under the Kyoto Protocol, which is 1990 for all gases except NF_3, for which the base year is 2000. The base year for cropland management and grazing land management under Article 3, paragraph 4, of the Kyoto Protocol is 1990 for Norway. For activities under Article 3, paragraph 3, of the Kyoto Protocol, and forest management under Article 3, paragraph 4, only the inventory years of the commitment period must be reported.

[b] Values in this table include emissions on lands subject to natural disturbances, if applicable.

[c] The value reported in this column refers to 1990.

[d] Norway reported an incorrect value for the FMRL in its accounting table (see table 5, ID# KL.1). The value contained in this table is as included in the appendix to decision 2/CMP.7.

[e] Value as calculated by the expert review team. See table 5, ID# KL.2, for the derivation of the technical correction.

2. Table 10 provides an overview of relevant key data for Norway's reporting under Article 3, paragraphs 3 and 4, of the Kyoto Protocol.

Table 10
Key relevant data for Norway under Article 3, paragraphs 3 and 4, of the Kyoto Protocol

Key parameters	*Values*
Periodicity of accounting	(a) Afforestation/reforestation: commitment period accounting
	(b) Deforestation: commitment period accounting
	(c) Forest management: commitment period accounting
	(d) Cropland management: commitment period accounting
	(e) Grazing land management: commitment period accounting
	(f) Revegetation: not elected
	(g) Wetland drainage and rewetting: not elected
Election of activities under Article 3, paragraph 4	Cropland management and grazing land management
Election of application of provisions for natural disturbances	No
3.5% of total base year GHG emissions, excluding LULUCF and including indirect CO_2 emissions	1 817.262 kt CO_2 eq (14 538.096 kt CO_2 eq for the duration of the commitment period)
Cancellation of AAUs, ERUs, CERs and/or issuance of RMUs in the national registry for:	
1. Afforestation and reforestation in 2013	NA
2. Deforestation in 2013	NA
3. Forest management in 2013	NA
4. Cropland management in 2013	NA
5. Grazing land management in 2013	NA
6. Revegetation in 2013	NA
7. Wetland drainage and rewetting in 2013	NA

Abbreviations: AAU = assigned amount unit, CER = certified emission reduction, ERU = emission reduction unit, GHG = greenhouse gas, LULUCF = land use, land-use change and forestry, NA = not applicable, RMU = removal unit.

Annex II

Information to be included in the compilation and accounting database

Table 11 includes the information to be included in the compilation and accounting database for Norway. Data shown are from the original annual submission of the Party, including the latest revised estimates submitted, adjustments (if applicable), as well as the final data to be included in the compilation and accounting database.

Table 11
Information to be included in the compilation and accounting database for 2013, including the commitment period reserve, for Norway
(t CO_2 eq)

	Original submission	*Revised estimates*	*Adjustment*[a]	*Final*[b]
Commitment period reserve	225 519 117	314 022 874		314 022 874
Annex A emissions for 2013				
CO_2	44 440 580	44 309 056		44 309 056
CH_4	5 427 956	5 341 828		5 341 828
N_2O	2 449 708	2 537 989		2 537 989
HFCs	1 155 095			1 155 095
PFCs	181 040			181 040
Unspecified mix of HFCs and PFCs	NA, NO			NA, NO
SF_6	60 624			60 624
NF_3	NA, NO			NA, NO
Total Annex A sources	**53 716 010**	**53 585 632**		**53 585 632**
Activities under Article 3, paragraph 3, of the Kyoto Protocol for 2013				
3.3 Afforestation and reforestation	–464 804	–476 305		–476 305
3.3 Deforestation	2 566 000	2 433 361		2 433 361
Forest management and elected activities under Article 3, paragraph 4, of the Kyoto Protocol for 2013				
3.4 Forest management for 2013	–30 587 147	–30 679 934		–30 679 934
3.4 Cropland management for 2013	1 716 527	1 885 986		1 885 986
3.4 Cropland management for the base year	1 662 522	1 773 339		1 773 339
3.4 Grazing land management for 2013	130 794	75 408		75 408
3.4 Grazing land management for the base year	106 760	81 843		81 843

Abbreviations: Annex A sources = sources included in Annex A to the Kyoto Protocol, NA = not applicable, NO = not occurring.

[a] "Adjustment" is relevant only for Parties for which the expert review team has calculated one or more adjustment(s).

[b] "Final" includes revised estimates, if any, and/or adjustments, if any.

Annex III

Additional information to support findings in table 2

Missing categories that may affect completeness

The categories for which methods are included in the *2006 IPCC Guidelines for National Greenhouse Gas Inventories* were reported as "NE" (not estimated), or for which the expert review team otherwise determined that there may be an issue with the completeness of reporting in the Party's inventory are the following:

(a) Carbon dioxide (CO_2) emissions from charcoal consumption (see ID# E.23 in table 5);

(b) Perfluorocarbon (PFC) emissions from refrigeration for 2009 (see ID# I.9 in table 3);

(c) Hydrofluorocarbon-143 (HFC-143) and HFC-134 emissions from commercial refrigeration (see ID# I.10 in table 3);

(d) HFC-134 emissions from filling of new manufactured products for 2008 onwards (see ID# I.11 in table 3);

(e) CO_2, methane (CH_4) and nitrous oxide (N_2O) emissions from CH_4 recovery at industrial wastewater treatment plants (see ID# W.3 in table 3).

Annex IV

Documents and information used during the review

A. Reference documents

Aggregate information on greenhouse gas emissions by sources and removals by sinks for Parties included in Annex I to the Convention. Note by the secretariat. Available at <http://unfccc.int/resource/webdocs/agi/2015.pdf>.

Annual status report for Norway for 2015. Available at <http://unfccc.int/resource/docs/2015/asr/nor.pdf>.

FCCC/ARR/2014/NOR. Report on the individual review of the annual submission of Norway submitted in 2014. Available at <http://unfccc.int/resource/docs/2015/arr/nor.pdf>.

FCCC/ARR/2013/NOR. Report of the individual review of the annual submission of Norway submitted in 2013. Available at <http://unfccc.int/resource/docs/2014/arr/nor.pdf>.

FCCC/ARR/2012/NOR. Report of the individual review of the annual submission of Norway submitted in 2012. Available at <http://unfccc.int/resource/docs/2013/arr/nor.pdf>.

"Guidelines for national systems for the estimation of anthropogenic greenhouse gas emissions by sources and removals by sinks under Article 5, paragraph 1, of the Kyoto Protocol". Decision 19/CMP.1. Available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a03.pdf#page=14>.

"Guidelines for review under Article 8 of the Kyoto Protocol". Decision 22/CMP.1. Available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a03.pdf#page=51>.

"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". Annex I to decision 24/CP.19. Available at <http://unfccc.int/resource/docs/2013/cop19/eng/10a03.pdf#page=4>.

"Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol". Decision 15/CMP.1. Available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a02.pdf#page=54>.

"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#page=6>.

"Implications of the implementation of decisions 2/CMP.7 to 4/CMP.7 and 1/CMP.8 on the previous decisions on methodological issues related to the Kyoto Protocol, including those relating to Articles 5, 7 and 8 of the Kyoto Protocol, part I: implications related to accounting and reporting and other related issues". Decision 3/CMP.11. Available at <http://unfccc.int/resource/docs/2015/cmp11/eng/08a01.pdf#page=5>.

"Implications of the implementation of decisions 2/CMP.7 to 4/CMP.7 and 1/CMP.8 on the previous decisions on methodological issues related to the Kyoto Protocol, including those relating to Articles 5, 7 and 8 of the Kyoto Protocol, part II: implications related to review and adjustments and other related issues". Decision 4/CMP.11. Available at <http://unfccc.int/resource/docs/2015/cmp11/eng/08a01.pdf#page=30>.

Intergovernmental Panel on Climate Change. 2006. *2006 IPCC Guidelines for National Greenhouse Gas Inventories*. Available at <http://www.ipcc-nggip.iges.or.jp/public/2006gl/index.html>.

Intergovernmental Panel on Climate Change. 2014. *2013 Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol*. Available at <http://www.ipcc-nggip.iges.or.jp/public/kpsg>.

Intergovernmental Panel on Climate Change. 2014. *2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands*. Available at <http://www.ipcc-nggip.iges.or.jp/public/wetlands/index.html>.

Standard independent assessment report, part 1, for Norway for 2015. Available at <http://unfccc.int/files/kyoto_mechanisms/application/pdf/siar_2015_nor_1_2.pdf>.

Standard independent assessment report, part 2, for Norway for 2015. Available at <http://unfccc.int/files/kyoto_mechanisms/application/pdf/siar_2015_nor_2_2.pdf>.

B. Additional information provided by the Party

Responses to questions during the review were received from Ms. Catrin Robertsen, (Norwegian Environment Agency), including additional material on the methodology and assumptions used. The following documents[1] and personal communications were also provided by Norway:

Aquateam COWI AS. 2014. Forbruk av annen organisk gjødsel for å beregne utslipp av N_2O fra jordbruket (Consumption of other organic fertilizer to calculate N_2O emissions from agriculture). Report number 14041.

Svihus, Birger. 2015. Production of methane from enteric fermentation in poultry in Norway. Norwegian University of Life Sciences.

[1] Reproduced as received from the Party.

Annex V

Acronyms and abbreviations

AAU	assigned amount unit
AD	activity data
C	confidential
C_3F_8	perfluoropropane
CCS	carbon dioxide capture and storage
CER	certified emission reduction
CH_4	methane
CM	cropland management
CO_2	carbon dioxide
CO_2 eq	carbon dioxide equivalent
COD	chemical oxygen demand
CPR	commitment period reserve
CRF	common reporting format
DC	degradable organic component
DOC	degradable organic carbon
DOCf	fraction of DOC that can decompose
EF	emission factor
ERT	expert review team
ERU	emission reduction unit
EU ETS	European Union Emissions Trading System
FAO	Food and Agriculture Organization of the United Nations
F-gases	fluorinated gases
FM	forest management
FMRL	forest management reference level
FOD	first-order decay
$Frac_{GASF}$	fraction of synthetic fertilizer N that volatilizes as NH_3 and NOx
g	gram
Gg	gigagram
GHG	greenhouse gas
GM	grazing land management
HFCs	hydrofluorocarbons
IE	included elsewhere
IEA	International Energy Agency
IEF	implied emission factor
IPCC	Intergovernmental Panel on Climate Change
IPPU	industrial processes and product use
kg	kilogram (1 kg = 1,000 grams)
kha	kilohectare
KP-LULUCF	LULUCF emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol
kt	kilotonne
LECA	lightweight expanded clay aggregate
LNG	liquefied natural gas
LPG	liquefied petroleum gas
LULUCF	land use, land-use change and forestry
m^3	cubic metre
MDI	metered dose inhaler

Mg	megagram
N	nitrogen
N_2O	nitrous oxide
NA	not applicable
NE	not estimated
NF_3	nitrogen trifluoride
NH_3	ammonia
NIR	national inventory report
NMVOC	non-methane volatile organic compound
NO	not occurring
PFCs	perfluorocarbons
QA/QC	quality assurance/quality control
RMU	removal unit
RV	revegetation
SEF	standard electronic format
SF_6	sulphur hexafluoride
SIAR	standard independent assessment report
SWDS	solid waste disposal site
t	tonne
TJ	terajoule (1 TJ = 10^{12} joule)
UNFCCC	United Nations Framework Convention on Climate Change
WDR	wetland drainage and rewetting