



**COMPLIANCE COMMITTEE**

**CC/ERT/ARR/2019/03**

**1 February 2019**

**Report of the individual review of the annual submission of  
Italy submitted in 2018**

**Note by the secretariat**

The report of the individual review of the annual submission of Italy submitted in 2018 was published on 29 January 2019. 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/2018/FIN, contained in the annex to this note, is being forwarded to the Compliance Committee in accordance with section VI, paragraph 3, of the annex to decision 27/CMP.1.



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## **Report on the individual review of the annual submission of Italy submitted in 2018\***

**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 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 2018 annual submission of Italy, 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 1 to 6 October 2018.

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\* In the symbol for this document, 2018 refers to the year in which the inventory was submitted, not to the year of publication.

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## Abbreviations and acronyms

2006 IPCC Guidelines	<i>2006 IPCC Guidelines for National Greenhouse Gas Inventories</i>
AAU	assigned amount unit
AD	activity data
Annex A sources	source categories included in Annex A to the Kyoto Protocol
AR	afforestation and reforestation
Article 8 review guidelines	“Guidelines for review under Article 8 of the Kyoto Protocol”
B <sub>0</sub>	maximum CH <sub>4</sub> producing capacity for manure
CER	certified emission reduction
CH <sub>4</sub>	methane
CM	cropland management
CORINAIR	core inventory of air emissions
CO <sub>2</sub>	carbon dioxide
CO <sub>2</sub> eq	carbon dioxide equivalent
CPR	commitment period reserve
CRF	common reporting format
CRPA	Research Centre on Animal Production
EF	emission factor
EPRT	European Pollutant Release and Transfer Register
ERT	expert review team
ERU	emission reduction unit
EU ETS	European Union Emissions Trading System
F-gas	fluorinated gas
FM	forest management
FMRL	forest management reference level
Frac <sub>leachMS</sub>	value of the percentage of managed manure nitrogen losses due to run-off and leaching
Frac <sub>LEACH-(H)</sub>	fraction of nitrogen input to managed soils that is lost through leaching and run-off
GHG	greenhouse gas
GM	grazing land management
HFC	hydrofluorocarbon
HWP	harvested wood products
IE	included elsewhere
IEA	International Energy Agency
IEF	implied emission factor
IPCC	Intergovernmental Panel on Climate Change
IPPU	industrial processes and product use
IUTI	Italian Land Use Inventory
KP-LULUCF activities	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
MAP	mean annual precipitation
MCF	methane conversion factor (manure management)
N	Nitrogen
NA	not applicable
NE	not estimated
NFI	national forest inventory

NF <sub>3</sub>	nitrogen trifluoride
NIR	national inventory report
NO	not occurring
N <sub>2</sub> O	nitrous oxide
PET	potential evapotranspiration
PFC	Perfluorocarbon
QA/QC	quality assurance/quality control
Revised 1996 IPCC Guidelines	<i>Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories</i>
RMU	removal unit
RV	Revegetation
SEF	standard electronic format
SF <sub>6</sub>	sulfur hexafluoride
SIAR	standard independent assessment report
UNFCCC	United Nations Framework Convention on Climate Change
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”
UNFCCC review guidelines	“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”
WDR	wetland drainage and rewetting
Wetlands Supplement	<i>2013 Supplement to the 2006 Intergovernmental Panel on Climate Change Guidelines for National Greenhouse Gas Inventories: Wetlands</i>
Y <sub>m</sub>	methane conversion factor (enteric fermentation)

## I. Introduction<sup>1</sup>

1. This report covers the review of the 2018 annual submission of Italy organized by the secretariat, in accordance with the Article 8 review guidelines (adopted by decision 22/CMP.1, and revised by decision 4/CMP.11). In accordance with the Article 8 review guidelines, this review process also encompasses the review under the Convention as described in the UNFCCC review guidelines, particularly in part III thereof, namely the “UNFCCC guidelines for the technical review of greenhouse gas inventories from Parties included in Annex I to the Convention” (decision 13/CP.20). The review took place from 1 to 6 October 2018 and was coordinated by Ms. Sevdalina Todorova (secretariat). Table 1 provides information on the composition of the ERT that conducted the review of Italy.

Table 1

**Composition of the expert review team that conducted the review of Italy**

<i>Area of expertise</i>	<i>Name</i>	<i>Party</i>
Generalist	Mr. Tomas Gustafsson	Sweden
	Ms. Sina Wartmann	Germany
Energy	Mr. Naofumi Kosaka	Japan
	Mr. Daniel Tutu Benefoh	Ghana
IPPU	Ms. Pia Forsell	Finland
	Mr. Alexander Valencia	Colombia
Agriculture	Mr. Kingsley Kwako Amoako	Ghana
	Mr. Daniel Bretscher	Switzerland
LULUCF	Mr. Doru Leonard Irimie	Romania
	Ms. Maria José Sanz Sánchez	Spain
Waste	Mr. Takefumi Oda	Japan
	Ms. Riitta Pipatti	Finland
Lead reviewers	Mr. Gustafsson	
	Mr. Tutu Benefoh	

2. The basis of the findings in this report is the assessment by the ERT of the Party’s 2018 annual submission, in accordance with the Article 8 review guidelines. The ERT notes that the individual inventory review of Italy’s 2017 submission did not take place during 2017 owing to insufficient funding for the review process.

3. The ERT has made recommendations that Italy resolve the findings related to issues,<sup>2</sup> including issues designated as problems.<sup>3</sup> Other findings and, if applicable, the encouragements of the ERT to Italy to resolve them are also included.

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

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

<sup>2</sup> Issues are defined in decision 13/CP.20, annex, paragraph 81.

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

5. Annex I shows annual GHG emissions for Italy, including totals excluding and including the LULUCF sector, indirect CO<sub>2</sub> emissions and emissions by gas and by sector. Annex I also contains background data related to emissions and removals from KP-LULUCF activities, if elected, by gas, sector and activity for Italy.
6. Information to be included in the compilation and accounting database can be found in annex II.

## II. Summary and general assessment of the 2018 annual submission

7. In accordance with paragraph 76 of the UNFCCC review guidelines and paragraphs 47 and 65 of the Article 8 review guidelines, the ERT has prioritized the review of issues and/or problems identified in previous review reports or in the initial assessment, recalculations that have changed the emissions or removals estimate for a category by more than 2 per cent and/or national total emissions by more than 0.5 per cent for any of the recalculated years, and supplementary information reported under the Kyoto Protocol. Table 2 provides the assessment by the ERT of the annual submissions with respect to the tasks undertaken during the desk review. Further information on the issues identified, as well as additional findings, may be found in tables 3, 5 and 6.

Table 2

### Summary of review results and general assessment of the inventory of Italy

Assessment		Issue or problem ID#(s) in table 3, 5 and/or 6 <sup>a</sup>	
Date of submission	Original submission: 13 April 2018 (NIR), 13 April 2018, version 1 (CRF tables), 13 April 2018 (SEF-CP1-2017 and SEF-CP2-2017 tables)		
Review format	Desk review		
Application of the requirements of the UNFCCC Annex I inventory reporting guidelines and Wetlands Supplement (if applicable)	<p>1. Have any issues been identified in the following areas:</p> <p>(a) Identification of key categories</p> <p>(b) Selection and use of methodologies and assumptions</p> <p>(c) Development and selection of EFs</p> <p>(d) Collection and selection of AD</p> <p>(e) Reporting of recalculations</p> <p>(f) Reporting of a consistent time series</p> <p>(g) Reporting of uncertainties, including methodologies</p> <p>(h) QA/QC</p> <p>(i) Missing categories/completeness<sup>b</sup></p> <p>(j) Application of corrections to the inventory</p>	<p>No</p> <p>Yes</p> <p>No</p> <p>Yes</p> <p>Yes</p> <p>No</p> <p>No</p> <p>QA/QC procedures were assessed in the context of the national system (see para. 2 in this table)</p> <p>No</p> <p>No</p>	<p></p> <p>W.4, W.7, KL.1</p> <p></p> <p>E.2, E.3, I.9, L.6</p> <p>E.1, E.9, E.10, L.8</p> <p></p> <p></p> <p></p>
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	L.12

<i>Assessment</i>		<i>Issue or problem ID#(s) in table 3, 5 and/or 6<sup>a</sup></i>	
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	2. Have any issues been identified related to the 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	
	3. Have any issues been identified related to the national registry:		
	(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	
	4. Have any issues been identified related to reporting of information on ERUs, CERs, AAUs and RMUs and on discrepancies reported in accordance with decision 15/CMP.1, annex, chapter I.E, in conjunction with decision 3/CMP.11, taking into consideration any findings or recommendations contained in the SIAR?	No	
	5. Have any issues been identified in 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, in conjunction with decision 3/CMP.11, including any changes since the previous annual submission?	No	
	6. Have any issues been identified related to the reporting of LULUCF activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, as follows:		
	(a) Reporting requirements in decision 2/CMP.8, annex II, paragraphs 1–5	Yes	KL.1
	(b) Demonstration of methodological consistency between the reference level and reporting on FM in accordance with decision 2/CMP.7, annex, paragraph 14	No	
	(c) Reporting requirements of decision 6/CMP.9	Yes	KL.6
	(d) Country-specific information to support provisions for natural disturbances, in accordance with decision 2/CMP.7, annex, paragraphs 33 and 34	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	



<i>Assessment</i>			<i>Issue or problem ID#(s) in table 3, 5 and/or 6<sup>a</sup></i>
	Did the Party submit a revised estimate to replace a previously applied adjustment?	NA	Party does not have a previously applied adjustment
Response from the Party during the review	Has the Party provided the ERT with responses to the questions raised, including the data and information 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?	Yes	
Recommendation for an exceptional in-country review	On the basis of the issues identified, does the ERT recommend that the next review be conducted as an in-country review?	No	
Question of implementation	Did the ERT list a question of implementation?	No	

<sup>a</sup> The ERT identified additional issues and/or problems in all the sectors that are not listed in this table but are included in table 3, 5 and/or 6.

<sup>b</sup> Missing categories for which methods are provided in the 2006 IPCC Guidelines may affect completeness and are listed in annex III.

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

8. Table 3 compiles all the recommendations made in previous review reports that were included in the previous review report, published on 31 May 2017.<sup>4</sup> 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 2018 annual submission and provided the rationale for its determination, which takes 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 Italy

<i>ID#</i>	<i>Issue and/or problem classification<sup>a, b</sup></i>	<i>Recommendation made in previous review report</i>	<i>ERT assessment and rationale</i>
<b>General</b>			
G.1	QA/QC and verification – (G.2, 2016) (G.2, 2015) Adherence to the UNFCCC Annex I inventory reporting guidelines	Ensure consistency between NIR tables 2.2 and 2.3 and CRF table 10s1.	Resolved. There are no inconsistencies detected between NIR tables 2.2 and 2.3 and CRF table 10s1 of the 2018 submission. The Party also provided information during the review clarifying how consistency between NIR tables 2.2 and 2.3 and CRF table 10s1 is ensured by linking the Excel file used to produce NIR tables 2.2 and 2.3 and the CRF table 10s1 and by introducing an additional QC step ensuring the correct links with the final CRF tables.
<b>Energy</b>			
E.1	1.A.2 Manufacturing industries and construction – other fuels – CO <sub>2</sub> , CH <sub>4</sub>	Include a discussion in the NIR on the impact of any recalculations on the trend in CO <sub>2</sub> , CH <sub>4</sub> and N <sub>2</sub> O	Addressing. General information on the impact of recalculations on the CO <sub>2</sub> emission trends for the category has been reported in the NIR (chapter 3.4.6). However, the NIR does not provide detailed

<sup>4</sup> FCCC/ARR/2016/ITA. The ERT notes that the individual inventory review of Italy's 2017 annual submission did not take place during 2017. As a result, the latest published annual review report reflects the findings of the review of the Party's 2016 annual submission.

<i>ID#</i>	<i>Issue and/or problem classification<sup>a, b</sup></i>	<i>Recommendation made in previous review report</i>	<i>ERT assessment and rationale</i>
	and N <sub>2</sub> O (E.2, 2016) (E.2, 2015) Transparency	emissions at the category, sector and national total levels, as appropriate.	information on the impact of recalculations on the trend of CH <sub>4</sub> and N <sub>2</sub> O at any level.
E.2	1.A.2.d Pulp, paper and print – biomass – CO <sub>2</sub> (E.3, 2016) (E.3, 2015) Accuracy	Further analyse the EU ETS data for the time series available, taking into consideration biomass fuel mix in the relevant year, and document the relevant information in the NIR.	Addressing. There is no specific information in the NIR on the analyses of the EU ETS data other than from 2008, which was used for the CO <sub>2</sub> EF (112.57 t CO <sub>2</sub> /TJ) for the entire time series in the 2016 submission. In the 2018 submission the reported CO <sub>2</sub> IEF value of 112.57 t CO <sub>2</sub> /TJ was constant for the period 1998–2012 but the CO <sub>2</sub> IEFs for 2013 and 2014 have been recalculated (as of the 2017 submission) to 58.51 and 55.19 t CO <sub>2</sub> /TJ. The NIR (chapter 3.4.3) states that biomass fuel consumption includes black liquor but also industrial sludge and biogas from industrial organic waste. However, from 2013 only biogas is included which is reflected in the IEFs for the period 2013–2016.
E.3	1.A.2.e Food processing, beverages and tobacco – biomass – CH <sub>4</sub> (E.4, 2016) (E.4, 2015) Accuracy	Further analyse and collect information at the plant level in order to verify, and if appropriate update, the CH <sub>4</sub> EF.	Addressing. As indicated in annex 12 of the NIR, Italy has provided information on the CH <sub>4</sub> EFs used and has provided disaggregated EFs for different biomass fuels in the NIR (chapter 3.6.3). However, the analysis of the EFs has not particularly addressed the CH <sub>4</sub> EF for food processing, beverages and tobacco. The NIR (chapter 3.4.3) further explains that the Party plans to collect the relevant information at the plant level to update the CH <sub>4</sub> EF, taking into account recent improvements in technology compared to the 1990s.
E.4	1.A.3 Transport – liquid fuels – CO <sub>2</sub> , CH <sub>4</sub> and N <sub>2</sub> O (E.5, 2016) (E.5, 2015) Comparability	Exclude the amount of non-combustible use of lubricants in railways from 1.A.3 transport and include it in the IPPU sector, category 2.D (lubricant use).	Resolved. Italy has indicated in the NIR (chapter 3.5.2) that non-energy use of lubricants is now reported under the IPPU sector, and the amount used in two-stroke engines is reported under road transport.
E.5	1.A.3.d Domestic navigation – liquid fuels – CO <sub>2</sub> , CH <sub>4</sub> and N <sub>2</sub> O (E.7, 2016) (E.7, 2015) Comparability	Estimate the amount of non-combustible use of lubricant in domestic navigation and include its CO <sub>2</sub> emission estimation in category 2.D.3 in order to improve the completeness and comparability of the reporting.	Resolved. There is no non-combustible use of lubricant allocated to domestic or international navigation in the 2018 submission. In line with the previous recommendation and the 2006 IPCC Guidelines, emission estimates from lubricants have been reported under IPPU instead of the energy sector, except those related to use in two-stroke engines in road transport (NIR, chapter 3.5.2, p.157).
E.6	1.B.2.c Venting and flaring – gaseous fuels – CH <sub>4</sub> (E.11, 2016) Accuracy	Revise the value of CH <sub>4</sub> emissions from 1.B.2.c.2 flaring – gas for 2014 to correct the error for flaring in production and processing.	Resolved. The error for 2014 for the CH <sub>4</sub> EF for flaring in production and processing was already corrected in the 2017 submission, as indicated in the 2017 NIR (chapter 3.9.5) and annex 12 of the 2018 NIR.
E.7	1.B.2.c Venting and flaring – liquid fuels – CO <sub>2</sub> , CH <sub>4</sub>	Report the correct value for the AD for flaring – oil production and improve the	Resolved. Italy indicated (annex 12 and NIR chapter 3.9) that AD in the CRF table have been corrected for the entire time series. There are no

<i>ID#</i>	<i>Issue and/or problem classification<sup>a, b</sup></i>	<i>Recommendation made in previous review report</i>	<i>ERT assessment and rationale</i>
	and N <sub>2</sub> O (E.12, 2016) Accuracy	QC by introducing a check to ensure the same AD are included for oil production in various parts of the CRF tables.	inconsistencies noted in the AD for oil production reported across CRF tables 1.B.2, which suggests the implementation of improved QC procedures.
E.8	International navigation – liquid fuels – CO <sub>2</sub> , CH <sub>4</sub> and N <sub>2</sub> O (E.8, 2016) (E.8, 2015) Transparency	Specify in CRF table 1.D the specific type(s) of liquid fuel consumed.	Resolved. In CRF table 1.D AD and emissions from other liquid fuels are reported as “NO”. Italy previously reported lubricants under this fuel type that are now reported under the IPPU sector (see ID# E.5 above).
IPPU			
I.1	2.A Mineral industry – CO <sub>2</sub> (I.13, 2016) (I.13, 2015) Adherence to the UNFCCC Annex I inventory reporting guidelines	Correct the error in the NIR on the allocation of CO <sub>2</sub> emissions from road paving and asphalt roofing.	Resolved. The relevant paragraph has been moved under the 2.D category description of the NIR (see chapter 4.5).
I.2	2.B.6 Titanium dioxide production – CO <sub>2</sub> (I.14, 2016) (I.14, 2015) Transparency	Include a detailed description of the methodology used to estimate emissions from titanium dioxide in the annual submission.	Resolved. The NIR (chapter 4.3.2, p.142) states that in Italy there is only one facility where this production occurs. Emissions are estimated according to the tier 2 approach and plant-specific data are used to develop the estimates. The plant operator supplies the amount of titanium dioxide produced and the emissions levels, so the average EF can be calculated and used for inventory purposes.
I.3	2.B.6 Titanium dioxide production – CO <sub>2</sub> (I.14, 2016) (I.2015) Transparency	Include a description of how European Pollutant Emission Register/EPRTTR and EU ETS methodologies correlate with the 2006 IPCC Guidelines for GHG emission estimation.	Resolved. CO <sub>2</sub> emissions from titanium dioxide production have been estimated on the basis of information supplied directly by the Italian manufacturer in the framework of the reporting obligation to the EPRTTR and the EU ETS register. In the NIR (chapter 4.3.2, p.142) the Party clarified that IPCC methodologies are referenced within the guidance documents as part of the methodologies to measure, calculate or estimate the information to the EPRTTR under which framework the operators provide data on titanium dioxide produced and CO <sub>2</sub> emission level. The information provided to the EU ETS relates only to boiler activity and hence not to process-related emissions.
I.4	2.D.2 Paraffin wax use – CO <sub>2</sub> (I.15, 2016) (I.15, 2015) Transparency	Include a description of the AD source for this category in the NIR.	Resolved. The NIR (chapter 4.5, p.158) states that in order to estimate CO <sub>2</sub> emissions for the whole time series it has been assumed that 65 per cent of the total amount of paraffin wax is destined to the manufacture of candles on account of information provided by the industrial association Assocandele in 2015. Paraffin wax consumption data are publicly available at the Ministry of Economic Development (Bollettino Petrolifero) website ( <a href="http://dgsaie.mise.gov.it/dgerm/bollettino.asp">http://dgsaie.mise.gov.it/dgerm/bollettino.asp</a> ).

<i>ID#</i>	<i>Issue and/or problem classification<sup>a, b</sup></i>	<i>Recommendation made in previous review report</i>	<i>ERT assessment and rationale</i>
I.5	2.E.1 Integrated circuit or semiconductor – HFCs, PFCs and SF <sub>6</sub> (I.16, 2016) (I.16, 2015) Transparency	Provide information in the NIR to present the correlation of the formula that is used to calculate the F-gas emissions from semiconductor manufacturing and the proposed tier 2a method in the 2006 IPCC Guidelines.	Resolved. The Party has indicated in the NIR (chapter 4.6.2, p.162) that F-gas emissions from semiconductor manufacturing are estimated using the tier 2a methodology of the 2006 IPCC Guidelines. Companies involved in semiconductor manufacturing provide annual data on consumption and emissions, calculated on the basis of the equation accepted by the World Semiconductor Council that combines the 2006 IPCC Guidelines equations 6.2, 6.3, 6.4, 6.5 and 6.6 and includes both direct and by-product emissions.
I.6	2.E.1 Integrated circuit or semiconductor – HFCs and SF <sub>6</sub> (I.17, 2016) (I.17, 2015) Consistency	Conduct an extrapolation of the estimates after 2001 in order to obtain the emissions for the period 1998–2000 and include these estimates in the inventory submission.	Resolved. The time series has been recalculated for the 2017 submission based on updated data from the producer for 1995. Gas-specific data are available for 1995 and from 2001 onwards. Chapter 4.6.5 of the 2017 NIR and chapter 4.6.2 of the 2018 NIR (p.163) explain that emissions of each gas for the period 1996–2000 have been estimated proportionally on the basis of the provided aggregated data taking into account their distribution in 1995 and 2001. Consumption data have been extrapolated for the missing years on the basis of the 2001 EFs (emissions gas <sub>i</sub> /consumption gas <sub>i</sub> ).
I.7	2.F. Product uses as substitutes for ozone depleting substances – HFCs (I.8, 2016) (I.8, 2015) (35, 2014) Accuracy	Provide information in the NIR to prove that a significant reduction in the leakage rates for F-gases occurred between 1999 and 2000.	Resolved. The NIR (chapter 4.7.2, p.168) explains that the leakage rates for the years since 2000 take into consideration the changes in technology which have been occurring in the manufacturing of the equipment concerned. The year 2000 has been taken as a turning point in terms of changes of technologies and good practice in refrigerants handling on the basis of the application of European Union regulation 2037/2000 (see European Commission regulation 2037/2000 on substances that deplete the ozone layer, available at <a href="https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=LEGISSUM%3A128064">https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=LEGISSUM%3A128064</a> ) that introduces the phase-out of chlorofluorocarbons, the phase-down of hydrochlorofluorocarbons and restrictions in handling these substances.
I.8	2.F.1 Refrigeration and air conditioning – HFCs (I.18, 2016) (I.18, 2015) Adherence to the UNFCCC Annex I inventory reporting guidelines	Correct the error in table 4.17 to distinguish clearly between commercial refrigeration and domestic refrigeration.	Resolved. The Party mentions in the NIR (chapter 4.7.2, p.166) that emissions from domestic refrigeration have been completely revised. Table 4.17 in the NIR clearly distinguishes between commercial refrigeration and domestic refrigeration.
I.9	2.F.3 Fire protection – HFCs (I.9, 2016) (I.9, 2015) (36, 2014) Accuracy	Implement the plans for collecting and updating AD for this category.	Addressing. The NIR (chapter 4.7.2, p.167) indicates that improvements have been made in the fire protection subcategory because of the revision of emission estimates, including emissions from HFC-125 and HFC-23. The European Association for Responsible Use of HFCs in Fire Fighting was

<i>ID#</i>	<i>Issue and/or problem classification<sup>a, b</sup></i>	<i>Recommendation made in previous review report</i>	<i>ERT assessment and rationale</i>
			contacted, as was the Consortium of fire protection systems, Clean Gas and Gastec Vesta, which provided information regarding AD and parameters to be used in the estimates. However, the contacted consortium is not the only consortium of fire protection in the country and expert judgment has been applied to ensure national coverage and that no underestimation occurs. The Party indicated that it is planning to investigate and to try to make a census of the fire protection system consortia.
I.10	2.F.3 Fire protection – HFCs (I.20, 2016) (I.20, 2015) Transparency	Correct the description in the expected trend of HFC emission estimates for the years 2010–2014 and explain that for these years the emissions are assumed to be constant and not decreasing.	Addressing. The NIR describes the expected trend of HFC emission estimates for the time series (chapter 4.7.2, p.167). However, a mistake was found in the statement on the period (2000–2005 instead of the correct 2005–2010) for which the assumption of a constant consumption of HFC-227ea was used.
I.11	2.F.4 Aerosols – HFCs (I.21, 2016) (I.21, 2015) Transparency	Include a description in the NIR of the methodology used to calculate the emission estimates for this category.	Resolved. The NIR (chapter 4.7.2, p.165) describes the methodology used to calculate the emissions estimates in line with tier 2a. Additionally, the NIR indicates the sources of AD and EFs, as well as the values of the leakage rate (percentage), average lifetime and recovery at decommissioning in line with equation 7.6 of the 2006 IPCC Guidelines.
I.12	2.G.1 Electrical equipment – HFCs, PFCs and SF <sub>6</sub> (I.12, 2016) (I.12, 2015) (34, 2014) Accuracy	Make contact with the treatment centres to verify that the recovery rate can be assumed to be 100 per cent.	Resolved. Recovery and disposal rates have been verified with the electrical companies association (ANIE) and reported in the NIR (chapter 4.8, p.175).
<b>Agriculture</b>			
A.1	3.A.1 Cattle – CH <sub>4</sub> (A.4, 2016) (A.4, 2015) Transparency	Provide more information on the Nitrogen Balance Inter-regional Project research results (including breeding performance, food consumption and composition of rations and digestibility) in the NIR to confirm country-specific Y <sub>m</sub> values for non-dairy cattle.	Resolved. Relevant information on the Nitrogen Balance Inter-regional Project research results were provided in the NIR (chapter A7.1), and the table therein included information on the specific feed rations. For a follow-up finding relating to the provided justification see ID# A.10 in table 6.
A.2	3.B Manure management – CH <sub>4</sub> (A.5, 2016) (A.5, 2015) Transparency	Include the results of the new survey on digesters in the submission.	Resolved. Relevant information on the amount of biogas flared has been collected and included in the emission estimates. Detailed information and data by the national electricity network Terna and CRPA is contained in the NIR (chapter A7.2).
A.3	3.B Manure management – CH <sub>4</sub> (A.6, 2016) (A.6, 2015) Adherence to the UNFCCC Annex I	Correct the error in the reporting of an MCF in table 3.B(a)s2 for 1990 and fill the cells with the correct notation keys.	Resolved. The error in CRF table 3.B(a)s2 for 1990 has been corrected and the notation key “NA” is used in table 3.B(a)s2, as relevant.

<i>ID#</i>	<i>Issue and/or problem classification<sup>a, b</sup></i>	<i>Recommendation made in previous review report</i>	<i>ERT assessment and rationale</i>
	inventory reporting guidelines		
A.4	3.B.5 Indirect N <sub>2</sub> O emissions – N <sub>2</sub> O (A.7, 2016) (A.7, 2015) Transparency	Make efforts to obtain information on the N losses due to leaching and run-off during manure storage.	Resolved. N losses due to leaching and run-off during manure storage are reported in CRF table 3.B(b) for the entire time series.
A.5	3.B.5 Indirect N <sub>2</sub> O emissions – N <sub>2</sub> O (A.7, 2016) (A.7, 2015) Accuracy	Improve the accuracy of reporting indirect N <sub>2</sub> O emissions from manure management in accordance with the 2006 IPCC Guidelines for manure management and the methodological description in the NIR.	Resolved. The accuracy was improved by revising indirect N <sub>2</sub> O emissions from manure management and reporting separate estimates for N <sub>2</sub> O emissions from leaching and run-off in line with the 2006 IPCC Guidelines. The methodological description in the NIR has been improved (see chapter 5.3, pp.198–199) consequently.
A.6	3.D.b Indirect N <sub>2</sub> O emissions from managed soils – N <sub>2</sub> O (A.9, 2016) (A.9, 2015) Transparency	Include information on the value used for Frac <sub>LEACH-(H)</sub> in the NIR.	Resolved. Information on Frac <sub>LEACH-(H)</sub> value is provided in the NIR (chapter 5.5.2, p.212).
A.7	3.G Liming – CO <sub>2</sub> (A.10, 2016) (A.10, 2015) Accuracy	Estimate emissions from limestone and dolomite application separately and confirm the amount of lime and dolomite for liming.	Resolved. AD and CO <sub>2</sub> emissions from limestone and dolomite application are reported separately in CRF table 3.G-I. Additional information has been collected from the industry on the amount of dolomite and limestone applied, and the weighted average EF has been used to estimate emissions (see NIR chapter 5.7).
<b>LULUCF</b>			
L.1	4. General (LULUCF) (L.3, 2016) (L.4, 2015) (55, 2014) Comparability	Use the notation key “NA” when a tier 1 zero stock change method is used referring to soil organic carbon pools for forest land remaining forest land.	Resolved. Italy uses the notation key “NA” when a tier 1 zero stock change method is applied to estimate the soil organic carbon pool for the subcategories stands, plantations, coppices and rupicolous/riparian under forest land remaining forest land.
L.2	4.A Forest land – CO <sub>2</sub> (L.5, 2016) (L.5, 2015) (56, 2014) Transparency	Document the For-est model validations in the NIR.	Addressing. Verification activities have been carried out by independent researchers (i.e. comparison of the model results versus NFI data (Tabacchi et al., 2010), comparison among NFI current increment data and For-est model current increment data), as indicated in the 2016 NIR and the 2018 NIR (chapter 6.2.6), but those are not documented in the NIR (e.g. the correction of the recent errors in the code of the model). Italy further explained during the review that the full validation of the model used for the forest land estimations had not yet been done owing to the unavailability of the data from the second phase (ground visit and attributes collection, currently ongoing) of the third NFI, which is expected to release data by the end of 2019.
L.3	4.A Forest land – CO <sub>2</sub>	Use 2005 NFI data to initiate model estimates	Resolved. The Party considers it more appropriate to use the latest NFI (2015), but the full analysis of

<i>ID#</i>	<i>Issue and/or problem classification<sup>a, b</sup></i>	<i>Recommendation made in previous review report</i>	<i>ERT assessment and rationale</i>
	(L.5, 2016) (L.5, 2015) (56, 2014) Transparency	until such time as the new inventory data become available.	the data is not yet available. At the moment, the model input data for the forest area, per region and inventory typologies, are from the available Italian forest inventories (1985 NFI, 2005 NFI), while the data from the first phase of the 2015 NFI were used for forest area assessment.
L.4	4.A Forest land – CO <sub>2</sub> (L.6, 2016) (L.6, 2015) (57, 2014) Transparency	Provide in the NIR documentation summarizing harvest removals from short-rotation crops, coppices and high forest categories so that drivers influencing trends in biomass stock changes can be made more evident.	Resolved. Figure 6.3 (chapter 6.2.4) has been added to the NIR with disaggregated information on harvest for stands, coppices and plantations.
L.5	4.A Forest land – CO <sub>2</sub> (L.7, 2016) (L.7, 2015) (58, 2014) Transparency	Provide definitions and thresholds for carbon pools in a table in the NIR.	Addressing. Chapter 6.2.4 of the NIR now includes a box on carbon pools and ecosystem components in the NFI surveys with information on different pools and relative thresholds. However, the NIR does not include documentation on the definitions of the pools (e.g. the diameter threshold for deadwood and how this pool is differentiated from litter, which soil horizons are included in the soil pool and which pool contains the humus layer).
L.6	4.C.1 Grassland remaining grassland – CO <sub>2</sub> (L.13, 2016) (L.13, 2015) Accuracy	Include the subset of “improved grazing” land in the CRF tables and the NIR under the Convention while the new information is becoming available.	Addressing. No disaggregation under the subcategory grazing lands is provided for improved grazing (organic and non-organic) in table 4.C, although improved grazing is reported under the Kyoto Protocol (table 4(KP-I)B.3), as a fraction of grazing lands in mineral soils. Italy is undertaking verification to disaggregate organic grazing from 1990 to 1998 (data are only available from 1999 onwards) to be able to report the disaggregated subset under the Convention for the complete time series.
L.7	4(I) Direct N <sub>2</sub> O emissions from N inputs to managed soils –N <sub>2</sub> O (L.10, 2016) (L.10, 2015) (62, 2014) Comparability	Report direct N <sub>2</sub> O emissions from N fertilization as “IE” and transparently explain that these emissions are reported under the agriculture sector (with a cross reference to the relevant section in the NIR).	Resolved. Italy reports direct N <sub>2</sub> O emissions from N fertilization as “IE” in CRF 4(I) and an explanation is provided in the NIR (chapters 5.5.2 and 6.8) and CRF table 9. The Party indicated that only short-rotation forest plantations are subjected to fertilization. But Italy is not able to disaggregate the national statistics on the amount of fertilizer applied to short-rotation plantations. This explanation is not included in the documentation box of table 4(I), but in the relevant cells of the table and in CRF table 9.
<b>Waste</b>			
W.1	5.A.1 Managed waste disposal sites – CH <sub>4</sub> (W.2, 2016) (W.2, 2015) Consistency	Develop a continuous time series of the CH <sub>4</sub> generation constant instead of using the step function variation over the relevant periods.	Resolved. The Party changed CH <sub>4</sub> generation constants in line with the 2006 IPCC Guidelines and taking into account the changes in climatic conditions in Italy. Information on the applied approach is included in the NIR (chapter 7.2).

<i>ID#</i>	<i>Issue and/or problem classification<sup>a, b</sup></i>	<i>Recommendation made in previous review report</i>	<i>ERT assessment and rationale</i>
W.2	5.A.1 Managed waste disposal sites – CH <sub>4</sub> (W.3, 2016) (W.3, 2015) Transparency	Make the necessary changes to the degradable organic carbon fraction in CRF table 5.A to improve the consistency between the NIR and the CRF tables.	Resolved. The relevant CRF table 5.A was corrected to report the fraction of degradable organic carbon that decomposes (50.0 per cent) instead of the value of degradable organic carbon, consistent with the data reported in the NIR (chapter 7.2.2, p.283).
W.3	5.A.2 Unmanaged waste disposal sites – CH <sub>4</sub> (W.4, 2016) (W.4, 2015) Transparency	Provide information supporting implementation of legal reforms to reduce to zero the amount of waste deposited in unmanaged landfills, together with an illustration of the trend in the decrease of waste deposited in unmanaged landfills.	Resolved. Italy provided additional information on the legal provisions leading to the abolishment of unmanaged landfills (see chapter 7.2 of the NIR). The trend in municipal solid waste production and disposal is illustrated in the NIR (table 7.2).
W.4	5.C.1 Waste incineration – CO <sub>2</sub> (W.1, 2016) (W.1, 2015) (66, 2014) Accuracy	Apply the time-series carbon content as well as fossil carbon fraction in line with the variation of the waste compositions, and report thereon.	Not resolved. Italy is not yet considering the time-series carbon content as well as fossil carbon fraction in line with the variation of the waste compositions in the estimates for the category. The NIR (chapter 7.4.6) provides information on the future improvement plan related to this issue. The ERT believes that future ERTs should consider this issue further to ensure that there is not an underestimation of CO <sub>2</sub> emissions from this category.
KP-LULUCF			
KL.1	Article 3.4 activities – CO <sub>2</sub> (KL.2, 2016) (KL.2, 2015) Accuracy	Include transparent and verifiable information that demonstrates that the litter pool and deadwood pools for CM and above-ground biomass, below-ground biomass, litter, deadwood pool for grassland management are not net sources, as stated in the annex to decision 2/CMP.7, and change the notation key from “NO” to “NE”.	Not resolved. Some of the notation keys have been changed for the litter pool and deadwood pools for cropland and grassland management. No further information is provided that demonstrates that these pools are not net sources, as stated in decision 2/CMP.7, annex, paragraph 26. According to the NIR (chapter 9.5.3), Italy assumes that the pools are in equilibrium when applying tier 1 methodologies in annual croplands and grasslands.
KL.2	Forest management – CO <sub>2</sub> (KL.3, 2016) (KL.3, 2015) Transparency	Complete CRF table 4(KP-I)B.1.1 to include the FMRL as included in the appendix to the annex to decision 2/CMP.7.	Resolved. The FMRL value as per the appendix to the annex to decision 2/CMP.7 is included in table 4(KP-I)B1.1.

<sup>a</sup> References in parentheses are to the paragraph(s) and the year(s) of the previous review report(s) where the issue and/or problem was raised. Issues are identified in accordance with paragraphs 80–83 of the UNFCCC review guidelines and classified as per paragraph 81 of the same guidelines. Problems are identified and classified as problems of transparency, accuracy, consistency, completeness or comparability in accordance with paragraph 69 of the Article 8 review guidelines, in conjunction with decision 4/CMP.11.

<sup>b</sup> The review of the 2017 annual submission of Italy did not take place during 2017 and as such, the 2017 annual review report was not available at the time of this review. Therefore, the recommendations reflected in table 3 are taken from the 2016 annual review report. For the same reason, the year 2017 is excluded from the list of years in which the issue has been identified.



#### 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 2018 annual submission of Italy, and have not been addressed by the Party.

Table 4

##### Issues identified in three successive reviews and not addressed by Italy

<i>ID#</i>	<i>Previous recommendation for the issue identified</i>	<i>Number of successive reviews issue not addressed<sup>a</sup></i>
General	No such general issues were identified	
Energy	No such issues for the energy sector were identified	
IPPU	No such issues for the IPPU sector were identified	
Agriculture	No such issues for the agriculture sector were identified	
LULUCF		
L.2	Document the For-est model validations in the NIR	3 (2014–2018)
L.5	Provide definitions and thresholds for carbon pools in a table in the NIR	3 (2014–2018)
Waste		
W.4	Apply the time-series carbon content as well as fossil carbon fraction in line with the variation of the waste compositions, and report thereon	3 (2014–2018)
KP-LULUCF	No such issues for KP-LULUCF activities were identified	

<sup>a</sup> The review of the 2017 annual submission of Italy did not take place during 2017. Therefore, the year 2017 is not taken into account when counting the number of successive years in table 4. In addition, as the reviews of the 2015 and 2016 annual submissions were held in conjunction with each other, they are not considered “successive” years and 2015/2016 is considered as one year.

#### V. Additional findings made during the individual review of the 2018 annual submission

10. Tables 5 and 6 contain findings made by the ERT during the individual review of the 2018 annual submission of Italy that are additional to those identified in table 3. In accordance with paragraph 76(b) of the UNFCCC review guidelines, the ERT has prioritized in table 5 recalculations that changed the total emissions/removals for a category by more than 2 per cent and/or national total emissions by more than 0.5 per cent for any of the recalculated years.

1.

Table 5

**Additional findings made during the individual review of the 2018 annual submission of Italy related to recalculations**

ID#	Finding classification	Description of the finding with recommendation or encouragement	<i>Is finding an issue and/or a problem?<sup>a</sup> If yes, classify by type</i>
<b>Energy</b>			
E.9	1.A Fuel combustion – sectoral approach – CO <sub>2</sub> , CH <sub>4</sub> and N <sub>2</sub> O	<p>In many cases recalculations in the energy sector were explained with the update of the energy conversion factors in accordance with the international statistics and due to changes in fuel consumption in accordance with the data provided to the joint questionnaire compiled by the Organisation for Economic Co-operation and Development, IEA and Eurostat. However, the information provided in the NIR does not specify the fuels and years affected by the changes. During the review, Italy explained that, up to the 2016 submission, the value used to convert Tcal to TJ was 4.18398, and from the 2017 submission it was changed to 4.1868 for comparability with Eurostat and IEA energy data. This change affected the whole time series. With regard to the AD submitted to Eurostat and IEA, some have been updated and are different from those published in the national energy balances (in general not updated for the time series) resulting in spot changes for some years and for some fuels.</p> <p>The ERT recommends that the Party clearly justify the recalculation in the NIR in line with paragraph 44 of the UNFCCC Annex I inventory reporting guidelines, explaining the choice of change of AD across years, as well as the fuels and years affected by the recalculations.</p>	Yes. Transparency
E.10	1.A.3.b Road transportation – liquid fuels – CH <sub>4</sub> and N <sub>2</sub> O	<p>The Party has reported recalculations for the energy sector for the period 1990–2015. The ERT observed a large range of differences in N<sub>2</sub>O emissions, particularly for the period 1996–2004 (drops of emissions between 20.8 and 59.7 per cent), as well as a reduction in CH<sub>4</sub> emissions of about 6–7 per cent annually over the period 1994–2004. During the review, the Party explained that the large differences in the recalculations for the period 1996–2004 were due to changing the model from COPERT version 4.11.4 (September 2016) to COPERT version 5.1 (December 2017), which involved different steps in the updating process and resulted in substantial changes in the estimation model structure. In particular the differences outlined are due to the differences in the EFs for the gasoline catalysed passenger car categories until 2004. Regarding N<sub>2</sub>O, the Party explained that the emissions are also linked to the use of after-treatment devices, such as catalytic converters. Therefore, the observed differences are particularly due to the updated fuel specification values, considering that in the model, fuel advanced specifications are based on the four reference years 1996, 2000, 2005 and 2009, explaining also the jump between 2004 and 2005.</p> <p>The ERT recommends that the Party include in the NIR a discussion on the impact of the application of COPERT version 5.1 on the trend in CH<sub>4</sub> and N<sub>2</sub>O emissions at the category and sectoral level, also specifying the different drivers behind the trends (e.g. the introduction of abatement devices) and any significant inter-annual changes.</p>	Yes. Transparency
<b>IPPU</b>			
I.13	2. General (IPPU)	<p>Recalculations were made to the IPPU sector that changed the emission/removal estimate for a category by more than 2 per cent and/or national total emissions by more than 0.5 per cent; however, the ERT did not identify any issues or problems with these recalculations.</p>	Not an issue/problem

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem? <sup>a</sup> If yes, classify by type
<b>Agriculture</b>			
A.8	3. General (agriculture)	Recalculations were made to the agriculture sector that changed the emission/removal estimate for a category by more than 2 per cent and/or national total emissions by more than 0.5 per cent; however, the ERT did not identify any issues or problems with these recalculations.	Not an issue/problem
<b>LULUCF</b>			
L.8	4. General (LULUCF)	<p>The ERT noted that the rationale for the recalculations reflected in the CRF tables is poorly described in the corresponding sections of the NIR. The category-specific chapters of the NIR indicate only minor recalculations for grassland, biomass burning and HWP due to updating AD and correcting errors. For the categories without recalculation, standard text is used but in some cases it erroneously makes the comparison with the 2016 submission (e.g. chapter 6.6.7 of the NIR). At the same time, table 8.1 on recalculations shows no recalculations in the sector, while the explanatory text in chapter 8.4.1 of the NIR indicates that all sectors were involved in changes owing to updates of AD and some EFs, and further specifies that for the LULUCF sector AD have been updated and errors corrected as a result of the implementation of the For-est model.</p> <p>The ERT recommends that Italy report more detailed explanatory information and a justification of recalculations in the NIR in line with paragraph 44 of the UNFCCC Annex I inventory reporting guidelines (e.g. providing information on the updated AD and/or on errors corrected in the models used). The ERT further recommends that the Party ensure that the NIR contains up-to-date and consistent information on recalculations applied in the sector. The ERT encourages the Party to include a discussion on the impact of the recalculations on the trend of the CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O emissions at the category and sectoral levels.</p>	Yes. Transparency
<b>Waste</b>			
W.5	5. General (waste)	Recalculations were made to the waste sector that changed the emission/removal estimate for a category by more than 2 per cent and/or national total emissions by more than 0.5 per cent; however, the ERT did not identify any issues or problems with these recalculations.	Not an issue/problem
<b>KP-LULUCF</b>			
KL.3	General (KP-LULUCF)	Recalculations made to KP-LULUCF activities changed the emission/removal estimate for a category by more than 2 per cent and/or national total emissions by more than 0.5 per cent; however, the ERT did not identify any issues or problems with these recalculations.	Not an issue/problem

<sup>a</sup> Recommendations made by the ERT during the review are related to issues as defined in paragraph 81 of the UNFCCC review guidelines, or problems as defined in paragraph 69 of the Article 8 review guidelines. Encouragements are made to the Party to address all findings not related to such issues or problems.

11. Table 6 contains additional findings made by the ERT during the individual review of the 2018 annual submission that are not covered in table 3 or 5, but are within the scope of the desk review as specified in paragraph 76 of the UNFCCC review guidelines or paragraph 65 of the Article 8 review guidelines and are findings that the ERT wishes to convey to the Party.

Table 6  
Additional findings made during the individual review of the 2018 annual submission of Italy

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem? <sup>a</sup> If yes, classify by type
General			
G.2	NIR	<p>The ERT noted that the link provided to the <i>Procedures Manual of the Quality Assurance/Quality Control plan for the Italian Emission Inventory</i> and the annual <i>QA/QC Plan for the Italian Emission Inventory</i> included in the NIR (chapter 1.6, p.41) could not be accessed with all browsers and browser versions. Italy provided an alternative direct link (<a href="http://www.isprambiente.gov.it/files/pubblicazioni">http://www.isprambiente.gov.it/files/pubblicazioni</a>) which allowed access to the documents during the review. When questioned about the different publication dates of the referenced <i>Procedures Manual of the Quality Assurance/Quality Control plan</i> in the NIR and on the provided website, Italy explained that the website mentioned in the NIR (provides information sometimes before the official publication, while the site <a href="http://www.isprambiente.gov.it/files/pubblicazioni">http://www.isprambiente.gov.it/files/pubblicazioni</a> provides the final version of the documents.</p> <p>The ERT encourages Italy to ensure that links to external references used in the NIR are easily accessible by various users and to provide the most up-to-date document version of the QA/QC plan for the Italian emissions inventory.</p>	Not an issue/problem
G.3	NIR	<p>The ERT noted that table 1.1 of the NIR (p.34) presents the main AD and sources for the Italian emission inventory in the sectoral structure of the inventory categories as per the Revised 1996 IPCC Guidelines (e.g. solvent and other product use is presented as sector 3). Similar inclusion of solvents and other product use is also noted in the QA/QC plan for the Italian emission inventory. During the review the Party explained that the table is not meant to present the Revised 1996 IPCC Guidelines sectoral structure as such and that it will be updated to avoid any misunderstandings.</p> <p>The ERT recommends that Italy ensure as part of its QA/QC processes that table 1.1 of the NIR, as well as the QA/QC plan are updated to be consistent with the latest UNFCCC Annex I inventory reporting guidelines when referring to IPCC sectors and categories.</p>	Adherence to the UNFCCC Annex I inventory reporting guidelines
Energy			
E.11	1.A Fuel combustion – sectoral approach – all fuels – CH <sub>4</sub> and N <sub>2</sub> O	<p>The NIR (chapter 3.2, p.71) indicates that “in response to the review process of the Initial report of the Kyoto Protocol, N<sub>2</sub>O and CH<sub>4</sub> stationary combustion emission factors were revised, in the 2006 submission, for the whole time series taking into account default IPCC (IPCC, 1997; IPCC, 2000) and CORINAIR emission factors (EMEP/CORINAIR, 2007).” Questioned on the relevance of the statement in the context of the 2018 submission, Italy provided information on the comparison made, indicating that it is made with the EFs from the 2006 IPCC Guidelines for the 2018 submission.</p>	Not an issue/problem

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem? <sup>a</sup> If yes, classify by type
		The ERT encourages Italy to ensure that the NIR contains up-to-date references and considers that including a table with the CH <sub>4</sub> and N <sub>2</sub> O country-specific EFs compared to the IPCC/CORINAIR default EFs as provided to the ERT during the review would further increase the transparency of the reporting in the NIR.	
E.12	1.A.1.a Public electricity and heat production – biomass – CO <sub>2</sub> , CH <sub>4</sub> and N <sub>2</sub> O	The NIR (chapter 3.1, p.66) explains that the emissions from landfill gas recovered and used for heating and power in commercial facilities are reported under category 1.A.4.a, biomass. However, given the increasing share of waste used to produce electricity, the Party plans to revise the allocation of emissions from incineration with energy recovery under category 1.A.1.a. When asked by the ERT to provide information on the misallocation of the emissions between categories 1.A.4 and 1.A.1.a, Italy explained that there is no robust method for estimating the fraction of electricity generated from the waste energy wheeled to the public grid and only data for 2010 are available, showing that in that year the gross electricity production by urban waste incinerators was 3,887 GWh (net 3,190 GWh) and the share sent to the network was 121 GWh, which can be considered negligible.  The ERT encourages Italy to report on its progress with the planned reallocation of emissions across the energy sector for the purpose of comparability, given the increasing share of emissions from the urban incinerators supplied to the grid.	Not an issue/problem
E.13	1.A.1.c Manufacture of solid fuels and other energy industries – biomass – CH <sub>4</sub>	In the NIR (chapter 3.3.3.1) Italy reported that CH <sub>4</sub> emissions from charcoal production are not accounted because of a lack of methodology in the 2006 IPCC Guidelines applicable to the type of furnace technology in use. However, in CRF table 1.A(a)s1, “NO” has been used, suggesting CH <sub>4</sub> emissions do not occur in Italy. During the review the Party stated that in the next submission the notation key “NE” will be appropriately used in the CRF table to ensure consistency between the CRF table and the NIR.  The ERT recommends that Italy use the appropriate notation key for emissions from charcoal production and provide justification for the use of “NE” in the NIR and CRF table 9.	Yes. Comparability
E.14	1.A.3.b Road transportation – liquid fuel – CO <sub>2</sub> , CH <sub>4</sub> and N <sub>2</sub> O	The ERT noted that chapter 3.5.3.2 of the NIR defines the method used to estimate emissions from road transportation, referring both to a national methodology and to the COPERT model (version 5.1). At the same time, CRF table summary 3 indicates the approaches used for transport as T1, T2 and T3. During the review, Italy explained that until the 2017 submission, a country-specific model was applied for the vehicle category compressed natural gas passenger cars. Nevertheless, in the 2018 submission, COPERT version 5.1 with its updated classification of the fleet is the reference model for all vehicle categories.  The ERT recommends that Italy update its NIR, clarifying that the COPERT methodology is used for the entire category and that country specificities are taken into account in the model in line with the tier 3 method of the 2006 IPCC Guidelines.	Yes. Transparency
IPPU			
I.14	2.A.4 Other process uses of	The ERT noticed significant inter-annual changes in the AD for other (other process uses of carbonates, 2.A.4.d), including 2001/2002 (38.7 per cent), 2010/2011 (31.7 per cent), 2011/2012 (–37.7 per cent), 2012/2013 (45.5 per cent) and 2015/2016 (–35.4 per cent). The category includes emissions from carbonates used in pulp and paper and in power plants. During the review, Italy explained that the emission trend is driven by the trend of using carbonates in power	Yes. Accuracy

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem? <sup>a</sup> If yes, classify by type
	carbonates – CO <sub>2</sub>	<p>plants as reported under the EU ETS and indicated that an error has been found for both emissions and AD in 2012 and that it will be corrected in the 2019 submission.</p> <p>The ERT recommends that the Party correct the 2012 AD and CO<sub>2</sub> emission values reported for the use of carbonates in power plants.</p>	
I.15	2.A.4 Other process uses of carbonates – CO <sub>2</sub>	<p>Significant variations in the emissions from carbonate use in pulp and paper and in power plants are reported in the last years of the time series. In particular, a large drop in AD and emissions is noted from 2015 to 2016 (emissions decreased from 156.97 kt CO<sub>2</sub> to 101.58 kt CO<sub>2</sub>, which is a decrease of 35.4 per cent). The NIR has not explained the reason behind the inter-annual change. During the review, Italy explained that the AD are based on data provided by operators in the framework of the EU ETS and the reduction in carbonate use in power plants in 2016 is due to the reduced energy production in three coal-fuelled power plants. In total the three plants produced 20,436,912 MW in 2015 and 13,407,521 MW in 2016; consequently, they reduced the use of calcium carbonate from 211,640 t in 2015 to 97,599 t in 2016.</p> <p>The ERT recommends that the Party improve the transparency of reporting on the emissions from carbonate use by providing information on the AD and any significant changes in the trend at the subcategory level in the NIR.</p>	Yes. Transparency
Agriculture			
A.9	3. General (agriculture) – CH <sub>4</sub> , N <sub>2</sub> O	<p>In the NIR (chapter 5.5.2, p.209) Italy states that when estimating the amount of animal manure N applied to soils “the amount of nitrogen from bedding materials is considered”. The Party further states that “in the estimation of N<sub>2</sub>O emissions from crop residues, the total amount of residues has been considered, without deducting the fraction removed for purposes such as feed, bedding and construction. Therefore, the data were revised using the fixed residues/removable residues ratio for each crop considered (ENEA, 1994), also used to estimate the emissions from category 3F (see para. 5.6.2)” (NIR, chapter 5.5.4, p.214). Finally, the Party states that among the parameters taken into account for estimating emissions from field burning of agricultural residues was the “amount of ‘fixed’ residues (t), estimated with annual crop production, removable residues/product ratio, and ‘fixed’ residue/removable residues ratio” (NIR, chapter 5.6.2, p.216). Based on this information the ERT found it difficult to assess where the N in bedding material (or the bedding material as such) has been accounted for and where it has not. During the review, Italy provided further clarification, including an Excel spreadsheet that allows a detailed assessment of the consideration of bedding material in the different emission categories. Based on this information, the ERT considers the method applied accurate and commends Italy for the detailed approach.</p> <p>The ERT recommends that Italy improve the description of the consideration of bedding material in the estimates for the categories animal manure applied to soils (3.D.a.2.a), crop residues (3.D.a.4) and field burning of agricultural residues in the NIR. The ERT encourages the Party to consider developing a flow chart and the use of clear terminology in this respect.</p>	Yes. Transparency

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem? <sup>a</sup> If yes, classify by type
A.10	3.A.1 Cattle – CH <sub>4</sub>	<p>Italy uses an average <math>Y_m</math> of 4.35 per cent for non-dairy cattle (CRF table 3.As1, 2016). This value is the second lowest compared with all other Parties (range 0.07–7.88 per cent). In annex 7 to the NIR Italy explains that “the rations consist mainly of silage and cereals and for fattening animals, the ration has been assumed more digestible”. Furthermore, the NIR explains (annex 7, p.474) that the lower default values of the <math>Y_m</math> (from the 2006 IPCC Guidelines) have been assigned to certain categories. However, the 2006 IPCC Guidelines distinguish only two values of <math>Y_m</math> in table 10.12 for non-dairy cattle, of which the lower (3 per cent) should only be used “when fed diets contain 90 percent or more concentrates”. The ERT considers that this prerequisite is not fulfilled in this case. Furthermore, the 2006 IPCC Guidelines allow using the lower bound of the range provided for “other cattle and buffaloes that are primarily fed low quality crop residues and by-products” when “good feed is available”. The respective value for the lower bound would be 5.5 per cent. Consequently, the ERT could not fully assess how the Italian <math>Y_m</math> for non-dairy cattle given in NIR table 5.5, in particular the values for non-dairy cattle &lt;1 year (4.0 per cent), 1–2 years male for breeding (4.5 per cent), 1–2 years for slaughter (4.0 per cent) and 1–2 years female for slaughter (4.0 per cent), were derived from the default values in table 10.12 of the 2006 IPCC Guidelines. During the review, Italy provided further explanation and supporting documentation (see Ellis et al. (2007)). Particularly, Italy could demonstrate that, given the specific feed ratios, the <math>Y_m</math> values should be in the range applied by the Party by using prediction equations for the CH<sub>4</sub> production of beef cattle from Ellis et al. (2007). The ERT thus considers that the <math>Y_m</math> values used by Italy are sufficiently supported.</p> <p>The ERT recommends that Italy transparently demonstrate in the NIR that the <math>Y_m</math> values for all non-dairy cattle subcategories are accurate by providing sufficient scientific evidence for the country-specific values (e.g. referring to the prediction equations in Ellis et al. (2007)).</p>	Yes. Transparency
A.11	3.B Manure management – CH <sub>4</sub>	<p>Table 5.13 of the NIR (p.195) provides the distribution of animals in temperate and cool climate zones. Percentage values are given in two columns, once as “% animals” (consistent with values in CRF table 3.B(a)s1) and once as “% animals: Based on temperature non weighted by % animals”. The two values differ significantly. During the review, Italy clarified that the values in the first column (“% animals”) are more appropriate since the average provincial temperature was calculated as the average of the temperatures weighed with the percentage of the heads in the different altimetric areas.</p> <p>The ERT commends Italy for the sophisticated method used for animal distribution analysis and encourages the Party to describe the difference between the two climate-zone assessments in detail in the NIR and/or to increase transparency by only referring to the more accurate distribution of climate zones.</p>	Not an issue/problem
A.12	3.B Manure management – CH <sub>4</sub>	<p>Italy uses an MCF of 1.13–1.14 per cent for animal manure digested in anaerobic digesters and provides detailed information in annex 7 (chapter A7.2) of the NIR. Italy also explains (chapter 5.3.2) that CH<sub>4</sub> emissions from anaerobic digestion of manure are estimated based on the biogas produced. Values for MCF and <math>B_o</math> are then calculated backwards using equation 10.23 of the 2006 IPCC Guidelines and the estimated amount of volatile solids used as feedstock for the digesters. Accordingly, MCF and <math>B_o</math> are not directly used for emission calculation but only calculated for reporting purposes. Based on the information contained in the NIR and the CRF tables, the ERT found it difficult to reconstruct the values in CRF tables 3.B(a)s1 and 3.B(a)s2. Part of the problem is that the values provided by Italy in the CRF</p>	Not an issue/problem

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem? <sup>a</sup> If yes, classify by type
		<p>tables are weighted averages and not all assumptions and parameters are described in the NIR. During the review, Italy provided further information on this issue, including a spreadsheet that facilitates comprehension of the approach used. The ERT considers the emission estimates accurate and commends Italy for the detailed approach.</p> <p>The ERT encourages Italy to improve transparency on the reporting of CH<sub>4</sub> emissions from digesters, in particular by providing clear and concise information (assumptions made, parameters used) on how the weighted average values for MCF and B<sub>0</sub> reported in the CRF tables were estimated.</p>	
A.13	3.B Manure management – CH <sub>4</sub> and N <sub>2</sub> O	<p>Italy uses in its inventory a share of manure excreted on pasture, range and paddock of approximately 5 per cent for dairy cattle (NIR, p.184; CRF table 3.B(a)s2) and a respective share for non-dairy cattle that is even lower (e.g. 2.5 per cent for the cool climate region for 2016; CRF table 3.B(a)s2). These values are among the lowest reported by Parties (range 2.9–69.9 for the cool climate region for 2016). During the review, Italy explained that for dairy cattle reared in mountain areas (above 600 m) the share of manure directly excreted during grazing was estimated as 5 per cent by the MeditAIRaneo project (CRPA, 2006) and that this assessment was confirmed by the 2010 General Agricultural Census. The same value was assumed for other females in the category non-dairy cattle while no grazing was assumed for males. The ERT considers that the country-specific values are based on best available national statistics and therefore as accurate as the current livestock data assessment permits.</p> <p>The ERT encourages Italy to reassess the share of manure directly excreted on pasture, range and paddock for dairy cattle and non-dairy cattle or to provide further information that supports the current values in the NIR (e.g. information on general cattle husbandry practices).</p>	Not an issue/problem
A.14	3.B Manure management – N <sub>2</sub> O	<p>Italy lists in the NIR (p.182) the key categories in the agriculture sector, where indirect N<sub>2</sub>O emissions from manure management are indicated as a key category by level in approach 2 when excluding the LULUCF sector, while direct N<sub>2</sub>O emissions from manure management are not identified as a key category. During the review, Italy explained that the indirect N<sub>2</sub>O emissions from manure management are a key category at level assessment only taking account of the relevant uncertainty, which is assumed for the indirect N<sub>2</sub>O EFs much higher than for the direct N<sub>2</sub>O EFs.</p> <p>The ERT encourages Italy to further clarify the key category assessment in the agriculture sector by highlighting in the NIR that indirect N<sub>2</sub>O emissions from manure management are a key category primarily due to the high uncertainty of the EFs.</p>	Not an issue/problem
A.15	3.B.5 Indirect N <sub>2</sub> O emissions – N <sub>2</sub> O	<p>Italy assumes a Frac<sub>leachMS</sub> of 1 per cent (NIR table 5.17). However, according to the same table Frac<sub>leachMS</sub> is applied on the amount of N after the N volatilized from manure management is subtracted. The ERT considers that this is not in line with equation 10.28 in the 2006 IPCC Guidelines. During the review, Italy explained that according to the national legislation, storage systems avoiding N leaching are adopted. Nevertheless, manure heaps near the field are permitted for limited times after storage. Leaching of N during manure management is thus restricted to these manure heaps after storage. The ERT considers that the approach used by Italy to apply Frac<sub>leachMS</sub> on the amount of N after the N</p>	Yes. Transparency



ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem? <sup>a</sup> If yes, classify by type
		<p>volatilized from manure management is subtracted is correct, because most N will already be volatilized before installing the manure heaps near the field.</p> <p>The ERT recommends that Italy describe the approach used when estimating the amount of N lost from leaching during manure management in the NIR, particularly with respect to the default methodology suggested by equation 10.28 in the 2006 IPCC Guidelines.</p>	
LULUCF			
L.9	4.A.1 Forest land remaining forest land – CO <sub>2</sub>	<p>The ERT noted that in chapter 6.2.8, Italy indicates an update in the For-est model. However, the NIR contains no details on the For-est model (see Federici et al. (2008)) other than an overall presentation and literature reference to it and no information on its latest updates indicated by the Party.</p> <p>The ERT recommends that Italy include a summary on the For-est model in an annex to the NIR, together with information on its verification and regular updates.</p>	Yes. Transparency
L.10	4.A.2 Land converted to forest land – CO <sub>2</sub>	<p>The ERT noted that the other wooded land stratum reported in CRF table 4.C under the subcategory grassland remaining grassland corresponds to scrublands according to the explanation in the NIR (chapter 6.2.2). The only lands converted to forest lands are grasslands. Given the difference between the substrata of other wooded lands (scrublands) and grazing lands, the ERT asked for the fractions that correspond to other wooded land and to grazing lands for land converted to forest land. During the review, Italy explained that there is no disaggregation to other wooded land and grazing lands subcategories under lands converted to forest lands due to the nature of the sources of AD (NFIs and IUTI). The Party also noted that a specific focus of the currently ongoing IUTI survey (with reference to 2013 and 2016) is the abovementioned issue, with an aim to result in a further subdivision to be applied in land remaining land and in land converted to other land categories.</p> <p>The ERT encourages Italy to provide the disaggregation for grazing lands and other wooded lands for lands converted to forest land once data become available in order to increase the accuracy and transparency of the estimation.</p>	Not an issue/problem
L.11	4.B.1 Cropland remaining cropland – CO <sub>2</sub>	<p>The ERT noted that the NIR (chapter 6.3.2) explains that land-use changes have been derived using land-use change matrices, smoothing the amount of changes over a five-year period, harmonizing the whole time series, resulting in a constant amount of carbon stock change in the five-year period, following a previous review remark. However, the NIR is not explicit on the way the smoothing is applied and annual data used in the process. During the review, Italy indicated that the area of each subdivision for each category is smoothed over a five-year period (i.e. the 2015–2010 difference in area for each subdivision is divided by five, and the resulting value is added, year by year, to the previous year area to deduce the current area). The smoothing period affects the assessment of the area, depending on the amount of the difference between the two reference years (i.e. 2015–2010), as well as on the number of years included in the smoothing period.</p> <p>The ERT recommends that Italy provide information on the smoothing process applied for the estimates and provide a table with the calculations with and without the smoothing in the NIR.</p>	Yes. Transparency

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem? <sup>a</sup> If yes, classify by type
L.12	4.E Settlements – CO <sub>2</sub> , CH <sub>4</sub> and N <sub>2</sub> O	<p>The ERT noted that the AD for biomass burning for settlements have been reported for the entire time series, while the relevant emissions were reported as “NO”. During the review, Italy indicated that area is derived from the data collected by the National Forest Service. In 2016, the National Forest Service made available the results, starting from 2013, of an additional annual survey. The survey complements the previous set of surveys for fire detection. Areas affected by fires encompassed in the settlements category have been reported, but no emissions are estimated, assuming the carbon losses from the settlements areas affected by fires are negligible. The ERT considered the assumption acceptable based on the available information for the latest years of the time series. However, the ERT noted that the area affected by fire was 6.12 ha in 2016 but 73,259.01 ha in 1990 and 62,393.64 ha in 1998. In addition, for all years in the time series the notation key “NO” is used for the emissions, which is not in line with the notation key use suggested by the UNFCCC Annex I inventory reporting guidelines for reporting of categories considered as insignificant, for which notation key “NE” should be used.</p> <p>The ERT recommends that Italy revise the use of the notation key from “NO” to “NE” for CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O emissions together with the relevant justification for excluding the emissions, in line with paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines. The ERT further recommends that Italy include emissions from fires in settlements for the years where the affected area is significant (e.g. 1990–1995, 1998), if emissions prove to be significant, together with supporting methodological information.</p>	Yes. Completeness
Waste			
W.6	5.A Solid waste disposal on land – CH <sub>4</sub>	<p>Italy estimates CH<sub>4</sub> emissions from this category by using six half-lives for three types of degradability (rapidly, moderately and slowly) and for two climate zones (dry and wet). For rapidly degrading (food, etc.) and moderately degrading (garden and park) waste, Italy uses default half-lives (rapidly degrading waste (dry climate: 12 year, wet climate: 4 year), moderately degrading waste (dry: 14 year, wet: 7 year)) as in the 2006 IPCC Guidelines. Italy does not have AD to distinguish values of wood/straw from those of paper/textiles and reports the CH<sub>4</sub> emissions from the waste types aggregated under slowly degrading waste, for which Italy uses a weighted average k value (ln(2)/half-life) on the basis of an assumed disaggregation to wood and paper/nappies/textiles. During the review, the Party provided additional data on the assumed disaggregation and calculation of the k value used. The ERT assessed this as a partial application of the bulk waste option (2006 IPCC Guidelines, volume 5, p.3.16). Additionally, the ERT notes that the weighted average for k values changes the half-life for paper (wet: 12 years to 14 years, dry: 17 years to 20 years) and wood (wet: 23 years to 14 years, dry: 35 years to 20 years).</p> <p>The ERT recommends that Italy provide in the NIR further explanation on the basis of the assumed disaggregation (studies, references) of slowly degraded waste as well as the reasons for using the aggregated k values for slowly degrading waste instead of the specific k values for wood and paper and thereby applying a different approach (bulk waste) for these waste types to that used for the other estimation of the emissions from solid waste disposal sites. Also, the ERT encourages the Party to consider using the same method for all waste types, for example by estimating CH<sub>4</sub> generated from paper and wood separately by using specific k values (e.g. wood (dry: 35 year, wet: 23 year) and paper (dry: 17 year, wet: 12 year)) for the entire time series.</p>	Yes. Transparency

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem? <sup>a</sup> If yes, classify by type
W.7	5.A Solid waste disposal on land – CH <sub>4</sub>	<p>For waste composition in 2006–2016 in solid waste disposal sites, Italy includes all waste types defined as default components in the 2006 IPCC Guidelines (volume 5, chapter 2.3). Italy also obtained historical data for waste types in 1950–1970, 1971–1990 and 1991–2005 from the literature. The ERT commends Italy for its effort to complete the time series of AD. However, the ERT notes that the historical waste composition often lacks consistency of categorization and completeness of items; those of 1950–1970 do not include textiles, leather and wood; those of 1971–1990 do not include leather and do not disaggregate paper, textiles and wood; and those of 1991–2005 do not include leather as degradable waste and wood entirely. The NIR does not provide any explanation for these inconsistencies in historical waste categorization.</p> <p>The ERT recommends that Italy provide in the NIR further explanation on how time-series consistency and completeness is ensured. This could be done by including a description on how the historical and more recent waste categorizations are combined (e.g. textiles, leather and wood in historical data are included in other waste type). Related to ID# W.6 above about slowly degraded waste (paper/nappies/textiles/leather/wood), which has variations of composition and inconsistent categorization throughout time series, the ERT recommends that Italy provide in the NIR a reason for applying the current waste composition in the calculation for the weighted average k values for the entire time series. The ERT believes that future ERTs should consider this issue further to ensure that there is not an underestimate of emissions for this category.</p>	Yes. Accuracy
W.8	5.A Solid waste disposal on land – CH <sub>4</sub>	<p>Italy estimates CH<sub>4</sub> emissions from solid waste disposal on land, distinguishing between two climate zones (based on the ratio between MAP and PET: dry: MAP / PET &lt; 1 and wet: MAP / PET &gt; 1) separately for the first time in its 2018 submission. The ERT commends Italy for this methodological improvement. However, the ERT noted that Italy provided the corresponding k values for the dry and wet zones in the NIR (chapter 7.2.2., pp.284–285) but does not provide any information on waste disposal amounts in each climate zone. During the review, Italy provided the calculation sheets for the CH<sub>4</sub> emissions including detailed data on disposal amounts.</p> <p>The ERT recommends that Italy provide in the NIR summary information on waste disposal amounts for each climate zone.</p>	Yes. Transparency
W.9	5.A Solid waste disposal on land – CH <sub>4</sub>	<p>In the category solid waste disposal (5.A), the NIR does not provide any information on delay time in the first-order decay method. During the review, the Party indicated that the decay reaction starts on 1 January in the year after disposal.</p> <p>The ERT recommends that the Party include in the NIR the information of the delay time used for the estimates.</p>	Yes. Transparency
W.10	5.A.2 Unmanaged waste disposal sites – CH <sub>4</sub>	<p>Italy reports disposal amounts on unmanaged disposal sites until 1999. However, the ERT is aware that illegal dumping took place in the country, known as the Naples waste management issue, until about 2010. During the review, the Party explained that there are no quantitative data about this issue, but that the waste was dominated by industrial waste rich</p>	Yes. Transparency

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem? <sup>a</sup> If yes, classify by type
		<p>in heavy metals and inorganic chemicals that are generally not or slowly biodegradable. Furthermore, the waste was collected and temporarily stored before appropriate treatments and thus registered in the national database.</p> <p>The ERT recommends that Italy include in the NIR information to justify why disposal amounts from unmanaged disposal sites related to the Naples waste management issue are not included in the inventory estimates.</p>	
W.11	5.B Biological treatment of solid waste – CH <sub>4</sub> and N <sub>2</sub> O	<p>The ERT noted that CRF table 5.B shows AD on a dry basis, while table 7.16 in the NIR reports those AD on a wet basis. However, the relationship between dry basis AD and wet basis AD is not provided. During the review, referring to volume 5, table 4.1, of the 2006 IPCC Guidelines, the Party answered that dry AD are estimated from those for wet waste assuming moisture content of 60 per cent in wet waste.</p> <p>The ERT recommends that the Party include in the NIR the information of dry basis AD and the assumption of moisture content.</p>	Yes. Transparency
W.12	5.D.2 Industrial wastewater – N <sub>2</sub> O	<p>Italy describes in its NIR (p.303) that to estimate N<sub>2</sub>O emissions from industrial wastewater, the Party uses an EF of 0.25 g N<sub>2</sub>O/m<sup>3</sup> of wastewater production based on EMEP/CORINAIR (2007). However, the ERT noted that the value of 1.00 kg N<sub>2</sub>O-N/kg N for the IEF reported in the CRF table 5.D entire time series is much higher than the default values of the 2006 IPCC Guidelines (0.0005–0.25 kg N<sub>2</sub>O-N/kg N). During the review, the Party explained that N in effluent reported in CRF table 5.D is in effect much lower than the actual values since the Party reports only the N-N<sub>2</sub>O in the effluent. The Party also informed the ERT of a plan to explore the availability of information useful for estimating the amount of N in effluent for the different industrial sectors (e.g. from data provided in the EPRTR database and/or the industrial association environmental report).</p> <p>The ERT recommends that the Party improve the transparency of the NIR and of CRF table 5.D by using the appropriate AD in the CRF table or by including an explanation that the AD reported in CRF table 5.D are in fact the N-N<sub>2</sub>O in the effluent. The ERT further recommends that Italy include in the NIR information on anticipated future improvements for the category.</p>	Yes. Transparency
KP-LULUCF			
KL.4	Deforestation – CO <sub>2</sub>	<p>In Italy land-use changes due to wildfires are forbidden by national legislation for 15 years after the disturbance (Decree No. 353 of 21 November 2000). The ERT noted that the 2016 annual review report (ID# KL.1) encouraged the Party to report information in the NIR documenting how it records the status of burned areas after the 15-year period required by law in order to ensure that those areas are not deforested. The ERT noted that this encouragement has not been implemented in the 2018 submission.</p> <p>The ERT reiterates the previous encouragement that Italy provide information on tracking the areas burned after the 15-year period.</p>	Not a problem
KL.5	Forest management– CO <sub>2</sub>	<p>The FMRL reported in the CRF accounting table of the 2018 submission is –22.166 Mt CO<sub>2</sub> eq. In chapter 9.5.2.2 and annex 10 of the NIR it is stated that the FMRL for Italy, inscribed in the appendix to the annex to decision 2/CMP.7, is</p>	Yes. Transparency

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem? <sup>a</sup> If yes, classify by type
		<p>equal to –21.182 Mt CO<sub>2</sub> eq per year assuming instantaneous oxidation of HWP and –22.166 Mt CO<sub>2</sub> eq applying a first-order decay function for HWP. The values are consistent with those included in the Report of the technical assessment of the forest management reference level submission of Italy submitted in 2011 (FCCC/TAR/2011/ITA). However, the ERT notes that the NIR does not transparently specify which value of FMRL is used for the accounting of forest management in accordance with decision 2/CMP.7, annex, paragraphs 12–15, although –22.166 Mt CO<sub>2</sub> is used in table 9.15 of the NIR and in the CRF accounting table.</p> <p>The ERT recommends that Italy transparently specify in the NIR the FMRL value used for the purposes of accounting for the forest management in the second commitment period in accordance with decision 2/CMP.7, annex, paragraphs 12–15.</p>	
KL.6	Forest management – CO <sub>2</sub>	<p>The value of the FM cap reported in the CRF accounting table of the 2018 submission is 145,141.74 kt CO<sub>2</sub> eq. The value in the Report on the review of the report to facilitate the calculation of the assigned amount for the second commitment period of the Kyoto Protocol of Italy is 146,237.768 kt CO<sub>2</sub> eq (FCCC/IRR/2016/ITA). The ERT notes that, according to paragraph 12 of decision 6/CMP.9, the value of the FM cap shall remain fixed for the second commitment period.</p> <p>The ERT recommends that Italy correct the reporting of the FM cap in the CRF accounting table.</p>	Yes. Accuracy
KL.7	Cropland management – CO <sub>2</sub>	<p>The ERT noted that emissions from cropland management (perennial woody crop losses) for the years 2013 and 2014 decreased by almost 45 per cent, while the value for the area subject to the activity experienced a minor update (around 100 ha) in the 2018 submission compared with the 2016 submission. As a result of this change the overall emissions from cropland management decreased by more than 70 per cent for 2013 and 2014. Italy indicated that the change was due to the variation of the AD (i.e. area of annual and perennial crops) driven by the updated IUTI (inventory of land use) data (related to 2012). However, the ERT does not consider this to explain the change in the IEF for above-ground biomass by 45 per cent (from 0.26 t C/ha in the 2016 submission to 0.14 t C/ha in the 2018 submission for 2013–2015). The value of the IEF further changed to 0.02 t C/ha in 2016.</p> <p>The ERT recommends that Italy provide detailed information in the NIR on how the IUTI is updated and how it impacts the further refinement of AD classes in woody crops and non-woody crops, together with detailed information on the typologies of perennial woody crops and biomass estimates that are affected by the IUTI updates, which may affect the IEF changes.</p>	Yes. Transparency

<sup>a</sup> Recommendations made by the ERT during the review are related to issues as defined in paragraph 81 of the UNFCCC review guidelines, or problems as defined in paragraph 69 of the Article 8 review guidelines. Encouragements are made to the Party to address all findings not related to such issues or problems.

## **VI. Application of adjustments**

12. The ERT has not identified the need to apply any adjustments to the 2018 annual submission of Italy.

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

13. Italy has elected commitment period accounting and therefore the issuance and cancellation of units for KP-LULUCF activities is not applicable for the 2018 review.

## **VIII. Question of implementation**

14. No questions of implementation were identified by the ERT during the individual review of the 2018 annual submission.

## Annex I

# Overview of greenhouse gas emissions and removals for Italy for submission year 2018 and data and information on activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, as submitted by Italy in its 2018 annual submission

1. Tables 7–10 provide an overview of total GHG emissions and removals as submitted by Italy.

Table 7

## Total greenhouse gas emissions for Italy, base year<sup>a</sup>–2016

(kt CO<sub>2</sub> eq)

	<i>Total GHG emissions excluding indirect CO<sub>2</sub> emissions</i>		<i>Total GHG emissions including indirect CO<sub>2</sub> emissions<sup>b</sup></i>		<i>Land-use change (Article 3.7 bis as contained in the Doha Amendment)<sup>c</sup></i>	<i>KP-LULUCF activities (Article 3.3 of the Kyoto Protocol)<sup>d</sup></i>	<i>KP-LULUCF activities (Article 3.4 of the Kyoto Protocol)</i>	
	<i>Total including LULUCF</i>	<i>Total excluding LULUCF</i>	<i>Total including LULUCF</i>	<i>Total excluding LULUCF</i>			<i>CM, GM, RV, WDR</i>	<i>FM</i>
FMRL <sup>e</sup>								–22 166.00
Base year	515 397.11	518 439.94	NA	NA	NA		–124.65	
1990	515 320.53	518 363.37	NA	NA				
1995	511 065.96	532 639.82	NA	NA				
2000	538 809.50	554 464.10	NA	NA				
2010	473 349.18	503 989.47	NA	NA				
2011	466 328.89	491 377.62	NA	NA				
2012	453 846.14	471 609.13	NA	NA				
2013	408 291.34	441 221.79	NA	NA		–5 830.08	–244.63	–30 214.07
2014	391 851.77	425 276.99	NA	NA		–6 360.93	–335.69	–31 199.40
2015	397 552.11	432 878.08	NA	NA		–6 819.81	–356.30	–32 464.61
2016	397 935.13	427 861.99	NA	NA		–6 328.59	–1 362.30	–29 110.27

*Note:* Emissions/removals reported in the sector other (sector 6) are not included in total GHG emissions.

<sup>a</sup> Base year refers to the base year under the Kyoto Protocol, which is 1990 for all gases except NF<sub>3</sub>, for which the base year is 1995. The base year for CM and GM under Article 3, paragraph 4, of the Kyoto Protocol is 1990 for Italy. For activities under Article 3, paragraph 3, of the Kyoto Protocol and FM under Article 3, paragraph 4, only the inventory years of the commitment period must be reported.

<sup>b</sup> The Party has not reported indirect CO<sub>2</sub> emissions in CRF table 6.

<sup>c</sup> The value reported in this column refers to 1990.

<sup>d</sup> Activities under Article 3, paragraph 3, of the Kyoto Protocol, namely AR and deforestation.

<sup>e</sup> The FMRL reported in the CRF accounting table of the 2018 submission differs from the value in the Report on the review of the report to facilitate the calculation of the assigned amount for the second commitment period of the Kyoto Protocol of Italy (see ID#KL.5 in table 6).

Table 8

**Greenhouse gas emissions by gas for Italy, excluding land use, land-use change and forestry, 1990–2016**(kt CO<sub>2</sub> eq)

	<i>CO<sub>2</sub><sup>a</sup></i>	<i>CH<sub>4</sub></i>	<i>N<sub>2</sub>O</i>	<i>HFCs</i>	<i>PFCs</i>	<i>Unspecified mix of HFCs and PFCs</i>	<i>SF<sub>6</sub></i>	<i>NF<sub>3</sub></i>
1990	439 944.10	48 235.88	26 422.80	444.00	2 906.86	NO, NE, NA	409.73	NA, NO
1995	451 978.91	50 310.75	27 231.38	869.05	1 492.31	NO, NE, NA	680.85	76.57
2000	470 767.75	50 736.58	28 374.46	2 478.65	1 488.50	NO, NE, NA	604.90	13.26
2010	424 873.16	46 769.06	19 056.72	11 356.41	1 520.39	NO, NE, NA	393.57	20.17
2011	413 431.51	45 123.17	18 450.47	12 242.33	1 661.28	NO, NE, NA	441.08	27.78
2012	391 990.36	45 724.15	19 065.65	12 859.60	1 499.21	NO, NE, NA	445.22	24.93
2013	363 399.90	44 045.72	18 145.20	13 478.59	1 705.41	NO, NE, NA	421.27	25.70
2014	348 476.24	43 131.59	17 627.16	14 090.86	1 564.34	NO, NE, NA	358.61	28.17
2015	355 483.21	43 133.26	17 635.57	14 468.12	1 688.33	NO, NE, NA	441.18	28.42
2016	350 323.01	42 869.65	17 954.17	14 681.59	1 628.55	NO, NE, NA	377.17	27.84
<b>Per cent change 1990– 2016</b>	<b>–20.4</b>	<b>–11.1</b>	<b>–32.1</b>	<b>3 206.7</b>	<b>–44.0</b>	<b>NA</b>	<b>–7.9</b>	<b>NA</b>

*Note:* Emissions/removals reported in the sector other (sector 6) are not included in total GHG emissions.

<sup>a</sup> Italy did not report indirect CO<sub>2</sub> emissions in CRF table 6.

Table 9

**Greenhouse gas emissions by sector for Italy, 1990–2016**(kt CO<sub>2</sub> eq)

	<i>Energy</i>	<i>IPPU</i>	<i>Agriculture</i>	<i>LULUCF</i>	<i>Waste</i>	<i>Other</i>
1990	425 498.80	40 473.12	35 078.01	–3 042.83	17 313.44	NO
1995	439 342.96	38 291.79	34 992.08	–21 573.86	20 012.98	NO
2000	459 129.94	39 161.08	34 259.15	–15 654.60	21 913.92	NO
2010	417 157.42	36 357.04	30 064.87	–30 640.29	20 410.14	NO
2011	404 666.37	36 612.67	30 329.24	–25 048.73	19 769.35	NO
2012	387 038.06	33 771.44	30 916.28	–17 763.00	19 883.36	NO
2013	359 961.21	32 824.53	29 747.24	–32 930.45	18 688.81	NO
2014	345 100.23	32 398.85	29 242.59	–33 425.22	18 535.31	NO
2015	352 536.34	32 281.58	29 434.95	–35 325.97	18 625.21	NO



	<i>Energy</i>	<i>IPPU</i>	<i>Agriculture</i>	<i>LULUCF</i>	<i>Waste</i>	<i>Other</i>
2016	347 080.21	32 097.69	30 393.98	-29 926.87	18 290.11	NO
<b>Per cent change 1990–2016</b>	<b>-18.4</b>	<b>-20.7</b>	<b>-13.4</b>	<b>883.5</b>	<b>5.6</b>	<b>NA</b>

*Notes:* (1) Emissions/removals reported in the sector other (sector 6) are not included in total GHG emissions. (2) Italy did not report indirect CO<sub>2</sub> emissions in CRF table 6.

Table 10

**Greenhouse gas emissions/removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol by activity, base year<sup>a</sup>–2016, for Italy**  
(kt CO<sub>2</sub> eq)

	Article 3.7 bis as contained in the Doha Amendment <sup>b</sup>	Article 3.3 of the Kyoto Protocol		FM and elected Article 3.4 activities of the Kyoto Protocol				
		Land-use change	AR	Deforestation	FM	CM	GM	RV
FMRL				−22 166.00				
Technical correction				−1 680.06				
Base year	NA				−119.52	−5.13	NA	NA
2013		−7 841.80	2 011.72	−30 214.07	396.99	−641.62	NA	NA
2014		−8 383.66	2 022.73	−31 199.40	336.54	−672.23	NA	NA
2015		−8 853.29	2 033.48	−32 464.61	349.69	−705.99	NA	NA
2016		−8 372.17	2 043.58	−29 110.27	−656.32	−705.99	NA	NA
Per cent change Base year–2016					449.1	13 669.1	NA	NA

*Note:* Values in this table include emissions on lands subject to natural disturbances, if applicable.

<sup>a</sup> The base year for CM and GM under Article 3, paragraph 4, of the Kyoto Protocol is 1990 for Italy. For activities under Article 3, paragraph 3, of the Kyoto Protocol, and FM under Article 3, paragraph 4, only the inventory years of the commitment period must be reported.

<sup>b</sup> The value reported in this column refers to 1990.

- Table 11 provides an overview of relevant key data for Italy's reporting under Article 3, paragraphs 3 and 4, of the Kyoto Protocol.

Table 11

**Key relevant data for Italy under Article 3, paragraphs 3 and 4, of the Kyoto Protocol in the 2018 annual submission**

<i>Key parameters</i>	<i>Values</i>
Periodicity of accounting	(a) AR: commitment period accounting (b) Deforestation: commitment period accounting (c) FM: commitment period accounting (d) CM: commitment period accounting (e) GM: commitment period accounting (f) RV: not elected (g) WDR: not elected
Election of activities under Article 3, paragraph 4	CM, GM
Election of application of provisions for natural disturbances	Yes, for AR and FM
3.5% of total base-year GHG emissions, excluding LULUCF and including indirect CO <sub>2</sub> emissions	18 267.221 kt CO <sub>2</sub> eq (146 137.768 kt CO <sub>2</sub> eq for the duration of the commitment period)
Cancellation of AAUs, ERUs, CERs and/or issuance of RMUs in the national registry for:	
1. AR in 2016	NA
2. Deforestation in 2016	NA
3. FM in 2016	NA
4. CM in 2016	NA
5. GM in 2016	NA
6. RV in 2016	NA
7. WDR in 2016	NA

## Annex II

### Information to be included in the compilation and accounting database

Tables 12–15 include the information to be included in the compilation and accounting database for Italy. Data shown are from the original annual submission of the Party, including the latest revised estimates submitted, adjustments (if applicable), and the final data to be included in the compilation and accounting database.

Table 12

#### Information to be included in the compilation and accounting database for 2016, including on the commitment period reserve, for Italy

(t CO<sub>2</sub> eq)

	<i>Original submission</i>	<i>Revised estimates</i>	<i>Adjustment</i>	<i>Final</i>
<b>CPR</b>	2 169 262 279			2 169 262 279
<b>Annex A emissions for 2016</b>				
CO <sub>2</sub>	350 323 015			350 323 015
CH <sub>4</sub>	42 869 646			42 869 646
N <sub>2</sub> O	17 954 172			17 954 172
HFCs	14 681 592			14 681 592
PFCs	1 628 549			1 628 549
Unspecified mix of HFCs and PFCs	NO, NE, NA			NO, NE, NA
SF <sub>6</sub>	377 174			377 174
NF <sub>3</sub>	27 845			27 845
<b>Total Annex A sources</b>	<b>427 861 993</b>			<b>427 861 993</b>
<b>Activities under Article 3, paragraph 3, of the Kyoto Protocol for 2015</b>				
3.3 AR	–8 372 165			–8 372 165
3.3 Deforestation	2 043 580			2 043 580
<b>FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol for 2016</b>				
3.4 FM	–29 110 271			–29 110 271
3.4 CM	–656 318			–656 318
3.4 CM for the base year	–119 523			–119 523
3.4 GM	–705 985			–705 985
3.4 GM for the base year	–5 127			–5 127

Table 13

#### Information to be included in the compilation and accounting database for 2015 for Italy

(t CO<sub>2</sub> eq)

	<i>Original submission</i>	<i>Revised estimates</i>	<i>Adjustment</i>	<i>Final</i>
<b>Annex A emissions for 2015</b>				
CO <sub>2</sub>	355 483 214			355 483 214
CH <sub>4</sub>	43 133 264			43 133 264
N <sub>2</sub> O	17 635 570			17 635 570
HFCs	14 468 116			14 468 116
PFCs	1 688 326			1 688 326
Unspecified mix of HFCs and PFCs	NO, NE, NA			NO, NE, NA

	<i>Original submission</i>	<i>Revised estimates</i>	<i>Adjustment</i>	<i>Final</i>
SF <sub>6</sub>	441 177			441 177
NF <sub>3</sub>	28 417			28 417
<b>Total Annex A sources</b>	<b>432 878 084</b>			<b>432 878 084</b>
<b>Activities under Article 3, paragraph 3, of the Kyoto Protocol for 2015</b>				
3.3 AR	–8 853 287			–8 853 287
3.3 Deforestation	2 033 477			2 033 477
<b>FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol for 2015</b>				
3.4 FM	–32 464 610			–32 464 610
3.4 CM	349 686			349 686
3.4 CM for the base year	–119 523			–119 523
3.4 GM	–705 985			–705 985
3.4 GM for the base year	–5 127			–5 127

Table 14

**Information to be included in the compilation and accounting database for 2014, for Italy**(t CO<sub>2</sub> eq)

	<i>Original submission</i>	<i>Revised estimates</i>	<i>Adjustment</i>	<i>Final</i>
<b>Annex A emissions for 2014</b>				
CO <sub>2</sub>	348 476 240			348 476 240
CH <sub>4</sub>	43 131 592			43 131 592
N <sub>2</sub> O	17 627 164			17 627 164
HFCs	14 090 857			14 090 857
PFCs	1 564 344			1 564 344
Unspecified mix of HFCs and PFCs	NO, NE, NA			NO, NE, NA
SF <sub>6</sub>	358 614			358 614
NF <sub>3</sub>	28 175			28 175
<b>Total Annex A sources</b>	<b>425 276 986</b>			<b>425 276 986</b>
<b>Activities under Article 3, paragraph 3, of the Kyoto Protocol for 2014</b>				
3.3 AR	–8 383 663			–8 383 663
3.3 Deforestation	2 022 730			2 022 730
<b>FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol for 2014</b>				
3.4 FM	–31 199 401			–31 199 401
3.4 CM	336 543			336 543
3.4 CM for the base year	–119 523			–119 523
3.4 GM	–672 234			–672 234
3.4 GM for the base year	–5 127			–5 127

Table 15

**Information to be included in the compilation and accounting database for 2013, for Italy**(t CO<sub>2</sub> eq)

	<i>Original submission</i>	<i>Revised estimates</i>	<i>Adjustment</i>	<i>Final</i>
<b>Annex A emissions for 2013</b>				
CO <sub>2</sub>	363 399 902			363 399 902
CH <sub>4</sub>	44 045 719			44 045 719

	<i>Original submission</i>	<i>Revised estimates</i>	<i>Adjustment</i>	<i>Final</i>
N <sub>2</sub> O	18 145 202			18 145 202
HFCs	13 478 589			13 478 589
PFCs	1 705 414			1 705 414
Unspecified mix of HFCs and PFCs	NO, NE, NA			NO, NE, NA
SF <sub>6</sub>	421 272			421 272
NF <sub>3</sub>	25 696			25 696
<b>Total Annex A sources</b>	<b>441 221 793</b>			<b>441 221 793</b>
<b>Activities under Article 3, paragraph 3, of the Kyoto Protocol for 2013</b>				
3.3 AR	-7 841 803			-7 841 803
3.3 Deforestation	2 011 719			2 011 719
<b>FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol for 2013</b>				
3.4 FM	-30 214 073			-30 214 073
3.4 CM	396 993			396 993
3.4 CM for the base year	-119 523			-119 523
3.4 GM	-641 624			-641 624
3.4 GM for the base year	-5 127			-5 127

## **Annex III**

### **Additional information to support findings in table 2**

#### **Missing categories that may affect completeness**

The only category for which a method is included in the *2006 IPCC Guidelines* that was reported as “NE” or for which the ERT otherwise determined that there may be an issue with the completeness of the reporting in the Party’s inventory is CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O emissions from biomass burning under settlements (see ID#L.12 in table 6).

## Annex IV

### Documents and information used during the review

#### A. Reference documents

##### IPCC reports

IPCC. 1997. *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*. JL Houghton, LG Meira Filho, B Lim, et al. (eds.). Paris: IPCC/Organisation for Economic Co-operation and Development/International Energy Agency. Available at <https://www.ipcc-nggip.iges.or.jp/public/gl/invs1.html>.

IPCC. 2006. *2006 IPCC Guidelines for National Greenhouse Gas Inventories*. S Eggleston, L Buendia, K Miwa, et al. (eds.). Hayama: Institute for Global Environmental Strategies. Available at <http://www.ipcc-nggip.iges.or.jp/public/2006gl>.

IPCC. 2014. *2013 Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol*. T Hiraishi, T Krug, K Tanabe, et al. (eds.). Hayama: Institute for Global Environmental Strategies. Available at <http://www.ipcc-nggip.iges.or.jp/public/kpsg>.

IPCC. 2014. *2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands*. T Hiraishi, T Krug, K Tanabe, et al. (eds.). Geneva: IPCC. Available at <http://www.ipcc-nggip.iges.or.jp/public/wetlands/>.

##### Annual review reports

Reports on the individual review of the 2013, 2014, 2015, 2016 annual submissions of Italy, respectively, contained in documents FCCC/ARR/2013/ITA, FCCC/ARR/2014/ITA, FCCC/ARR/2015/ITA and FCCC/ARR/2016/ITA.

##### Other

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 [https://unfccc.int/sites/default/files/resource/AGI%20report\\_2018.pdf](https://unfccc.int/sites/default/files/resource/AGI%20report_2018.pdf).

Annual status report for Italy for 2018. Available at <http://unfccc.int/resource/docs/2018/asr/ita.pdf>.

EMEP/CORINAIR, 2007. *Atmospheric Emission Inventory Guidebook*. Technical report No 16/2007. Available at <https://www.eea.europa.eu/publications/EMEPCORINAIR5>.

Federici S, Vitullo M, Tulipano S, De Lauretis R, et al. 2008. An approach to estimate carbon stocks change in forest carbon pools under the UNFCCC: the Italian case. *iForest*. 1: pp.86–95. Available at <http://www.sisef.it/forest@/show.php?id=466>.

Tabacchi G, De Natale F, Gasperini P. 2010. *Coerenza ed entità delle statistiche forestali - Stime degli assorbimenti netti di carbonio nelle foreste italiane*. Sherwood n.165/2010.

Report on the review of the report to facilitate the calculation of the assigned amount for the second commitment period of the Kyoto Protocol of Italy contained in FCCC/IRR/2016/ITA. Available at <https://unfccc.int/sites/default/files/resource/docs/2017/irr/ita.pdf>.

Report of the technical assessment of the forest management reference level submission of Italy submitted in 2011 contained in FCCC/TAR/2011/ITA. Available at <https://unfccc.int/sites/default/files/resource/docs/2011/tar/ita01.pdf>.

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**B. Additional information provided by the Party**

Responses to questions during the review were received from Mr. Riccardo De Lauretis (Institute for Environmental Protection and Research), including additional material on the methodology and assumptions used. The following documents<sup>1</sup> were also provided by Italy:

ISPRA, 2013. *Quality Assurance/Quality Control Plan for the Italian Emission Inventory. Procedures Manual*. Available at [www.isprambiente.gov.it/files/pubblicazioni](http://www.isprambiente.gov.it/files/pubblicazioni).

ISPRA, 2018. *Quality Assurance/Quality Control Plan for the Italian Emission Inventory*. Available at [www.isprambiente.gov.it/files/pubblicazioni](http://www.isprambiente.gov.it/files/pubblicazioni).

CRPA. 2006. *Progetto MeditAIRaneo: settore Agricoltura. Relazione finale. [Technical report on the framework of the MeditAIRaneo project for the Agriculture sector]*. Reggio Emilia, Italy: CRPA.

Ellis JL, Kebreab E, Odongo NE, McBride BW, et al. 2007. Prediction of methane production from dairy and beef cattle. *Journal of Dairy Science*. 90: pp.3456–3467.

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<sup>1</sup> Reproduced as received from the Party.