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Climate Change

# Report of the technical review of the sixth national communication of Italy

Parties included in Annex I to the Convention are requested, in accordance with decision 9/CP.16, to submit a sixth national communication to the secretariat by 1 January 2014. In accordance with decision 7/CMP.8, Parties included in Annex I to the Convention that are also Parties to the Kyoto Protocol shall include in their sixth national communication supplementary information under Article 7, paragraph 2, of the Kyoto Protocol. In accordance with decision 15/CMP.1, these Parties shall start reporting the information under Article 7, paragraph 1, of the Kyoto Protocol with the inventory submission due under the Convention for the first year of the commitment period. This includes supplementary information on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol.

This report presents the results of the technical review of the sixth national communication and 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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# I. Introduction and summary

## A. Introduction

1. For Italy the Convention entered into force on 14 July 1994 and the Kyoto Protocol on 16 February 2005. Under the Convention, Italy made a commitment to contribute to the joint European Union (EU) economy-wide greenhouse gas (GHG) emission reduction target of 20 per cent by 2020 below the 1990 level. Within the burden-sharing agreement of the EU for meeting commitments under the Kyoto Protocol, Italy committed itself to reducing its GHG emissions by 6.5 per cent compared with the base year[1] level during the first commitment period, from 2008 to 2012.[2] For the second commitment period of the Kyoto Protocol, from 2013 to 2020, Italy committed to contributing to the joint EU commitment to reduce its GHG emissions by 20 per cent compared with the base year level.

2. This report covers the in-country technical review of the sixth national communication (NC6) of Italy, 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" (decision 23/CP.19) and the "Guidelines for review under Article 8 of the Kyoto Protocol" (decision 22/CMP.1).

3. The review took place from 7 to 12 April 2014 in Rome, Italy, and was conducted by the following team of nominated experts from the UNFCCC roster of experts: Ms. Maryna Bereznytska (Ukraine), Ms. Ann Gan (Singapore), Mr. Amit Garg (India) and Mr. Kai Bastian Kuhnhenn (Germany). Ms. Bereznytska and Mr. Garg were the lead reviewers. The review was coordinated by Ms. Ruta Bubniene (secretariat).

4. During the review, the expert review team (ERT) reviewed each section of the NC6. The ERT also reviewed the supplementary information provided by Italy as a part of the NC6 in accordance with Article 7, paragraph 2, of the Kyoto Protocol. In addition, the ERT reviewed the information on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol, which was provided by Italy in its 2013 annual submission and previous submissions under Article 7, paragraph 1, of the Kyoto Protocol.

5. In accordance with decisions 23/CP.19 and 22/CMP.1, a draft version of this report was communicated to the Government of Italy, which provided comments that were considered and incorporated, as appropriate, into this final version of the report.

## B. Summary

6. The ERT conducted a technical review of the information reported in the NC6 of Italy in accordance with the "Guidelines for the preparation of national communications by

[1] "Base year" refers to the base year under the Kyoto Protocol, which is 1990 for all gases. The base year emissions include emissions from sectors/source categories listed in Annex A to the Kyoto Protocol.

[2] The target under the Convention is a joint target for the EU and its 28 member States, while the Kyoto Protocol target for the second commitment period is a joint target for the EU, its 28 member States and Iceland. A political statement on the fulfilling of the Kyoto Protocol target for the second commitment period by the EU, its 28 member States and Iceland can be found in document FCCC/KP/CMP/2012/13, paragraph 45.

Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications" (hereinafter referred to as the UNFCCC reporting guidelines on NCs). As required by decision 15/CMP.1, supplementary information required under Article 7, paragraph 2, of the Kyoto Protocol[3] is provided in the NC6 (see paras. 125–127) below). The supplementary information on the minimization of adverse impacts referred to in paragraph 4 above is complete and transparent.

7. Italy considered most recommendations provided in the report of the in-depth review of the fifth national communication (NC5) of Italy.[4] The ERT commends Italy for its coherent and consistent reporting. During the review, Italy provided further relevant information on the GHG emissions reduction target; policies and measures (PaMs); GHG emission projections and the total effect of PaMs as well as progress made towards its targets; supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17; and financial resources and technology transfer.

### 1. Completeness and transparency of reporting

8. Gaps and issues related to the reported information identified by the ERT are presented in table 1 below.

### 2. Timeliness

9. The NC6 was submitted on 12 February 2014, after the deadline of 1 January 2014 mandated by decision 9/CP.16. Italy informed the secretariat about its difficulties with the timeliness of its NC6 on 20 December 2013 in accordance with paragraph 79 of the annex to decision 23/CP.19 and paragraph 139 of the annex to decision 22/CMP.1. The ERT noted with concern the delay in the submission of the NC6.

### 3. Adherence to the reporting guidelines

10. The information reported by Italy in its NC6 is mostly in adherence to the UNFCCC reporting guidelines on NCs as per decision 4/CP.5 (see table 1).

[3] Decision 15/CMP.1, annex, chapter II.
[4] FCCC/IDR.5/ITA.

Table 1
**Assessment of completeness and transparency issues of reported information in the sixth national communication of Italy[a]**

| *Sections of national communication* | *Completeness* | *Transparency* | *Reference to paragraphs* | *Supplementary information under the Kyoto Protocol* | *Completeness* | *Transparency* | *Reference to paragraphs* |
|---|---|---|---|---|---|---|---|
| Executive summary | Complete | Transparent | | National systems | Complete | Transparent | |
| National circumstances | Complete | Transparent | | National registries | Complete | Transparent | |
| Greenhouse gas inventory | Complete | Transparent | | Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17 | Complete | Transparent | |
| Policies and measures (PaMs) | Complete | Transparent | | PaMs in accordance with Article 2 | Complete | Transparent | |
| Projections and total effect of PaMs | Complete | Mostly transparent | 32, 72 | Domestic and regional programmes and/or arrangements and procedures | Mostly complete | Transparent | 20 |
| Vulnerability assessment, climate change impacts and adaptation measures | Complete | Transparent | | Information under Article 10 | Complete | Transparent | |
| Financial resources and transfer of technology | Mostly complete | Mostly transparent | 97, 106 | Financial resources | Mostly complete | Mostly transparent | 97, 106 |
| 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 | | | | | |

[a] A list of recommendations pertaining to the completeness and transparency issues identified in this table is included in the Conclusions and recommendations chapter of this report.

# II. Technical review of the reported information in the national communication and supplementary information under the Kyoto Protocol

## A. Information on greenhouse gas emissions and national circumstances relevant to greenhouse gas emissions and removals, including other elements related to the Kyoto Protocol

### 1. Information on relevant national circumstances

11. In its NC6, Italy has provided a detailed description of the national circumstances and elaborated on the framework legislation and key policy documents on climate change. Further information on the review of the institutional and legislative arrangements for the coordination and implementation of PaMs is provided in chapter II.B below.

Table 2
**Indicators relevant to greenhouse gas emissions and removals for Italy**

| | *1990* | *2000* | *2005* | *2010* | *2011* | *Change 1990–2011 (%)* | *Change 2010-2011 (%)* |
|---|---|---|---|---|---|---|---|
| Population (million) | 56.72 | 56.94 | 58.61 | 60.48 | 60.72 | 7.1 | 0.4 |
| GDP (2005 USD billion using PPP) | 1 346.00 | 1 578.27 | 1 657.40 | 1 636.63 | 1 642.74 | 22.1 | 0.4 |
| TPES (Mtoe) | 146.56 | 171.52 | 183.87 | 170.24 | 167.42 | 14.2 | –1.7 |
| GHG emissions without LULUCF (kt $CO_2$ eq) | 518 984.17 | 551 301.20 | 574 433.42 | 500 313.89 | 488 792.02 | –5.8 | –2.3 |
| GHG emissions with LULUCF (kt $CO_2$ eq) | 506 830.43 | 525 466.63 | 536 162.08 | 456 973.03 | 458 201.95 | –9.6 | 0.3 |
| GDP per capita (2005 USD thousand using PPP) | 23.73 | 27.72 | 28.28 | 27.06 | 27.05 | 14.0 | –0.0 |
| TPES per capita (toe) | 2.58 | 3.01 | 3.14 | 2.81 | 2.76 | 7.0 | –1.8 |
| GHG emissions per capita (t $CO_2$ eq) | 9.15 | 9.68 | 9.80 | 8.27 | 8.05 | –12.0 | –2.7 |
| GHG emissions per GDP unit (kg $CO_2$ eq per 2005 USD using PPP) | 0.39 | 0.35 | 0.35 | 0.31 | 0.30 | –23.1 | –3.2 |

*Sources*: (1) GHG emissions data: Italy's 2013 GHG inventory submission; (2) Population, GDP and TPES data: International Energy Agency.

*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.

*Abbreviations*: GDP = gross domestic product, GHG = greenhouse gas, LULUCF = land use, land-use change and forestry, PPP = purchasing power parity, TPES = total primary energy supply.

12. The ERT noted that during the period 1990–2011 Italy's population and gross domestic product (GDP) increased by 7.1 per cent and 22.1 per cent, respectively, while GHG emissions per GDP and GHG emissions per capita decreased by 23.1 and 12.0 per cent, respectively. Table 2 above illustrates the national circumstances of Italy by providing some indicators relevant to GHG emissions and removals.

### 2. Information on the greenhouse gas inventory, emissions and trends

13. Italy has provided a summary of information on GHG emission trends for the period 1990–2011. This information is fully consistent with the 2013 national GHG inventory submission. Summary tables, including trend tables for emissions in carbon dioxide equivalent ($CO_2$ eq) (given in the common reporting format tables), are provided in an annex to the NC6. During the review, the ERT took note of the recently submitted 2014 annual submission. The relevant information therein is reflected in this report.

14. Total GHG emissions[5] excluding emissions and removals from land use, land-use change and forestry (LULUCF) decreased by 11.4 per cent between 1990 and 2012, whereas total GHG emissions including net emissions or removals from LULUCF decreased by 14.3 per cent over the same period. An analysis of the drivers of GHG emissions trends in each sector is provided in chapter II.B below. Table 3 provides an overview of GHG emissions by sector from the base year to 2012.

[5] In this report, the term "total GHG emissions" refers to the aggregated national GHG emissions expressed in terms of $CO_2$ eq excluding land use, land-use change and forestry, unless otherwise specified.

Table 3
**Greenhouse gas emissions by sector in Italy, 1990–2012**

| Sector | GHG emissions (kt $CO_2$ eq) | | | | | Change (%) | | Share[a] by sector (%) | |
|---|---|---|---|---|---|---|---|---|---|
| | *1990* | *2000* | *2010* | *2011* | *2012* | *1990–2012* | *2011–2012* | *1990* | *2012* |
| 1. Energy | 417 736.09 | 449 686.56 | 415 299.28 | 404 443.53 | 379 862.79 | –9.1 | –6.1 | 80.5 | 82.6 |
| A1. Energy industries | 137 213.79 | 152 556.12 | 133 182.38 | 131 230.50 | 126 298.33 | –8.0 | –3.8 | 26.4 | 27.5 |
| A2. Manufacturing industries and construction | 86 947.74 | 83 810.80 | 61 373.93 | 61 250.92 | 54 922.10 | –36.8 | –10.3 | 16.8 | 11.9 |
| A3. Transport | 103 105.53 | 122 441.81 | 118 910.98 | 117 851.35 | 106 056.81 | 2.9 | –10.0 | 19.9 | 23.1 |
| A4.–A5. Other | 79 688.47 | 81 853.94 | 94 314.17 | 86 705.12 | 94 110.76 | 18.1 | 8.5 | 15.4 | 20.5 |
| B. Fugitive emissions | 10 780.57 | 9 023.90 | 7 517.81 | 7 405.65 | 7 239.09 | –32.9 | –2.2 | 2.1 | 1.6 |
| 2. Industrial processes | 38 389.92 | 36 249.03 | 31 829.82 | 31 640.92 | 28 201.34 | –26.5 | –10.9 | 7.4 | 6.1 |
| 3. Solvent and other product use | 2 454.62 | 2 301.35 | 1 676.71 | 1 656.28 | 1 515.72 | –38.3 | –8.5 | 0.5 | 0.3 |
| 4. Agriculture | 40 738.59 | 40 135.38 | 33 722.59 | 33 530.43 | 34 289.44 | –15.8 | 2.3 | 7.8 | 7.5 |
| 5. LULUCF | –12 153.74 | –25 834.57 | –43 340.86 | –30 590.07 | –18 556.30 | 52.7 | –39.3 | – | – |
| 6. Waste | 19 664.96 | 22 928.87 | 17 785.50 | 17 520.85 | 16 214.17 | –17.5 | –7.5 | 3.8 | 3.5 |
| 7. Other | NA | NA | NA | NA | NA | NA | NA | – | – |
| **GHG total with LULUCF** | **515 446.32** | **534 262.90** | **468 239.23** | **458 201.95** | **441 527.15** | **–14.3** | **–3.6** | **–** | **–** |
| **GHG total without LULUCF** | **519 054.90** | **551 237.06** | **499 358.60** | **488 792.02** | **460 083.45** | **–11.4** | **0.4** | **100.0** | **100.0** |

*Source:* GHG inventory submission of 2014, version 1.3, 4 April 2014.

*Notes*: The changes in emissions and the share by sector are calculated using the exact (not rounded) values and may therefore differ from values calculated with the rounded numbers provided in the table.

*Abbreviations*: GHG = greenhouse gas, LULUCF = land use, land-use change and forestry, NA= not applicable.

[a] The shares of sectors are calculated relative to GHG emissions without LULUCF; for the LULUCF sector, the negative values indicate the share of GHG emissions that was offset by GHG removals through LULUCF.

### 3. National system

15. Italy provided in its NC6 a description of how its national system is performing the general and specific functions defined in the guidelines for national systems under Article 5, paragraph 1, of the Kyoto Protocol (decision 19/CMP.1). The description includes all the elements mandated by decision 15/CMP.1. The NC6 also contains a reference to the description of a national system provided in the national inventory report (NIR) of the 2013 annual submission. The ERT took note of the review of the changes to the national system as reflected in the report of the individual review of the GHG inventory of Italy submitted in 2013.

16. During the review, Italy provided additional information on the national system. It reported that except for improvements to fully operationalize it, there was no change in the national inventory system since its establishment. The national registry for forest carbon sinks, instituted by a ministerial decree of the Ministry for the Environment, Land and Sea (IMELS) on 1 April 2008, is part of the Italian national inventory system. It includes information on activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol and related carbon stock changes. The Institute for Environmental Protection and Research (ISPRA) and the State Forestry Corps provide technical and scientific support for these activities.

### 4. National registry

17. In its NC6, Italy has provided information on the national registry in accordance with the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1. The ERT took note of the review of the changes to the national registry as reflected in the report of the individual review of the GHG inventory of Italy submitted in 2013.

18. Italy described the changes specifically due to the centralization of the European Union Emissions Trading System (EU ETS) operations into a single EU registry operated by the European Commission and called the Consolidated System of European Union registries (CSEUR). The CSEUR is a consolidated platform which implements the national registries in a consolidated manner and was developed together with the new EU registry.

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

19. Italy has reported in its NC6 comprehensive information on domestic and regional programmes and legislative arrangements and procedures related to the Kyoto Protocol.

20. The NC6 does not include some information required by decision 15/CMP.1 on the description of any 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, of the Kyoto Protocol also contribute to the conservation of biodiversity and sustainable use of resources. During the review, Italy provided this information. Italy informed the ERT that activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol have been considered in the context of (1) Italy's Framework Programme for the Forest Sector, which includes the protection of ecological biodiversity in forest ecosystems; (2) the 2007–2013 Rural Development National Strategic Plan, which provided a formal framework for planning agriculture and forestry measures and supplying guidance for the integration process between agriculture and the environment; (3) the National Strategy for Biodiversity, which sets out a number of objectives to be achieved by 2020, such as protecting the landscape, biological diversity and the complexity of forest ecosystems, and enhancing their ecological connectivity; (4) European Council directive 1999/105/EC (transposed into Legislative Decree

386/2006), which introduces regulations on seed collection, nursery production, marketing and the traceability of forest reproductive material; and (5) the European Sustainable Forest Management Programme, which focuses on the protection of European forests. The ERT recommends that Italy report this detailed information in its next NC.

21. IMELS is responsible for developing the national plan for the reduction of GHG emissions, which was adopted by the Inter-Ministerial Committee for Economic Planning (CIPE). CIPE is a collective governmental body chaired by the President of the Council of Ministers. The national energy policy is within the competences of the Ministry of Economic Development. The policy has been developed based on the general guidelines set by the Government of Italy and by the Parliament.

22. In 2002 CIPE established an Inter-Ministerial Technical Committee for Greenhouse Gas Emissions (CTE) to (1) monitor the GHG emissions trend; (2) monitor the status of implementation of the PaMs identified in the overall national strategy for GHG emissions; and (3) provide general assistance to IMELS in drawing up the national plan for the reduction of GHG emissions.

23. Italy informed the ERT during the review that information on all domestic and regional programmes as well as legislative arrangements and procedures is available to the public on the IMELS website.[6]

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

24. Italy has provided in its NC6 well-organized information on its package of PaMs implemented, adopted and planned in order to fulfil its commitments under the Convention and its Kyoto Protocol.

### 1. Policies and measures related to implementation of commitments under the Convention

25. In its NC6, Italy reported on its PaMs adopted, implemented and planned in achieving its commitments under the Convention. Italy provided information on PaMs by sector and by gas and a description of the principal PaMs. The NC6 contains a set of PaMs similar to those in the NC5.

26. The ERT was not able to locate in chapter 4 of the NC6 information on how Italy believes its PaMs are modifying longer-term trends in anthropogenic GHG emissions and removals in accordance with the objectives of the Convention. During the review, Italy explained how its PaMs are modifying longer-term trends, which can be seen in the emission projections by sector. Italy also highlighted that longer-term trends can be seen in its 2050 scenarios as well as its National Energy Strategy. The ERT reiterates the recommendation made in the previous review report that Italy provide more transparent information on how the Party believes its PaMs are modifying longer-term trends in GHG emissions.

27. Italy, in its NC6, did not report on PaMs under the LULUCF sector. During the review, Italy explained that LULUCF is not included in the 20-20-20 target and there are therefore no PaMs for the sector and thus no PaMs reported. The ERT recommends that Italy provide in the PaMs chapter of its next NC an explanation of why PaMs in the LULUCF sector are not reported.

[6] Available at <http://www.minambiente.it/pagina/clima>.

28. In its NC6, Italy briefly described the way in which progress with PaMs is monitored and evaluated over time, including institutional arrangements for the policy on monitoring GHG mitigation. During the review, Italy informed the ERT that CIPE is responsible for evaluating progress towards the Party's economy-wide emission reduction target.

29. During the review, Italy provided more information on how groups of PaMs are implemented, monitored and evaluated. For instance, activities related to the management, evaluation and certification of the energy savings associated with energy efficiency projects under the white certificates system are under the responsibility of the Energy Service Management (*Gestore Servizi Energetici).* The policy on supporting energy savings in buildings through tax deductions has been implemented and is being monitored and evaluated by the Italian National Agency for New Technologies, Energy and Sustainable Economic Development. Local and regional governments are also involved in the implementation, monitoring and evaluation of PaMs, particularly in the agriculture sector.

30. The ERT noted that PaMs from different sectors involve different institutions and tools for monitoring and evaluation, and there are also different methodologies for calculating their effects. During the review, Italy elaborated on the methodology used to evaluate the GHG reductions from some of the PaMs. In particular, the information covered the parameters used for the evaluation of emission reductions from the use of renewable energy. This included calculation of the annual reduction of carbon dioxide ($CO_2$) emissions from the energy produced by multiplying the annual average emission factor of thermal power plants, which is assumed to be equal to 0.5 t $CO_2$ per megawatt-hours (MWh).[7] The ERT encourages Italy to include information on administrative and institutional arrangements, such as the specific agencies and tools involved, and on the monitoring and evaluation of individual or groups of PaMs, including the methodology by which the expected effects were calculated, in its next NC.

31. Italy has reported on how it is addressing international transport emissions in a separate section of the PaMs chapter in the NC6. During the review, Italy explained that its efforts to address international transport emissions were not under the sole control of the Government of Italy. In the NC6, Italy reported that in order to address international transport emissions, the Party supported the European Commission's proposal to incorporate aviation into the EU ETS. With regard to international maritime transport emissions, the European Commission adopted a communication setting out a strategy for progressively including GHG emissions from maritime transport in the EU ETS, which included setting reduction targets for the maritime transport sector. The ERT encourages Italy to report on PaMs targeting GHG emissions from international transport in the transport section of the PaMs chapter in accordance with the UNFCCC reporting guidelines on NCs, or to include a reference to the separate section in the PaMs chapter, in its next NC.

32. In its NC6, Italy provided information on the aggregate costs of some energy efficiency and renewable energy PaMs, such as white certificates, tax deduction schemes, and the promotion of renewable energies in the electricity sector. However, costs were not disaggregated by individual measures. The total cost of the PaMs was also not clear, and the costs of non-energy PaMs were not reported. To improve transparency, Italy may wish to include information on the cost of each policy or measure reported, including a brief definition of the term 'cost' in this context, in its next NC.

33. The ERT was unable to locate in chapter 4 of the NC6 information on how PaMs interact with other PaMs at the national level and information on how policies complement each other in order to enhance overall GHG mitigation. Lack of this information had been

[7] Evaluation of $CO_2$ reduction by PaMs provided by Italy during the review.

highlighted by the ERT for the NC5. During the review, Italy explained that the ways in which the PaMs interact can be seen in their projection scenarios and models, which were included in chapter 5 on the projections and the total effect of PaMs. To improve transparency of reporting, Italy may wish to provide this information in chapter 4 on PaMs, or provide a reference to the projections chapter, in future NCs.

34. Information on the non-greenhouse gas mitigation benefits of PaMs was not provided in the NC6. During the review, Italy explained that the non-greenhouse gas mitigation benefits could be described only qualitatively. To improve transparency of reporting, Italy may wish to include this information in future NCs.

35. The ERT noted that Italy did not provide information on PaMs listed in the previous NC that are no longer in place. During the review, Italy provided the ERT with a list of PaMs that have been implemented or planned since 2007, including their status of implementation. To improve completeness of future NCs, the ERT encourages Italy to make clear references to previous NCs in which PaMs are thoroughly described and to provide only a brief description in the current NC, focusing on any updates to the PaM, including the results achieved. In addition, Italy may wish to provide information on PaMs that were listed in the previous NC that are no longer in place, and explain why these PaMs are no longer in place.

36. Some of the recommendations from the previous review were taken into consideration in order to improve reporting in the NC6, including the provision of summary tables on PaMs in all required and relevant sectors such as agriculture and industrial processes. The effects of some implemented PaMs have also been included, although double counting was not taken into account while calculating the total effect of PaMs.

### 2. Policy framework and cross-sectoral measures

37. Implementation of the Convention and its Kyoto Protocol is underpinned by the EU climate and energy package, or the 20-20-20 package, which includes the effort-sharing decision (ESD) – the division of renewable energy targets among the EU member States – and the strengthening of the EU ETS. At the national level, Italy's efforts to fulfil its international obligations include (1) the National Plan for the Reduction of GHG Emissions,[8] which identifies a number of additional measures to meet the medium-term goals already established (their full implementation will ensure the respect of such goals while putting the country on the right path towards decarbonization); (2) the National Energy Strategy (adopted in March 2013), which identifies a path to achieve the 2020 targets related to energy efficiency and renewable energy use and contains a list of measures that should be implemented; and (3) the National Programme for the Containment of Carbon Dioxide Emissions (in force since 1994), which aims to stabilize emissions at 1990 levels.

38. As an EU member State, Italy is bound by the EU climate and energy package, which is a set of binding legislation that aims to ensure the EU meets its ambitious climate and energy targets for 2020. These targets, known as the 20-20-20 targets, set three key objectives for the EU by 2020: (1) a 20 per cent reduction in

[8] The first National Plan for the Reduction of GHG Emissions was adopted in 1994. It aimed to stabilize $CO_2$ emissions at the level of 1990 by 2000. It was enhanced and updated in 1997 and 1998. Based on the plan a National Climate Change Strategy to Meet the Kyoto Protocol Target was adopted in 2002 (deliberation 123/2002) and updated in 2007 (deliberation 135/2007). Deliberation 17/2013, adopted in 2013, will enable Italy to contribute to the achievements of the EU Kyoto Protocol target and commitments set by decision 406/2009/EC).

GHG emissions from 1990 levels; (2) an increase in the share of energy consumption produced from renewable sources to 20 per cent; and (3) a 20 per cent improvement in energy efficiency.

39. Italy is thus applying EU climate policy, including PaMs common to and coordinated by the EU that are relevant to climate change. These include, among others, the European Council decision 2002/358/EC on the burden sharing of the EU's emission reduction target for the Kyoto Protocol, and European Parliament and European Council decision 280/2004/EC on the so-called monitoring mechanism, which ensures that EU progress towards meeting the Kyoto Protocol target is monitored and evaluated in a systematic way. The EU directive 2003/87/EC introduced the EU system for $CO_2$ emissions trading. With the introduction of the EU ETS, a large part of EU emissions was restricted under an EU-wide cap. As a result, national targets under EU legislation take into account only emissions outside the EU ETS (under the ESD, 406/2009/EC).

40. According to Italy, the most effective national cross-sectoral measure that has been implemented is the white certificates system, which aims at promoting energy efficiency and delivering emission reductions in all the energy end-use sectors. The system was first introduced in 2001 and has been improved and expanded over the years. In 2012, the White Certificate Decree was issued, which relates to (1) the determination of national quantitative targets for energy savings that must be achieved by the distribution companies for electricity and gas from 2013 to 2016 and (2) the expansion of the white certificates system. The decree also defines the criteria, conditions and procedures for implementing energy efficiency measures in the energy end-use sectors.

41. A further extension of the white certificates system until 2020 is planned. To date, 14,769,053 energy efficiency titles or certificates, each equivalent to 1 Mtoe, have been issued under the system. The total estimated mitigation impact of the white certificates system was not provided in the NC6. Instead, the impact was divided into the relevant energy use sectors. During the review, Italy informed the ERT that the success of the white certificates system has been recognized by the European Commission as a best practice. and that the European Commission issued a directive under which other EU member States are to adopt similar systems.

42. In the NC6, Italy stated that the protection of the environment, the ecosystem and natural resources is under the exclusive competencies of the central government. However, the regional and local governments are part of the consultation process in determining climate change policies and they are involved in the implementation of various policies, such as rationalization of nitrogen fertilizer use on agricultural land and waste separation in cities and settlements.

43. Italy noted three groups of policies that have been implemented or planned for achieving its target: cross-sectoral, energy sector and non-energy sector. Italy provided a description of 24 implemented and 20 planned PaMs. Table 4 provides a summary of the key PaMs of Italy.

Table 4
**Summary of information on policies and measures reported by Italy**

| | | *Estimate of mitigation impact (kt $CO_2$ eq)* | |
|---|---|---|---|
| *Sectors affected* | *List of key policies and measures* | *2015* | *2020* |
| ***Policy framework and cross-sectoral measures*** | European Union Emissions Trading System | NE[a] | NE[a] |
| | National Energy Strategy (2013) | NE[a] | NE[a] |

| *Sectors affected* | *List of key policies and measures* | *Estimate of mitigation impact (kt $CO_2$ eq)* | |
|---|---|---|---|
| | | *2015* | *2020* |
| | White certificates system | | |
| | *Conto Termico* (Heating Account), which encourages small-scale energy efficiency measures in public buildings and the production of thermal energy from renewable sources in both the public and the private sector | NE[a] | NE[a] |
| ***Energy*** | | | |
| Energy supply | White certificates that support combined heat and power and district heating plants for 2008–2012 | 970 | 970 |
| | National Action Plan for Energy Efficiency 2011, which promotes cogeneration and trigeneration | 1 050 | 2 260 |
| Renewable energy | National Action Plan for Renewable Energy 2010 and National Action Plan for Energy Efficiency 2011, which include measures for the promotion of thermal energy from renewable sources and incentives for small-scale interventions to increase the production of thermal energy from renewable sources | 0 | 10 600 |
| | Third *Conto Energia* (Energy Account), which supports the expansion of solar photovoltaic plants through feed-in tariffs up to a maximum capacity of 8,000 MW | 2 300 | 2 300 |
| | New policy for promoting and supporting renewable electricity production, which includes measures to be determined after achieving the 130 TWh renewable electricity target indicated in the National Energy Strategy | 3 500 | 10 000 |
| Residential and commercial | Building regulations imposing minimum mandatory standards on new and existing buildings | 2 180 | 3 610 |
| ***Transport*** | Fuel switch to renewable energy with a target of 10 per cent biofuel for transport by 2020 | 590 | 1 580 |
| | European Union carbon dioxide emission standards for new cars requiring a fleet update at 120 g $CO_2$ per km in 2015 and 95 g $CO_2$ per km in 2020 | 5 400 | 10 200 |
| | Measures to improve transport infrastructure including high-capacity and high-speed roads (to avoid traffic congestion) and regional networks for passengers and freight to encourage a modal switch | 3 750 | 5 700 |
| ***Industrial sectors*** | Promotion of energy efficiency | 0 | 3 580 |
| ***Agriculture*** | Rationalization of nitrogen fertilizer use | 790 | 790 |
| ***Industrial processes*** | Reduction of nitrous dioxide emissions in nitric acid production plants | 740 | 740 |
| ***Forestry*** | No policies or measures reported | NA | NA |

| Sectors affected | List of key policies and measures | Estimate of mitigation impact ($kt\ CO_2\ eq$) 2015 | 2020 |
|---|---|---|---|
| ***Waste management*** | Separate waste collection | 3 700 | 3 700 |

*Note*: Estimates of mitigation impact are relative to the 2010 historical emissions level.
*Abbreviations*: NA = not applicable, NE = not estimated.
[a] Effects of these cross-cutting measures are reflected in the sectoral policies and measures listed in the table.

### 3. Policies and measures in the energy sector

44. Between 1990 and 2012, GHG emissions from the energy sector decreased by 9.1 per cent (37,873.3 kt $CO_2$ eq), mainly owing to decreasing emissions in the manufacturing industries and construction. From 2004 on, emissions decreased as a result of policies adopted at the EU and national levels to promote the use of renewable energy sources. After 2009, the economic downturn led to a further decrease in emissions.

45. ***Energy supply.*** Emissions from fuel combustion in the energy sector are covered by the EU ETS. Italy is also required to fulfil its renewable energy target under the EU 20-20-20 package of achieving 17.0 per cent renewable energy in the total energy supply, as well as the National Energy Strategy target of achieving 19.0 per cent renewable energy, by 2020. The ERT notes that according to information provided by Italy during the review, Italy's renewable contribution to the fuel mix increased from 9.3 per cent in 2009 to 13.5 per cent in 2013.[9]

46. Italy reported that the PaMs in the energy sector are one of the key drivers that have led to an increase in the use of natural gas and renewable energy and a decrease in the use of petroleum products. However, the ERT noted that the PaMs in the energy supply sector did not have an impact on the use of solid fuels in particular. In fact, according to Eurostat data on Italy's total fuel mix, solid fuel's contribution to the fuel mix increased marginally from 8.8 per cent in 2005 to 10.0 per cent in 2012.[10]

47. Italy reported that cogeneration provided significant energy savings compared with separate generation. In Italy, cogeneration was supported by incentive schemes; in particular, all cogeneration plants benefited from the white certificates scheme.

48. ***Renewable energy sources.*** The ERT noted that electricity production from renewable sources developed significantly in the period 2010–2012 owing to financial incentives. According to the National Energy Strategy, the national target for 2020 was 120–130 TWh of gross electricity production per year from renewable sources; Italy was already producing 93 TWh of electricity from renewable sources in 2012. Italy stated that the rapid increase in renewable energy could be attributed to the high increase in solar photovoltaic production. The *Conto Energia* was introduced in 2010 and provides compensation for electricity produced by solar photovoltaic and thermodynamic systems for a fixed period (20 years for photovoltaic and 25 years for thermodynamic) through a tariff for all energy produced by such plants. However, the ERT noted that the *Conto Energia* had exhausted the available financial allowances by mid-2013. Italy reported that photovoltaic generation had reduced the capital cost of photovoltaic panels and equipment by about 70 per cent from 2008 to 2012, and incentives for small installations are limited to tax incentives.

[9] Information provided by Italy during the review on renewable energy in the fuel mix.
[10] Information provided by Italy during the review on Italy's total fuel mix.

49. ***Industrial sector.*** Italy reported that the main instrument in the industrial sector is the white certificates system (see para. 40 above). Another initiative introduced in this sector by the government is the replacement of existing inefficient electric motors with highly efficient ones. The high purchase price of the engines and the lack of information about their energy-saving potential has been the main obstacle to their diffusion.

50. ***Residential and commercial sectors.*** Italy reported that it has been improving and tightening its building standards with regard to energy efficiency since the implementation of the EU directive 2002/91/EC, which laid down minimum standards for energy performance. There have since been legislative decrees strengthening the requirements and transposing the directive into national law. In addition, EU directive 2010/31/EU[11] on energy performance of existing and new buildings defined mandatory standards for buildings that raise the energy efficiency requirement on new buildings and at the same time play a major role in strengthening the certification and inspection system of buildings, making it consistent across the EU.

51. The ERT noted that the building standards were useful as they applied to both new buildings as well as existing buildings undergoing major renovation. Tax deductions for part of the costs incurred for the energy efficiency restructuring of dwellings and common parts of residential buildings have been popular. However, the use of these deductions is on the decline and the fate of the policy after 2016 is uncertain as expenditure incurred up to 31 December 2014 will be tax deductible up to 65 per cent, this will fall to 50 per cent in 2015 and further to 36 per cent in 2016.

52. ***Transport sector.*** PaMs in the transport sector focused on (1) infrastructural measures such as high-capacity and high-speed transport networks and the fine-tuning of regional networks for passengers and goods; (2) intermodal measures for shifting from private road vehicles to public road transport and for shifting goods transport from road to sea; (3) vehicle fleet update measures such as subsidies to replace older cars with new ones that produce less emissions per kilometre; and (4) fuel switching to renewable energy, with a target of 10 per cent biofuel for transport by 2020.

53. PaMs in the transport sector are particularly important given Italy's national circumstance of being the country with the highest per capita car ownership in the world: 1.64 inhabitants per car (0.61 cars per capita). The ERT noted that the fleet update measure, with a reduction target of 120 g $CO_2$ per km by 2015 and 95 g $CO_2$ per km by 2020, had the highest mitigation potential of Italy's implemented measures (10,200 kt $CO_2$ eq by 2020).

### 4. Policies and measures in other sectors

54. Between 1990 and 2012, GHG emissions from industrial processes (including solvent and other product use), agriculture and waste decreased by 30.8 per cent (27,429.98 kt $CO_2$ eq), mainly owing to a decrease in GHG emissions in the industrial processes and agriculture sectors due to a decline in industrial production and in the number of livestock.

55. ***Industrial processes.*** Between 1990 and 2012, GHG emissions from the industrial processes sector decreased by 26.5 per cent (10,188.58 kt $CO_2$ eq), mainly owing to reduced production due to the recent economic recession and a decrease in emissions from mineral products, the chemical industry and metal production. The decrease in emissions was also influenced by the implementation of abatement equipment in adipic acid and nitric acid production and the change in process technology in aluminium production.

[11] Under this directive, EU member States must establish and apply minimum energy performance requirements for new and existing buildings, ensure the certification of building energy performance, and institute the requirement for regular inspection of boilers and air-conditioning systems in buildings. Moreover, the directive requires member States to ensure that by 2021 all new buildings are so-called 'nearly zero-energy buildings'.

56. During the review, Italy explained that the production of both iron and steel in particular was the main driver of decrease emissions in the industrial processes sector. In the early 1990s seven facilities manufactured nitric acid, but from 2003 production was carried out in only three plants. In 2008 another plant ceased nitric acid production; nitric acid production has therefore been carried out in only two plants since 2008.

57. Italy assessed the measure targeting nitrous dioxide ($N_2O$) emissions in nitric acid production plants and deemed that it could result in significant reductions in process emissions from the industrial sector at a relatively small cost. While $N_2O$ emissions from nitric acid production plants were not a significant contributor to emissions from the industrial processes sector, Italy explained during the review that this policy was chosen for the sector as it had found no other feasible ways of reducing emissions in other subsectors. The ERT noted that this measure was introduced in 2008 with reduction of 740 kt $CO_2$ eq by 2020.

58. ***Agriculture.*** Between 1990 and 2012, GHG emissions from the agriculture sector decreased by 15.8 per cent (6,449.15 kt $CO_2$ eq), mainly owing to a reduction in the number of livestock (especially cattle), a decrease in the use of nitrogen fertilizers (mainly owing to the EU Common Agricultural Policy (CAP) measures) and an increase in methane ($CH_4$) recovery from biogas produced from animal manure.

59. The main measures in the agriculture sector are based on (1) the EU CAP; (2) the EU nitrates directive; and (3) the EU integrated pollution prevention and control directive. Two additional national PaMs were reported for the agriculture sector: rationalization of nitrogen fertilizer use and the recovery of biogas from animal manure storage systems, with a combined expected total emissions reduction of 1,190 kt $CO_2$ eq in 2020. In order to ensure that PaMs in the agriculture sector are realistic and in line with the Rural Development Plan, the Ministry of Agriculture, Food and Forestry has been involved in the policymaking process at the central government level and in the monitoring of the results of the policies. Local governments also have been consulted in the process and are involved in the implementation of the policies.

60. ***LULUCF.*** The LULUCF sector was a net removal of 18,556.30 kt $CO_2$ eq in Italy in 2012 and net GHG removal increased by 52.7 per cent (6,402.56 kt $CO_2$ eq) since 1990. The trend was mainly driven by an increase in carbon stock changes from forest land and the occurrence of forest fires (e.g. large fires in 2007 resulted in significantly lower net removals). A major contributor to the trend was the increase in the area reported as forest land remaining forest land.

61. Italy's approach towards LULUCF was described in the NC6; however, no policy or measure was reported for the LULUCF sector. During the review, Italy explained that LULUCF was not included in the EU 20-20-20 target, and no PaMs were reported for this reason (see para. 27 above).

62. Italy selected to report on forest management as an activity under Article 3, paragraph 4, of the Kyoto Protocol. In accordance with the annex to decision 16/CMP.1, there is a cap on credits from forest management in the first commitment period of the Kyoto Protocol. Following decision 8/CMP.2, the cap is equal to 10,190 kt $CO_2$ per year, or 50,970 kt $CO_2$ for the whole first commitment period. As Italy exceeded this cap, it chose not to pursue further PaMs in this sector.

63. ***Waste management.*** Between 1990 and 2012, GHG emissions from the waste sector decreased by 17.5 per cent (3,450.79 kt $CO_2$ eq), mainly owing to a decrease of solid waste disposed on land due to the waste policies in place in recent years and an increase in waste incineration, composting and recycling.

64. Italy reported that emission reductions in the waste sector were mainly related to the improvement of waste management regarding the composition of waste disposed of in landfills. The key policy in the waste sector was the separation and separate collection of waste, which sought to reduce $CH_4$ emissions through compliance with separate collection targets and the reduction of biodegradable waste disposed of in landfills. The expected emission reductions from this policy are 3,700 kt $CO_2$ eq in 2020. During the review, Italy reported on the progress made towards reaching separate collection targets. The ERT noted that no additional measures in the waste sector were planned. Italy explained that this was because it was confident of achieving its 2020 emissions reduction target through PaMs in the other sectors.

### 5. Policies and measures related to implementation of commitments under the Kyoto Protocol

65. Italy reported on its package of PaMs adopted, implemented and elaborated in achieving its commitment under the Kyoto Protocol.

66. The NC6 includes information on how Italy promotes and implements the decisions of the International Civil Aviation Organization and the International Maritime Organization to limit emissions from aviation and marine bunker fuels.

67. In its NC6, 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. Further information on how Italy strives to implement its commitments under Article 3, paragraph 1, of the Kyoto Protocol in such a way as to minimize adverse social, environmental and economic impacts on developing country Parties, as reported in the 2013 annual submission, is presented in chapter III.B below.

68. The NC6 underlined that domestic mitigation measures included in the national climate change strategy do not focus exclusively on $CO_2$ from fossil fuels, but cover all sectors of economic activity relevant to GHG emissions and carbon sinks. Italy also reported that it ensured that the measures implemented to increase the differentiation of energy sources did not contradict the full liberalization of its energy markets. In particular, the promotion of natural gas consumption improves the security of the energy supply of the country, while new commercial relationships were developed with those countries from which natural gas is imported. Italy has also indicated that some of its PaMs might have potential positive impacts on other countries, for instance through their use of joint implementation and the clean development mechanism. In addition, measures taken at the EU level, such as changes to subsidies under the CAP linking payments to environmental, food safety and animal welfare standards and not to agricultural production volume, encourage responsible agricultural practices. The ERT encourages Italy to elaborate on these measures in its next NC.

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

69. Italy provided projections up to the year 2030 in its NC6. No updated projections were provided during the review.

### 1. Projections overview, methodology and key assumptions

70. The GHG emission projections provided by Italy in the NC6 include a 'with measures' and a 'with additional measures' scenario up to 2030, presented relative to actual inventory data for 1990, 1995, 2000 and 2005. For the year 2010, Italy presented the average emissions of the first commitment period of the Kyoto Protocol (2008–2012). Projections are presented on a sectoral basis. The sectoral categories used in the PaMs section are different, but PaMs are attributed to the sectoral categories of the projections chapter in table 3 of the first biennial report (BR1). Projections are presented on a gas-by-gas basis for all of the following GHGs: $CO_2$, $CH_4$, $N_2O$, perfluorocarbons (PFCs), hydrofluorocarbons (HFCs) and sulphur hexafluoride (treating PFCs and HFCs collectively in each case). Projections are also provided in an aggregated format for each sector as well as for a national total, using global warming potential values. Emission projections related to fuel sold to ships and aircraft engaged in international transport were reported separately and not included in the totals.

71. Italy's NC6 does not include a 'without measures' scenario. During the review, Italy presented a hypothetical 'without measures' scenario, calculated by subtracting the total effect of all PaMs from the 'with (existing) measures' scenario. The Party may wish to include a 'without measures' scenario based on the same methodology used for the other scenarios in its next NC, as this enables the consideration of overlapping and synergistic effects when calculating the total effects of the PaMs in the 'with measures' scenario.

72. In its NC6, Italy does not provide a textual description of projections for the LULUCF sector and a disaggregation of emissions by gas for the 'with measures' scenario. However, these data are available in the BR1 common tabular format (CTF) tables 6(a) and 6(c) in the annex to the NC6. The ERT recommends that Italy include either the LULUCF projections in the projections chapter or a reference to the CTF tables in its next NC.

73. Italy provided a 'with measures' and a 'with additional measures' scenario. The former includes all measures implemented or adopted up to 2010. The latter includes planned measures as foreseen in Italy's National Energy Strategy. Italy reported no changes to the methodology compared with the NC5.

74. Italy provided key assumptions on economic growth, carbon prices under the EU ETS, international fuel prices and population. In light of developments in recent years, Italy used a lower growth rate for GDP in the NC6 than in the NC5. It is not clear from the NC6 what the data source of the information on fuel and carbon prices is. During the review, Italy explained that it used data provided by the EU to fulfil the reporting obligations laid down in decision 280/2004/EC, Article 3(2). As these reporting obligations and the UNFCCC reporting guidelines have a similar aim, using the data provided by the EU seems to be a reasonable approach. However, as the figures provided by the EU have not been updated recently, higher carbon prices than those included in the most up-to-date forecasts were assumed by Italy, which may have led to lower projected GHG emissions over the period.

75. The NC6 does not report the number of households and the assumed floor space per household. During the review, Italy provided additional information regarding numbers of households and average floor space per dwelling. The ERT encourages Italy to include the information about this key assumption underlying GHG projections in its next NC.

76. Italy did not provide a quantified sensitivity analysis in the NC6. Instead, it presented a comparison of the projections reported in the NC6 with those reported in all previous NCs. The ERT welcomes the inclusion of this comparison noting, however, that it does not substitute for a sensitivity analysis on the projections reported in the NC6. A sensitivity analysis would have been especially important to analyse the different GDP pathways, as GDP is usually a very important and an uncertain driver, and the different

assumptions for carbon prices, as those used are notably higher than the ones included in the most up-to-date forecasts. The ERT encourages Italy to provide a sensitivity analysis in its next NC.

### 2. Results of projections

77. As a member State of the EU, Italy takes part in the joint target of the EU under the Convention to reduce emissions by 20 per cent by 2020 compared with the base year level. The target and the trajectory to meet the target are enshrined in the EU ETS directive (2003/87/EC and respective amendments) and the ESD (06/2009/EC). The emission reduction to be achieved by the sectors covered by the EU ETS will be 21.0 per cent below 2005 emission levels for the EU as a whole. For the emissions covered under the ESD, Italy's target is to reduce emissions by 13.0 per cent by 2020 compared with 2005.

78. As noted in paragraph 43 above, Italy has designed a number of existing and planned PaMs in in the non-emissions trading system sectors; however, it is not clear to what extent it expects to rely on these PaMs to fulfil its ESD target. Given the emission projections provided, however, it seems reasonable to assume that Italy will be able to reach its ESD target with existing domestic measures alone or with minor additional emission reductions from planned domestic measures.

79. In terms of gases, according to the 'with measures' scenario, $CO_2$ emissions will increase the most in absolute terms (16,800 kt $CO_2$ eq), while HFCs will show the highest increase in relative terms (3,900 kt $CO_2$ eq or 44.9 per cent) from 2010 to 2020. At the same time, $CH_4$ emissions are projected to slightly decrease (700 kt $CO_2$ eq), as are PFC emissions (100 kt $CO_2$ eq). For the following decade leading up to 2030, $CO_2$ and HFC emissions are expected to continue to increase (7,000 kt $CO_2$ eq and 4,000 kt $CO_2$ eq, respectively), while $CH_4$ emissions show a considerable decline during this period (5,900 kt $CO_2$ eq).

80. In the 'with measures' scenario, the contribution of $CO_2$ to overall emissions remains relatively stable at around 85 per cent over the period 2010–2030. It is followed by $CH_4$, which falls from 7.5 per cent in 2010 to 5.9 per cent in 2030. The share of $N_2O$ emissions stays constant at 5.5 per cent. The share of HFCs almost doubles, from 1.7 per cent in 2010 to 3.2 per cent in 2030. All other gases remain at or below a share of 0.3 per cent.

81. In terms of sectors, according to the 'with measures' scenario, emissions in the industrial sector are expected to increase the most from 2010 up to 2020 both in absolute terms (12,700 kt $CO_2$ eq) and in relative terms (20.7 per cent), followed by industrial processes (including fluorinated gas emissions) (5,500 kt $CO_2$ eq) and energy industries (4,100 kt $CO_2$ eq). To a limited extent, these increases are balanced by emission reductions in the transport sector (2,700 kt $CO_2$ eq) and the waste sector (1,400 kt $CO_2$ eq). From 2020 to 2030, energy industries become the most important driver of rising emissions (13,500 kt $CO_2$ eq), followed by the transport sector, whose emissions start increasing again (6,200 kt $CO_2$ eq), and industrial processes (5,000 kt $CO_2$ eq). At the same time, emissions from the residential and commercial sector start decreasing (7,100 kt CO2 eq) as well as emissions in the industrial sector (5,900 kt $CO_2$ eq), while the waste sector continues to deliver emission reductions (3,200 kt $CO_2$ eq).

82. In terms of gases, in the 'with additional measures' scenario, $CO_2$ emissions will show a strong decrease (44,100 kt $CO_2$ eq) from 2010 to 2020 as the result of all the assumed changes between the 'with measures' and 'with additional measures' scenarios. $CH_4$ emissions are also reduced, but to a much lesser extent (2,900 kt $CO_2$ eq). At the same time, HFC and $N_2O$ emissions are increasing (3,900 and 1,100 kt $CO_2$ eq, respectively).

From 2020 to 2030, $CO_2$ and $CH_4$ emissions continue to fall (23,700 and 3,900 kt $CO_2$ eq, respectively), while only HFC emissions show a significant increase (4000 kt $CO_2$ eq).

83. In terms of sectors, in the 'with additional measures' scenario, the increase in emissions in the industrial sector is much less pronounced (7,300 kt $CO_2$ eq) for the period 2010–2020 while emissions from industrial processes are expected to increase in line with the 'with measures' scenario (5,500 kt $CO_2$ eq) because no additional PaMs are assumed in this sector. There are considerably more reductions delivered in the energy industries sector (29,500 kt $CO_2$ eq), the transport sector (15,100 kt $CO_2$ eq), and the residential and commercial sector (6,600 kt $CO_2$ eq). For the period from 2020 to 2030, increasing trend in emissions is expected in the industrial processes sector (5,000 kt $CO_2$ eq) and other sectors (100 kt $CO_2$ eq). The residential and commercial sector shows the largest emissions reduction for this period (10,100 kt $CO_2$ eq), followed by energy industries (9,300 kt $CO_2$ eq), transport and waste (3,200 kt $CO_2$ eq each).

84. In the 'with additional measures' scenario, the additional PaMs in the energy sector lead to a decline in the share of $CO_2$ in overall emissions from 85 per cent to 82 per cent. Correspondingly, the share of $N_2O$ increases from 5.5 per cent to 6.3 per cent, and the share of HFCs from 1.7 per cent to 3.9 per cent. $CH_4$ shows only a slight decline from 7.5 per cent to 7.1 per cent. All other gases remain at or below a share of 0.3 per cent.

85. Total emissions increased from 519,000 kt $CO_2$ eq in 1990 to 574,500 kt $CO_2$ eq in 2005, followed by a sharp decline to 497,200 kt $CO_2$ eq in 2010 (representing the average emissions in the first commitment period of the Kyoto Protocol). In the 'with measures' scenario, emissions will rise again to 516,100 kt $CO_2$ eq (–0.6 per cent compared with 1990) in 2020 and 523,800 kt $CO_2$ eq (+0.92 per cent) in 2030. In the 'with additional measures' scenario, emissions will continue to decrease from 2010 onwards and reach 455,000 kt $CO_2$ eq in 2020 (–12 per cent compared with 1990) and 431,000 kt $CO_2$ eq in 2030 (–17 per cent). According to the NC6, "the reduction in emissions [in the energy sector] is due to many different factors, some of them structural and other[s] only temporary". The report further states that the most important of these factors are: (1) an increase in the share of renewable energy; (2) increased energy efficiency on the supply side, for example the entry into service of many combined cycle plants; (3) a reduction of activity levels in the transport sector; (4) a reduction of energy consumption in the industrial sector due to economic crisis and structural changes; and (5) an increase in efficiency of end user devices.

86. In order to meet its quantified economy-wide emission reduction target of 13.0 per cent in the ESD sector, Italy would have to reduce non-emissions trading system emissions from 285,700 kt $CO_2$ eq (2013) to 296,300 kt $CO_2$ eq by 2020. Italy's projections for total emissions show that this target is expected to almost be reached with existing measures (299,400 kt $CO_2$ eq) and exceeded when considering the effect of planned PaMs (267,500 kt $CO_2$ eq). The ERT thus noted that Italy made significant progress towards its target for the emissions not covered under the EU ETS. 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 5 and the figure.

Table 5
**Summary of greenhouse gas emission projections for Italy**

| | *Greenhouse gas emissions (kt $CO_2$ eq per year)* | *Changes in relation to the base year level[a] (%)* | *Changes in relation to the 1990 level (%)* |
|---|---|---|---|
| Kyoto Protocol base year[b] | 516 850.89 | NA | –0.4 |
| Kyoto Protocol target for the first commitment period (2008–2012) | 483 255.58 | –6.5 | –6.9 |

| | *Greenhouse gas emissions (kt $CO_2$ eq per year)* | *Changes in relation to the base year level[a] (%)* | *Changes in relation to the 1990 level (%)* |
|---|---|---|---|
| Kyoto Protocol target for the second commitment period (2013–2020)[c] | Not available yet | NA | NA |
| Quantified economy-wide emission reduction target under the Convention[d] | Not available yet | NA | NA |
| Inventory data 1990[e] | 518 984.17 | 0.4 | NA |
| Inventory data 2012[e] | 460 083.45 | –11.0 | –11.3 |
| Average annual emissions for 2008–2012[e] | 484 039.00 | –6.3 | –6.7 |
| 'With measures' projections for 2020[f] | 516 078.93 | –0.1 | –0.6 |
| 'With additional measures' projections for 2020[f] | 455 036.66 | –12.0 | –12.3 |
| 'With measures' projections for 2030[f] | 523 903.22 | 1.4 | 0.9 |
| 'With additional measures' projections for 2030[f] | 430 977.45 | –16.6 | –17.0 |

*Abbreviation*: NA = not applicable.

[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/2007/ITA.

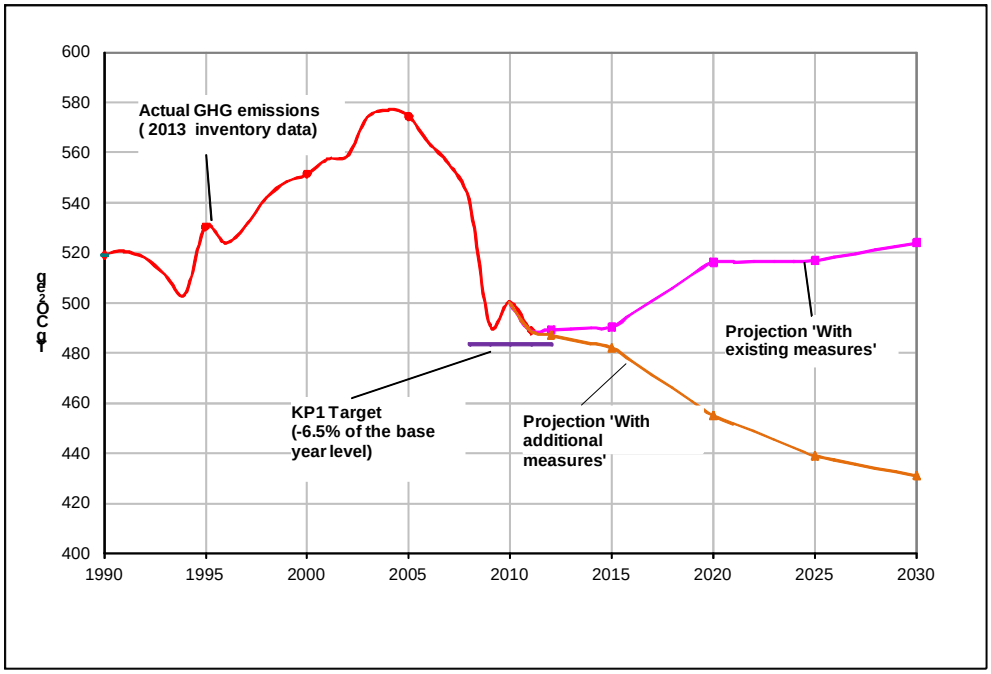
[c] The Kyoto Protocol target for the second commitment period (2013–2020) is a joint target for the European Union and its 28 member States and Iceland. The target is to reduce emissions by 20 per cent by 2020 compared with the base year (1990) level. The target for sectors not covered by the European Union Emissions Trading System is 13.0 per cent for Italy under the European Union effort-sharing decision.

[d] Quantified economy-wide emission reduction target under the Convention is a joint target for the European Union and its 28 member States. The target is to reduce emissions by 20 per cent by 2020 compared with the base year (1990) level.

[e] Italy's 2014 greenhouse gas inventory submission, version 1.3 of 4 April 2014; the emissions are without land use, land-use change and forestry; the GHG inventory data are not reviewed data.

[f] Italy's sixth national communication and/or first biennial report.

**Greenhouse gas emission projections**




*Sources*: (1) Data for the years 1990–2011: Italy's 2013 greenhouse gas inventory submission; the emissions are without land use, land-use change and forestry; (2) Data for the years 2011– 2030: Italy's sixth national communication and/or first biennial report; the emissions are without land use, land-use change and forestry; information on the KP1 target and some captions added by the expert review team.

*Abbreviations:* GHG = greenhouse gas, KP1 = first commitment period of the Kyoto Protocol.

## 3. Total effect of policies and measures

87. Italy provided the total effect of PaMs in the PaMs chapter of the NC6 as a sum of the effects of individual PaMs for both the 'with measures' and the 'with additional measures' scenarios relative to the 2010 emissions level or a 'without measures' scenario. However, the NC6 does not include information on the total effect of PaMs disaggregated by gas. The ERT recommends that Italy include this information in its next NC.

88. The effects of individual PaMs and the projections were attained using different processes and a different methodology. Therefore, for the 'with additional measures' scenario, the sum of the individual effects of all PaMs amounts to 65,970 kt $CO_2$ eq in 2020 while the difference between the 'with additional measures' and the 'with measures' projections yields 61,000 kt $CO_2$ eq.

89. Italy reported that the estimated total effect of adopted and implemented PaMs is 54,090 kt $CO_2$ eq in 2020 compared with a scenario without these PaMs. For a description of these PaMs and drivers behind GHG emission reductions, see chapter II.B above. Italy did not provide a disaggregation of the total effect of PaMs by sector, but according to the calculations of the ERT, PaMs implemented in the energy, industry and industrial processes sectors will in sum deliver the largest emissions reduction, followed by PaMs implemented in the transport and waste sectors.

90. Table 6 provides an overview of the total effect of PaMs as calculated by the ERT.

Table 6
**Projected effects of planned, implemented and adopted policies and measures in 2020**

| *Sector* | *Effect of implemented and adopted measures (kt $CO_2$ eq)* | *Relative value (% of 1990 emissions)* | *Effect of planned measures (kt $CO_2$ eq)* | *Relative value (% of 1990 emissions)* |
|---|---|---|---|---|
| | | *2020* | | |
| Energy (without transport) | 25 950 | 5.0 | 33 600 | 6.5 |
| Industry | NA | NA | 5 400 | 1.0 |
| Industrial processs | NA | NA | NA | NA |
| Transport | 20 250 | 3.9 | 12 400 | 2.4 |
| Residential and commercial sectors | NA | NA | 9 400 | 1.8 |
| Agriculture | 1 190 | 0.2 | 100 | 0.0 |
| Waste management | 3 700 | 0.7 | NA | NA |
| Other | NA | NA | 100 | 0.0 |
| **Total** | **51 090** | **9.8** | **61 000** | **11.8** |

*Source*: Italy's sixth national communication.

*Notes*: The total effect of implemented and adopted policies and measures (PaMs) is defined as the sum of the individual effects of PaMs for the adopted and implemented measures relative to a scenario without these measures. This is the effect of individual PaMs, including potential double counting and disregarding potential synergies. The total effect of PaMs is defined as the difference between the 'with measures' and 'with additional measures' scenarios. The total effect of planned PaMs was calculated by the ERT by subtracting the sector emissions of the 'with measures' scenario from the ones of the 'with additional measures' scenario. Thus double counting is excluded and synergies are reflected.

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

91. In its NC6, 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. Italy explained that its definition of supplementarity is in line with that of the EU's. It is interpreted as the possibility to use certified emission reductions (CERs) and emission reduction units (ERUs) for up to 50 per cent of its reduction effort. Italy's emission reduction effort was estimated to be equal to 90,300 kt $CO_2$ eq in the year 2005. As a consequence, the maximum amount of CERs and ERUs that can be used per year in the period 2008–2012 is 45,150 kt $CO_2$ eq (0.50 * 90,300 kt $CO_2$ eq). This value includes both CERs and ERUs to be used by the Government of Italy to meet its commitment under the Kyoto Protocol and those to be used by operators to meet their commitments under directive 2003/87/EC.[12]

92. According to information given to the ERT during the review taken from Italy's *Documento di Economia e Finanza 2014*, Italy expects a gap of 102,100 kt $CO_2$ eq for the first commitment period. Taking into account Italy's estimated use of 10,000 kt $CO_2$ eq of CERs and ERUs and its further plans to use 75,200 kt $CO_2$ eq of removal units (RMUs), the gap is reduced to 16,900 kt $CO_2$ eq per year. To fill the estimated gap, Italy would have to

[12] Under the EU ETS, Italian operators have been allowed to use CERs and ERUs of up to 15.0 per cent of the total quantity of allowances to be allocated. This makes 12,900 kt $CO_2$ per year.

purchase assigned amount units (AAUs) but would still meet its definition of supplementarity.

93. Italy has not yet allocated the necessary resources to purchase AAUs to fill this gap. Italy informed the ERT during the review that the mechanism to ultimately allocate the necessary funds can be triggered only once the exact amount of units needed to comply with the target is defined (i.e. after the in-depth review). The ERT concludes that although the funds required to purchase the necessary amount of AAUs could not yet be allocated, Italy is aware of the need to do so and has prepared a suitable procedure.

94. In the framework of the EU burden-sharing agreement (decision 2002/358/EC), the target for Italy under the first commitment period of the Kyoto Protocol is to reduce total GHG emissions to an average emissions level that is 6.5 per cent below the 1990 base year level over the 2008–2012 period, or an average annual GHG emissions level of 483,300 kt $CO_2$ eq, or 2416,500 kt $CO_2$ eq over the five-year period. Based on non-reviewed estimates from the 2014 annual GHG inventory submission and taking into account all the reductions achievable through existing measures (including the purchase of CERs and ERUs), the average annual total emissions for the 2008–2012 period amount to about 497,100 kt $CO_2$ eq.

## D. Provision of financial resources and technology transfer to developing country Parties, including information under Articles 10 and 11 of the Kyoto Protocol

### 1. Financial resources, including 'new and additional' resources and resources under Article 11 of the Kyoto Protocol

95. In its NC6, Italy provided information on provision of support required under the Convention and its Kyoto Protocol.

96. In its NC6, Italy provided details on measures taken to give effect to its commitments under Article 4, paragraphs 3, 4 and 5, of the Convention as required by the UNFCCC reporting guidelines on NCs and under Article 11 of the Kyoto Protocol, as required by the "Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol". Italy has indicated what 'new and additional' financial resources it has provided pursuant to Article 4, paragraph 3, of the Convention.

97. The NC6 does not include information required by the UNFCCC reporting guidelines on NCs on how Italy has determined financial resources as being 'new and additional'. However, during the review, Italy clarified that resources not considered official development assistance (ODA) are defined as 'new and additional'. The ERT recommends that Italy clearly indicate how it has determined such financial resources as being 'new and additional' in its next NC. Italy has also provided detailed information on the assistance it has made available 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. Furthermore, Italy has provided information on other financial resources related to the implementation of the Convention provided through bilateral, regional and other multilateral channels, including the Global Environment Facility (GEF).

98. Since 2002, IMELS has been authorized by the law to finance activities worth EUR 137.54 million (for 2009–2012) in developing countries to contribute to the implementation of the UNFCCC. Italy also contributed EUR 166.01 million towards bilateral funding and EUR 8.58 million to the GEF.

99. The bilateral funding covered countries in Asia and the Middle East, Central and Eastern Europe, Latin America and small island developing States (SIDS) in the South Pacific. A share of 38.3 per cent of the total bilateral funding (EUR 63.6 million), Italy's largest bilateral contribution, was provided to China for improvements in energy sector, capacity-building and technology transfer. Italy's second largest contribution (EUR 18.72 million) was provided to Brazil for improvements in energy and forestry sectors, followed by support to Iraq (EUR 14.42 million), mainly for adaptation. These three contributions together accounted for 58.3 per cent of the total bilateral financial support provided by Italy during 2009–2012. The financial contributions to other Parties were much smaller in average size, although they were spread across many Parties, including least developed countries.

100. There has been some shift in country focus between the NC5 and the NC6. SIDS in the South Pacific, Albania, Brazil, China, Egypt, India, Iraq, Mexico, Montenegro, Romania, Serbia and the former Yugoslav Republic of Macedonia form the central focus in the NC6, whereas Argentina, Belize, Benin, Burkina Faso, Cuba, Kenya, the Niger and Thailand had been the focus in the NC5.

101. Italy has provided financial resources for diverse activities. Most financial resources are provided for cross-cutting issues, followed by mitigation and then adaptation. These activities include the promotion of renewable energy technologies in Kenya, Tunisia and the United Republic of Tanzania; the promotion of energy efficiency in Cameroon and Kenya; the promotion of sustainable development in Iraq and the Caribbean; technology transfer and capacity-building through the Sino-Italian Climate Change Cooperation Program; promotion of biofuels in Brazil; provision of legal support to the designated national authority in Albania; the monitoring of environmental quality in Montenegro; the restoration of water resources and the environment in Iraq; and a pilot project on eco-tourism in Egypt.

102. The multilateral funding was mainly provided to the African Development Bank, the Asian Development Bank, the Food and Agriculture Organization of the United Nations, the GEF, the Regional Environmental Center for Central and Eastern Europe, the United Nations Educational, Scientific and Cultural Organization, the United Nations Industrial Development Organization and the World Bank. The multilateral financial support was mainly provided for core/general purposes (USD 300.63 million in 2011; USD 260.5 million in 2012), followed by mitigation (USD 8.78 million in 2011; USD 5.99 million in 2012) and adaptation (USD 1.09 million in 2011; USD 1.4 million in 2012). USD 9.79 million was also contributed for cross-cutting climate-specific funding in 2011.

103. There was a general increase in climate-specific funding by Italy during the NC6 period (EUR 137.54 million covering 2009–2012) in comparison with that provided during the NC5 period (EUR 114.6 million covering 2005–2008). The bilateral funding also increased marginally from EUR 158.94 million during the NC5 period to EUR 166.01 million during NC6 period.

104. The financial resources provided address the needs of the beneficiary countries. Italy entered into memorandums of understanding with most of the developing countries to whom financial resources were provided. This indicates that the involved beneficiary countries agree with the needs addressed by the financial support. In addition, a few of these countries, for example China, have also committed financial resources for these bilateral projects. This also indicates that the financial resources address the needs felt by developing countries.

105. Italy has included in its NC6 details on its contributions towards the implementation of the Montreal Protocol. The ERT notes that the Montreal Protocol has its own reporting

mechanisms and this information is beyond the scope of the UNFCCC reporting guidelines on NCs.

106. Italy has indicated ODA as the funding source in NC6 tables 7.3(a) and 7.3(b). During the review, Italy specified that climate-specific 'new and additional' financial resources are different from those of ODA and submitted revised relevant tables of the NC6. The ERT commends Italy for this revision and recommends the Party specify more details on how it determines financial resources as being 'new and additional' in its next NC.

107. With regard to the most recent financial contributions to enhance the implementation of the Convention by developing countries (fast-start funding), Italy has not specifically indicated any commitments in its NC6. However, additional information provided by Italy during the review indicates planned total climate expenditure of EUR 19.35 million for 2013, EUR 15.00 million for 2014 and another EUR 15.00 million for 2015. Table 7 summarizes information on financial resources.

Table 7
**Summary of information on financial resources for 2009-2012**

| *Allocation channel of public financial support* | *Unit* | *Years of disbursement* | | | |
|---|---|---|---|---|---|
| | | *2009* | *2010* | *2011* | *2012* |
| Official development assistance | USD million | 3 150 | 3 000 | 4 070 | 2 740 |
| Contributions through multilateral channels, including: | USD million | 376.80 | 552.20 | 547.80 | 403.27 |
| Contribution to the Global Environment Facility | EUR million | 0.89 | – | 6.08 | 1.61 |
| Contributions through United Nations bodies | USD million | 29.20 | 34.90 | 28.99 | 18.54 |
| Fast-start finance | EUR million | – | 149.48 | 120.43 | 166.41 |
| Climate-related contributions through bilateral and regional channels | EUR million | 52.30 | 37.72 | 36.85 | 39.14 |

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

108. Italy has provided in its NC6 comprehensive and well-organized information on activities related to the transfer of technology and notable activities by the public sector. A detailed review of reported information is provided in chapter II.D.3 of the report of the technical review of the first biennial report.

109. When reporting details on measures related to the promotion, facilitation and financing of the transfer of or access to environmentally sound technologies, Italy has not clearly distinguished between activities undertaken by the public sector and those undertaken by the private sector. This information was not provided in the NC5 and the ERT had recommended doing so in the NC6. As the ability to collect information on private sector activities is limited, Italy may indicate, where feasible, the ways in which it has encouraged private sector activities, and how these activities help to meet Italy's commitments under Article 4, paragraphs 3, 4 and 5, of the Convention.

110. Italy has not reported on its activities for financing access by developing countries to 'hard' or 'soft' environmentally sound technologies, and has also not specifically provided information in textual format on the steps taken to support the development and enhancement of endogenous capacities and technologies of developing countries. The ERT reiterates the recommendation made in the previous review report that Italy provide this information in its next NC and biennial report.

111. Italy did not provide information on the institutional, legal and procedural arrangements in place for assessing technology transfer and for reporting and archiving this information, as well as any changes to these arrangements, since the last report. Italy is encouraged to provide this information in its next submission.

112. Italy provided information on how it has provided capacity-building support that responds to the existing and emerging capacity-building needs identified by Parties not included in Annex I to the Convention in the areas of mitigation, adaptation, and technology development and transfer. In general, the technology transfer support and capacity-building support provided by Italy are synchronized. The ERT commends Italy for such capacity-building initiatives.

113. The regions and countries provided with such capacity-building support include the Caribbean (Barbados and Grenada), South-East Europe, the Southern Mediterranean (Albania, Algeria, Bosnia and Herzegovina, Croatia, Egypt, Israel, Jordan, Lebanon, Montenegro, Morocco, the State of Palestine, Tunisia and Turkey), China, Libya, Nepal, Pakistan, Serbia, the Syrian Arab Republic, the former Yugoslav Republic of Macedonia and Uganda.

## E. Vulnerability assessment, climate change impacts and adaptation measures

114. In its NC6, Italy has provided the required information on the expected impacts of climate change in the country and on adaptation options. Table 8 summarizes the information on vulnerability and adaptation to climate change presented in the NC6.

Table 8
**Summary of information on vulnerability and adaptation to climate change**

| *Vulnerable area* | *Examples/comments/adaptation measures reported* |
|---|---|
| Agriculture and food security | *Vulnerability:* climate change is projected to have mainly negative impacts on the agriculture and food security sector. Among these are the possibility of overall decreases in yields and the increased variability of yields of most crops, especially in areas bordering the Mediterranean, due to increased and more extreme temperatures during critical phenological phases, drought and water availability, and pest damage. Wine production and olive plantations are also at risk.<br>*Adaptation*: implementation of the national irrigation plan and a rural development plan for improving water and soil management through measures such as forest restoration and the building of water-retaining stone walls. |
| Biodiversity and natural ecosystems | *Vulnerability*: increasing temperatures and the increasing incidence and intensity of hydrometeorological events have led to biodiversity loss in terrestrial, coastal, mountain and aquatic ecosystems. Several terrestrial species are at risk of extinction owing to northward and upward shifts resulting from increasing temperatures and changes in phenological phases.<br>*Adaptation*: establishment of a National Biodiversity Strategy, legislative frameworks for terrestrial and marine protected areas, and the Life Plus Programme. |
| Coastal zones | *Vulnerability*: the morphology of coastal zones and significant anthropogenic pressures make them vulnerable to the impacts of climate change, in particular to relative sea level rise and the increased occurrence of storm surges that will lead to increased flood risk, instability, coastal erosion and |

| *Vulnerable area* | *Examples/comments/adaptation measures reported* |
|---|---|
| | saline intrusions into coastal aquifers.<br>*Adaptation*: implementation of technical measures, such as hard defences and beach nourishment; behavioural strategies, such as changing the location of recreational facilities; managerial interventions, such as changing agricultural practices in areas prone to floods; and integrated coastal zone management strategies, including land-use planning and research. |
| Drought | *Vulnerability*: climate change is expected to worsen the desertification trend, especially in the south of the country. An increased risk of soil degradation, further desertification and erosion are expected, which will be the highest in areas also characterized by intensive land use.<br>*Adaptation*: implementation of measures to combat drought and desertification; pilot projects and actions, such as water-saving technologies and slope stabilization; and pilot projects to combat drought in certain regions. |
| Fisheries | *Vulnerability*: in the Mediterranean Sea, fish stock movements (including new invasive species), anthropogenic stresses caused by overfishing, pollution, fragmentation and loss of habitat will all be exacerbated by climate change and transboundary aquatic infections.<br>*Adaptation*: establishment of an operational programme for the period 2007–2013 on the sustainable management of fisheries. |
| Forests | *Vulnerability*: expected effects on forests include northward and altitudinal range shifts, productivity changes with negative impacts in south-central Italy, the threat of drought, an increase in forest productivity in the Alps due to the extension of the growing season, and a higher risk of forest fires; the most critical areas are the Alps, Sicily and Sardinia.<br>*Adaptation*: Protection of forests from fires, a plan for natural parks and reserves, and technical and scientific support for forest management. |
| Human health | *Vulnerability*: there will be increased heat-related mortality and morbidity, a slight reduction in winter mortality, an increase in the risk of injuries, deaths and morbidity from floods and fires, an increase in allergic disorders, and an increase in vector-borne, waterborne and food-borne diseases. The most vulnerable will be the elderly, children and marginalized peoples.<br>*Adaptation*: prevention of and response to health effects from heat waves, implementation of the National Heat Health Prevention Plan, and the dissemination of information and scientific research. |
| Infrastructure and economy | *Vulnerability*: there will be reduced hydropower production, less summer tourism and more expensive or reduced winter tourism, reduced fishery productivity, disruptions in the transport network, disruptions to settlements and trade, and pressure to build infrastructure.<br>*Adaptation*: artificial snow-making systems for adapting winter tourism. |
| Water resources | *Vulnerability*: the high stress on water resources will be exacerbated by changes in the climate, thus compromising the ability to mitigate extreme climate events and regenerate reservoirs. Impacts include reduced water availability, especially in summer, increased competition among different water users, and an increased risk of landslides.<br>*Adaptation*: improved water management, response to water emergencies and crises, and drought control; development of irrigation and potable water plans; establishment of networks integrating national and regional warning systems; and the diversification of the tourism sector. |

115. The NC6 provides a balanced description of vulnerability and adaptation. Macroeconomic impacts of climate change in Italy cover four vulnerable areas: the Alps and glacier ecosystems; coastal zones; arid areas and areas threatened by desertification; and areas prone to floods and landslides. Italy uses national climate change impact assessment methodologies that are consistent with the Intergovernmental Panel on Climate Change (IPCC) *Technical Guidelines for Assessing Climate Change Impacts and Adaptations* and the United Nations Environment Programme (UNEP) *Handbook on Methods for Climate Change Impact Assessment and Adaptation Strategies*. The ERT welcomes further reporting of explanations of the social impacts of climate change and variability provided to the ERT during the review in Italy's next NC.

116. Italy is currently preparing a National Adaptation Strategy, the final approval of which is expected in 2014. The ERT encourages Italy to provide further information on the Strategy and its implementation in its next NC.

## F. Research and systematic observation

117. Italy has provided information on its actions relating to research and systematic observation, and addressed both domestic and international activities, including the World Climate Programme, the International Geosphere–Biosphere Programme, the Global Climate Observing System (GCOS) and the IPCC. The NC6 also reflects action taken to support related capacity-building in developing countries. Furthermore, Italy has provided a summary of information on GCOS activities.

118. General policy on research and systematic observation in Italy is provided in the 2011–2013 National Research Programme and implemented through different funding schemes. The Programme aims at enhancing participation in European research programmes as well as at ensuring coherence of national research priorities with European and international priorities.

119. The ERT noted that Italy fully participates in the GCOS element of the World Climate Programme, including the GCOS Surface Network, the GCOS Upper Air Network and the Global Atmosphere Watch with regard to systematic observation. Regarding the International Geosphere–Biosphere Programme, Italy has established a national committee chaired by the National Research Council as part of a network of 51 national committees covering the developing and the developed world.

120. Italy provided detailed information related to the capacity-building support provided to developing countries (including issues on research and observation) that is continuing within the framework of bilateral and multilateral agreements and specific memorandums of understanding concluded by IMELS. The ERT encourages Italy to include in its next NC additional information on research and systematic observation funding opportunities for, and barriers to, the free and open international exchange of data and information presented to the ERT during the review.

## G. Education, training and public awareness

121. In the NC6 Italy provided information on its actions relating to education, training and public awareness, including detailed and transparent description of its policies on education, training and public awareness; primary, secondary and higher education; public information campaigns; training programmes; information centres; and involvement of the public and non-governmental organizations (NGOs).

122. At the national level, ISPRA plays an important role in the promotion and implementation of educational programmes, projects and initiatives on various environmental issues, including climate change. The Sino-Italian Climate Change Cooperation Program, the Stations at High Altitude for Research on the Environment project, the Euro-Mediterranean Partnership Programme for the Prevention, Preparedness and Response to Natural and Man-made Disasters, the European Volunteers for Response of Emergencies in the Caribbean project, and the popularity index of main public awareness websites are among the newest successful initiatives undertaken by Italy in education, training and public awareness.

123. At the local level, municipal, regional and provincial administrations are the key actors in promoting and implementing innovative methods for teaching, learning and

raising awareness on climate change issues. The ERT noted that Italy may wish to report information, if available, on the effect of the *Guidelines for Environmental Education on Sustainable Development* prepared for primary and secondary schools and on the number of visitors to educational websites on climate change.

124. NGOs are very active in Italy in the initiatives relating to public awareness and involvement, particularly among young people, on the topic of climate change.

# III. Summary of reviewed supplementary information under the Kyoto Protocol

## A. Overview of supplementary information under Article 7, paragraph 2, of the Kyoto Protocol

125. Supplementary information provided by Italy under Article 7, paragraph 2, of the Kyoto Protocol in its NC6 is mostly complete and mostly transparent. The supplementary information is located in different sections of the NC6. Table 9 provides an overview of supplementary information under Article 7, paragraph 2, of the Kyoto Protocol as well as references to the NC6 chapters in which this information is provided.

126. Italy has not reported the following elements of the supplementary information required under Article 7, paragraph 2, of the Kyoto Protocol: a description of national legislative arrangements and administrative procedures that seek to ensure that the implementation of activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol also contribute to the conservation of biodiversity and sustainable use of natural resources; information on how it has determined such financial resources as being 'new and additional'.

127. The technical assessment of the information reported under Article 7, paragraph 2, of the Kyoto Protocol is contained in the relevant sections of this report. The ERT recommends that Italy include this reporting element in its next NC.

Table 9
**Overview of supplementary information under Article 7, paragraph 2, of the Kyoto Protocol**

| *Supplementary information* | *Reference to the sixth national communication* |
|---|---|
| National registry | Chapter 3.3, pages 55–58 |
| National system | Chapter 3.2, pages 46–54 |
| Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17 | Chapter 5.7, pages 130–131 |
| Policies and measures in accordance with Article 2 | Chapter 4, pages 59–106 |
| Domestic and regional programmes and/or legislative arrangements and enforcement and administrative procedures | Chapters 3 and 4, pages 38–108 |
| Information under Article 10 | Chapter 8, pages 196–240 |
| Financial resources | Chapter 7, pages 168–195 |

### B. Minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol

128. Italy reported the information requested in section H, "Minimization of adverse impacts in accordance with Article 3, paragraph 14", of the annex to decision 15/CMP.1 as a part of its 2013 annual submission. During the review, Italy provided the ERT with the additional information on how it strives to implement its commitments under Article 3, paragraph 1, of the Kyoto Protocol in such a way as to minimize adverse social, environmental and economic impacts on developing country Parties, particularly those identified in Article 4, paragraphs 8 and 9, of the Convention. The ERT considers the reported information to be complete and transparent. The ERT commends Italy for the additional information provided. The ERT noted that Italy could continue exploring and reporting on the adverse impacts of the response measures.

129. The information provided by Italy in its NC6 is in line with its 2013 NIR and the supplementary information required under Article 7, paragraph 1, of the Kyoto Protocol (decision 15/CMP.1).

130. The 2013 and previous NIRs and the additional information provided during the review presented several initiatives of Italy aimed at minimizing adverse impacts, including the EU ETS, joint implementation, the clean development mechanism and the Kyoto Protocol mechanisms, as well as bilateral and multilateral cooperation. Through multilateral and bilateral cooperation with developing countries, Italy is funding projects on the efficient use of energy, efficient water management, carbon sequestration, the promotion of eco-efficient technologies and professional training.

## IV. Conclusions and recommendations

131. The ERT conducted a technical review of the information reported in the NC6 of Italy according to the UNFCCC reporting guidelines on NCs. The ERT concludes that the NC6 provides a good overview of the national climate policy of Italy. The information provided in the NC6 includes most elements of the supplementary information under Article 7 of the Kyoto Protocol with the exception of information on: arrangements and procedures that seek to ensure that activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol contribute to the conservation of biodiversity and sustainable use of natural resources; and clarification on how Italy has determined financial resources as being 'new and additional'.

132. Italy's emissions for 2012 were estimated to be 11.4 per cent below its 1990 level excluding LULUCF and 14.3 per cent above including LULUCF. Emission decreases were driven by the economic recession, policies adopted at the EU and national level for promoting renewable energy sources, and energy efficiency measures, especially observed as a consequence of the EU ETS.

133. In the NC6, Italy presents GHG projections for the period from 2010 to 2030. Two scenarios are included: 'with measures' and 'with additional measures'. The projected reductions in GHG emissions in relation to the base year, and under the 'with measures' and 'with additional measures' scenarios, are 0.6 and 12.3 per cent in 2020, respectively. Based on a comparison with the Kyoto Protocol target for the first commitment period, the allocated emissions under the EU ETS and the national emissions under the ESD, and taking into consideration the use of RMUs and AAUs, Italy is in a position to meet its Kyoto Protocol target for the first commitment period (6.5 per cent reduction).

134. Italy participates in and contributes to the EU target of a 20 per cent emission reduction by 2020 under the Convention and the second commitment period of the Kyoto

Protocol, and therefore does not have a specific national target. The EU ETS sector has an EU-wide emission cap and can purchase emission credits to offset GHG emissions. For the non-emissions trading system sector (excluding LULUCF), projections suggest that Italy expects to achieve its 2020 target for this sector of a 16 per cent emission reduction by 2020 compared with the 2005 level based on its implemented and planned PaMs.

135. The NC6 contains information on how Italy's use of the mechanisms under Articles 6, 12 and 17 of the Kyoto Protocol is supplemental to domestic action. Further information provided during the review indicates that Italy is planning to make use of the Kyoto Protocol mechanisms to meet its Kyoto Protocol target within its definition of supplementarity. Italy expects a gap of 102,100 kt $CO_2$ eq for the first commitment period. Taking into account Italy's estimated use of CERs, ERUs and RMUs, the gap is reduced to 16,900 kt $CO_2$ eq. Italy has not yet allocated the necessary resources to purchase AAUs to fill this gap; however, it has put in place necessary procedures to do so once the exact amount of units needed to comply with the target is defined (after the true-up period review in 2015).

136. Italy has introduced a package of PaMs across all sectors but LULUCF, aiming to achieve its 2020 emission reduction target. Among the national PaMs, the most important measures are those targeted at the electricity and transport sectors. The most effective cross-sectoral measure implemented is the white certificates system, which aims at promoting energy efficiency and delivering emission reductions in all energy end-use sectors. This measure has been followed by another successful measure, the *Conto Energia*, which through feed-in tariffs promotes solar photovoltaic and other forms of renewable electricity. In addition, PaMs in the transport sector, particularly those targeted at vehicle fleet update, are most promising for tackling the increasing emissions trend from this sector. Among EU-wide framework PaMs, the EU ETS and the EU CAP play the most significant role in reducing GHG emissions.

137. Italy has provided financial resources for diverse activities covering mitigation, adaptation and cross-cutting issues. Italy's provision of multilateral and bilateral support reported in the NC6 at EUR 610.91 million and USD 1991.7 million (for four years) increased compared with that reported in the NC5 at EUR 471.2 million and USD 1392.85 million (for three years) on cumulative and average per year. More than one third of Italy's bilateral support is provided to the Sino-Italian Climate Change Cooperation Program for energy, capacity-building and technology transfer.

138. To assess the expected impacts of climate change in the country and adaptation options, Italy uses national methodologies that are consistent with the IPCC *Technical Guidelines for Assessing Climate Change Impacts and Adaptations* and the UNEP *Handbook on Methods for Climate Change Impact Assessment and Adaptation Strategies*. Italy is currently preparing the National Adaptation Strategy and plans to finalize it in 2014. Italy fully participates in the GCOS element of the World Climate Programme and provides research and observation-related capacity-building support to developing countries.

139. Developed National Research Programme is harmonised with relevant EU policy and describes national policy on research and systematic observation. With regard to systematic observation Italy fully participates in the GCOS element of the World Climate Programme. Also Italy provides the capacity-building support to developing countries on research and observation. The support is substantiated by bilateral and multilateral agreements and specific memorandums of understandings between Italy and support receiving Parties.

140. ISPRA as well as regional and provincial administrations play an important role in the promotion and implementation of educational programmes, projects and initiatives on various environmental issues, including climate change. The Sino-Italian Climate Change

Cooperation Program, the Stations at High Altitude for Research on the Environment project, the Euro-Mediterranean Partnership Programme for the Prevention, Preparedness and Response to Natural and Man-made Disasters, the European Volunteers for Response of Emergencies in the Caribbean project, and the popularity index of main public awareness websites are among the newest successful initiatives undertaken by Italy in education, training and public awareness.

141. 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 is provided by Italy in its 2013 annual submission. During the review, Italy presented more complete and transparent information on how it gives priority to the implementation of commitments under Article 3, paragraph 14, of the Kyoto Protocol.

142. In the course of the review, the ERT formulated several recommendations relating to the completeness and transparency of Italy's reporting under the Convention and its Kyoto Protocol. The key recommendations[13] are that Italy:

(a) Improve completeness of reporting by including in the next NC information on:

(i) The arrangements and procedures that seek to ensure that activities under Article 3, paragraphs 3 and 4 contribute to the conservation of biodiversity and sustainable use of natural resources;

(ii) Projections for the LULUCF sector;

(iii) The total effect of PaMs disaggregated by gas;

(iv) How Italy has determined financial resources as being 'new and additional';

(v) Support provided for the development and enhancement of endogenous capacities and technologies in developing countries;

(vi) Activities for financing access by developing countries to 'hard' or 'soft' environmentally sound technologies;

(b) Improve the transparency of reporting by including in the next NC the following information:

(i) How the individual or groups of PaMs modify longer-term trends in GHG emissions;

(ii) Why there are no PaMs reported in LULUCF sector;

(iii) Distinguishing technology transfer activities undertaken by the public sector and those undertaken by the private sector.

# V. Questions of implementation

143. During the review, the ERT assessed the NC6, including supplementary information provided under Article 7, paragraph 2, of the Kyoto Protocol and reviewed 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 reporting guidelines on NCs. No question of implementation was raised by the ERT during the review.

[13] The recommendations are given in full in the relevant sections of this report.

# Annex

## Documents and information used during the review

### A. Reference documents

"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 national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories". 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". Decision 15/CMP.1. Available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a02.pdf#page=54>.

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

"Guidelines for the 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 23/CP.19. Available at <http://unfccc.int/resource/docs/2013/cop19/eng/10a02.pdf#page=20>.

FCCC/SBI/2011/INF.1. Compilation and synthesis of fifth national communications. Executive summary. Note by the secretariat. Available at <http://unfccc.int/resource/docs/2011/sbi/eng/inf01.pdf>.

FCCC/SBI/2011/INF.1/Add.1. Compilation and synthesis of fifth national communications. Note by the secretariat. Addendum. Policies, measures, and past and projected future greenhouse gas emission trends of Parties included in Annex I to the Convention. Available at <http://unfccc.int/resource/docs/2011/sbi/eng/inf01a01.pdf>.

FCCC/SBI/2011/INF.1/Add.2. Compilation and synthesis of fifth national communications. Note by the secretariat. Addendum. Financial resources, technology transfer, vulnerability, adaptation and other issues relating to the implementation of the Convention by Parties included in Annex I to the Convention. Available at <http://unfccc.int/resource/docs/2011/sbi/eng/inf01a02.pdf>.

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FCCC/ARR/2013/ITA. Report of the individual review of the annual submission of Italy submitted in 2013. Available at <http://unfccc.int/resource/docs/2014/arr/ita.pdf>.

FCCC/IRR/2007/ITA. Report of the review of the initial report of Italy. Available at <http://unfccc.int/resource/docs/2007/irr/ita.pdf>.

FCCC/IDR.5/ITA. Report of the in-depth review of the fifth national communication of Italy. Available at <http://unfccc.int/resource/docs/2011/idr/ita05.pdf>.

Sixth national communication of Italy. Available at <http://unfccc.int/files/national_reports/annex_i_natcom_/application/pdf/ita_nc6.pdf>.

2013 GHG inventory submission of Italy. Available at <http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/7383.php>.

2014 GHG inventory submission of Italy. Available at <http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/8108.php>.

## B. Additional information provided by Italy

Responses to questions during the review were received from Mr. Roberto Binatti (Ministry for the Environment, Land and Sea) as well as Mr. Riccardo Delauretis (Institute for Environmental Protection and Research) including additional material on updated policies and measures, greenhouse gas projections, provision of support and the recent climate policy developments in Italy. The following documents[1] were also provided by Italy:

Repubblica Italiana. 2013. *Comitato Interministeriale per la Programmazione Economicae.* Gazzetta Ufficiale della Repubblica Italiana, 19 June 2013. Rome: Repubblica Italiana. Available at <http://www.serviziparlamentari.com/index.php?option=com_mtree&task=att_download&link_id=928&cf_id=54>.

Ministry of Economy. 2014. *Documento di Economia e Finanza* (Economic and Financial Document. Available at <http://www.tesoro.it/doc-finanza-pubblica/def/2014>.

[1] Reproduced as received from the Party.