



United Nations

FCCC/IDR.7/ITA



Framework Convention on
Climate Change

Distr.: General
12 November 2018

English only

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

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

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Abbreviations and acronyms

AEA	annual emission allocation
BR	biennial report
CH ₄	methane
CO ₂	carbon dioxide
CO ₂ eq	carbon dioxide equivalent
CTF	common tabular format
ERT	expert review team
ESD	effort-sharing decision
EU	European Union
EU ETS	European Union Emissions Trading System
F-gas	fluorinated gas
GCOS	Global Climate Observing System
GDP	gross domestic product
GHG	greenhouse gas
HFC	hydrofluorocarbon
ICAO	International Civil Aviation Organization
IMELS	Italian Ministry for the Environment, Land and Sea
IMO	International Maritime Organization
IPCC	Intergovernmental Panel on Climate Change
IPPU	industrial processes and product use
ISPRA	Italian National Institute for Environmental Protection and Research
LDCs	least developed countries
LULUCF	land use, land-use change and forestry
MOU	memorandum of understanding
Mtoe	million tonnes of oil equivalent
NA	not applicable
NC	national communication
NE	not estimated
NF ₃	nitrogen trifluoride
NGO	non-governmental organization
NIR	national inventory report
NO	not occurring
non-Annex I Party	Party not included in Annex I to the Convention
non-ETS sectors	sectors not covered by the European Union Emissions Trading System
N ₂ O	nitrous oxide
PaMs	policies and measures
PFC	perfluorocarbon
reporting guidelines for supplementary information	“Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol. Part II: Reporting of supplementary information under Article 7, paragraph 2”
RES	renewable energy sources
SF ₆	sulfur hexafluoride
SIDS	small island developing States
UNEP	United Nations Environment Programme
UNFCCC reporting guidelines on BRs	“UNFCCC biennial reporting guidelines for developed country Parties”

UNFCCC reporting guidelines on NCs	“Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications”
WAM	‘with additional measures’
WEM	‘with measures’
WOM	‘without measures’

I. Introduction and summary

A. Introduction

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

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

3. The review was conducted from 21 to 26 May 2018 in Rome by the following team of nominated experts from the UNFCCC roster of experts: Ms. Gamze Çelikyılmaz (Turkey), Ms. Hoy Yen Chan (Malaysia), Ms. Ann Gordon (Belize), Mr. Nicolo Macaluso (Canada) and Mr. David Muscat (Malta). Ms. Chan and Mr. Macaluso were the lead reviewers. The review was coordinated by Mr. Nalin Srivastava (UNFCCC secretariat).

B. Summary

4. The ERT conducted a technical review of the information reported in the NC7 of Italy in accordance with the UNFCCC reporting guidelines on NCs (decision 4/CP.5) and the reporting guidelines for supplementary information, in particular the supplementary information required under Article 7, paragraph 2, and on the minimization of adverse impacts under Article 3, paragraph 14, of the Kyoto Protocol (annex to decision 15/CMP.1 and annex III to decision 3/CMP.11).

1. Timeliness

5. The NC7 was submitted on 22 December 2017, before the deadline of 1 January 2018 mandated by decision 9/CP.16. The Party made a resubmission of the NC7 on 19 January 2018. As explained by the Party during the review, the resubmission of the NC7 was made only to include the report’s cover page, thus it had no substantive impact on the report or its review.

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

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

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

Table 1

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

<i>Section of NC</i>	<i>Completeness</i>	<i>Transparency</i>	<i>Reference to description of recommendations</i>	<i>Supplementary information under the Kyoto Protocol</i>	<i>Completeness</i>	<i>Transparency</i>	<i>Reference to description of recommendations</i>
Executive summary	Complete	Transparent	–	National system	Mostly complete	Transparent	Issue 1 in table 6
National circumstances	Complete	Transparent	–	National registry	Complete	Transparent	–
GHG inventory	Complete	Transparent	–	Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17	Complete	Transparent	–
PaMs	Complete	Mostly transparent	Issue 1 in table 9	PaMs in accordance with Article 2	Complete	Transparent	–
Projections and the total effect of PaMs	Complete	Mostly transparent	Issue 1 in table 15	Domestic and regional programmes and/or arrangements and procedures	Complete	Mostly transparent	Issue 1 in table 7
Vulnerability assessment, climate change impacts and adaptation measures	Mostly complete	Transparent	Issue 1 in table 20	Information under Article 10 ^a	Complete	Transparent	–
Financial resources and transfer of technology	Mostly complete	Mostly transparent	Issues 1 and 2 in table 18	Financial resources	Mostly complete	Transparent	Issue 1 in table 17
Research and systematic observation	Complete	Transparent	–	Minimization of adverse impacts in accordance with Article 3, paragraph 14	Complete	Transparent	–
Education, training and public awareness	Complete	Transparent	–				

Note: A list of recommendations pertaining to the completeness and transparency issues identified in this table is included in chapter III below.

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

3. Summary of reviewed supplementary information under the Kyoto Protocol

7. The supplementary information under Article 7, paragraph 2, of the Kyoto Protocol is incorporated in different sections of the NC7, and the supplementary information under Article 7, paragraph 1, of the Kyoto Protocol is reported in the NIR of the 2018 annual submission. Table 2 provides references to where the information is reported. The technical assessment of the information reported under Article 7, paragraphs 1 and 2, of the Kyoto Protocol is contained in the relevant sections of this report.

Table 2

Overview of supplementary information under the Kyoto Protocol reported by Italy

<i>Supplementary information</i>	<i>Reference to the section of NC7</i>
National registry	Section 3.3
National system	Section 3.2
Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17	Section 4.3.6
PaMs in accordance with Article 2	Chapter 4
Domestic and regional programmes and/or legislative arrangements and enforcement and administrative procedures	Section 4.1
Information under Article 10	Chapter 7
Financial resources	Chapter 7
Minimization of adverse impacts in accordance with Article 3, paragraph 14	Reported in the NIR of the Party's 2018 annual submission

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

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

1. National circumstances relevant to greenhouse gas emissions and removals

(a) Technical assessment of the reported information

8. The national circumstances of Italy generally explain the relationship between its historic and future emission trends and the climate change policy agenda. The changing nature of those circumstances defines the factors that affect the climate policy development and implementation of the Convention. The NC7 contains key data on legislation, population trends, geography and land use, climate and climate change, economic developments, energy, transport, the buildings sector, industry, trade, the services sector, agriculture, forestry, resource efficiency and wastewater. Italy has the world's eighth largest economy. Primary energy supply is characterized by a dominant share of oil and gas, a relatively smaller contribution from coal and the absence of nuclear power. The share of renewable energy in Italy's energy supply mix is high compared with the average among countries of the Organisation for Economic Co-operation and Development, mostly owing to a significant amount of hydropower. Although Italy's energy intensity is lower than the EU average, in recent years that average has decreased and Italy is closing the gap owing to the growth of its civil sector and the consequent increase in energy intensity. Italy's economy has been experiencing a moderate recovery following the recession of 2012–2013. Industry-related activities have recovered and the export of goods and services increased in 2015 and 2016, resulting in a slightly upward trend in emissions.

9. The ERT noted that during the period 1990–2016, Italy’s population and GDP increased by 6.9 and 18.9 per cent, respectively, while GHG emissions per GDP unit and GHG emissions per capita decreased by 30.6 and 22.8 per cent, respectively. While there has been a significant decoupling of emissions from GDP growth since 1990, following the recent economic recovery, the decrease in emission intensity has been slowing down. Between 2015 and 2016, GHG emissions per GDP unit decreased by 2.2 per cent, while GHG emissions per capita decreased by 1.0 per cent. Table 3 illustrates the national circumstances of Italy by providing some indicators relevant to emissions and removals.

Table 3
Indicators relevant to greenhouse gas emissions and removals for Italy for the period 1990–2016

Indicator	Change (%)						
	1990	2000	2010	2015	2016	1990–2016	2015–2016
GDP per capita (thousands 2011 USD using purchasing power parity)	31.14	36.54	36.20	34.24	34.66	11.3	1.2
GHG emissions without LULUCF per capita (t CO ₂ eq)	9.14	9.74	8.50	7.13	7.06	–22.8	–1.0
GHG emissions without LULUCF per GDP unit (kg CO ₂ eq per 2011 USD using purchasing power parity)	0.29	0.27	0.23	0.21	0.20	–30.6	–2.2

Sources: (1) GHG emission data: Italy’s 2018 GHG inventory submission, version 1; (2) population and GDP: World Bank.

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

(b) Assessment of adherence to the reporting guidelines

10. The ERT assessed the information reported in the NC7 of Italy and identified an issue relating to transparency and adherence to the UNFCCC reporting guidelines on NCs. The findings are described in table 4.

Table 4
Findings on national circumstances relevant to greenhouse gas emissions and removals from the review of the seventh national communication of Italy

No.	Reporting requirement, issue type and assessment	Description of the finding with recommendation or encouragement
1	Reporting requirement specified in paragraph 8 Issue type: transparency Assessment: encouragement	In its NC7, while Italy transparently described how some of its national circumstances are relevant to factors affecting GHG emissions and removals in some sectors, including energy, transport, waste, buildings and agriculture, it did not transparently report such information for government structure by clearly specifying the linkage between government structure and the factors affecting emissions and removals. During the review, Italy explained that changes in governance have had no effect on GHG emissions and removals. The ERT encourages Italy to include in its next NC transparent information on how its national circumstances regarding government structure are relevant to factors affecting GHG emissions and removals by clearly specifying the linkage between government structure and the factors affecting emissions and removals.

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

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

(a) Technical assessment of the reported information

11. Total GHG emissions² excluding emissions and removals from LULUCF increased 17.5 per cent between 1990 and 2016, whereas total GHG emissions including net emissions or removals from LULUCF decreased by 22.8 per cent over the same period. Table 5 illustrates the emission trends by sector and by gas for Italy.

Table 5
Greenhouse gas emissions by sector and by gas for Italy for the period 1990–2016

	GHG emissions (kt CO ₂ eq)					Change (%)		Share (%)	
	1990	2000	2010	2015	2016	1990–2016	2015–2016	1990	2016
<i>Sector</i>									
1. Energy	425 498.80	459 129.94	417 157.42	352 536.34	347 080.21	–18.4	–1.6	82.1	81.1
A1. Energy industries	137 158.26	149 461.31	134 012.09	105 800.48	104 357.94	–23.9	–1.4	26.5	24.4
A2. Manufacturing industries and construction	93 234.98	92 195.38	62 580.55	50 919.71	47 944.66	–48.6	–6.2	18.0	11.2
A3. Transport	102 100.09	123 261.53	115 158.69	105 987.65	104 505.49	2.4	–1.4	19.7	24.4
A4. and A5. Other	80 128.19	83 393.35	96 565.04	82 277.78	83 051.56	3.6	0.9	15.5	19.4
B. Fugitive emissions from fuels	12 877.28	10 818.37	8 841.06	7 550.73	7 220.56	–43.9	–4.6	2.5	1.7
C. CO ₂ transport and storage	NO	NO	NO	NO	NO	NA	NA	NO	NO
2. IPPU	40 473.12	39 161.08	36 357.04	32 281.58	32 097.69	–20.7	–0.6	7.8	7.5
3. Agriculture	35 078.01	34 259.15	30 064.87	29 434.95	30 393.98	–13.4	3.2	6.8	7.1
4. LULUCF	–3 042.83	–15 654.60	–30 640.29	–35 325.97	–29 926.87	883.5	–18.0	–0.6	–7.0
5. Waste	17 313.44	21 913.92	20 410.14	18 625.21	18 290.11	5.6	–1.8	3.3	4.3
6. Other	NO	NO	NO	NO	NO	NA	NA	NO	NO
<i>Gas^a</i>									
CO ₂	439 944.10	470 767.75	424 873.16	355 483.21	350 323.01	–20.4	–1.5	84.9	81.9
CH ₄	48 235.88	50 736.58	46 769.06	43 133.26	42 869.65	–11.1	–0.6	9.3	10.0
N ₂ O	26 422.80	28 374.46	19 056.72	17 635.57	17 954.17	–32.1	1.8	5.1	4.2
HFCs	444.00	2 478.65	11 356.41	14 468.12	14 681.59	3 206.7	1.5	0.1	3.4
PFCs	2 906.86	1 488.50	1 520.39	1 688.33	1 628.55	–44.0	–3.5	0.6	0.4
SF ₆	409.73	604.90	393.57	441.18	377.17	–7.9	–14.5	0.1	0.1
NF ₃	NO	13.26	20.17	28.42	27.84	NA	–2.0	0.0	0.0
Total GHG emissions without LULUCF	518 363.37	554 464.10	503 989.47	432 878.08	427 861.99	–17.5	–1.2	100.0	100.0
Total GHG emissions with LULUCF	515 320.53	538 809.50	473 349.18	397 552.11	397 935.13	–22.8	0.1	NA	NA

Source: GHG emission data: Italy's 2018 annual submission, version 1.

^a Emissions by gas without LULUCF and without indirect CO₂.

² In this report, the term “total GHG emissions” refers to the aggregated national GHG emissions expressed in terms of CO₂ eq excluding LULUCF, unless otherwise specified. Values in this paragraph are calculated based on the 2018 annual submission, version 1.

12. The decrease in total emissions was driven mainly by factors such as structural changes in the economy, the lingering effects of the economic recession, the declining and ageing population, and the effects of PaMs, including those aimed at promoting the use of energy from RES and less carbon intensive fuels (e.g. switching from coal to gas) and energy efficiency. GHG emissions from most sectors decreased between 1990 and 2016, with the notable exceptions of transport in the energy sector and refrigeration and air conditioning in the IPPU sector. The largest emission reductions stemmed from changes in energy use in manufacturing industries and construction, electricity and heat production, and residential combustion. The largest decrease in emissions in relative terms was in waste management (through reduced landfilling and better control of it).

13. Between 1990 and 2016, GHG emissions from the energy sector decreased by 18.4 per cent (78,419 kt CO₂ eq), owing mainly to changing economic conditions and policies adopted at the European and national level to enhance energy production from renewable sources and to promote the shift from coal and petroleum to natural gas. The trend in GHG emissions from fuel combustion showed notable increases in transport (2.4 per cent or 2,405.40 kt CO₂ eq) and energy use in other sectors (3.6 per cent or 2,923.37 kt CO₂ eq). The trend in GHG emissions from fuel combustion showed notable decreases in energy industries (23.9 per cent or 32,800 kt CO₂ eq) and manufacturing and construction (48.6 per cent or 45,290.32 kt CO₂ eq). Fugitive emissions also experienced a noticeable decline (43.9 per cent or 5,656.72 kt CO₂ eq). Between 1990 and 2016, there was a notable shift in the share of energy supply from carbon intensive to less carbon intensive fuels. For example, while the shares of coal and oil declined from 9.7 per cent to 7.3 per cent and from 59.9 per cent to 36.8 per cent, respectively, for low carbon intensive fuels, the shares of natural gas and RES increased from 26.1 per cent to 38.6 per cent and from 4.3 per cent to 17.3 per cent respectively, thus contributing to an overall share of less carbon intensive fuels of 55.9 per cent in 2016.

14. Between 1990 and 2016, GHG emissions from IPPU decreased by 20.7 per cent (8,375.43 kt CO₂ eq), owing mainly to reductions in N₂O emissions from the chemical industry (97.7 per cent), stemming from the installation of abatement technologies in adipic and nitric acid production plants, and in CO₂ emissions from the mineral industry, stemming from a decrease in cement production resulting from a slowdown in economic activity.

15. Between 1990 and 2016, GHG emissions from the agriculture sector decreased by 13.4 per cent (4,684.03 kt CO₂ eq), owing mainly to the implementation of the EU's Common Agricultural Policy, which resulted in changes to agricultural practices in Italy, including: reductions in livestock population, cultivated area, crop production and the amount of nitrogen fertilizers applied; enhancement in the recovery of biogas; and modifications to manure management systems.

16. The LULUCF sector was a net sink of 29,926.87 kt CO₂ eq in Italy in 2016; net GHG removals have increased by 883.5 per cent (26,884.03 kt CO₂ eq) since 1990. The trend was mainly driven by an increase in the carbon stocks in forest land.

17. Between 1990 and 2016, GHG emissions from the waste sector increased by 5.6 per cent (976.67 kt CO₂ eq), owing mainly to population growth. Following steady growth since 1990, emissions from the waste sector decreased since 2001, owing to the implementation of PaMs addressing waste management, particularly those promoting the incineration, composting, mechanical and biological treatment, and recycling of waste, and the increase in efficiency of biogas capture systems.

18. CO₂ emissions are the largest contributor to Italy's GHG emissions. On a CO₂ eq basis, CO₂ represented 81.9 per cent of Italy's total GHG emissions in 2016 compared with 84.9 per cent in 1990. Between 1990 and 2016, CO₂ emissions (excluding emissions and removals from LULUCF) decreased by 20.4 per cent (89,621.09 kt CO₂ eq), driven mainly by their decrease from energy industries (23.9 per cent), manufacturing industries and construction (48.8 per cent) and the mineral industry (48.8 per cent). The overall decrease was offset to some extent by an increase in CO₂ emissions from transport and energy use in other sectors.

19. CH₄ emissions represented, on a CO₂ eq basis, 10.0 per cent of Italy's total GHG emissions in 2016, the second largest contribution of all GHGs. Between 1990 and 2016,

CH₄ emissions decreased by 11.1 per cent (5,366.23 kt CO₂ eq), owing mainly to their decrease from enteric fermentation (9.4 per cent) and manure management (21.1 per cent) resulting from a reduction in livestock population and the recovery of biogas from manure management systems, and from wastewater treatment and discharge (22.8 per cent). The overall decrease was offset to some extent by an increase in CH₄ emissions from solid waste disposal (11.6 per cent).

20. In 2016, N₂O emissions represented 4.2 per cent of Italy's total GHG emissions. N₂O emissions decreased by 32.1 per cent between 1990 and 2016 (8,468.63 kt CO₂ eq), owing mainly to their decrease from the chemical industry (97.7 per cent) and, to a lesser extent, from manufacturing industries and construction (47.4 per cent) and manure management (26.4 per cent).

21. In 2016, emissions from F-gases (HFCs, PFCs, SF₆ and NF₃) represented 3.9 per cent of total GHG emissions in Italy. HFC emissions increased by 3,206.7 per cent (14,237.59 kt CO₂ eq) from 1990 to 2016 owing to their use as substitutes for ozone-depleting substances and the greater use of air conditioners in automobiles. PFC and SF₆ emissions, in contrast, decreased by 44.0 (1,278.31 kt CO₂ eq) and 7.9 per cent (32.56 kt CO₂ eq), respectively, over the same period. In the period 2000–2016, NF₃ emissions increased by 110.0 per cent.

22. The summary information provided on GHG emissions was consistent with the information reported in the 2018 annual submission.

(b) Assessment of adherence to the reporting guidelines

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

3. National system for the estimation of anthropogenic emissions by sources and removals by sinks

(a) Technical assessment of the reported information

24. Italy provided in the NC7 a description of how its national system for the estimation of anthropogenic emissions by sources and removals by sinks of all GHGs not controlled by the Montreal Protocol is performing the general and specific functions defined in the annex to decision 19/CMP.1. The description includes most of the elements mandated by paragraph 30 of the annex to decision 15/CMP.1. The NC7 also contains a reference to the description of the national system provided in the report mandated by decision 2/CMP.8, submitted in 2017³ and the NIR of the 2018 annual submission. The ERT took note of the review of the changes to the national system reflected in the report on the individual review of the 2016 annual submission of Italy.

(b) Assessment of adherence to the reporting guidelines

25. The ERT assessed the information reported in the NC7 of Italy and identified an issue relating to completeness. The finding is described in table 6.

³ Italy's report to facilitate the calculation of the assigned amount pursuant to Article 3, paragraphs 7 and 8, of the Kyoto Protocol for the second commitment period (2013–2020), available at http://unfccc.int/national_reports/initial_reports_under_the_kyoto_protocol/second_commitment_period_2013-2020/items/9499.php.

Table 6

Findings on the national system for the estimation of anthropogenic emissions by sources and removals by sinks from the review of the seventh national communication of Italy

No.	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation</i>
1	Reporting requirement specified in paragraph 30 Issue type: completeness Assessment: recommendation	In its NC7, Italy did not provide the name and contact information of the designated representative of the national entity with overall responsibility for its national inventory. During the review, Italy provided the missing contact information. The ERT recommends that Italy include in its next NC the name and contact information of the designated representative of the national entity with overall responsibility for its national inventory.

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

4. National registry

(a) Technical assessment of the reported information

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

(b) Assessment of adherence to the reporting guidelines

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

B. Information on policies and measures and institutional arrangements

1. Domestic and regional programmes and/or legislative arrangements and procedures related to the Kyoto Protocol

(a) Technical assessment of the reported information

28. For the second commitment period of the Kyoto Protocol, from 2013 to 2020, Italy committed to contributing to the joint EU effort to reduce GHG emissions by 20 per cent below the base-year level. Under the ESD, Italy has a legally binding target of a 13 per cent reduction below the 2005 level for emissions not covered under the EU ETS. Italy has in place a number of national policies and strategies aimed at achieving its target under the ESD, including: the National Renewable Energy Action Plan 2010; the Conto Termico decree, implementing the incentive scheme introduced by Legislative Decree 28/2011; the white certificates system, aimed at promoting energy efficiency and delivering emission reductions in all the energy end-use sectors; Legislative Decree 20/2007 on the eco-design of energy-using products; and the Structural Funds 2007–2013.

29. Implementation of the Kyoto Protocol by Italy is underpinned by Law No. 79/2016 (the ratification of the Doha Amendment to the Kyoto Protocol). The overall responsibility for climate change policymaking, including elaborating the national plan for GHG emission reductions for adoption by the interministerial committee for economic planning, lies with IMELS. Financial support and legislative instruments to implement the plan have been identified through financial law and are allocated to central and local bodies on the basis of their respective jurisdictions. Law No. 79/2016 established, under its article 5, and in accordance with article 12 of the EU regulation on a mechanism for monitoring and reporting

GHG emissions (525/2013/EU), the national system for PaMs and emission projections. ISPRA is responsible for the system and, in cooperation with IMELS, collects all the information and data from the competent ministries for preparing and reporting information on PaMs and projections.

30. Italy has provisions in place to make information on the legislative arrangements and enforcement and administrative procedures (e.g. rules on enforcement and administrative procedures, action taken) established pursuant to the implementation of the Kyoto Protocol publicly accessible, such as a web repository of the EU Greenhouse Gas Monitoring Mechanism regulation.⁴

31. Italy has national legislative arrangements and administrative procedures in place that seek to ensure that the implementation of activities under Article 3, paragraph 3, forest management under Article 3, paragraph 4, and any elected activities under Article 3, paragraph 4, of the Kyoto Protocol also contributes to the conservation of biodiversity and the sustainable use of natural resources. During the review, Italy explained that the areas of land subject to activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol (in particular, afforestation and reforestation and forest management) include the forest areas designated primarily for the conservation of biological diversity (3,265 kha in 2015). The Party also explained that its forests are managed sustainably under the relevant national and subnational legislation (e.g. the framework programme for the forest sector and national Law No. 227/2001), which is aimed at ensuring sustainable forest management by guiding forestry operations and forest use. Italy noted that one of the themes of its national strategy for biodiversity, consistent with the EU Biodiversity Strategy to 2020,⁵ explicitly links biodiversity with the need to mitigate and adapt to climate change, aiming at sustainable management of the terrestrial ecosystem and the enhancement of the role of carbon sequestration.

(b) Assessment of adherence to the reporting guidelines

32. The ERT assessed the information reported in the NC7 of Italy and identified an issue relating to transparency. The finding is described in table 7.

Table 7

Findings on domestic and regional programmes and/or legislative arrangements and procedures related to the Kyoto Protocol from the review of the seventh national communication of Italy

<i>No.</i>	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation</i>
1	Reporting requirement specified in paragraph 38 Issue type: transparency Assessment: recommendation	In its NC7, Italy did not provide a transparent description of the national legislative arrangements and administrative procedures that seek to ensure that the implementation of activities under Article, paragraph 3, and any elected activities under Article 3, paragraph 4, also contribute to the conservation of biodiversity and sustainable use of natural resources, particularly with regard to the identification of their contribution towards the conservation of biodiversity. During the review, Italy provided information on this issue, including a brief description of the relevant elements in its national strategy for biodiversity (see para. 31 above). The ERT considers that the information provided by the Party clarifies the issue. The ERT recommends that Italy provide in its next NC a transparent description of the national legislative arrangements and administrative procedures that seek to ensure that the implementation of activities under Article 3, paragraph 3, and any elected activities under Article 3, paragraph 4, also contribute to the conservation of biodiversity and sustainable use of natural resources, particularly with regard to the identification of their contribution towards the conservation of biodiversity.

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

⁴ For information, see <http://cdr.eionet.europa.eu/it/eu/mmr>.

⁵ http://ec.europa.eu/environment/nature/biodiversity/strategy/index_en.htm.

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

(a) Technical assessment of the reported information

33. Italy provided information on its package of PaMs implemented and planned, by sector and by gas, in order to fulfil its commitments under the Convention and its Kyoto Protocol. Italy reported on its policy context and legal and institutional arrangements put in place to implement its commitments and monitor and evaluate the effectiveness of its PaMs. The ERT noted that in its NC7 and CTF table 3, Italy provided information on only implemented and planned PaMs. During the review, the Party clarified that there are no adopted PaMs at present.

34. Italy provided information on a set of PaMs similar to those previously reported, with a few exceptions. Italy also provided information on changes made since the previous submission to its institutional, legal, administrative and procedural arrangements used for domestic compliance, monitoring, reporting, archiving of information and evaluation of the progress made towards its target. In 2017, Italy adopted a new national energy strategy (SEN 2017), which is a package of PaMs planned to enable Italy to achieve its national energy targets by 2030. Italy also adopted Law No. 79/2016 (the ratification of the Doha Amendment to the Kyoto Protocol), which established the national system for PaMs and emission projections, in accordance with article 12 of EU regulation 525/2013/EU (Greenhouse Gas Monitoring Mechanism). Article 1 of the decree of 2016 that implements Law No. 79/2016 aims to improve the statistical data flow for the preparation of information on PaMs and projections by documenting a list of information and data that needs to be reported by the competent ministries to IMELS and ISPRA as per a stipulated timeline.

35. Italy gave priority to implementing the PaMs that make the most significant contribution to its emission reduction efforts. Italy provided information on how it believes its PaMs are modifying longer-term trends in anthropogenic GHG emissions and removals in accordance with the objective of the Convention. Italy reported on how it periodically updates its PaMs to reduce greater levels of emissions and on the PaMs that have been discontinued since the previous submission.

36. Some PaMs are deferred to the regional and local level. While regions have binding targets for renewable energy and waste separation, the responsibility of implementing strategies and action plans in achieving such targets lies with the local governments. Local actions on climate change issues are based on voluntary initiatives by relevant jurisdictions within the framework of the Global Covenant of Mayors for Climate and Energy,⁶ an initiative launched by the European Commission to endorse and support the voluntary efforts deployed by local authorities in the implementation of sustainable energy policies.

37. The key overarching related cross-sectoral policy in the EU is the 2020 climate and energy package, adopted in 2009, which includes the revised EU ETS and the ESD. The package is supplemented by renewable energy and energy efficiency legislation and legislative proposals on the 2020 targets for CO₂ emissions from cars and vans, the carbon capture and storage directive, and the general programmes for environmental conservation, namely the 7th Environment Action Programme and the clean air policy package.

38. In operation since 2005, the EU ETS is a cap-and-trade system that covers all significant energy-intensive installations (mainly large point emissions sources such as power plants and industrial facilities) that produce 40–45 per cent of the GHG emissions of the EU. It is expected that the EU ETS will guarantee that the 2020 target (a 21 per cent emission reduction below the 2005 level) will be achieved for sectors under the scheme. The third phase of the EU ETS started in 2013 and the system now includes aircraft operations (since 2012) as well as N₂O emissions from chemical industries, PFC emissions from aluminium production and CO₂ emissions from industrial processes (since 2013).

39. The ESD became operational in 2013 and covers sectors outside the EU ETS, including transport (excluding domestic and international aviation, and international maritime transport), residential and commercial buildings, agriculture and waste, together

⁶ <https://www.globalcovenantofmayors.org/>.

accounting for 55–60 per cent of the GHG emissions of the EU. The aim of the ESD is to decrease GHG emissions in the EU by 10 per cent below the 2005 level by 2020 and includes binding annual targets for each member State for 2013–2020.

40. Italy introduced national-level policies to achieve its targets under the ESD and domestic emission reduction targets. The key policies are: the white certificates system, which promotes energy efficiency in all the energy end-use sectors; the green certificates system, which promotes RES; the Conto Termico decree, which provides incentives to small plants to improve their energy efficiency and incentives for the production of thermal energy from RES; Legislative Decree 201/07 on energy efficiency; the Conto Energia decree, which provides support for a fixed period for electricity production by solar photovoltaic and thermodynamic systems; Legislative Decree 201/07, transposing the EU directive on eco-design (2005/32/EC), which sets minimum mandatory standards for energy-using products; building regulations setting minimum mandatory standards for new and existing buildings (Legislative Decree 192/05, as amended by Legislative Decree 311/06); an emission standard for new cars (EU regulation 443/2009/EC); the development of high-capacity and high-speed rail networks and the improvement of regional rail networks for commuting; the reduction of N₂O emissions from nitric acid production plants; the rationalization of nitrogen fertilizer use; and the separation of urban waste for collection.

41. The mitigation effect of the emission standard for new cars is the most significant, with an estimated impact of 10,200 kt CO₂ eq by 2020. Other policies that have delivered significant emission reductions are: the white certificates system; infrastructure measures for urban transport; Legislative Decree 201/07; the green certificates system; the promotion of energy saving in buildings; and the separation of urban waste. The ERT noted that, although they are being implemented, Italy did not report EU-wide measures for specific gases and sectors (e.g. the EU directive on the reduction of HFCs in transport (2006/40/EC)) because it focused on domestic measures.

42. Italy highlighted the domestic mitigation actions that are under development, such as: further extension of the energy saving targets of the white certificates system; the promotion of energy efficiency in residential buildings via tax deductions; the promotion of a modal transport shift from private cars to public buses and walking; and the promotion of and support for the renewal of the car fleet of the country with electric vehicles and vehicles using low carbon fuels as well as the use of liquefied natural gas in transport. Among the mitigation actions that provide a foundation for significant additional actions, further extension of the white certificates system is critical for Italy to attain its 2020 emission reduction target because it is a measure aimed at promoting energy efficiency in all the energy end-use sectors. Table 8 provides a summary of the reported information on the PaMs of Italy.

Table 8

Summary of information on policies and measures reported by Italy

<i>Sector</i>	<i>Key PaMs</i>	<i>Estimate of mitigation impact by 2020 (kt CO₂ eq)</i>
Policy framework and cross-sectoral measures	EU ETS	NE ^a
Energy	Conto Termico decree	NE
Transport	Emission standard for new cars (EU regulation 443/2009/EC)	10 200
	Infrastructure measures (the development of high-capacity and high-speed rail networks and the improvement of regional rail networks for commuting)	5 700
	Mandatory use of biofuels (legislative decrees 128/05 and 28/2011 transposing EU directives 2003/30/EC and 2009/28/EC, respectively)	3 070
	Green certificates system	4 000

<i>Sector</i>	<i>Key PaMs</i>	<i>Estimate of mitigation impact by 2020 (kt CO₂ eq)</i>
Renewable energy	Conto Energia decree	3 200
	European Regional Development Fund/National Strategic Framework 2008–2013 (increase of RES in electricity production)	1 400
Energy efficiency	White certificates system	6 110
	Legislative Decree 201/07 on energy efficiency (transposing EU directive 2005/32/EC)	4 520
	Building regulations (Legislative Decree 192/05, as amended by Legislative Decree 311/06)	3 610
	Promotion of energy saving in buildings	4 080
	Legislative Decree 102/2014 on energy efficiency (transposing EU directive 2012/27/EC)	NE
IPPU	Reduction of N ₂ O emissions from nitric acid production plants	740
Agriculture	Rationalization of nitrogen fertilizer use	790
	Recovery of biogas from animal manure management systems	400
LULUCF	Not reported	NE
Waste	Separation of urban waste for collection	3 700

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

^a The specific effects of this cross-cutting measure are reflected in the sectoral PaMs listed in the table.

43. As an EU member State, Italy has put in place institutional arrangements for the assessment and monitoring of progress in the implementation of mitigation actions and their impacts. The ERT noted that CTF table 3 lists seven planned PaMs with 2017 as the start year of implementation, which indicates a delay in their implementation; that is, they should have already been listed as implemented PaMs. The total mitigation impact of these PaMs (excluding those whose mitigation effects have not been reported) is 7,964 kt CO₂ eq, which is about 1.9 per cent of the total projected emissions in 2020. The ERT notes that Italy should consider bringing forward the implementation of these PaMs while also noting that they are not included in the WEM scenario and the delay in their implementation will therefore not likely have a significant effect on Italy's achievement of its emission reduction target.

(b) Policies and measures in the energy sector

44. **Energy supply.** The shares of oil, coal, natural gas and RES in Italy's primary energy supply in 2015 were 35.1, 8.1, 36.2 and 18.0 per cent, respectively. The shares of oil, coal, natural gas and RES in the primary energy supply in 1990 were 56.8, 10.0, 26.6 and 4.5 per cent, respectively. The increase in the contribution of natural gas and RES to the primary energy supply indicates a shift towards a cleaner energy supply mix in Italy.

45. The PaMs that contributed to this shift include: Legislative Decree 4/1999, which mandated the conversion of fuel oil steam plants to new combined cycle gas turbine plants using natural gas; Law No. 239/2004, which facilitated the construction of new combined cycle gas turbine plants; and the white certificates system for combined heat and power generation.

46. **Renewable energy sources.** Italy has a large portfolio of RES in its energy mix, comprising solar photovoltaic, solar thermal, wind, hydro, geothermal, ocean, biofuel,

biomass and biogas power systems. The National Renewable Energy Action Plan 2010 encompasses measures to achieve Italy's national target of 17 per cent use of renewable energy in final energy consumption by 2020, as mandated by EU directive 2009/28/EC, which forms part of the EU 2020 climate and energy package. This directive has been transposed into Legislative Decree 28/2011, which defines the mechanisms, the incentives and the institutional, financial and legal tools necessary to achieve the 2020 renewable energy target for Italy. In 2015, Italy achieved a share of 17.5 per cent of renewable energy in its final energy consumption against its national target of 17 per cent by 2020.

47. Italy has used a combination of market-based mechanisms and financial incentives to achieve its renewable energy target. The use of RES in electricity generation is governed by Legislative Decree 28/2011, which requires power producers and importers of electricity generated from non-renewable sources to inject a minimum quota of renewable energy annually into the grid. Policy instruments that supported this legislation until 2012 were the green certificates system and the all-inclusive feed-in tariff for all types of renewable energy. Following the ministerial decree of 6 July 2012, these two instruments were replaced for all types of renewable energy except photovoltaic systems with a new instrument for accessing the incentives on the basis of the type and capacity of the power plant. Photovoltaic systems continued to be supported by the Conto Energia decree incentive mechanism until mid-2013. While there are no specific PaMs promoting renewable energy in heat generation, the integration of efficient renewable energy in the thermal sector is incentivized through the energy efficiency tax deductions and the white certificates system. The implemented PaMs promoting renewable energy are expected to have a total mitigation impact of 8,600 kt CO₂ eq by 2020.

48. **Energy efficiency.** Italy has an indicative national target of final energy consumption of 124 Mtoe in accordance with the EU energy efficiency target of a 20 per cent reduction in energy use by 2020. EU directive 2012/27/EU, which establishes a common framework for the promotion of energy efficiency, has been transposed into Legislative Decree 102/2014, which established a new fund to provide loans to public and private entities for implementing energy efficiency measures. First approved by the government in 2014 and revised in 2017, the Italian Energy Efficiency Action Plan sets out the national energy efficiency objectives and the measures to achieve them, including targets for the residential, service, industrial and transport sectors for 2020. Of the implemented PaMs, the white certificates system is the key measure – it promotes energy efficiency in all end-uses, including combined heat and power and the industrial and commercial sectors, accounting for a total energy saving of more than 4.75 Mtoe per year of primary energy, which is equivalent to more than 4.38 Mtoe per year of final energy from 2005 to 2015.

49. The ERT noted that alongside the improvements in energy efficiency, the reduction in energy consumption partly stems from the decline in production caused by the economic recession following the global financial crisis in 2008. The ERT also noted that despite being below its indicative national 2020 target for final energy consumption in 2015, given the upward trend in final energy consumption in recent years, Italy would need to make greater efforts to achieve its 2020 energy efficiency target.

50. **Residential and commercial sectors.** The PaMs deployed in these sectors comprise regulations and fiscal measures that aim to improve energy efficiency through specific actions targeted at both existing and new buildings and appliances. Legislative Decree 102/2005 (subsequently amended by Legislative Decree 311/2006) transposes the EU directive on energy efficiency (2002/91/CE) and mandates stricter energy demand requirements and the adoption of RES in the buildings sector. Of the implemented PaMs, the most effective ones are: the minimum mandatory standards for new and existing buildings for energy efficiency; the regulation on mandatory energy efficiency standards for energy-using products; and the white certificates system. The ERT noted that these implemented PaMs, together with a number of planned PaMs to promote energy efficiency in residential buildings, will contribute significantly to helping Italy achieve its goal of making all new buildings nearly zero-energy by 2020.

51. **Transport sector.** Italy has implemented, including by transposing EU directives, PaMs relating to the transport sector addressing the use of biofuels, emission standards and transport infrastructure. However, unlike other sectors, emissions from the transport sector

in Italy have not shown a significant decreasing trend since 1990. Pursuant to the EU 2020 climate and energy package, legislative decrees 128/05 and 28/2011 set mandatory targets for the use of biofuels in the transport sector. These PaMs are estimated to have a total mitigation effect of 3,017 kt CO₂ eq by 2020, and have contributed to Italy already achieving a 7.2 per cent share of biofuels in the transport sector. The EU regulation mandating a minimum average emission standard for new passenger cars of 120 g CO₂ per km (EC/443/2009) has been the most effective measure in the transport sector, and has an estimated mitigation impact of 10,200 kt CO₂ eq by 2020. The development of high-capacity and high-speed rail networks and public transport in urban areas are infrastructure PaMs with significant mitigation effects by 2020.

52. The ERT noted that the downward trend in emissions from the transport sector in the past decade demonstrates the impact of the implemented PaMs. The ERT also noted the range of planned PaMs in this sector that will further contribute to modifying the longer-term trend in anthropogenic GHG emissions. These PaMs include the development of infrastructure for recharging points for electric vehicles and refuelling points for natural gas and hydrogen, the renewal of the country's car fleet with low carbon fuel vehicles and a modal shift in transport from private cars to public transport and walking.

53. The NC7 includes information on how Italy promotes and implements the decisions of ICAO and IMO to limit emissions from aviation and marine bunker fuels. Italy reported on its promotion and implementation of the decisions of ICAO and IMO in the context of the EU efforts in that regard. Italy supported the European Commission's proposal to incorporate aviation into the EU ETS, which led to the issuance of EU directive 2008/101/EC. In regard to the maritime sector, the EU adopted a communication setting out a strategy to progressively include GHG emissions from maritime transport in the EU climate change mitigation policy, which includes establishing a system for the monitoring, reporting and verification of CO₂ emissions from the sector, setting reduction targets for the sector, and applying further measures, including market-based instruments, in the medium to long term.

54. **Industrial sector.** In 2015, 63.5 per cent of Italy's emissions from this sector was subject to the EU ETS while the remainder was addressed under the ESD. Emissions from energy consumption in the industrial sector have been decreasing since 2004 owing to the economic recession following the global financial crisis in 2008 as well as the impact of the implemented PaMs. Of the implemented PaMs, the white certificates system, which promotes energy efficiency in the industrial sector, is the most effective. Other significant PaMs include the EU eco-design directive (2009/125/EC), which imposes a minimum mandatory standard of high efficiency electric motors and inverters.

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

55. **Industrial processes.** Of the main gases emitted in this sector (N₂O, HFCs, PFCs and SF₆), only HFCs, particularly from refrigeration and air conditioning, showed an increasing trend in the period 1990–2016, mainly owing to the substitution of chlorofluorocarbon and hydrochlorofluorocarbon refrigerants by HFCs pursuant to the Montreal Protocol. Italy follows the relevant EU regulations for this sector but has only a few domestic PaMs specifically addressing it. The EU regulation on F-gases (517/2014) mandates a reduction in the supply of HFCs by 27 and 79 per cent below the 2015 level by 2020 and 2030, respectively. The other measure reported for this sector aims at a reduction in N₂O emissions from nitric acid production through the application of the best available technology and has resulted in a nearly 93 per cent decrease in N₂O emissions (27.7 to 2.1 kt CO₂ eq) over the period 2005–2015.

56. **Agriculture.** Between 1990 and 2016, GHG emissions from the agriculture sector decreased by 13.4 per cent (4,684.03 kt CO₂ eq), owing mainly to the decreases in livestock population, cultivated area, crop production and the amount of nitrogen fertilizers applied, all of which are changes resulting from the implementation of the EU Common Agricultural Policy. The PaMs implemented in this sector at the national level address N₂O emissions from agricultural soils through rationalization of nitrogen fertilizers and recovery of biogas from animal manure management systems.

57. **LULUCF.** The LULUCF sector was a net sink of 29,926.87 kt CO₂ eq in Italy in 2016. Net GHG removals increased by 883.5 per cent (26,884.03 kt CO₂ eq) between 1990 and 2016, driven mainly by an increase in the carbon stocks in forest land. EU decision 529/2013/EU sets out the accounting rules on emissions and removals resulting from LULUCF activities by 2020. While the contribution from the LULUCF sector is not included in the EU target for 2020, the LULUCF regulation for 2021–2030 passed in 2017⁷ includes emissions and removals from LULUCF in the 2030 climate and energy framework. The effort-sharing regulation includes a new ‘flexibility’ that allows for a limited use of net removals from certain LULUCF accounting categories, with a proposed cap for Italy of about 11.5 Mt for the period 2021–2030.

58. **Waste management.** Between 1990 and 2016, GHG emissions from the waste sector increased by 5.6 per cent (976.67 kt CO₂ eq), owing mainly to population growth. However, following steady growth since 1990, emissions from the waste sector decreased since 2001 owing to the implementation of PaMs addressing waste management. The PaMs for the waste sector mainly relate to improved waste management by controlling the composition of waste disposed of in landfills. The key measure in this sector is separated waste collection, which sets binding targets for biodegradable waste disposed of in landfills for the regions. In 2016, though not all regions achieved their targets, Italy already achieved its 2018 target for the average rate of biodegradable waste disposed of in landfills of 74 kg waste per person per year. The total mitigation effect of increased separated collection of urban waste is estimated to be 3,700 kt CO₂ eq by 2020.

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

59. In the NC7 Italy reported information on how it strives to implement PaMs under Article 2 of the Kyoto Protocol in such a way as to minimize adverse effects, including the adverse effects of climate change and effects on international trade and social, environmental and economic impacts on other Parties, especially developing country Parties. Italy reported that its climate policies are formulated and implemented in a way that minimizes the potential adverse impacts on specific economic and industrial sectors and on other Parties, including adverse effects on international trade, and social, environmental and economic impacts in developing countries.

60. As reported in the NC7, Italy has ensured that measures implemented to increase the differentiation of energy sources do not contradict the full liberalization of its energy markets. Furthermore, Italy has strived to ensure the investments made through the Kyoto Protocol flexible mechanisms minimize the impacts on the world economy and enhance the development of new commercial relationships between developed and developing countries. At the EU level, to encourage responsible agricultural practices, the Common Agricultural Policy links subsidies to environmental, food safety and animal welfare standards.

61. Further information on how Italy strives to implement its commitments under Article 3, paragraph 14, of the Kyoto Protocol in such a way as to minimize adverse social, environmental and economic impacts on developing country Parties was reported in the 2018 annual submission. Italy reported on the assessment of economic and social consequences of response measures, adverse effects of climate change, the minimization of effects on international trade, and social, environmental and economic impacts on other Parties.

62. The reporting included information on cooperation on the development of technologies, assisting developing Parties that are highly dependent on the export of fossil fuels in diversifying their economies, and providing financial resources to developing countries and multilateral organizations for activities related to climate change. As at February 2018, Italy was sponsoring 128 projects registered under the clean development mechanism, involving at least nine developing countries, related to energy industries, waste management, afforestation and reforestation, fugitive emissions and energy demand. The Party has also funded projects in developing countries related to energy efficiency, the implementation of innovative financial mechanisms, efficient water management, carbon

⁷ https://ec.europa.eu/clima/lulucf_en.

sequestration, professional training and exchange of know-how, and the promotion of eco-efficient technologies. Italy reported in its NIR 2018 that future improvements in reporting on research activities will be included in the next NIR.

(e) **Assessment of adherence to the reporting guidelines**

63. The ERT assessed the information reported in the NC7 of Italy and identified issues relating to completeness, transparency and adherence to the UNFCCC reporting guidelines on NCs. The findings are described in table 9.

Table 9

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

No.	Reporting requirement, issue type and assessment	Description of the finding with recommendation or encouragement
1	Reporting requirement ^a specified in paragraph 22 Issue type: transparency Assessment: recommendation	<p>In its NC7, Italy did not provide transparent information on the objectives of all of its PaMs. Specifically, PaMs 19 and 20 reported in table 4.14 of the NC7 both relate to the mandatory use of biofuels but it is not clear whether the target for PaM 20 (10 per cent) is in addition to or included in the target for PaM 19 (4.5 per cent). Consequently, it is also not clear whether the mitigation impact of PaM 20 includes or does not include the mitigation impact of PaM 19.</p> <p>During the review, Italy explained that PaM 19 refers to a target of 4.5 per cent biofuel use to 2012, while the actual target for PaM 20 is only 5.5 per cent additional biofuel use to 2020. The ERT considers that the explanation provided by the Party also clarifies that the mitigation impacts of the two PaMs do not overlap.</p> <p>The ERT recommends that Italy clearly describe the objectives of the PaMs included in its NC7, particularly the targets of the PaMs related to biofuel use (PaMs 19 and 20), in line with the information provided on these PaMs during the review.</p>
2	Reporting requirement ^a specified in paragraph 15 Issue type: transparency Assessment: encouragement	<p>In its NC7, Italy did not report any PaMs planned, adopted and/or implemented at the national level aimed at reducing F-gases. The ERT noted, however, that Italy is implementing the EU regulation on F-gases (517/2014) and the EU directive on air-conditioning systems used in small motor vehicles (2006/40/EC).</p> <p>During the review, Italy explained it did not report the PaMs relating to F-gases in the NC7 because it reported only those PaMs that were implemented and measured at the national level, while under the EU regulation, the F-gases are measured at the EU level. The Party provided detailed information on the PaMs addressing F-gases and on the emissions of these gases (see para. 55 above), and also explained it has included the impacts of these PaMs in the WEM scenario.</p> <p>The ERT encourages Italy to include in its next NC information on the PaMs planned, adopted and/or implemented at the national level related to F-gases, regardless of whether they are measured at the EU level.</p>
3	Reporting requirement ^a specified in paragraph 16 Issue type: completeness Assessment: encouragement	<p>In its NC7, Italy did not report on actions taken to implement commitments under Article 4, paragraph 2(e)(ii), of the Convention, which requires that Parties identify and periodically update their own policies and practices which encourage activities that lead to greater levels of anthropogenic GHG emissions than would otherwise occur.</p> <p>During the review, Italy identified the PaMs that may lead to an increase in GHG emissions, such as tax reductions for some users of fossil fuels in the transport sector. The Party, however, reiterated its compliance with its total GHG emission targets.</p> <p>The ERT encourages Italy to include in its next NC the information provided during the review on actions taken to implement commitments under Article 4, paragraph 2(e)(ii), of the Convention.</p>
4	Reporting requirement ^a specified in paragraph 24	<p>In its NC7, Italy did not report for each PaM information on costs, non-GHG mitigation benefits and how it interacts with other PaMs at the national level. The</p>

No.	Reporting requirement, issue type and assessment	Description of the finding with recommendation or encouragement
	<p>Issue type: completeness</p> <p>Assessment: encouragement</p>	<p>ERT noted that the costs of PaMs were reported for only a few PaMs as annual support by technology and the tax deduction by type of project.</p> <p>During the review, Italy explained that while information on costs and benefits is not always available for individual PaMs, it might be available at the sectoral level. The Party also explained that given that the economic, energy-related and technological scenarios used for projections were the same for both GHGs and non-GHG atmospheric pollutants, only the ‘win-win’ PaMs achieving both mitigation and non-mitigation benefits had been considered during assessment and decision-making processes. In regard to the interaction of PaMs at the national level, Italy explained that the integrated model used ensures that there is no double counting of the mitigation effects of PaMs, while noting that it would be possible to specify the relevant interactions in a qualitative manner.</p> <p>The ERT reiterates the encouragement made in the previous review report for Italy to include in its next NC information on PaMs relating to costs, non-GHG mitigation benefits and how each PaM interacts with other PaMs at the national level.</p>
5	<p>Reporting requirement^a specified in paragraph 26</p> <p>Issue type: transparency</p> <p>Assessment: encouragement</p>	<p>In the NC7 (table 4.27), in the summary of PaMs no longer in place, Italy reported the status of some PaMs as “expired” and that of others as “implemented”, without providing a clear explanation for the different meaning of these two terms in either the text or the table.</p> <p>During the review, Italy explained that “expired” PaMs are those that have been implemented and are no longer effective, while “implemented” PaMs, even though completely implemented, remain effective.</p> <p>The ERT encourages Italy to include in its next NC a transparent explanation for the difference between “expired” and “implemented” PaMs in its summary of PaMs no longer in place.</p>

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

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

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

1. Projections overview, methodology and results

(a) Technical assessment of the reported information

64. Italy reported updated projections for 2020 and 2030 relative to actual inventory data for 2015 under the WEM scenario. The WEM scenario reported by Italy includes implemented and adopted PaMs until 2030. The WEM scenario takes into account the evolution of Italy’s national energy system and considers only the PaMs in force on 31 December 2014 as well as the minimum standards for building efficiency measure adopted in June 2015. The WEM scenario uses the same assumptions as those used by the European Commission for the Reference Scenario 2016 using the PRIMES model.⁸ The base year for the WEM scenario is 2015. The definition of the WEM scenario indicates that it was prepared in accordance with the UNFCCC reporting guidelines on NCs.

65. Italy did not report a WAM or WOM scenario. During the review week, Italy provided estimates for the WOM scenario developed by interpolating the estimated impacts of implemented PaMs up to 2030 and adding their impacts to the WEM projections.

66. The projections are presented on a sectoral basis, using the same sectoral categories as those used in the reporting on mitigation actions, and on a gas-by-gas basis for CO₂, CH₄, N₂O, PFCs, HFCs and SF₆ (treating PFCs and HFCs collectively in each case) as well as NF₃ for 1990–2030. The projections are also provided in an aggregated format for each sector as

⁸ The Price-Induced Market Equilibrium System energy system model.

well as for a Party total using global warming potential values from the Fourth Assessment Report of the IPCC.

67. Italy did not report emission projections for indirect GHGs such as carbon monoxide, nitrogen oxides, non-methane volatile organic compounds or sulfur oxides.

68. Emission projections related to fuel sold to ships and aircraft engaged in international transport were reported separately and were not included in the totals. Italy reported on factors and activities affecting emissions for each sector.

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

69. The methodology used for the preparation of the projections is identical to that used for the preparation of the emission projections for the BR2. The energy sector projections were developed using a partial equilibrium TIMES model.⁹ The model follows a bottom-up demand-driven approach in which each technology is identified by technical and economic parameters and the production of a good is conditioned to the effective demand by the end-user. The projections for other sectors, except LULUCF, were developed by means of accounting spreadsheet models using emissions and fuel-specific coefficients that are projected forward using sector- and gas-specific parameters. IPPU sector projections were developed using sector-specific economic parameters, while projections for the waste sector were developed on the basis of population, PaMs addressing recycling, and other relevant variables. Projections for the LULUCF sector (the forest management reference level) were developed using two EU models, namely G4M¹⁰ developed by the International Institute for Applied Systems Analysis and EFISCEN¹¹ developed by the European Forest Institute.

70. To prepare its projections, Italy relied on the following key underlying assumptions: GDP, population, international coal, oil and natural gas prices, carbon price, gross value added for industry and services, passenger person-kilometres, freight tonne-kilometres, livestock population (i.e. dairy cattle, non-dairy cattle, swine, sheep, poultry), nitrogen input (e.g. synthetic fertilizers, manure), the area of cultivated organic soils, municipal solid waste generation, the amount of waste in landfills, the share of CH₄ recovery in total CH₄ generation from landfills, and final energy consumption. These variables and assumptions were reported in CTF table 5.

71. The assumptions were updated on the basis of the most recent economic developments known at the time of the preparation of the projections. The key assumptions relate to: rate of growth of the economy as measured by GDP (0.71 per cent per year between 2015 and 2020, and 1.19 per cent per year between 2020 and 2030); rate of population change (growth of 0.4 per cent per year between 2015 and 2020, and a reduction of 0.3 per cent per year between 2020 and 2030); rates of growth of gross value added for services (1.5 per cent per year between 2015 and 2020, and 1.3 per cent per year between 2020 and 2030) and industry (0.6 per cent per year between 2015 and 2020, and 0.8 per cent per year between 2020 and 2030); rates of growth of international oil, coal and natural gas prices (9.3, 4.5 and 4.5 per cent per year, respectively, between 2015 and 2020, and 2.3, 3.7 and 1.5 per cent per year, respectively, between 2020 and 2030); rates of growth of passenger person-kilometres (2.5 per cent per year) and freight tonne-kilometres (5.2 per cent per year); and rate of growth of carbon price (14.9 per cent per year between 2015 and 2020, and 8.4 per cent per year between 2020 and 2030).

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

73. Sensitivity analyses were conducted for a number of important assumptions, such as population trends, energy prices, economic development indicators and carbon price. During

⁹ The Integrated Markal-Energy Flow Optimization Model System model.

¹⁰ The Global Forest Model. For information, see <http://www.iiasa.ac.at/web/home/research/modelsData/G4M.en.html>.

¹¹ The European Forest Information Scenario Model. For information, see <https://www.efi.int/knowledge/models/efiscen>.

the review, Italy explained that it performed a sensitivity analysis considering only a single scenario ('sensitivity scenario'), which was developed using a different set of assumptions than those used for the WEM scenario projections, which are based on the EU Reference Scenario 2016. The sensitivity scenario was developed using the most recent national statistics for population and the actual GDP for 2016, together with GDP growth rates that were lower than and international carbon and fuel prices that were the same as those used in the EU Reference Scenario 2016 for the periods up to 2020 and between 2020 and 2030.

74. The sensitivity scenario projections were higher than the WEM projections in 2020 (435.3 Mt CO₂ eq compared with 425.8 Mt CO₂ eq) and lower than the WEM projections in 2030 (380.2 Mt CO₂ eq compared with 392.0 Mt CO₂ eq). The projections for 2020 in the sensitivity scenario are higher than the WEM projections owing to lower fossil fuel and carbon prices, while the lower 2030 projections in the sensitivity scenario are driven by lower commodity demand due to lower GDP and population. The transport and civil sectors in the sensitivity scenario had lower projected emissions compared with the WEM scenario. The ERT noted that the sensitivity analysis provided by Italy, although useful in helping to explain the differences between the country-specific drivers and assumptions and those used at the EU level in the EU Reference Scenario 2016, does not follow the more traditional approach for sensitivity analyses. To explore how specific assumptions impact Italy's emission projections, the Party may consider undertaking a sensitivity analysis for individual or a combination of key assumptions and drivers.

(c) Results of projections

75. The projected emission levels under different scenarios and information on the Kyoto Protocol targets and the quantified economy-wide emission reduction target are presented in table 10 and the figure below.

Table 10

Summary of greenhouse gas emission projections for Italy

	<i>GHG emissions (kt CO₂ eq per year)</i>	<i>Changes in relation to base-year^a level (%)</i>	<i>Changes in relation to 1990 level (%)</i>
Kyoto Protocol base year ^b	521 920.60	0.0	0.4
Quantified emission limitation or reduction commitment under the Kyoto Protocol (2013–2020) ^c	2 399 376.64	NA	NA
Quantified economy-wide emission reduction target under the Convention ^d	2 399 376.64	NA	NA
Inventory data 1990 ^e	519 917.40	–0.4	0.0
Inventory data 2015 ^e	433 024.55	–17.0	–16.7
WEM projections for 2020 ^f	425 826.51	–18.4	–18.1
WEM projections for 2030 ^f	392 002.75	–24.9	–24.6

^a "Base year" in this column refers to the base year used for the target under the Kyoto Protocol, while for the target under the Convention it refers to the base year used for that target.

^b The Kyoto Protocol base-year level of emissions is provided in the initial review report, contained in document FCCC/IRR/2016/ITA.

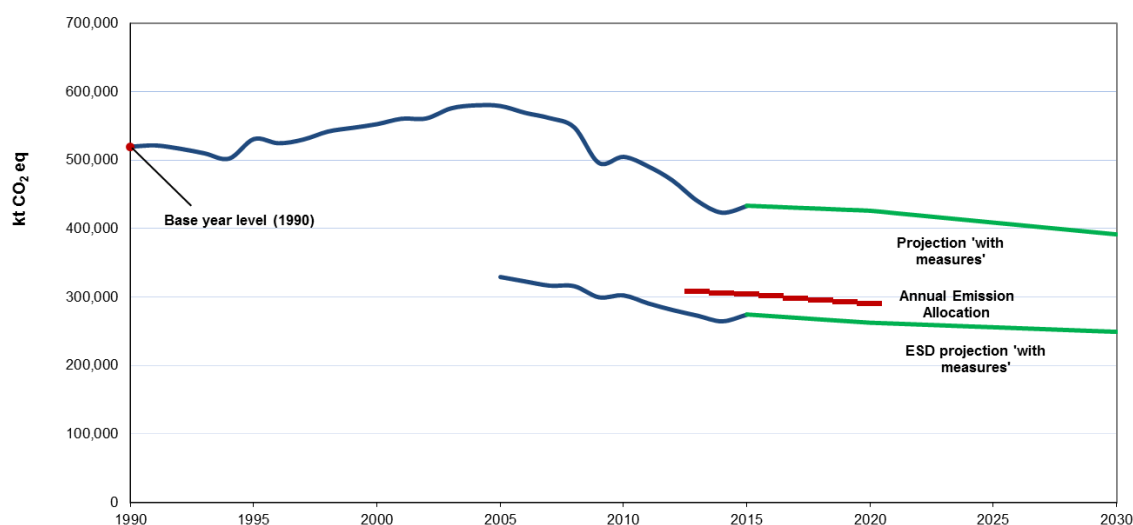
^c The Kyoto Protocol target for the second commitment period (2013–2020) is a joint target of the EU and its 28 member States and Iceland. The target is to reduce emissions by 20 per cent compared with the base-year (1990) level by 2020. The target for non-ETS sectors is 13 per cent for Italy under the ESD. The value presented in this line is based on annex II to European Commission decision 2013/162/EU and as adjusted by Commission implementing decision 2013/634/EU that established the assigned amount for the EU member States and divided by eight years to calculate the annual emission level.

^d The quantified economy-wide emission reduction target under the Convention is a joint target of the EU and its 28 member States. The target is to reduce emissions by 20 per cent compared with the base-year (1990) level by 2020.

^e From Italy's NC7.

^f From Italy's NC7.

Greenhouse gas emission projections reported by Italy



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

76. Italy’s total GHG emissions excluding LULUCF in 2020 and 2030 are projected to be 425,826.51 and 392,002.74 kt CO₂ eq, respectively, under the WEM scenario, which represents a decrease of 18.1 and 24.6 per cent, respectively, below the 1990 level. The 2020 projections suggest that Italy will continue contributing to the achievement of the EU target under the Convention.

77. Italy’s target for non-ETS sectors is to reduce its total emissions by 13 per cent below the 2005 level by 2020. Italy’s AEAs, which correspond to its national emission target for non-ETS sectors, change linearly from 308,161.63 kt CO₂ eq in 2013 to 291,006.01 kt CO₂ eq for 2020. According to the projections under the WEM scenario, emissions from non-ETS sectors are estimated to reach 262,617 kt CO₂ eq by 2020. The projected level of emissions under the WEM scenario is 9.8 per cent below the AEAs for 2020. The ERT notes that this suggests that Italy expects to meet its target under the WEM scenario.

78. Italy presented the WEM scenario by sector for 2020 and 2030, as summarized in table 11.

Table 11
Summary of greenhouse gas emission projections for Italy presented by sector

Sector	GHG emissions and removals (kt CO ₂ eq)			Change (%)	
	1990	2020	2030	1990–2020	1990–2030
		WEM	WEM	WEM	WEM
Energy (not including transport)	231 855.05	190 070.04	163 408.17	–18.0	–29.5
Transport	102 702.31	104 386.27	103 465.09	1.6	0.7
Industry/industrial processes	126 493.77	85 675.97	82 552.78	–32.3	–34.7
Agriculture	35 600.99	30 536.03	30 617.05	–14.2	–14.0
LULUCF	–3 255.59	–24 380.58	–41 535.25	648.9	1 175.8
Waste	23 265.28	15 158.20	11 959.66	–34.9	–48.6
Other (specify)	0.00	0.00	0.00	NA	NA
Total GHG emissions without LULUCF	519 917.40	425 826.51	392 002.75	–18.1	–24.6

Source: Italy’s BR3 CTF table 6.

79. According to the projections reported for 2020 under the WEM scenario, the most significant emission reductions are expected to occur in the energy sector, followed by the IPPU sector and the waste sector, amounting to projected reductions of 41,785.01 kt CO₂ eq (18.0 per cent), 40,817.80 kt CO₂ eq, (32.3 per cent) and 8,107.08 kt CO₂ eq (34.9 per cent) between 1990 and 2020, respectively. The pattern of projected emissions reported for 2030 under the same scenario is similar to 2020, although the emission reductions from the energy sector are more pronounced. Emission reductions in 2030 for the energy, IPPU and waste sectors are projected to be 68,446.88 kt CO₂ eq (29.5 per cent), 43,940.99 kt CO₂ eq (34.7 per cent) and 11,305.62 kt CO₂ eq (48.6 per cent), respectively, below the 1990 levels. The greater emission reductions in the energy sector in the period 2020–2030 are driven by a range of planned PaMs that target energy sector activities together with the assumption of a gradual increase in the EU ETS carbon price.

80. Italy presented the WEM scenario by gas for 2020 and 2030, as summarized in table 12.

Table 12

Summary of greenhouse gas emission projections for Italy presented by gas

Gas	GHG emissions and removals (kt CO ₂ eq)			Change (%)	
	1990	2020	2030	1990–2020	1990–2030
		WEM	WEM	WEM	WEM
CO ₂	434 967.84	352 865.54	327 886.58	–18.9	–24.6
CH ₄	54 241.73	40 475.01	36 628.71	–25.4	–32.5
N ₂ O	26 949.36	18 747.72	18 565.05	–30.4	–31.1
HFCs	444.00	11 751.57	6 934.50	2 546.8	1 461.8
PFCS	2 906.86	1 638.24	1 638.24	–43.6	–43.6
SF ₆	407.61	320.26	321.49	–21.4	–21.1
NF ₃	0.00	28.17	28.17	NA	NA
Total GHG emissions without LULUCF	519 917.40	425 826.51	392 002.74	–18.1	–24.6

Source: Italy's BR3 CTF table 6.

81. For 2020 the most significant reductions are projected for CO₂, CH₄ and N₂O emissions: 82,102.30 kt CO₂ eq (18.9 per cent), 13,766.72 kt CO₂ eq (25.4 per cent) and 8,201.64 kt CO₂ eq (30.4 per cent) between 1990 and 2020, respectively.

82. While the pattern of projected emissions of gases reported for 2030 is similar to that of 2020, the emission reductions for CO₂ are more pronounced in the period 2020–2030 owing to the planned PaMs, which target energy use in the IPPU sector, together with the assumption of an increase in the EU ETS carbon price. Between 1990 and 2030, emission reductions for CO₂, CH₄ and N₂O are projected to be 107,081.26 kt CO₂ eq (24.6 per cent), 17,613.02 kt CO₂ eq (32.5 per cent) and 8,384.31 kt CO₂ eq (31.1 per cent), respectively, below their 1990 levels.

(d) Assessment of adherence to the reporting guidelines

83. The ERT assessed the information reported in the NC7 of Italy and identified issues relating to completeness, transparency and adherence to the UNFCCC reporting guidelines on NCs. The findings are described in table 13.

Table 13

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

No.	Reporting requirement, issue type and assessment	Description of the finding with recommendation or encouragement
1	Reporting requirement ^a specified in paragraph 28 Issue type: completeness Assessment: encouragement	In its NC7, Italy did not report WOM or WAM projections. During the review, Italy provided the WOM projections, which were calculated by adding the mitigation impacts of the implemented and adopted PaMs to the WEM projections. The Party acknowledged that this approach leads to an overestimation of the WOM projections because it does not fully account for overlap and interactions among PaMs. Italy explained that it has also developed a WAM scenario taking into account the new national energy strategy, even though all major drivers are still under review. The ERT encourages Italy to provide in its next NC projections for the WOM and WAM scenarios.
2	Reporting requirement ^a specified in paragraph 35 Issue type: completeness Assessment: encouragement	In its NC7, Italy did not report projections for the indirect GHGs carbon monoxide, nitrogen oxides, non-methane volatile organic compounds and sulfur oxides. During the review, Italy explained that projections of these indirect gases as well as of ammonia and PM _{2.5} , consistent with the WEM scenario, can be found in the 2018 annual communication of the national emission inventory of transboundary substances in the framework of the United Nations Economic Commission for Europe Convention on Long-range Transboundary Air Pollution and relevant protocols (http://www.isprambiente.gov.it/en/publications/reports/italian-emission-inventory-1990-2016.-informative-inventory-report-2018). The ERT encourages Italy to provide in its next NC projections of the indirect GHGs carbon monoxide, nitrogen oxides, non-methane volatile organic compounds and sulfur oxides.
3	Reporting requirement ^a specified in paragraph 43 Issue type: transparency Assessment: encouragement	In the information on models or approaches used to assess the impact of PaMs and to develop the emission projections reported in its NC7, Italy did not include a summary of the strengths and weaknesses of the models or approaches used or an explanation of how the models or approaches used account for any overlap or synergies that may exist among PaMs. During the review, Italy provided information on the strengths and weaknesses of the TIMES model and how the model accounts for any overlap or synergies that may exist among PaMs. The ERT encourages Italy to provide in its next NC a summary of the strengths and weaknesses of all the models or approaches used to estimate the effect of PaMs and to develop emission projections, and an explanation for how the models or approaches used account for any overlap or synergies that may exist among PaMs.

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

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

2. Assessment of the total effect of policies and measures

(a) Technical assessment of the reported information

84. In the NC7 Italy presented the estimated and expected total effect of implemented and adopted PaMs in the PaMs chapter. The total effect of Italy's PaMs was generated by adding the reported effects of individual PaMs, which had been estimated using various methodologies. Information is presented in terms of GHG emissions avoided or sequestered, by gas (on a CO₂ eq basis), in 2020 and 2030. The ERT noted, and Italy further explained during the review, that the methodology used to estimate the effect of individual PaMs is based on setting specific targets for them and assuming a stepwise trend to reach the target. The emissions avoided are estimated by calculating the level of the target parameter (e.g. electricity or natural gas saving) multiplied by an average emission factor of fuel mix involved in the measure. The ERT also noted, as acknowledged by Italy, this approach leads to an imprecise estimate that might be affected by double counting because it does not

consider interaction among PaMs. The ERT further noted that the information on the total effect of implemented and adopted PaMs does not include those PaMs whose effects have not been reported.

85. Italy reported that the total estimated effect of its adopted and implemented PaMs is 51,100 kt CO₂ eq in 2020, with an additional effect of 4,000 kt CO₂ eq by 2030. According to the information reported in the NC7, in 2020, PaMs implemented in the energy sector (without transport) will deliver the largest emission reductions (25,210 kt CO₂ eq), followed by PaMs implemented in the transport (20,250 kt CO₂ eq) and waste (3,700 kt CO₂ eq) sectors. Table 14 provides an overview of the total effect of PaMs as reported by Italy.

Table 14
Projected effects of Italy's planned, implemented and adopted policies and measures by 2020 and 2030

Sector	2020		2030	
	Effect of implemented and adopted measures (kt CO ₂ eq)	Effect of planned measures and adopted measures (kt CO ₂ eq)	Effect of implemented and adopted measures (kt CO ₂ eq)	Effect of planned measures (kt CO ₂ eq)
Energy (without transport)	25 210	9 059	4 000	26 254
Transport	20 250	3 150	NE	11 600
Industrial processes	740	NE	NE	NE
Agriculture	1 190	NE	NE	NE
Land-use change and forestry	NE	NE	NE	NE
Waste management	3 700	NE	NE	NE
Total	51 090	12 209	4 000	38 124

Source: Italy's NC7.

Note: The total effect of implemented and adopted PaMs is defined as the difference between the WOM and the WEM scenario.

(b) Assessment of adherence to the reporting guidelines

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

Table 15
Findings on the assessment of the total effect of policies and measures from the review of the seventh national communication of Italy

No.	Reporting requirement, issue type and assessment	Description of the finding with recommendation or encouragement
1	Reporting requirement specified in paragraph 39 Issue type: transparency Assessment: recommendation	In its NC7, Italy did not present the estimated and expected total effect of implemented and adopted PaMs in the section on projections and the total effect of PaMs. During the review, Italy explained that the estimated and expected total effect of implemented and adopted PaMs was reported in the PaMs chapter. The ERT noted that the total effects of implemented and adopted PaMs reported in the PaMs chapter were calculated by adding the reported effects of individual implemented and adopted PaMs in 2020 and 2030, while the effects of some other implemented and adopted PaMs were not estimated and reported and thus not included in the estimate of the total effect of implemented and adopted PaMs. The ERT recommends that Italy include in its next NC, in the section on projections and the total effect of PaMs, the estimated and expected total effect of implemented and adopted PaMs or provide a cross-reference in the section on projections and the total effect of PaMs to such information reported in another section of the submission. The ERT also recommends that Italy include the effects of those implemented and adopted PaMs whose effects were not reported in the total effect of implemented and adopted PaMs.

<i>No.</i>	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation or encouragement</i>
2	<p>Reporting requirement specified in paragraph 39</p> <p>Issue type: transparency</p> <p>Assessment: encouragement</p>	<p>In its NC7, Italy did not present the total expected effect of planned PaMs in the section on projections and the total effect of PaMs.</p> <p>During the review, Italy explained that the estimated and expected total effect of planned PaMs was reported in the PaMs chapter. The ERT noted that the total effects of planned PaMs reported in the PaMs chapter were calculated by adding the reported effects of individual planned PaMs in 2020 and 2030, while the effects of some other planned PaMs were not estimated and reported and thus not included in the estimate of the total effect of planned PaMs.</p> <p>The ERT encourages Italy to include in its next NC, in the section on projections and the total effect of PaMs, the estimated and expected total effect of planned PaMs or provide a cross-reference in the section on projections and the total effect of PaMs to such information reported in another section of the submission. The ERT also encourages Italy to include the effects of those planned PaMs whose effects were not reported in the total effects of planned PaMs.</p>

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

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

(a) Technical assessment of the reported information

87. In the NC7 Italy provided information on how its use of the mechanisms under Articles 6, 12 and 17 of the Kyoto Protocol is supplemental to domestic action. The ERT noted that Italy does not plan to use the market-based mechanisms to meet its Kyoto Protocol target.

88. Italy explained that in defining supplementarity, it took into account 50 per cent of the difference between the projected emissions and the Kyoto Protocol target, which equals 344.8 Mt CO₂ eq, of which 241.6 Mt CO₂ eq is being allowed for use by operators under the EU ETS.

89. For the first commitment period of the Kyoto Protocol, the contribution of credits from project-based mechanisms, excluding those credits used by operators under the EU ETS, to Italy's achievement of its target amounted to 10.15 Mt CO₂ eq. The credits from project-based mechanisms were financed by IMELS through various funds. For the second commitment period, a certain amount of credits from project-based mechanisms will be voluntarily cancelled by IMELS to offset emissions from events hosted by the Government of Italy to enhance mitigation ambition, in accordance with decisions 1/CP.19 and 1/CP.21.

(b) Assessment of adherence to the reporting guidelines

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

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

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

(a) Technical assessment of the reported information

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

92. Italy indicated what “new and additional” financial resources it has provided and clarified how it has determined such resources as being “new and additional”. As reported in its NC7, Italy considered only climate finance committed or disbursed during the period 2013–2016 through bilateral and multilateral channels as “new and additional”, particularly the budget increase for development cooperation dedicated to climate change, revenues from the auctioning of GHG emission allowances, and financial contributions to the Green Climate Fund.

93. Italy described how its resources address the adaptation and mitigation needs of non-Annex I Parties. It also described how those resources assist non-Annex I Parties to mitigate and adapt to the adverse effects of climate change, facilitate economic and social response measures, and contribute to technology development and transfer and capacity-building related to mitigation and adaptation. Italy reported information on the assistance that it has provided to developing country Parties that are particularly vulnerable to the adverse effects of climate change to help them to meet the costs of adaptation to those adverse effects. The Party reported that IMELS has signed 31 new bilateral agreements with developing countries, including regional groups, to: support mitigation and adaptation actions; facilitate access to climate finance; and provide capacity-building and technology transfer. In order to ensure that the activities envisaged under the bilateral cooperation address the needs of developing countries and enhance country ownership, each MOU establishes a joint committee composed of representatives of both governments to provide general direction and oversight over the work, which is complemented by periodic site visits by national experts to monitor and assess the activities.

94. In its NC7, Italy reported it had expanded its support to new countries and regions that are particularly vulnerable, such as SIDS and African countries. Italy supports adaptation activities, including disaster risk reduction, protection and conservation of marine and terrestrial ecosystems and biodiversity, and climate-smart agriculture, to increase resilience in SIDS in the Pacific region. In SIDS in the Caribbean Community, the activities supported by Italy are related to sustainable energy, vulnerability assessment, and adaptation to climate change and climate variability (e.g. protection from sea level rise).

95. The ERT noted that Italy has strengthened its support to the Least Developed Countries Fund to help the LDCs in their efforts to adapt to the effects of climate change. During the review, Italy provided the information that in the biennium 2015–2016, it allocated 47 per cent of its bilateral and multilateral support to the LDCs, particularly those in Africa and Asia, allocating to them 80 and 12 per cent, respectively, of its total support to the LDCs. The projects financed through this support include those addressing water, agriculture, disaster risk management and prevention, and health. Italy also allocated 7.5 per cent of its bilateral and multilateral support to SIDS in Africa and in the Caribbean, Indian Ocean, Mediterranean, Pacific Ocean and South China Sea regions. As reported in its NC7, Italy provided EUR 7 million to the Adaptation Fund in the period 2015–2018, comprising disbursed funds amounting to EUR 2 and 5 million in 2015 and 2017, respectively. It also committed EUR 7 million to the Adaptation Fund for 2018.

96. With regard to the most recent financial contributions aimed at enhancing the implementation of the Convention by developing countries, Italy reported that its climate finance has been allocated on the basis of priority areas, strategies and programmes that reflect its commitment to achieving the objectives of the Paris Agreement and the Sustainable Development Goals by supporting the implementation of nationally determined contributions by Parties as well as related mitigation and adaptation actions. Legislative Decree 30/2013 strongly expresses Italy’s commitment to combating climate change and to providing support to developing countries in their efforts to combat climate change. The financial support provided by Italy focuses on the following priority areas: management of extreme events, promotion of renewable energy and energy efficiency, water resource management, waste management, air quality, prevention of forest degradation, land rehabilitation, soil improvement and sustainable mobility. The priority regions are: Asia (China, and SIDS in the Pacific), the Mediterranean, Central and Eastern Europe, the Caribbean and Africa. Table 16 includes some of the information reported by Italy on its provision of financial support.

Table 16
Summary of information on provision of financial support by Italy in 2013–2016
(Millions of United States dollars)

Allocation channel of public financial support	Year of disbursement			
	2013	2014	2015	2016
Official development assistance ^a	3 093.28	3 955.02	4 385.52	5 262.35
Climate-specific contributions through multilateral channels, including:	154.52	178.81	241.67	154.40
Global Environment Facility	11.40	17.60	17.05	24.63
Least Developed Countries Fund	0.00	0.00	0.00	1.98
Special Climate Change Fund	0.00	0.00	0.00	0.00
Adaptation Fund	0.00	0.00	2.22	0.00
Green Climate Fund	0.00	0.50	55.46	0.00
Trust Fund for Supplementary Activities	0.00	0.00	0.00	0.00
Financial institutions, including regional development banks	124.06	116.86	106.37	85.24
United Nations bodies	19.06	43.85	46.18	34.33
Other	0.00	0.00	14.38	8.23
Climate-specific contributions through bilateral, regional and other channels	71.36	34.18	197.27	136.42
Other	NA	NA	NA	NA

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

(b) Assessment of adherence to the reporting guidelines

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

Table 17
Findings on financial resources, including under Article 11 of the Kyoto Protocol from the review of the seventh national communication of Italy

No.	Reporting requirement, issue type and assessment	Description of the finding with recommendation or encouragement
1	Reporting requirement ^a specified in paragraph 41	In its NC7, Italy did not provide information on how it has taken into account the need for adequacy and predictability in the flow of “new and additional” financial resources reported.
	Issue type: completeness	During the review, Italy explained that it ensured the adequacy and predictability of financial resources through an increase in the budget for development cooperation dedicated to climate change, a share of revenue from auctioning GHG emission allowances, and financial contributions to the Green Climate Fund.
	Assessment: recommendation	The ERT recommends that Italy include in its next NC information on how it has taken into account the need for adequacy and predictability in the flow of “new and additional” financial resources reported.

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

^a Paragraph numbers listed under reporting requirement refer to the relevant paragraph of the reporting guidelines for supplementary information.

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

(a) Technical assessment of the reported information

98. Italy provided information on steps, measures and activities related to technology transfer, access and deployment benefiting developing countries, including information on activities undertaken by the public sector, but not by the private sector. Italy provided examples of support provided for the deployment and enhancement of the endogenous capacities and technologies of non-Annex I Parties, which include the installation and operation of start-up plants through tailored training to ensure proper control, functioning and routine maintenance of the technologies.

99. The ERT noted that Italy reported on its PaMs as well as success (but not failure) stories in relation to technology transfer, and in particular on measures taken to promote, facilitate and finance the transfer and deployment of climate-friendly technologies. These measures, implemented over the period 2015–2017, relate, for example, to vulnerability and adaptation, the promotion of renewable energy (e.g. photovoltaic systems) and energy efficiency, the upgrade of early warning systems with RES, the installation of hydropower plants, the improvement of resilient water infrastructure, and the promotion of investment and technology transfer to small and medium-sized enterprises.

100. Among the notable success stories, the first phase of a heat pump project under a technical agreement on sustainable development, a cooperation between IMELS and the Lebanese Center for Energy Conservation, ongoing since 2016, aims to support the Lebanese Government in addressing the climate change mitigation challenges in the implementation of Lebanon's nationally determined contribution. The project is introducing heat pump technologies in the heating, domestic hot water and cooling sectors through transfer of know-how and technology, and is phasing out refrigerant gases with high global warming potential (i.e. HFCs). In the Solomon Islands, a sustainable programme of widespread rural electrification for water and energy security is being implemented, aiming to promote the sustainability of renewable energy technologies in rural areas by deploying energy services, creating awareness and providing training and employment opportunities at the community level.

101. Italy provided information on steps taken to promote, facilitate and finance the transfer of technology to developing countries and to build their capacity in order to facilitate implementation of Article 10 of the Kyoto Protocol. In its NC7, Italy provided relevant information on the support provided in technology transfer and capacity-building to other Parties.

102. Italy provided information on activities for financing access by developing countries to 'hard' and 'soft' technologies for mitigation and adaptation. Soft technologies comprise knowledge transfer and specific training for the installation and maintenance of equipment, while hard technologies relate to the essential transfer of specific technologies, including vapour compression, and renewable energy and energy efficiency systems (e.g. solar water heaters, solar photovoltaic systems, compact fluorescent lamps and photovoltaic cells).

(b) Assessment of adherence to the reporting guidelines

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

Table 18

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

No.	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation or encouragement</i>
1	Reporting requirement ^a specified in paragraph 54 Issue type: transparency Assessment: recommendation	In its NC7, Italy did not clearly distinguish between activities undertaken by the public sector and those undertaken by the private sector in the information reported on measures related to the promotion, facilitation and financing of the transfer of, or access to, environmentally sound technologies. During the review, Italy explained that it was not able to distinguish between activities undertaken by the public and private sectors because there is no monitoring system in place to track activities undertaken by the private sector. The Party informed the ERT that a planned pilot study on private financial resources would enable the reporting of this information in future submissions. The ERT reiterates the recommendation made in the previous review report that Italy include in its next NC information on the promotion, facilitation and financing of the transfer of, or access to, environmentally sound technologies, clearly distinguishing between activities undertaken by the public and private sectors.
2	Reporting requirement ^a specified in paragraph 55 Issue type: completeness Assessment: recommendation	In its NC7, Italy provided some success stories in tabular format (see para. 100 above). However, the Party did not report, where feasible, on failure stories related to technology transfer activities in either textual or tabular format. During the review, Italy provided information on the experience and lessons learned from failures in previous projects related to the sustainable programme on widespread rural electrification for water and energy security in the Pacific region, which has been implemented in the Solomon Islands since 2016. The ERT reiterates the recommendation made in the previous review report that Italy include information, where feasible, in its next NC, in a tabular format following table 6 of the UNFCCC reporting guidelines on NCs, on any failure stories related to technology transfer activities.

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

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

E. Vulnerability assessment, climate change impacts and adaptation measures

1. Technical assessment of the reported information

104. In the NC7, Italy provided the required information on the expected impacts of climate change in the country; the adaptation policies covering regional, sectoral and cross-sectoral vulnerabilities and considerations; and an outline of the action taken to implement Article 4, paragraph 1(b) and (e), of the Convention with regard to adaptation. Italy provided a description of climate change vulnerability and impacts on the most important sectors and areas, such as coastal zones, biodiversity, urban areas and hydrogeology, and highlighted the adaptation response actions taken and planned at different levels of government.

105. Italy has several vulnerable sectors and areas relating to its geographical location in the Mediterranean basin, including water supply, tourism, cultural heritage, agriculture, forestry, infrastructure and transport. The adaptation measures aimed at reducing the impacts of climate change on the most vulnerable sectors and areas include: diversification of crops and application of effective irrigation and water management systems; development of drought management plans; development of coastal basin management systems; recovery of degraded lands; reforestation; implementation of early warning and environmental monitoring systems; development of urban adaptation plans and strategies; maintenance of public transport networks; and application of instruments for integrated water management in terrestrial zones.

106. Impetus has been given to addressing adaptation matters with the adoption in 2015 of the National Adaptation Strategy for Climate Change,¹² which provided further direction to government agencies on enhancing preparedness for climate change. The strategy contains a set of sectoral adaptation measures with a specific focus on Italian hotspots. Several regions have started procedures aiming to define planning instruments for adaptation. The national adaptation plan for climate change, in development since 2016, is planned to be released in 2018. Italy has also published some background documents to support the ongoing efforts to develop adaptation strategies and plans, including a report on the state of scientific knowledge on the impacts of and vulnerability and adaptation to climate change in Italy. Since the NC6, the Party has strived to develop a national institutional framework for adapting to climate change and for responding to international and EU commitments in that regard.

107. The key findings of the research on the impacts of climate change indicate these will be average temperature rise, an increase in the frequency of extreme weather events, sea level rise, a reduction in the availability of fresh water, and an increase in the occurrence of droughts and floods. The methodologies used for determining the climate change impacts and vulnerabilities are based on literature review and expert judgment, and are in accordance with the approach indicated by the European Climate Adaptation Platform,¹³ the IPCC *Technical Guidelines for Assessing Climate Change Impacts and Adaptations*¹⁴ and the UNEP *Handbook on Methods for Climate Change Impact Assessment and Adaptation Strategies*.¹⁵

108. The impacts of climate change in the country include: reduced freshwater availability and quality in terrestrial zones owing to increased average temperature and decreased precipitation; saltwater intrusion and erosion in coastal zones; increased intensity and frequency of droughts and floods; increased frequency of extreme weather events; biodiversity loss; deterioration of marine fauna owing to seawater temperature and pH changes and infestation by invasive species; increased incidence of vector-borne diseases; and deforestation. Table 19 summarizes the information on vulnerability and adaptation to climate change presented in the NC7 of Italy.

Table 19
Summary of information on vulnerability and adaptation to climate change reported by Italy

<i>Vulnerable area</i>	<i>Examples/comments/adaptation measures reported</i>
Agriculture and food security	<p><i>Vulnerability:</i> Climate change is expected to cause water shortages owing to temperature and precipitation changes, and an increase in pathogen species, which may cause a reduction in yields of several important crops, such as corn, soybean, wheat, and various fruits and vegetables.</p> <p><i>Adaptation:</i> The measures reported include diversifying crops, applying sustainable agricultural practices, implementing efficient irrigation systems and promoting innovative infrastructural investments at the farm level.</p>
Aquaculture and fisheries	<p><i>Vulnerability:</i> The increased mean surface temperature of seawater, together with changes in the concentration of dissolved oxygen and in salinity, have been observed to cause changes in the geographical and bathymetric distribution of animal and plant species in the Mediterranean Sea, including through the increasing threat of invasion of non-Mediterranean species. The main vulnerabilities are the change in the composition of biological communities and the reduction in economically viable fish species. Coastal environments, lagoons and river deltas are the most vulnerable areas to climate change.</p> <p><i>Adaptation:</i> The measures reported include applying annual fishing quotas and selecting climate-resilient species for aquaculture.</p>
Biodiversity and natural ecosystems	<p><i>Vulnerability:</i> The biodiversity of Italy is vulnerable to the impacts of climate change on species and habitats in terrestrial, marine, freshwater and inland ecosystems. In terrestrial ecosystems,</p>

¹² http://www.minambiente.it/sites/default/files/archivio/allegati/clima/documento_SNAC.pdf (in Italian).

¹³ <https://www.eea.europa.eu/themes/climate/european-climate-adaptation-platform-climate-adapt>.

¹⁴ <https://www.ipcc.ch/pdf/special-reports/ipcc-technical-guidelines-1994n.pdf>.

¹⁵ http://www.ivm.vu.nl/en/Images/UNEPHandbookEBA2ED27-994E-4538-B0F0C424C6F619FE_tcm234-102683.pdf.

Vulnerable area	Examples/comments/adaptation measures reported
Coastal zones	<p>changes in life cycle phenology, physiology, behaviour, geographical distribution, composition and interactions of species are expected. A significant change in the composition of fish fauna in the Adriatic Sea has already been observed. The spreading of pathogenic bacteria and invasive species and the mass mortality of invertebrates are expected in marine ecosystems. In freshwater ecosystems, loss of habitats, biotic components and processes are expected, together with excessive growth of algae and cyanobacteria in lakes.</p> <p><i>Adaptation:</i> The measures reported include: maintaining and expanding gene banks for plant and animal species and for traditional crops; reframing current policies on forest fire prevention based on bioengineering, taking into account climate-related risks; and extending the network of green corridors between national protected areas (with a specific focus on Alpine areas and the Apennine mountains).</p> <p><i>Vulnerability:</i> The coastal zones of Italy are quite vulnerable to impacts of climate change such as coastal erosion, saltwater intrusion and flooding caused by sea level rise. These impacts are expected to increase, with further associated impacts on coastal rural economies, local tourism and human health. The northern Adriatic coast of Italy, featuring the Po River delta and the Venetian Lagoon, is at a high risk from sea level rise.</p> <p><i>Adaptation:</i> The measures reported include the conservation of coastal vegetation to prevent coastal erosion and the reduction of pollution in marine environments to achieve the conditions of “Good Environmental Status” as per the EU marine strategy framework directive (2008/56/EC).</p>
Desertification, land degradation and drought	<p><i>Vulnerability:</i> Several regions, such as Basilicata, Emilia-Romagna, Marche, Molise, Puglia, Sardinia and Sicily, are highly sensitive to desertification owing to their extended arid climates. Coastal areas such as those in Puglia, Sardinia and Sicily also suffer from saltwater intrusion attributable to insufficient groundwater resources. Desertification is expected to accelerate as a result of erosion, soil salinization, loss of organic matter and drying up of soil. The expected indirect socioeconomic impacts of desertification include: a decline in agriculture and tourism productivity; growing unemployment in rural areas and consequent migration; conflicts over water use; harm to properties and people owing to increased frequency of fires; and overall biodiversity loss.</p> <p><i>Adaptation:</i> Italy has made plans to promote and disseminate scientific and technological research on desertification, land degradation and drought, and to adopt more sustainable agricultural practices (plant and livestock), including increasing the vegetation cover in arid areas and implementing efficient irrigation methods.</p>
Forests	<p><i>Vulnerability:</i> Climate change has already caused observable impacts on the forests of Italy, including reduced growth rates and productivity, changes in composition of existing species, displacement of forest habitats resulting from local biodiversity loss, an increased risk of damage from fire and from insect and pathogen infestation, and an alteration of the water and carbon cycle.</p> <p><i>Adaptation:</i> The measures reported include: the reform of current policies on forest fire prevention on the basis of bioengineering, taking into account climate-related risks; forest fire protection; soil protection; and reduction of hydrogeological risk through recovery of land prone to erosion and land degradation and through reforestation.</p>
Hydrogeology	<p><i>Vulnerability:</i> In Italy, floods, landslides, debris flows, erosion and subsidence have been observed to have an increasing trend over the past 50 years. The risks include variations in the hydrological regime, inland flooding due to heavy precipitation, increased winter run-off, changes in hydrological balance, flash mud or debris flows, and increased occurrence of landslides. The areas most exposed to the hydrogeological risk of flooding include the Po River basin and Alpine and Apennine areas.</p> <p><i>Adaptation:</i> The adaptation measures reported include: the strengthening of warning systems; the organization of public training activities on flood preparedness; the removal of the criticalities of the water network (bottlenecks and culverts); and the maintenance of natural areas (agricultural areas, wetlands, lakes) to reduce vulnerability to floods.</p>
Human health	<p><i>Vulnerability:</i> Public health is expected to have an increased level of vulnerability owing to climate change, including increased mortality and morbidity caused by respiratory diseases, allergic disorders, and other psychological and physical pathologies. Vector-borne diseases, such as Chikungunya virus infection, West Nile disease, leishmaniasis and dengue fever have the potential to increase in Italy.</p> <p><i>Adaptation:</i> The measures reported for the health sector include the planning of early warning and environmental monitoring systems for vegetal species (toxic, allergenic) and animals (toxic, alien species having an impact on animal health, carriers of infectious disease), and the</p>

Vulnerable area	Examples/comments/adaptation measures reported
Infrastructure and economy	<p>development of a database of adverse meteorological events and their impacts on the health, well-being and safety of the population.</p> <p><i>Vulnerability:</i> Several economic sectors in Italy are vulnerable to the impacts of climate change, particularly the energy sector, where technologies that need water, such as hydropower plants, are extremely vulnerable to reduced water availability and extreme weather events.</p> <p><i>Adaptation:</i> Italy is developing urban adaptation plans and strategies within the framework of the Global Covenant of Mayors for Climate and Energy. Other measures include: regulations for increasing the climate resilience of urban infrastructure, public networks, buildings and public spaces; the reduction of hydraulic and geomorphological risks through the implementation of the EU floods directive (2007/60/EC); the monitoring of weather and water variability for the energy sector; and the review of safety and hazard warning systems for dangerous industrial plants.</p>
Tourism and cultural heritage	<p><i>Vulnerability:</i> Climate change is expected to have a range of impacts on the tourism sector in Italy, stemming from increased temperature and reduction in freshwater resources in coastal areas and snow levels in mountain areas.</p> <p><i>Adaptation:</i> The measures reported include the diversification and seasonal adjustment of touristic options and the continuous monitoring and maintenance of cultural sites to increase their resilience. In the important touristic areas of the Alps and the Apennines, the reported adaptation measures are focused on mountain touristic options (low environmental impact winter sports and non-winter options). In the Po River basin, measures reported include the strengthening of the emergency services of the Regional Environmental Protection Agency and the Civil Protection Department in the case of floods and droughts.</p>
Water resources	<p><i>Vulnerability:</i> In Italy, climate change has been observed to have negative impacts on the hydrological cycle, including on soil moisture, run-off and groundwater recharge – effects that are further exacerbated by anthropogenic influences. Freshwater resources (groundwater and rivers) in Italy are expected to decrease owing to decreased annual precipitation and river discharge, which in turn is expected to cause droughts, especially in summer, and mainly in southern Italy. Consequently, economic and ecological systems that depend on water resources from alluvial aquifers, such as agriculture and tourism, are considered to be vulnerable to water shortages.</p> <p><i>Adaptation:</i> The adaptation measures reported include: integrated programmes to improve water use efficiency for agricultural, civil and industrial uses; drought management plans; investments to reduce water losses in distribution systems; and the integration of river basin planning with planning related to the coastal zones and sectoral plans.</p>

109. Italy provided a detailed description of international adaptation activities, including the financing and implementing of projects that aim to support developing countries in their efforts in climate change mitigation and adaptation. Italy supports international efforts to increase climate resilience in developing countries through cooperation with several global and regional financing institutions and implementing agencies, such as the World Bank, Green Climate Fund, Global Environment Facility, Least Developed Countries Fund, Adaptation Fund, Food and Agriculture Organization of the United Nations, Regional Environmental Center for Central and Eastern Europe, Capacity-building Initiative for Transparency and African Development Bank. Italy also provided information on bilateral cooperation with developing countries on adaptation, such as its ongoing programmes and projects (including the Sino-Italian Cooperation Program for Environmental Protection), a partnership with SIDS, bilateral agreements with African developing countries, and cooperation on capacity-building activities with several countries (Argentina, Botswana, Comoros, Congo, Cuba, Djibouti, Ethiopia, Georgia, Kazakhstan, Lesotho, Maldives, Mali, Morocco, Peru, Qatar, Rwanda, South Africa, Sudan, Swaziland and Tunisia), including several SIDS and Caribbean Community countries.

2. Assessment of adherence to the reporting guidelines

110. The ERT assessed the information reported in the NC7 of Italy and identified issues relating to completeness, transparency and adherence to the UNFCCC reporting guidelines on NCs. The findings are described in table 20.

Table 20

Findings on the vulnerability assessment, climate change impacts and adaptation measures from the review of the seventh national communication of Italy

No.	Reporting requirement, issue type and assessment	Description of the finding with recommendation or encouragement
1	Reporting requirement specified in paragraph 49 Issue type: completeness Assessment: recommendation	In its NC7, Italy did not include an outline of the actions taken to implement Article 4, paragraph 1(b) and (e), of the Convention, including adaptation measures and integrated plans for coastal zone management, water resources and agriculture, and for the protection and rehabilitation of areas affected by drought and desertification and floods. During the review, Italy provided information on the adaptation measures that are in place in key sectors and areas (see table 19), and explained that the national adaptation plan for climate change, tentatively planned for release in 2018, will have more concrete and detailed information on adaptation measures. The ERT recommends that Italy include in its next NC an outline of the actions taken to implement Article 4, paragraph 1(b) and (e), of the Convention, including adaptation measures and integrated plans for coastal zone management, water resources and agriculture, and for the protection and rehabilitation of areas affected by drought and desertification and floods.
2	Reporting requirement specified in paragraph 49 Issue type: transparency Assessment: encouragement	From the NC7, it is not clear whether Italy used the IPCC <i>Technical Guidelines for Assessing Climate Change Impacts and Adaptations</i> and the UNEP <i>Handbook on Methods for Climate Change Impact Assessment and Adaptation Strategies</i> to prepare the information on the expected impacts of climate change and adaptation actions. During the review, Italy explained that it used both of the above-mentioned documents to prepare the information on the expected impacts of climate change and adaptation actions. The ERT encourages Italy to clarify in its next NC whether it has used the IPCC <i>Technical Guidelines for Assessing Climate Change Impacts and Adaptations</i> and the UNEP <i>Handbook on Methods for Climate Change Impact Assessment and Adaptation Strategies</i> to prepare the information on the expected impacts of climate change and adaptation actions.

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

F. Research and systematic observation

1. Technical assessment of the reported information

111. Italy provided information on its general policy and funding relating to research and systematic observation and both domestic and international activities, including contributions to the World Climate Programme, GCOS and the IPCC.

112. Italy has implemented and planned international and domestic policies and programmes on climate change research, systematic observation and climate modelling that aim to advance capabilities to predict and observe the physical, chemical, biological and human components of the Earth's system over space and time. Italy's climate change research policies are framed within integrated research strategies and plans, such as the national Smart Specialisation Strategy and the Strategic Plan for Research and Innovation in the Agricultural, Food and Forestry Sectors 2014–2020. Italy implements several research projects with national and international partners in order to support innovation in the areas of mitigation and adaptation. Apart from its participation in international programmes such as Horizon 2020,¹⁶ Italy provides financing for climate change research from national resources through major research programmes such as the National Research Programme in Antarctica

¹⁶ <https://ec.europa.eu/programmes/horizon2020/>.

and the National Research Programme 2015–2020 as well as other projects relevant to national interest. The Party is currently participating in the development, with the European Commission, of the European research programme that will succeed Horizon 2020 (Framework Programme 9).¹⁷

113. In terms of activities related to systematic observation, Italy reported on national plans, programmes and support for ground- and space-based climate observing systems, including satellite and non-satellite climate observation. Italy also reported on challenges related to the maintenance of a consistent and comprehensive observation system. Italy has a comprehensive observational network covering its whole territory, which is also used for climate observation. IMELS has established GEOItaly,¹⁸ a network of national experts contributing to the Group on Earth Observations international initiative and the European Strategy Forum on Research Infrastructures. Italy, as a member of the International Council for Science, formally participated in the International Geosphere-Biosphere Programme until its conclusion in December 2015. Italy contributes significantly to international programmes involving land, ocean and space-based measurements by means of its very long instrumental temperature record. The Party also fully participates in the GCOS Surface Network,¹⁹ the GCOS Upper-Air Network²⁰ and Global Atmosphere Watch.²¹ Italy contributes to long-term observations of polar regions, in Antarctica.

114. The NC7 reflects actions taken to support capacity-building and the establishment and maintenance of observation systems and related data and monitoring systems in developing countries. Italy provided funding for scientists from developing countries working on global climate change research. Italy has provided technical and financial support for systematic observation regarding climate change to Nepal by establishing three meteorological stations, in cooperation with the Nepalese Government. The Party provides technical and financial support to developing countries, through several projects, for enhancing their capacities in research related to climate change and observation.

2. Assessment of adherence to the reporting guidelines

115. The ERT assessed the information reported in the NC7 of Italy and identified an issue relating to completeness and adherence to the UNFCCC reporting guidelines on NCs. The finding is described in table 21.

Table 21

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

<i>No.</i>	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation or encouragement</i>
1	Reporting requirement specified in paragraph 62 Issue type: completeness Assessment: encouragement	In its NC7, Italy did not identify the opportunities for and barriers to free and open international exchange of data and information and did not report on action taken to overcome such barriers. During the review, Italy explained that it has identified no barriers to free and open international exchange of data because its programmes are specifically designed to have a common data standard, with only one access point for retrieving data. The ERT reiterates the encouragement made in the previous review report for Italy to include in its next NC information on identified opportunities for and barriers to free and open international exchange of data and on action taken to overcome such barriers.

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

¹⁷ <https://ec.europa.eu/programmes/horizon2020/en/tags/fp9>.

¹⁸ <http://www.geoitaly.org/>.

¹⁹ <https://www.ncdc.noaa.gov/gosic/global-climate-observing-system-gcos/gcos-surface-network-gsn-program-overview/gcos-surface-network-gsn-data-access>.

²⁰ <https://www.ncdc.noaa.gov/gosic/global-climate-observing-system-gcos/development-gcos-networks/gcos-upper-air-network-guan-data-access>.

²¹ http://www.wmo.int/pages/prog/arep/gaw/gaw_home_en.html.

G. Education, training and public awareness

1. Technical assessment of the reported information

116. In the NC7, Italy provided information on its actions relating to education, training and public awareness at the domestic and international level. The Party provided information on the general policy on education, training and public awareness, primary, secondary and higher education, public information campaigns, training programmes, education materials, resource or information centres, the involvement of the public and NGOs and its participation in international activities.

117. Italy's national programme for environmental education, information and training provides the overarching framework for policies, programmes and initiatives on education, training and public awareness and also serves as the basis for the regional programmes. The recently developed guidelines for environmental education and sustainable development cover several aspects of climate change education. The Rome Charter is a new programme of commitments in environmental education in Italy that aims to support the implementation of the Italian national strategy for sustainable development and the Sustainable Development Goals enshrined in the 2030 Agenda for Sustainable Development. In order to raise public awareness on climate change, IMELS has organized several events, such as States General of Youth on Environment and All4TheGreen. The Italian Youth Think Tank on Intergenerational Equity is an initiative aimed at drafting a policy proposal for the implementation of intergenerational equity with the participation of environmental NGOs and non-profit organizations. Public participation in environmental issues is also promoted through innovative technologies such as smartphone applications, which allow data sharing by the public through the exchange of immediate information on extreme events and other meteorological and environmental phenomena. The newsletter *AmbienteInforma* provides integrated access to environmental information, particularly on climate change issues, by the public at the national level. Italy also has several international partnerships and programmes for the promotion of environmental education in developing countries.

2. Assessment of adherence to the reporting guidelines

118. The ERT assessed the information reported in the NC7 of Italy and identified an issue relating to completeness and adherence to the UNFCCC reporting guidelines on NCs. The finding is described in table 22.

Table 22

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

No.	Reporting requirement, issue type and assessment	Description of the finding with recommendation or encouragement
1	Reporting requirement specified in paragraph 65 Issue type: completeness Assessment: encouragement	In its NC7, Italy did not report on the extent of public participation in the preparation or domestic review of the NC. During the review, Italy explained that the NC sections on the GHG inventory, PaMs and projections are developed through a process involving all the relevant authorities and institutions. The feedback received from various stakeholders on the NC (which is publicly available on both the Government of Italy and the UNFCCC websites) is taken into consideration, to the extent possible, for subsequent submissions. Even though PaMs reported in the NC are already developed on the basis of stakeholder consultations, the government is further promoting public participation in policymaking, including through online consultations. The ERT encourages Italy to include in its next NC information on the extent of public participation in the preparation and domestic review of the NC.

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

III. Conclusions and recommendations

119. The ERT conducted a technical review of the information reported in the NC7 of Italy in accordance with the UNFCCC reporting guidelines on NCs. The ERT concludes that the reported information mostly adheres to the UNFCCC reporting guidelines on NCs and that the NC7 provides an overview of the national climate policy of Italy.

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

121. Italy's total GHG emissions excluding LULUCF covered by its quantified economy-wide emission reduction target were estimated to be 17.5 per cent below its 1990 level, whereas total GHG emissions including LULUCF were 22.8 per cent below its 1990 level in 2016. Emission decreases were driven by factors such as structural changes in the economy, the lingering effects of the economic recession, the declining and ageing population, and the effects of PaMs, including those aimed at promoting the use of energy from RES and less carbon intensive fuels (e.g. switching from coal to gas) and energy efficiency. Those factors outweighed the increase in emissions from transport and refrigeration and air conditioning.

122. Italy has introduced national-level policies to achieve its targets under the ESD and domestic emission reduction targets. The key policies are: the white certificates system for the promotion of energy efficiency; the green certificates system for the promotion of RES; the Conto Termico decree to support improvements in energy efficiency and the production of thermal energy from RES; Legislative Decree 201/07 on energy efficiency; the Conto Energia decree to support electricity production by solar photovoltaic and thermodynamic systems; Legislative Decree 201/07, transposing the EU eco-design directive (2005/32/EC), which sets minimum mandatory standards for energy-using products; building regulations setting minimum mandatory standards for new and existing buildings (Legislative Decree 192/05, as amended by Legislative Decree 311/06); an emission standard for new cars (EU regulation 443/2009/EC); the development of high-capacity and high-speed rail networks and the improvement of regional rail networks for commuting; the reduction of N₂O emissions from nitric acid production plants; the rationalization of nitrogen fertilizer use; and the separation of urban waste for collection. The mitigation action with the most significant mitigation impact is the emission standard for new cars, with an estimated impact of 10,200 kt CO₂ eq by 2020. Other policies that have delivered significant emission reductions are: the white certificates system; the infrastructure measures for urban transport; Legislative Decree 201/07; the green certificates system; the promotion of energy saving in buildings; and the separation of urban waste.

123. The GHG emission projections provided by Italy include those under the WEM scenario. In the scenario, emissions are projected to be 18.1 per cent below the 1990 level in 2020. On the basis of the reported information, the ERT concludes that Italy expects to meet its 2020 target under the WEM scenario. Under the WEM scenario, the projected level of emissions is 9.8 per cent below the AEAs for 2020. In addition, the cumulative ESD emissions over the 2015–2020 period are projected to be 12.3 per cent below the aggregate AEAs for the same period. On the basis of the reported information, the ERT concludes that Italy expects to meet its target for non-ETS sectors.

124. The projections indicate that Italy can meet its Kyoto Protocol target for the second commitment period under the WEM scenario, and that GHG emissions are not expected to exceed Italy's assigned Kyoto Protocol target by 2020, as reflected in the AEAs for Italy pursuant to the ESD.

125. The NC7 contains information on how the Party's use of the mechanisms under Articles 6, 12 and 17 of the Kyoto Protocol is supplemental to domestic action. Italy is not planning to make use of the Kyoto Protocol mechanisms to meet its Kyoto Protocol target.

126. Italy continued to provide climate financing to developing countries in line with its climate finance programmes such as Legislative Decree 30/2013, which addresses climate

change and the provision of related support to developing country Parties for implementing the Convention. It has reduced the level of its financial support since the NC6, and its public financial support in 2015 and 2016 totalled USD 438.94 and 290.82 million per year, respectively. In 2015, Italy's support provided for mitigation action was higher than its support provided for adaptation, while in 2016, the support provided for adaptation was higher compared with that provided for mitigation. For those years, Italy's support provided for cross-cutting projects related to climate change was higher than the support provided for stand-alone mitigation and adaptation actions. The biggest share of financial support went to cross-cutting projects, followed by projects related to environmental policies and those in the energy sector. In recent years, Italy has significantly intensified bilateral cooperation on technology transfer with a number of MOUs with developing countries for implementing projects related to mitigation and adaptation and based on the needs and circumstances of the beneficiary countries. These projects include the dissemination of soft (e.g. training for the installation and maintenance of equipment) and hard technologies aimed at enhancing national capacities for the implementation of the Convention and its related instruments by institutional strengthening and knowledge transfer in the area of sustainable development.

127. Italy provided the required information on the expected impacts of climate change in the country; the adaptation policies covering regional, sectoral and cross-sectoral vulnerabilities; and an outline of the actions taken to implement Article 4, paragraph 1(b) and (e), of the Convention regarding adaptation. Italy has several vulnerable sectors and areas relating to its geographical location in the Mediterranean basin. The economic sectors most vulnerable to the impacts of climate change are tourism, cultural heritage, agriculture, forestry, infrastructure and transport. The main vulnerabilities include: reduced freshwater availability and quality in terrestrial zones owing to increased average temperature and decreased precipitation; saltwater intrusion and erosion in coastal zones; increased intensity and frequency of droughts and floods; increased frequency of extreme weather events; biodiversity loss; deterioration of marine fauna owing to seawater temperature and pH changes and infestation by invasive species; increased incidence of vector-borne diseases; and deforestation.

128. Italy provided information on its general policy and funding relating to research and systematic observation and addressed both domestic and international activities. Italy's climate change research policies are framed within integrated research strategies and plans, such as the national Smart Specialisation Strategy and the Strategic Plan for Research and Innovation in the Agricultural, Food and Forestry Sectors 2014–2020. Italy contributes significantly to international programmes involving land, ocean and space-based measurements by means of its very long instrumental temperature record, and participates in the GCOS Surface Network, the GCOS Upper-Air Network, Global Atmosphere Watch and long-term observations of polar regions, in Antarctica.

129. Italy provided information on its actions relating to education, training and public awareness at the domestic and international level. The information provided included the general policy on education, training and public awareness, primary, secondary and higher education, public information campaigns, training programmes, education materials, resource or information centres, the involvement of the public and NGOs and participation in international activities. Examples of actions included: the national programme for environmental education, information and training; guidelines for environmental education and sustainable development; States General of Youth on Environment; All4TheGreen; Italian Youth Think Tank on Intergenerational Equity; smartphone applications; and the newsletter *AmbienteInforma*.

130. In the course of the review, the ERT formulated the following recommendations for Italy to improve its adherence to the UNFCCC reporting guidelines on NCs and its reporting of supplementary information under the Kyoto Protocol:²²

- (a) To improve the completeness of its reporting by:

²² The recommendations are given in full in the relevant sections of this report.

- (i) Providing the name and contact information of the designated representative of the national entity with overall responsibility for the national inventory (see issue 1 in table 6);
 - (ii) Providing information on how the need for adequacy and predictability in the flow of “new and additional” financial resources reported has been taken into account (see issue 1 in table 17);
 - (iii) Providing information, where feasible, in a tabular format following table 6 of the UNFCCC reporting guidelines on NCs, on any failure stories related to technology transfer activities (see issue 2 in table 18);
 - (iv) Including an outline of the actions taken to implement Article 4, paragraph 1(b) and (e), of the Convention, including adaptation measures and integrated plans for coastal zone management, water resources and agriculture, and for the protection and rehabilitation of areas affected by drought and desertification and floods (see issue 1 in table 20);
- (b) To improve the transparency of its reporting by:
- (i) Providing a transparent description of the national legislative arrangements and administrative procedures that seek to ensure that the implementation of activities under Article 3, paragraph 3, and any elected activities under Article 3, paragraph 4, also contribute to the conservation of biodiversity and sustainable use of natural resources, particularly with regard to the identification of their contribution towards the conservation of biodiversity (see issue 1 in table 7);
 - (ii) Clearly describe the objectives of PaMs, particularly the targets of the PaMs related to biofuel use (19 and 20), in line with the information provided on these PaMs during the review (see issue 1 in table 9);
 - (iii) Providing, in the section on projections and the total effect of PaMs, the estimated and expected total effect of implemented and adopted PaMs. including the effects of those implemented and adopted PaMs whose effects were not reported in the total effect of implemented and adopted PaMs (see issue 1 in table 15);
 - (iv) Providing information on the promotion, facilitation and financing of the transfer of, or access to, environmentally sound technologies, clearly distinguishing between activities undertaken by the public and private sectors (see issue 1 in table 18).

IV. Questions of implementation

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

Annex

Documents and information used during the review

A. Reference documents

2017 GHG inventory submission of Italy. Available at

<https://unfccc.int/process/transparency-and-reporting/reporting-and-review-under-the-convention/greenhouse-gas-inventories-annex-i-parties/submissions/national-inventory-submissions-2017>.

2018 GHG inventory submission of Italy. Available at

<https://unfccc.int/process/transparency-and-reporting/reporting-and-review-under-the-convention/greenhouse-gas-inventories-annex-i-parties/national-inventory-submissions-2018>.

BR3 of Italy. Available at

http://unfccc.int/files/national_reports/biennial_reports_and_iar/submitted_biennial_reports/application/pdf/132867045_italy-br3-1-br3_2017_italy.pdf.

BR3 CTF tables of Italy. Available at

http://unfccc.int/files/national_reports/biennial_reports_and_iar/submitted_biennial_reports/application/vnd.openxmlformats-officedocument.spreadsheetml.sheet/ita_2018_v1.0.xlsx.

“Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual greenhouse gas inventories”. Annex to decision 24/CP.19. Available at

<http://unfccc.int/resource/docs/2013/cop19/eng/10a03.pdf>.

“Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications”.

FCCC/CP/1999/7. Available at <http://unfccc.int/resource/docs/cop5/07.pdf>.

“Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol”. Annex to decision 15/CMP.1. Available at

<http://unfccc.int/resource/docs/2005/cmp1/eng/08a02.pdf>.

“Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol”. Annex III to decision 3/CMP.11. Available at

<http://unfccc.int/resource/docs/2015/cmp11/eng/08a01.pdf>.

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

“Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention”. Annex to decision 13/CP.20. Available at

<http://unfccc.int/resource/docs/2014/cop20/eng/10a03.pdf>.

NC7 of Italy. Available at https://unfccc.int/sites/default/files/resource/258913076_Italy-NC7-2-Italy%20Seventh%20National%20Communication%20Final.pdf.

Report on the individual review of the annual submission of Italy submitted in 2016.

FCCC/ARR/2016/ITA. Available at

<https://unfccc.int/sites/default/files/resource/docs/2017/arr/ita.pdf>.

Report on the review of the report to facilitate the calculation of the assigned amount for the second commitment period of the Kyoto Protocol of Italy. FCCC/IRR/2016/ITA.

Available at <https://unfccc.int/process/transparency-and-reporting/reporting-and-review-under-the-kyoto-protocol/second-commitment-period/initial-reports>.

Report of the technical review of the second biennial report of Italy. FCCC/TRR.2/ITA.

Available at <https://unfccc.int/sites/default/files/resource/docs/2016/trr/ita.pdf>.

Report on the technical review of the sixth national communication of Italy.
FCCC/IDR.6/ITA. Available at
<https://unfccc.int/sites/default/files/resource/docs/2014/idr/ita06.pdf>.

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

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

B. Additional information provided by the Party

Responses to questions during the review were received from Mr. Riccardo de Lauretis (ISPRA), including additional material. The following documents²³ were provided by Italy:

EC. 2017. *Energy, transport and environment indicators 2017*. Available at
<http://ec.europa.eu/eurostat/documents/3217494/8435375/KS-DK-17-001-EN-N.pdf/18d1ecfd-acd8-4390-ade6-e1f858d746da>.

ENEA. 2016. *Italy's Energy Efficiency Annual Report 2016*. Available at
<http://www.enea.it/it/seguici/pubblicazioni/pdf-volumi/executive-summary-2016-eng.pdf>.

Gestore Mercati Energetici. 2016. *Relazione Annuale 2016*. Available at
http://www.mercatoelettrico.org/it/MenuBiblioteca/documenti/20170724_RelazioneAnnuale2016.pdf.

Italian Ministry of Environment, Land and Sea. 2015. *National Strategy for Adaptation to Climate Change*. Rome. Available at
http://www.minambiente.it/sites/default/files/archivio/allegati/clima/documento_SNAC.pdf

GSE. 2009. *Quarta relazione dell'Italia in merito ai progressi ai sensi della direttiva 2009/28/CE 2009*. Available at
https://www.gse.it/documenti_site/Documenti%20GSE/Studi%20e%20scenari/Progress%20Report%20Rinnovabili%20Italia%202017.pdf.

ISPRA. 2018. *Italian emission inventory 1990–2016 informative inventory report. 2018*. Available at <http://www.isprambiente.gov.it/en/publications/reports/italian-emission-inventory-1990-2016.-informative-inventory-report-2018>.

Indirect Emissions projection data submitted to the UNECE-CLRTAP Convention in 2017. Available at
http://www.ceip.at/ms/ceip_home1/ceip_home/status_reporting/2017_submissions/.

²³ Reproduced as received from the Party.