



**Report of the technical review of the sixth national communication  
of the European Union**

**Note by the secretariat**

The report of the technical review of the national communication of the European Union was published on 28 August 2014. For purposes of rule 10, paragraph 2, of the rules of procedure of the Compliance Committee (annex to decision 4/CMP.2, as amended by decisions 4/CMP.4 and 8/CMP.9), the report is considered received by the secretariat on the same date. This report, FCCC/IDR.6/EU, contained in the annex to this note, is being forwarded to the Compliance Committee in accordance with section VI, paragraph 3, of the annex to decision 27/CMP.1.



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## Report of the technical review of the sixth national communication of the European Union

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 the European Union 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”.

## Contents

|   | <i>Paragraphs</i> | <i>Page</i> |
|---|-------------------|-------------|
| I. Introduction and summary .....   | 1–10              | 3           |
| A. Introduction .....   | 1–5               | 3           |
| B. Summary .....  | 6–10              | 4           |
| II. Technical review of the reported information in the national communication and supplementary information under the Kyoto Protocol.....  | 11–124            | 7           |
| A. Information on greenhouse gas emissions and national circumstances relevant to greenhouse gas emissions and removals, including other elements related to the Kyoto Protocol.....            | 11–35             | 7           |
| B. Policies and measures, including those in accordance with Article 2 of the Kyoto Protocol.....   | 36–72             | 13          |
| C. Projections and the total effect of policies and measures, including information on complementarity relating to the mechanisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol ..... | 73–95             | 22          |
| D. Provision of financial resources and technology transfer to developing country Parties, including information under Articles 10 and 11 of the Kyoto Protocol.....                            | 96–111            | 29          |
| E. Vulnerability assessment, climate change impacts and adaptation measures .   | 112–116           | 32          |
| F. Research and systematic observation.....   | 117–121           | 34          |
| G. Education, training and public awareness.....  | 122–124           | 35          |
| III. Summary of reviewed supplementary information under the Kyoto Protocol .....   | 125–128           | 35          |
| A. Overview of supplementary information under Article 7, paragraph 2, of the Kyoto Protocol.....   | 125–126           | 35          |
| B. Minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol.....   | 127–128           | 36          |
| IV. Conclusions and recommendations .....   | 129–140           | 36          |
| V. Questions of implementation .....  | 141               | 40          |
| Annex   |                   |             |
| Documents and information used during the review.....   |                   | 41          |

## I. Introduction and summary

### A. Introduction

1. For the European Union (EU), the Convention entered into force on 21 March 1994 and the Kyoto Protocol on 16 February 2005. Under the Convention, the EU made a commitment to reducing its greenhouse gas (GHG) emissions by 20 per cent by 2020 below the 1990 level, with an offer to move to a 30 per cent reduction conditional on other developed countries committing to a comparable target and developing countries contributing adequately under a new global climate change agreement. Under the Kyoto Protocol, the EU-15<sup>1</sup> committed itself to reducing its GHG emissions by 8 per cent compared with the base year<sup>2</sup> level during the first commitment period, from 2008 to 2012<sup>3</sup>. For the second commitment period of the Kyoto Protocol, from 2013 to 2020, the EU-28<sup>4</sup> committed itself to reducing 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 the EU, 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 24 to 29 March 2014 in Brussels, Belgium, and was conducted by the following team of nominated experts from the UNFCCC roster of experts: Mr. Takeshi Enoki (Japan), Mr. Mikhail Gitarskiy (Russian Federation), Ms. Alexa Nicole Kleysteuber (Chile), Mr. Elan Strait (United States of America) and Mr. Hongwei Yang (China). Mr. Yang and Mr. Enoki were the lead reviewers. The review was coordinated by Mr. Daniel Hooper and 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 the EU 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 the EU in its 2013 annual submission and previous submissions and elaborated further in its 2014 annual submission under Article 7, paragraph 1, of the Kyoto Protocol.

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<sup>1</sup> The 15 member States that formed the European Community (EU-15) at the time of ratification of the Kyoto Protocol are as follows: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden and United Kingdom of Great Britain and Northern Ireland.

<sup>2</sup> “Base year” refers to the base year under the Kyoto Protocol, which is 1990 for carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O) for all EU-15 members, and 1995 for perfluorocarbons (PFCs), hydrofluorocarbons (HFCs) and sulphur hexafluoride (SF<sub>6</sub>) for 12 member States and 1990 for Austria, France and Italy. The base year emissions include emissions from sectors/source categories listed in Annex A to the Kyoto Protocol.

<sup>3</sup> The European Community and its 15 member States (EU-15) agreed to fulfil their commitments under Article 3, paragraph 1, of the Kyoto Protocol, jointly and in accordance with Article 4 of the Kyoto Protocol (see FCCC/CP/2002/2). While the European Community is the signatory of the Convention, the EU is the legal entity representing the constituent member States, in accordance with the Lisbon Treaty of 2009.

<sup>4</sup> The 28 member States of the EU-28 include the EU-15 and the following countries: Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia and Slovenia.

5. In accordance with decisions 23/CP.19 and 22/CMP.1, a draft version of this report was communicated to the EU, which provided comments that were considered and incorporated with revisions, 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 the EU in accordance with the “Guidelines for the preparation of national communications by 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, some supplementary information required under Article 7, paragraph 2, of the Kyoto Protocol<sup>5</sup> is not provided in the NC6 (see para. 126 below). The supplementary information on the minimization of adverse impacts referred to in paragraph 4 above is complete and transparent.

7. The EU considered most recommendations provided in the report of the in-depth review (IDR) of the fifth national communication (NC5) of the EU.<sup>6</sup> The ERT commended the EU for its improved reporting. During the review, the EU provided further relevant information on:

(a) The missing supplementary information required under Article 7, paragraph 2, of the Kyoto Protocol (see para. 6 above);

(b) The administrative structure and policymaking process of the EU, including the European Commission (EC), European Council and European Parliament;

(c) The quantified economy-wide emission reduction target, including the effort-sharing decision (ESD) for member States;

(d) The role of the new Monitoring Mechanism Regulation (MMR) in evaluating policies and measures (PaMs) and tracking member States’ progress in meeting their emission reduction targets;

(e) The cumulative and individual effects of PaMs;

(f) How funds were determined as “new and additional”;

(g) Methods for tracking climate finance;

(h) Financial support for assisting Parties not included in Annex I to the Convention (non-Annex I Parties) in adapting to the economic and social consequences of response measures;

(i) Technology transfer, including distinguishing between ‘hard’ and ‘soft’ technologies.

### **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 13 January 2014, after the deadline of 1 January 2014 mandated by decision 9/CP.16. During the review, the EU explained that relevant national communication (NC) documents need to be adopted as an EC decision and translated into

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<sup>5</sup> Decision 15/CMP.1, annex, chapter II.

<sup>6</sup> FCCC/IDR.5/EU.

all EU languages before submission to the secretariat. These procedural steps led to a delay in the submission beyond the deadline of 1 January 2014. The ERT noted the delay in the submission of the NC6.

**3. Adherence to the reporting guidelines**

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

9

Table 1  
**Assessment of completeness and transparency issues of reported information in the sixth national communication of the European Union<sup>a</sup>**

| <i>Sections of national communication</i>                                | <i>Completeness</i> | <i>Transparency</i> | <i>Reference to paragraphs</i> | <i>Supplementary information under the Kyoto Protocol</i>                    | <i>Completeness</i> | <i>Transparency</i> | <i>Reference to paragraphs</i> |
|--|---------------------|---------------------|--------------------------------|--|---------------------|---------------------|--------------------------------|
| Executive summary  | Complete            | Transparent         |                                | National systems   | Mostly complete     | Transparent         | 24                             |
| National circumstances   | Complete            | Transparent         |                                | National registries  | Partially complete  | Transparent         | 28                             |
| Greenhouse gas inventory   | Complete            | Transparent         |                                | Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17 | Complete            | Transparent         |                                |
| Policies and measures (PaMs)   | Complete            | Mostly transparent  | 40                             | PaMs in accordance with Article 2  | Complete            | Transparent         |                                |
| Projections and total effect of PaMs                                     | Mostly complete     | Mostly transparent  | 83, 91                         | Domestic and regional programmes and/or arrangements and procedures          | Mostly complete     | Transparent         | 30                             |
| 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  | 98, 99, 107, 108, 109, 110     | Financial resources  | Complete            | Transparent         |                                |
| 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         |                                |  |                     |                     |                                |

<sup>a</sup> A list of recommendations pertaining to the completeness and transparency issues identified in this table is included in the chapter on conclusions and recommendations.

## 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, the EU 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.

12. During the review, the EU provided additional information on its national circumstances, elaborating on the administrative structure and policymaking process of the EU. This included the institutional system of the EU and the interactions between the EC, the European Council and the European Parliament during the policymaking process. The EU also presented information from a decomposition analysis that estimated the impacts that various factors – including carbon intensity, energy efficiency and population – have on GHG emission trends. The analysis from 1990 to 2012 showed that there is a significant correlation between the increase in gross domestic product (GDP) per capita and an increase of carbon dioxide (CO<sub>2</sub>) emissions in the energy sector, while the decrease of energy intensity (final energy use per unit of GDP) and the use of more non-carbon fuels are correlated with a decrease in CO<sub>2</sub> emissions. To improve the transparency of its national circumstances, the ERT encourages the EU to include this information in its next NC.

13. The ERT noted that during the period 1990–2011, the population and GDP for the EU-28 increased by 6.3 per cent and 46.9 per cent, respectively, while GHG emissions per GDP and GHG emissions per capita decreased by 44.8 per cent and 23.2 per cent, respectively. Table 2 illustrates the national circumstances of the EU-28 by providing some indicators relevant to GHG emissions and removals.

Table 2

**Indicators relevant to greenhouse gas emissions and removals for the EU-28**

|   | 1990         | 2000         | 2005         | 2010         | 2011         | Change<br>1990–2011<br>(%) | Change<br>2010–2011<br>(%) |
|---|--------------|--------------|--------------|--------------|--------------|----------------------------|----------------------------|
| Population (million)                                    | 477.61       | 487.44       | 496.55       | 506.53       | 507.78       | 6.3                        | 0.2                        |
| GDP (2005 USD billion<br>using PPP)                     | 9 730.19     | 12 015.33    | 13 293.16    | 13 987.07    | 14 208.15    | 46.0                       | 1.6                        |
| TPES (Mtoe)   | 1 644.75     | 1 692.72     | 1 785.88     | 1 724.29     | 1 662.45     | 1.1                        | –3.6                       |
| GHG emissions without<br>LULUCF (kt CO <sub>2</sub> eq) | 5 606 117.83 | 5 092 807.13 | 5 159 659.74 | 4 733 944.07 | 4 578 596.79 | –18.3                      | –3.3                       |
| GHG emissions with<br>LULUCF (kt CO <sub>2</sub> eq)    | 5 344 822.66 | 4 804 835.19 | 4 878 041.92 | 4 438 148.52 | 4 281 481.49 | –19.9                      | –3.5                       |
| GDP per capita (2005 USD<br>thousand using PPP)         | 20.37        | 24.65        | 26.77        | 27.61        | 27.98        | 37.4                       | 1.3                        |
| TPES per capita (toe)                                   | 3.44         | 3.47         | 3.60         | 3.40         | 3.27         | –4.9                       | –3.8                       |



|   | 1990  | 2000  | 2005  | 2010 | 2011 | Change<br>1990–2011<br>(%) | Change<br>2010–2011<br>(%) |
|---|-------|-------|-------|------|------|----------------------------|----------------------------|
| GHG emissions per capita<br>(t CO <sub>2</sub> eq)                              | 11.74 | 10.45 | 10.39 | 9.35 | 9.02 | –23.2                      | –3.5                       |
| GHG emissions per GDP<br>unit (kg CO <sub>2</sub> eq per 2005<br>USD using PPP) | 0.58  | 0.42  | 0.39  | 0.34 | 0.32 | –44.8                      | –5.9                       |

*Sources:* (1) GHG emissions data: the European Union’s 2013 GHG inventory (re)submissions for the EU-15, the EU-12 (EU-27 minus the EU-15) and Croatia; (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:* EU = European Union, GDP = gross domestic product, GHG = greenhouse gas, LULUCF = land use, land-use change and forestry, PPP = purchasing power parity, TPES = total primary energy supply.

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

14. The EU has provided a summary of information on GHG emission trends for the period 1990–2011. Summary tables, including trend tables for emissions in CO<sub>2</sub> eq (given in the common tabular format (CTF)), are provided as an annex to the NC6 in the first biennial report (BR1). The GHG data presented in the NC6/BR1 for the EU-15 are consistent with the 2013 national GHG inventory resubmission on 18 November 2013. The GHG data presented for the EU-28 are the aggregate of data from the EU-15 (resubmission on 18 November 2013), the EU-12<sup>7</sup> (which is part of the EU-27<sup>8</sup> 2013 national GHG inventory resubmission on 27 May 2013) and Croatia (2013 national GHG inventory resubmission on 4 November 2013). The inclusion of Croatia in the GHG data for the EU-28 reflects the enlargement of the EU from 27 member States to 28 member States as of 1 July 2013. As the 2013 EU national GHG inventory was submitted prior to this enlargement, it covers the EU-27 only. However, at the date of submission of the NC6, the EU comprised 28 member States; the EU GHG inventory submission in 2014 includes data for the EU-28.

15. For the EU-15, total GHG emissions<sup>9</sup> excluding emissions and removals from land use, land-use change and forestry (LULUCF) decreased by 14.7 per cent between 1990 and 2011, whereas total GHG emissions including net emissions or removals from LULUCF decreased by 16.1 per cent over the same period. This decrease in total GHG emissions was mainly attributed to CO<sub>2</sub> emissions (constituting 82.7 per cent of total GHG emissions in 2011), which decreased by 10.8 per cent over this period. Over the same period, emissions of methane (CH<sub>4</sub>) decreased by 34.0 per cent, while emissions of nitrous oxide (N<sub>2</sub>O) decreased by 34.1 per cent. The decrease of CO<sub>2</sub> emissions in the EU-15 from 1990 to 2011 was mainly owing to fossil fuel switching and better energy efficiency in the manufacturing industries and construction sector, as well as the public electricity and heat production sector. The decrease in CH<sub>4</sub> emissions was driven by reductions in managed waste disposal on land mainly caused by the increased use of recycling and incineration of waste with energy recovery and reductions in coal mining. Reductions in N<sub>2</sub>O emissions were driven by emission reduction measures in adipic acid production and nitric acid production.

<sup>7</sup> The EU-12 includes Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia and Slovenia.

<sup>8</sup> The EU-27 is the member States included in the EU-28 minus Croatia, which joined in July 2013.

<sup>9</sup> In this report, the term “total GHG emissions” refers to the aggregated national GHG emissions expressed in terms of CO<sub>2</sub> eq excluding LULUCF, unless otherwise specified.

16. For the EU-28, total GHG emissions excluding emissions and removals from LULUCF decreased by 18.3 per cent between 1990 and 2011, whereas total GHG emissions including net emissions or removals from LULUCF decreased by 19.9 per cent over the same period. Similar to the EU-15, this decrease in total GHG emissions was mainly attributed to CO<sub>2</sub> emissions (constituting 82.2 per cent of total GHG emissions in 2011), which decreased by 15.0 per cent over this period. Over the same period, emissions of CH<sub>4</sub> decreased by 35.0 per cent, while emissions of N<sub>2</sub>O decreased by 35.7 per cent. The decrease of CO<sub>2</sub> emissions in the EU-28 from 1990 to 2011 was also driven by fossil fuel switching and better energy efficiency in the manufacturing industries and construction sector, as well as the public electricity and heat production sector. The decrease in CH<sub>4</sub> emissions was driven by reductions in managed waste disposal on land mainly caused by the increased use of recycling and incineration of waste with energy recovery, reductions in coal mining, and a decrease in cattle production. Reductions in N<sub>2</sub>O emissions were driven by emission reduction measures in adipic acid production and nitric acid production, as well as decreased use of fertilizer and manure on agricultural soils (direct and indirect soil emissions).

17. The total emissions of fluorinated gases (F-gases), which include perfluorocarbons (PFCs), hydrofluorocarbons (HFCs) and sulphur hexafluoride (SF<sub>6</sub>), increased by 42.9 per cent in the EU-15 and 52.6 per cent in the EU-28 from 1990 to 2011. This increase in emissions was driven solely by HFCs, as they were the only group of F-gases for which emissions increased between 1990 and 2011. Specifically, this increase in emissions from HFCs was due to the consumption of halocarbons resulting from the phase-out of ozone-depleting substances such as chlorofluorocarbons under the Montreal Protocol, and the replacement of these substances with HFCs (mainly in refrigeration, air conditioning, foam production and as aerosol propellants). Conversely, HFC emissions from the production of halocarbons decreased substantially. The decrease started in 1998 and was most prominent in 1999 and 2000 as a result of reducing HFC-23 by-production by destroying this substance as part of the process.

18. Since the fourth national communication in 2007, emissions have decreased in the EU-28 with a sharp decrease in 2009 when the economic downturn caused substantial emission reductions in all member States. In 2010, emissions increased again, partly due to the economic recovery from the 2009 recession in many EU member States. In particular, emissions from iron and steel production and other manufacturing industries increased significantly in 2010.

19. Between 2010 and 2011, total GHG emissions in the EU-15 and the EU-28 decreased by 4.2 per cent and 3.3 per cent, respectively. These decreases were driven partially by:

(a) A warmer winter than the previous year, leading to decreased demand for heating and lower emissions from the residential and commercial sectors;

(b) Decreasing emissions from electricity and heat production, in particular in the United Kingdom of Great Britain and Northern Ireland and in France, where demand for electricity was accompanied by greater use of nuclear power and decreased use of gas (United Kingdom) and coal (France) for electricity generation;

(c) Decreasing emissions from road transportation following a decreasing trend for the fourth consecutive year, which was driven by reductions in both passenger and freight transportation;

(d) Reducing emissions in the category 'manufacturing industries excluding iron and steel industry' due to a decline in industrial production (Greece and Spain), a decline in cement production (Greece, Italy, Portugal and Spain) and a fuel shift from oil to natural gas in the United Kingdom's manufacturing industry;

(e) A slight decrease in emissions from iron and steel production following a substantial increase in emissions in 2010, which was caused by a significant increase in crude steel production due to the recovery from the economic crisis;

(f) A substantial decrease in emissions from nitric acid production mainly driven by decreases in Belgium, France and the United Kingdom.

20. 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 1990 to 2011 for the EU-28.

21. During the review, the EU provided information on GHG emission trends based on the 2014 draft GHG inventory submissions of the member States under the MMR for the years 1990–2012. This information included a discussion on the relative decoupling of GDP and GHG emissions within the EU, which highlighted that the EU has reduced GHG emissions by approximately 19 per cent since 1990 while GDP has increased by approximately 45 per cent.<sup>10</sup>

Table 3  
Greenhouse gas emissions by sector in the EU-28, 1990–2011

| Sector  | GHG emissions (kt CO <sub>2</sub> eq) |                     |                     |                     | Change (%)   |             | Share <sup>a</sup> by sector (%) |              |
|---|---------------------------------------|---------------------|---------------------|---------------------|--------------|-------------|----------------------------------|--------------|
|   | 1990                                  | 2000                | 2010                | 2011                | 1990–2011    | 2010–2011   | 1990                             | 2011         |
| 1. Energy                                     | 4 319 604.66                          | 4 000 241.99        | 3 784 410.73        | 3 634 726.58        | –15.9        | –4.0        | 77.1                             | 79.4         |
| A1. Energy industries                         | 1 675 312.30                          | 1 507 831.45        | 1 434 346.08        | 1 412 362.81        | –15.7        | –1.5        | 29.9                             | 30.8         |
| A2. Manufacturing industries and construction | 859 818.46                            | 710 068.96          | 578 908.70          | 567 158.05          | –34.0        | –2.0        | 15.3                             | 12.4         |
| A3. Transport                                 | 778 344.39                            | 914 697.99          | 935 862.14          | 926 442.00          | 19.0         | –1.0        | 13.9                             | 20.2         |
| A4.–A5. Other                                 | 850 404.21                            | 755 934.64          | 754 576.87          | 648 412.25          | –23.8        | –14.1       | 15.2                             | 14.2         |
| B. Fugitive emissions                         | 155 725.30                            | 111 708.94          | 80 716.93           | 80 351.47           | –48.4        | –0.5        | 2.8                              | 1.8          |
| 2. Industrial processes                       | 461 477.34                            | 393 099.41          | 337 859.87          | 334 684.91          | –27.5        | –0.9        | 8.2                              | 7.3          |
| 3. Solvent and other product use              | 16 855.39                             | 13 442.00           | 10 414.76           | 10 214.56           | –39.4        | –1.9        | 0.3                              | 0.2          |
| 4. Agriculture                                | 604 007.70                            | 508 448.25          | 463 189.33          | 464 418.21          | –23.1        | 0.3         | 10.8                             | 10.1         |
| 5. LULUCF                                     | –261 295.16                           | –287 971.94         | –295 795.55         | –297 115.30         | 13.7         | 0.4         | –                                | –            |
| 6. Waste                                      | 204 172.74                            | 177 575.48          | 138 069.38          | 134 552.52          | –34.1        | –2.5        | 3.6                              | 2.9          |
| 7. Other                                      | NA, NO                                | NA, NO              | NA, NO              | NA, NO              | –            | –           | –                                | –            |
| <b>GHG total with LULUCF</b>                  | <b>5 344 822.66</b>                   | <b>4 804 835.19</b> | <b>4 438 148.52</b> | <b>4 281 481.49</b> | <b>–19.9</b> | <b>–3.5</b> | <b>–</b>                         | <b>–</b>     |
| <b>GHG total without LULUCF</b>               | <b>5 606 117.83</b>                   | <b>5 092 807.13</b> | <b>4 733 944.07</b> | <b>4 578 596.79</b> | <b>–18.3</b> | <b>–3.3</b> | <b>100.0</b>                     | <b>100.0</b> |

Source: GHG emissions data: the European Union’s 2013 GHG inventory (re)submissions for the EU-15, the EU-12 (the EU-27 minus the EU-15) and Croatia.

Note: 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.

<sup>10</sup> European Environment Agency (EEA) Ameco database.

*Abbreviations:* EU = European Union, GHG = greenhouse gas, LULUCF = land use, land-use change and forestry, NA = not applicable, NO = not occurring.

<sup>a</sup> 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

22. The EU provides 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 most of the elements mandated by decision 15/CMP.1. The NC6 also contains a reference to the description of the national system provided in the EC staff working document “Elements of the Union greenhouse gas inventory system and the Quality Assurance and Control (QA/QC) programme”. The ERT took note of the review of the changes to the national system as reflected in the report on the individual review of the GHG inventory of the EU submitted in 2013.

23. The ERT noted that neither the NC6 nor the EC staff working document (see para. 22 above) includes the information required by the UNFCCC reporting guidelines on NCs on the designated representative with overall responsibility for the national inventory of the EU and the results of the key category analysis. Upon request from the ERT, this information was provided by the EU during the review. The EU also provided additional information on its MMR, which entered into force in July 2013. The MMR repeals the Monitoring Mechanism Decision (280/2004/EC) and aims to enhance the monitoring and reporting of GHG emissions to meet the requirements arising from the Convention and its Kyoto Protocol.

24. The ERT recommends the EU to either include the required information on its national system directly or reference relevant documents that contain the information (such as the national GHG inventory or the initial report under Article 7, paragraph 4, of the Kyoto Protocol) in its next NC.

### 4. National registry

25. In its NC6, the EU has provided some of the required 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 on the individual review of the GHG inventory of the EU submitted in 2013.

26. The EU described the changes, which specifically result from the centralization of the European Union Emissions Trading System (EU ETS) operations into a single EU registry operated by the EC, called the Consolidated System of European Union registries (CSEUR). The CSEUR implements the national registries in a consolidated manner and was developed together with the new EU registry.

27. The NC6 does not include information required by the UNFCCC reporting guidelines on NCs regarding the name and contact information of the registry administrator designated by the EU to maintain the national registry; a description of the procedures employed in the national registry to minimize discrepancies in the issuance, transfer, acquisition, cancellation and retirement of emission reduction units (ERUs), certified emission reductions (CERs), temporary certified emission reductions (tCERs), long-term certified emission reductions (lCERs), assigned amount units (AAUs) and/or removal units (RMUs), and the replacement of tCERs and lCERs, and of the steps taken to terminate the transaction where a discrepancy is notified and to correct problems in the event of a failure to terminate the transaction; an overview of security measures employed in the national

registry to prevent error and of how these measures are kept up to date; and a list of the information publicly accessible by means of the user interface to the national registry, and the Internet address of the interface to its national registry. Upon request from the ERT, this information was provided by the EU during the review.

28. The ERT recommends the EU to either include the required information on its national registry directly, or reference relevant documents that contain the information (such as the national GHG inventory or the initial report under Article 7, paragraph 4, of the Kyoto Protocol) in its next NC.

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

29. The EU has reported in its NC6 well-organized information on domestic and regional programmes, legislative arrangements and procedures related to the Kyoto Protocol.

30. The EU did not provide a description of the national legislative arrangements and administrative procedures that seek to ensure that the implementation of activities under Article 3, paragraph 3, and elected activities under Article 3, paragraph 4, of the Kyoto Protocol also contribute to the conservation of biodiversity and the sustainable use of natural resources. During the review, the EU explained that it does not have specific arrangements or procedures in place to address these issues, as that they are implemented and reported by individual member States. The ERT recommends the EU to include in its next NC an explanation of the national circumstances of the EU in regard to the implementation of activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol that contribute to the conservation of biodiversity and the sustainable use of natural resources.

31. In addition, the legal nature/legal force of some EU policy instruments, such as strategies, targets, road maps, directives, green papers and white papers, were not fully described in the NC6. The ERT encourages the EU to include an explanation of the legal nature/legal force of its policy instruments to increase transparency in its next NC.

32. The overall responsibility for climate change policymaking in the EU lies with the EC, the European Council and the European Parliament as set out by the EU Treaties.<sup>11</sup> Adoption of legislation in the EU follows the co-decision procedure (ordinary legislative procedure) whereby both the European Council and the European Parliament collectively amend, adopt or reject legislation proposed by the EC. In this process the Parliament and the Council are given equal weighting. The EC is the EU's executive body and is therefore responsible for implementing European legislation, budget and programmes. EU-level institutions involved in policy development include the Court of Justice, the Court of Auditors and the European Central Bank.

33. Implementation of the Kyoto Protocol at the EU level is underpinned by the burden-sharing agreement between the EU member States, which take responsibility for their commitments at the national level. Progress in implementation is assessed during the European Semester, which is an annual policy coordination exercise, and the outcomes of this process include recommendations for the enhancement of the efforts of member States to reach their targets.

34. The EC is responsible for the coordination and monitoring of the member States' efforts and ensuring their compliance. The Directorates-General (DGs) of the EC lead the implementation of policies and coordinate between other departments responsible for the implementation of PaMs in specific sectors. In addition, the DGs monitor implementation

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<sup>11</sup> Treaties are international agreements serving as the founding core legal acts establishing the European Union and regulating its relations with its member States.

of the legislation, and proceed with EU-level enforcement and infringement procedures, if needed.

35. The progress towards achieving the Kyoto Protocol targets at the EU and the member State levels and other relevant information are made publically available by the EC on its website<sup>12</sup> and through the publication of regular assessment and technical reports. Copies of these reports were provided to the ERT during the review.

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

36. The EU has provided in its NC6 comprehensive and 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. The NC6 includes a description of the overall policy context, including national targets for GHG mitigation. Strategies for sustainable development and other relevant policy objectives are also included, along with a description of the policymaking and decision-making processes at the EU level.

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

37. In its NC6, the EU reported on its adopted, implemented and planned PaMs relating to achieving its commitments under the Convention. The EU provided information on PaMs by sector and by gas, as well as a description of the principal PaMs. The EU has also provided information on how it believes its PaMs are modifying longer-term trends in anthropogenic GHG emissions and removals in accordance with the objective of the Convention. This information is addressed in chapter II.C below. The NC6 contains, with a few exceptions, a set of PaMs similar to those in the NC5, as the majority of PaMs are ongoing or have been updated to reflect consistency in the EU's climate policy. Cross-references between the ongoing PaMs and previous PaMs have been made, increasing the transparency of the NC6.

38. Most of the recommendations from the previous review were taken into consideration in order to improve reporting in the NC6. In particular, the improvements in the NC6 include the provision of quantitative estimates of the effects of some individual PaMs on GHG emissions for specific years; enhanced reporting on additional information under Article 2 of the Kyoto Protocol; and information on how PaMs modify long-term trends, particularly in the agriculture sector. The ERT commends the EU for the improvements made since the NC5.

39. The NC6 does not include some information required by the UNFCCC reporting guidelines on NCs. In particular, the summary table with the description of principal PaMs was not provided. In the NC6, the EU referenced CTF table 3 of the biennial report (BR) in lieu of providing the summary table. However, the overall strategic PaMs described in the NC6 were not included in CTF table 3. The ERT further noted that some communications, assessment reports and other supporting documents that were reported as PaMs in the NC6 do not precisely meet the classification of a policy or a measure.

40. The ERT recommends that the EU include a summary table on the principal PaMs in its next NC including: a short description of the PaM, its objectives, the GHG(s) affected, the type of PaM, the status of implementation and the implementing entity or entities. The ERT encourages the EU to report in the same table the estimated mitigation impact of

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<sup>12</sup> <<http://ec.europa.eu>>.

individual PaMs, by gas, for a particular year. Furthermore, the ERT encourages the EU to undertake consistency checks of PaMs reported in the NCs and the BRs.

41. The ERT noted that the NC6 does not include reporting on policies and practices that may lead to greater levels of anthropogenic GHG emissions than would otherwise occur. During the review, the EU confirmed that such PaMs were not identified during the preparation of the NC6. The ERT encourages the EU to periodically update such information and include it in its next NC.

42. The NC6 does not provide a transparent description of the way in which progress with PaMs to mitigate GHG emissions is monitored and evaluated over time along with relevant institutional arrangements aimed at monitoring GHG mitigation policy. During the review, the EU provided additional information on the impact assessments that have been performed for various economic sectors and on the MMR, which entered into force in 2013. These institutional arrangements and procedures enable continuous monitoring and assessment of progress in implementation of the mitigation PaMs. Therefore, to increase transparency, the ERT encourages the EU to include a description of the impact assessments and the MMR in relation to the monitoring and evaluation of GHG mitigation policy in its next NC.

43. The NC6 includes information on historical trends and long-term projections of GHG emissions for each sector. However, the ERT noted that the individual and cumulative effects of some PaMs on sectoral activity data and emission trends were not quantified at all, or they were quantified only for certain years. During the review, the EU presented additional information on the quantified cumulative effects of PaMs on sector emission trends. The ERT encourages the EU to provide quantitative estimates of the individual and cumulative effects of PaMs (e.g. at the sectoral level) on sectoral activity data and emission trends for particular years (1995, 2000, 2005, 2010, 2015 and 2020) using the historical and long-term GHG mitigation trends in chapter II.C below.

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

44. Climate policy is integrated in the EU sustainable development agenda and is organized as general development strategies as well as cross-sectoral and sector-specific PaMs. The general strategies establish basic objectives for the socioeconomic development of the EU, which include climate and energy goals: a 20 per cent decrease in GHG emissions compared with 1990, the provision of 20 per cent of the energy supply from renewable sources, and an increase in energy efficiency by 20 per cent by 2020. The achievement of these goals, as set out in the climate and energy package, is underpinned by the strategic PaMs for socioeconomic development, particularly the Europe 2020 Strategy, the European Climate Change Programme II and the European Union Sustainable Development Strategy, and is supported by funding from the LIFE+ and Roadmap 2050 packages.

45. Many of the overarching cross-sectoral PaMs in the EU are outlined in the climate and energy package adopted in 2009, including the revised EU ETS and the ESD; renewable energies and energy efficiency legislation; and legislative proposals on 2020 targets for CO<sub>2</sub> from cars and vans. These cross-sectoral PaMs are supplemented by a number of other cross-sectoral and sector-specific policies and programmes such as the carbon capture and storage (CCS) directive, and the general programmes for environment conservation, namely 7th Environment Action Programme (EAP) and the Clean Air Policy Package (CAPP). The financial support for their implementation is provided under the Structural Funds and the Cohesion Fund.

46. In operation since 2005, the EU ETS is a cap-and-trade system that covers all significant energy-intensive installations, which produce 40–45 per cent of GHG emissions

in the EU. The third phase of the EU ETS started in 2013, and the system now includes aircraft operations (2012) as well as N<sub>2</sub>O emissions from chemical industries, PFC emissions from aluminium production and CO<sub>2</sub> emissions from industrial processes (2013). The ESD became operational in 2013, and covers sectors outside the EU ETS, including transport (excluding domestic and international aviation, and international maritime transport), residential and commercial buildings, agriculture, waste and other sectors, together accounting for 55–60 per cent of GHG emissions in the EU. The ESD is aimed at decreasing GHG emissions in the EU by 10 per cent below 2005 levels by 2020, and includes annual binding targets at the level of each member State for 2013–2020, which are underpinned by the national policies and actions of the member States. The CCS Directive, 7th EAP, CAPP, the Structural Funds and the Cohesion Fund provide additional financial and administrative support for decision-making and implementation of specific activities at the member State level.

47. The ERT noted that the policy context regarding the establishment of the ESD has not been sufficiently described in the NC6. During the review, the EU provided the ERT with additional information, clarifying that the ESD included transport, building and construction, agriculture and waste sectors, which had not been covered by the EU ETS. The ERT encourages the EU to enhance the description of the ESD in its next NC, including an estimation of its effect on GHG emission trends.

48. In its NC6, the EU reported on the proposed long-term targets and trajectories for 2030 and 2050. For 2030, the proposed Commission framework for climate and energy policies (2030 framework)<sup>13</sup> has been presented and is currently under discussion within the EU institutions. The 2030 framework highlights a 40 per cent reduction target for GHG emissions compared with 1990 levels, and a 27 per cent target for renewable energy share of the total energy consumption. A target for energy efficiency will be under EU review in 2014 and an additional target expressed by new key indicators may be added to the new governance system for 2030. For 2050, a cost-efficient pathway towards 2050 was presented, indicating that an 80 per cent EU internal reduction compared with 1990 levels is technically feasible with proven technologies, while the application of a sufficiently strong carbon price incentive across all sectors was highlighted as a precondition.

49. To increase the transparency of its long-term targets, the EU may consider providing more in-depth information on key components such as the means to enhance the carbon price incentive, the technical and economic feasibility for an almost zero emission power sector, and approaches to reverse the trend of rising transport emissions in its next NC.

50. The ERT noted that most of the PaMs described in the NC6 are coordinated at the EU level and are legally binding (i.e. regulations and directives). During the review, the EU explained that its member States may identify and choose the methods of implementation of these PaMs at the domestic level (provincial, regional and local) subject to their national circumstances. The progress of implementation at the member State level is continuously monitored and evaluated during the European Semester and under the MMR. Table 4 provides a summary of the reported information on the PaMs of the EU.

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<sup>13</sup> In March 2013 the European Commission adopted a green paper entitled ‘A 2030 Framework for climate and energy policies’. COM (2013) 169 final.



Table 4  
**Summary of information on policies and measures reported by the European Union**

| <i>Sectors affected</i>                             | <i>List of key policies and measures</i>                        | <i>Estimate of mitigation impact (kt CO<sub>2</sub> eq) 2010/2020</i> |           |
|---|---|---|-----------|
| <b>Policy framework and cross-sectoral measures</b> | LIFE+ package (1992)  | NA  |           |
|   | Structural Funds and Cohesion Fund (1994)                       | NA  |           |
|   | European Climate Change Programme II (2005)                     | NA  |           |
|   | European Union Emissions Trading System (2005)                  | NA  |           |
|   | European Union Sustainable Development Strategy (2006)          | NA  |           |
|   | Carbon Capture and Storage Directive (2009)                     | NP  |           |
|   | Europe 2020 strategy (2011)                                     | NA  |           |
|   | Roadmap 2050 package (2011)                                     | NA  |           |
|   | 7th Environment Action Programme (2013)                         | NA  |           |
|   | Clean Air Policy Package (2013)                                 | NA  |           |
|   | Effort-sharing decision (2013)                                  | NA  |           |
|   | <b>Energy</b>   | Cogeneration Directive (2006)   | 33 000/NP |
|   |   | Climate and energy package (2009)                                     | NA        |
| Intelligent Energy Europe II Programme (2013)       |   | NA  |           |
| Energy supply                                       | Taxation of energy products and electricity (2003)              | NA  |           |
|   | Internal Market in Electricity Directive (2011)                 | NA  |           |
| Renewable energy                                    | Renewable energy roadmap and directive (2009, 2010)             | NA/750 000  |           |
| Energy efficiency                                   | European Motor Challenge Programme (2003)                       | NA  |           |
|   | Energy End-use Efficiency and Energy Services Directive (2008)  | NA  |           |
|   | Eco-design Framework Directive (2009)                           | NP/366 300  |           |
|   | Energy Labelling Directive (2010)                               | NA  |           |
|   | Energy Efficiency Plan and Directive (2011, 2014)               | NA/740 000  |           |
| Residential and commercial sectors                  | Energy Performance on Buildings Directive (2012)                | NA/185 000  |           |
| <b>Transport</b>                                    | Strategy to reduce CO <sub>2</sub> from light vehicles (2007)   | NA  |           |
|   | Euro 5 and 6 standards (2009)                                   | NP/2 000  |           |
|   | Regulation on CO <sub>2</sub> emissions from cars (2009)        | NP/24 900   |           |
|   | Regulation on CO <sub>2</sub> emissions from vans (2011)        | NA/1 900  |           |
|   | Tyre labelling and minimum rolling resistance regulation (2000) | NP/2 750  |           |
|   | Fuel Quality Directive (2010)                                   | NA/55 000   |           |

| <i>Sectors affected</i>          | <i>List of key policies and measures</i>  | <i>Estimate of mitigation impact (kt CO<sub>2</sub> eq) 2010/2020</i> |
|----------------------------------|---|---|
|                                  | Clean Vehicles Directive (2010)   | NA/NP   |
|                                  | European Bio-economy Strategy (2012)  | NA  |
|                                  | Euro VI standard for heavy duty vehicles (2013)   | NA  |
| <b><i>Industrial sectors</i></b> | F-gas Regulation (2006)   | NP/33 000   |
|                                  | Emissions from air conditioning systems in motor vehicles (2006)  | NP/13 000   |
|                                  | Eco-design Framework Directive (2009)   | NA  |
|                                  | Industrial Emission Directive (2011)  | NA  |
| <b><i>Agriculture</i></b>        | Common Agricultural Policy<br>Rural Development Policy,<br>Soil Thematic Strategy<br>Nitrates Directive | NP  |
| <b><i>Forestry</i></b>           | EU Forest Strategy<br>Rural development policy<br>Land use, land-use change and forestry accounting     | NP  |
| <b><i>Waste management</i></b>   | Waste Framework Directive (1975, 2008)  | NP/40 100   |
|                                  | EU policies targeting waste streams (1994–2012)   | NA  |
|                                  | Urban Waste Water Directive (1991)  | NA  |
|                                  | Landfill Directive (1999)   | 48 000/44 000   |
|                                  | Waste Incineration Directive (2000)   | NA  |
|                                  | Management of biodegradable waste   | NP  |

*Note:* The greenhouse gas reduction estimates given for some measures are reductions in carbon dioxide or carbon dioxide equivalent.

*Abbreviations:* NA = not applicable (i.e. Party reported that the direct mitigation impact cannot be estimated), NP = not provided.

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

51. Between 1990 and 2011, GHG emissions from the energy sector decreased by 15.9 per cent (684,878.08 kt CO<sub>2</sub> eq) for the EU-28 and by 11.7 per cent (384,473.49 kt CO<sub>2</sub> eq) for the EU-15, mainly owing to the decline in fuel combustion for energy-related purposes. Along with the decrease in emissions from energy and manufacturing industries and residential and commercial sectors, the fuel combustion trend showed an increase in emissions from transport operations of 19.0 per cent (148,097.61 kt CO<sub>2</sub> eq) for the EU-28 and of 14.2 per cent (99,105.73 kt CO<sub>2</sub> eq) for the EU-15. The EU ETS, which is the key cross-sectoral PaM in the energy sector, is supported by more than 22 sector-specific PaMs as discussed below. However, the ERT noted that the objectives of some of the relevant PaMs are not transparent in the NC6, such as how these PaMs are anticipated to effect energy sector emissions. The ERT encourages the EU to elaborate on the objective of energy sector PaMs, including their key purposes and benefits, as well as descriptions of activities and/or source and sink categories affected in its next NC.

52. **Energy supply.** In 2011, final energy consumption in the EU was approximately 3 per cent higher than in 1990. Oil accounts for the largest share of fossil fuel consumption in the EU (47 per cent), followed by natural gas (31 per cent) and solid fuels (22 per cent). The majority of oil and gas consumed is imported (up to 47 per cent of primary energy supply). In 2011, power was generated by coal, oil, and lignite (together 29 per cent), nuclear processes (28 per cent) and natural gas (23 per cent). The contribution of renewable energy sources has increased more than 80 per cent since 1990, and in 2011, renewable energy sources accounted for approximately 19 per cent of total power generation. Total primary power production increased by 23 per cent between 1990 and 2011 because of increased demand for electricity. Meanwhile, the fuel mix for power generation has become less carbon intensive because of the substitution of coal with natural gas as well as enhanced energy efficiency and renewable energy use. However, the impact on emissions from lower carbon intensity has been somewhat counterbalanced by an overall rise in total electricity production of approximately 23 per cent from 1990 to 2011.

53. The major PaM in the energy supply sector is the EU ETS, which was updated in 2009 to contribute to the EU meeting the 20 per cent GHG emission reduction commitment by 2020. The Internal Market in Electricity directive and the proposed revision of the Energy Taxation Directive aim to be consistent in their treatment of energy products and electricity, ensuring their competitiveness and the enforcement the use of the EU-wide taxation instruments, including the CO<sub>2</sub>-related tax.

54. **Renewable energy sources.** The EU has set a legally binding target to provide 20 per cent of its energy supply from renewable sources by 2020. This target is translated in legally binding national renewable energy targets for member States ranging from 10 to 49 per cent. The targets are implemented through cross-sectoral and sector-specific PaMs, including the Europe 2020 Strategy, the climate and energy package, and the Renewable Energy Directive, which also includes sustainability criteria for biofuels.<sup>14</sup> National renewable energy action plans have been prepared by the 28 member States of the EU, containing measures and sectorial targets for reaching the legally binding national renewable energy targets. Progress in the implementation of the member State targets has been visible and subject to regular assessment. Under the framework of the 2009 Renewable Energy Directive, the EC publishes Renewable Energy Progress Reports.

55. The most recent Renewable Energy Progress Report (2013)<sup>15</sup> from the European Commission states that barriers still exist preventing the planned expansion of renewable sources, namely with regard to administrative simplification and permitting procedures for infrastructure development and operation, but also because of the consequences of the economic crisis. In 2010, the EU-28 had a share of 12.7 per cent of renewable energy but the growth of renewable energy development was slower than expected. The report states that any disruption of investment policies will have a significant impact in the future and that at present more effort and further measures will be necessary on part of the member States to achieve the 20 per cent renewable energy target.

56. During the review, the ERT noted the implementation of the Renewable Energy Directive, the improvement of cost competitiveness of renewable technologies, and the intention of the EU to enhance regulatory and institutional arrangements to ensure the integration of renewable energy policies in the post-2020 climate and energy framework. The ERT noted that the implementation of renewable energy policies will enable the EU to supply up to 245 Mtoe of total energy consumption from renewable sources by 2020,

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<sup>14</sup> Directive 2009/28/EC on the promotion of the use of energy from renewable sources.

<sup>15</sup> Report from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Renewable Energy Progress Report COM (2013) 175 final.

equating to approximately 30 per cent of electricity use and 21.5 per cent of heating and cooling. The ERT encourages the EU to include this information in its next NC, together with ex-post and ex-ante estimations of the overall effect of renewable energy PaMs on the energy sector.

57. **Energy efficiency.** Another strategic target of the EU's climate policy is the 20 per cent increase in energy efficiency by 2020. This target has been included in the Europe 2020 Strategy and reinforced by cross-sectoral and sector-specific PaMs (see table 4 above). The ERT noted that the energy efficiency policies of the EU represent a combination of regulatory (Energy End-use Efficiency and Energy Services Directive, Energy Efficiency Plan and Directive, Eco-design Framework Directive and Energy Labelling Directive) and voluntary (European Motor Challenge Programme) PaMs aimed at promoting new, efficient and high-quality products to the European market in an effort to achieve end-use energy savings. During the review, the EU provided information on 38 adopted energy efficiency measures that are currently being implemented. Furthermore, the ERT was informed that work on another 16 measures was on-going, and another 11 were in the preparatory stage. The ERT encourages the EU to include this information in its next NC, along with the estimated ex-post and ex-ante overall effects of energy efficiency PaMs on the energy sector.

58. **Residential and commercial sectors.** The heating and cooling of buildings accounts for a significant portion of the energy consumption in the EU. In 2011, the residential and commercial sectors accounted for 12.2 per cent of the GHG emissions for the EU-28 and 12.9 per cent for the EU-15. Between 1990 and 2011, the emissions from the heating and cooling of buildings have decreased by 22.8 per cent (164,783.51 kt CO<sub>2</sub> eq) for the EU-28 and by 19.7 per cent (114,898.82 kt CO<sub>2</sub> eq) for the EU-15. The PaMs in residential and commercial sectors aim to enhance energy efficiency of building stock. This is accomplished through the implementation of general and sector-specific energy performance policies such as the ESD, and the introduction of energy-efficient solutions for existing building stock and new house construction through the sector-specific Energy Performance and Buildings Directive.

59. **Transport sector.** The transport sector accounted for 25.5 per cent of GHG emissions from the energy sector for the EU-28 and 27.5 per cent for the EU-15 in 2011. Between 1990 and 2011, the emissions from the transport sector have increased by 19.0 per cent (148,097.61 kt CO<sub>2</sub> eq) for the EU-28 and by 14.2 per cent (99,105.73 kt CO<sub>2</sub> eq) for the EU-15. The choice of PaMs for the transport sector is driven by the notable increase in transport activities. The ESD is an overarching cross-sectoral PaM that includes GHG mitigation for transport (except aviation and international maritime transport). GHG emissions from aviation are included under the EU ETS.

60. In addition to the ESD, sector-specific PaMs include recent regulations which aim at reducing the emissions of the passenger car fleet by 40 per cent and emissions of light commercial vehicles by 28 per cent by 2020, compared with the 2007 fleet emission average. These efforts are supplemented by environmental performance requirements such as tyre pressure monitoring systems and gear shift indicators. Binding targets have been set for emissions from new passenger cars (130 g CO<sub>2</sub>/km by 2015 and 95 g CO<sub>2</sub>/km by 2020). The Fuel Quality Directive also introduced a binding target for fuel suppliers to reduce life cycle GHG emissions per unit of energy by up to 6 per cent by 2020 compared with 2010.

61. The ERT noted that the estimated GHG mitigation effects of cross-sectoral and sector-specific transport PaMs have the potential to partially overlap, such as the ESD with the Regulation on CO<sub>2</sub> emissions from cars, and the Strategy to reduce CO<sub>2</sub> from light vehicles with the renewable energy and clean vehicle directives. Therefore, the ERT encourages the EU to undertake efforts to take into account such a potential overlap when estimating the mitigation effects of cross-sectoral and sector-specific transport PaMs.

#### 4. Policies and measures in other sectors

62. Between 1990 and 2011, GHG emissions from industrial processes (including solvent and other product use), agriculture and waste decreased by 26.7 per cent (342,642.91 kt CO<sub>2</sub> eq) for the EU-28 and by 24.6 per cent (239,373.06 kt CO<sub>2</sub> eq) for the EU-15, mainly owing to increased emission reduction measures in adipic acid production and nitric acid production, the decrease in CH<sub>4</sub> and N<sub>2</sub>O emissions from agricultural activities (reduction in cattle production and decreased use of fertilizer and manure on agricultural soils), and increased use of recycling and incineration of waste with energy recovery. However, there was a notable increase in emissions of F-gases, which mainly consist of the HFCs from the consumption of halocarbons and SF<sub>6</sub> used in refrigeration, air conditioning, foam production and aerosol propellants. In 2011, emissions from F-gases were 52.6 per cent and 43.4 per cent (31,647.43 and 24,300.15 kt CO<sub>2</sub> eq) higher than the 1990 levels for the EU-28 and the EU-15, respectively.

63. **Industrial processes.** Between 1990 and 2011, GHG emissions from the industrial processes sector decreased by 27.5 per cent (126,792.43 kt CO<sub>2</sub> eq) for the EU-28 and by 28.3 per cent (99,967.83 kt CO<sub>2</sub> eq) for the EU-15, mainly owing to emission reduction measures in adipic acid production, nitric acid production and production of halocarbons. The ERT further noted the increase in emissions of HFCs due to the consumption of halocarbons resulting from the phase-out of ozone-depleting substances and related increase in imports and subsequent use of refrigeration, air-conditioning and electrical equipment.

64. The GHG mitigation policies in the industrial processes sector are underpinned by the cross-sectoral EU ETS and ESD, which cover all major installations. The sector-specific PaMs, such as the F-gas Regulation, are aimed at reducing F-gas emissions. Additional efforts have been undertaken to reduce general air pollution with GHG mitigation as a co-benefit (see table 4 above). The ERT noted that in the NC6 sector-specific PaMs for industrial processes are described and the quantitative estimates of their impact on long-term emission trends for particular years are provided. Additional information on the industrial processes sector PaMs was provided during the review. The ERT commends the EU for the complete and transparent reporting on the industrial processes sector PaMs. The ERT encourages the EU to include the additional information regarding industrial processes sector PaMs that was presented during the review in its next NC.

65. **Agriculture.** In the EU-15, the agriculture sector is the second largest emissions source category (10.2 per cent of total GHG emissions). Total GHG emissions from the agriculture sector decreased by 14.8 per cent from 433,868.14 kt CO<sub>2</sub> eq in 1990 to 369,784.65 kt CO<sub>2</sub> eq in 2011. In the EU-28, GHG emissions from the agriculture sector steadily decreased between 1990 and 2011 by 23.1 per cent (604,007.70 kt CO<sub>2</sub> eq in 1990 to 464,418.21 kt CO<sub>2</sub> eq in 2011). These GHG emission decreases in the EU-15 and the EU-28 were owing to a combination of policy interventions that resulted in less intensive use of fertilizer and manure on agricultural soils (direct and indirect soil emissions), as well as decreases in agricultural and cattle production.

66. The Common Agricultural Policy (CAP) initiated in 1962 is one of the main drivers of EU agricultural development. As a result of the CAP reform in 2013, the CAP now includes GHG mitigation as a priority area. In addition to the CAP, the EU implements a number of agricultural policies that promote sustainable land management, such as the EU Timber Regulation, the EU Forest Strategy, the EU Biodiversity Strategy to 2020, the NATURA 2000 directives, the Waste Framework Directive, and the Soil Thematic Strategy and the Nitrates Directive. The ERT notes the EU's statement that policies that contribute to better overall land management tend to have a positive impact on mitigation. While the agricultural policies, except for the Nitrates Directive, are voluntary in nature, they are

supported by robust incentives. In particular, the CAP has a pillar related to income support and financial incentives that encourage farmers to implement better land management activities.

67. The ERT commends the EU for its detailed descriptions of agricultural policies. However, the EU did not provide information on the quantified impacts of the individual PaMs. During the review, the EU provided some information related to the quantified impact of the Nitrates Directive. The ERT encourages the EU to provide quantified impacts of the agriculture sector PaMs, and the EU may consider providing a single aggregate effect of the multiple agriculture sector PaMs.

68. **LULUCF.** For the EU-15, the LULUCF sector was a net removal of 173,992.46 kt CO<sub>2</sub> eq in 2011, marking an increase of emission removals of 27.2 per cent since 1990. For the EU-28, LULUCF was a net removal of 297,115.30 kt CO<sub>2</sub> eq in 2011, marking a 13.7 per cent increase in net emission removal since 1990, showing that carbon sequestration in the LULUCF sector is outpacing carbon release in the EU-28. The ERT recognizes that the EU faces challenges in regulating LULUCF because forestry is not referenced in the Treaty on the Functioning of the European Union. Afforestation and reforestation efforts are overseen by member States; however, there are a number of policies in place at the EU level that enable mitigation in the LULUCF sector. For example, the EU Forest Strategy comprises eight linked priority areas, in one of which the relationship between climate and forests is considered. In addition, the LIFE+ Package, which regards climate change as an important priority, contains robust support for forestry management activities.

69. **Waste management.** Between 1990 and 2011, GHG emissions from the waste sector decreased by 34.1 per cent (69,620.22 kt CO<sub>2</sub> eq) for the EU-28 and by 40.7 per cent (70,078.09 kt CO<sub>2</sub> eq) for the EU-15. The GHG mitigation is mostly a co-benefit of the general waste management PaMs, which aim to enhance solid waste treatment, minimization, and disposal methods. The waste management PaMs are described in the NC6 and additional information was provided to the ERT during the review. However, the ERT noted that only some quantitative estimates of the impacts of individual PaMs on GHG emissions are provided in CTF table 3. The ERT encourages the EU to enhance the estimation of the impacts of individual waste management PaMs on GHG emissions as outlined by the UNFCCC reporting guidelines on NCs.

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

70. The EU reported on its package of PaMs adopted, implemented and elaborated in achieving its commitment under the Kyoto Protocol. Along with the description of specific PaMs aimed at achieving quantified emission limitation and reduction commitments under Article 3 of the Kyoto Protocol, the NC6 also addresses PaMs that promote sustainable development. The NC6 includes a description of the impact assessment performed to analyse the adverse effects on climate change, the effects on international trade, and social, environmental and economic consequences for other Parties.

71. The NC6 includes information on how the EU promotes and implements the International Civil Aviation Organization (ICAO)/International Maritime Organization (IMO) decisions to limit the emissions from aviation and marine bunker fuels. During the review, the EU elaborated on how it has developed an approach to include international aviation in the EU ETS to promote cost-efficient GHG mitigation. Furthermore, the European Regional Airspace Approach has been developed to operationalize ICAO Resolution A38-17/2. The ERT noted that the inclusion of international aviation in the EU ETS has been postponed subject to a global agreement on aviation emissions under the ICAO. Under the IMO, the EU has developed a proposal on monitoring, reporting and verification activities for the GHG emissions from marine transport and posted a

submission on global data collection for maritime transport at the sixty-sixth session of the Marine Environmental Protection Committee of the IMO.

72. In its NC6, the EU 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 the EU 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. The ERT commends the EU for its complete and transparent information on PaMs related to implementation of commitments under the Kyoto Protocol.

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

73. In its NC6, the EU has presented comprehensive and well-organized information on its projections of GHG emissions and the total effect of PaMs. The information contained in the NC6 is based on data presented in the European Environment Agency (EEA) report published in 2013 (see EEA, 2013 in the annex below).

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

74. The GHG emission projections provided by the EU in the NC6/BR1 include a ‘with measures’ (WEM) and a ‘with additional measures’ (WAM) scenario until 2020 for the EU-15 and until 2030 for the EU-28, presented relative to actual inventory data for 2010. Projections are presented on a sectoral basis, using the same sectoral categories used in the PaMs section and on a gas-by-gas basis for all the following GHGs: CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, PFCs, HFCs and SF<sub>6</sub> (treating PFCs, HFCs and SF<sub>6</sub> collectively in each case). Projections are also provided in an aggregated format for each sector as well as for a Party total, using global warming potential values from the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Emission projections related to fuel sold to ships and aircraft engaged in international transport were reported separately and not included in the totals.

75. The WEM projection represents a business-as-usual scenario aggregated from the WEM projections of member States where only PaMs that have been adopted or already implemented in the member States are considered. The WAM projection represents a scenario where all planned measures for the member States are considered to be fully implemented. This definition indicates that the WEM and WAM scenarios have been prepared according to the reporting guidelines.

76. Projections for the ‘without measures’ (WOM) scenario were not provided in the NC6/BR1. During the review, the EU explained that an aggregation of WOM projections from the national projections of member States was not possible for the NC6/BR1 because of the lack of data: only four of the 28 member States reported WOM projections. However, the ERT was informed that the reporting requirements for projections from member States has changed from voluntary to mandatory since the MMR entered into force in July 2013. This will result in more complete reporting on projections by the member States in the future. The ERT encourages the EU to provide the estimates for the WOM scenario at the EU level and include information on its projections improvements in its next NC.

77. The EU reported on the changes to the methodology compared with the NC5 and provided supporting documentation. Following the recommendations from the report of the in-depth review of the fifth national communication (IDR/NC5), the EU included explanations on the methodologies used for the aggregation of projections by member States. The EU-28 projections have been aggregated using member State's submissions to the European Commission under the Monitoring Mechanism Decision in 2013. EEA and its European Topic Centre for Air Pollution and Climate Change Mitigation (ETC/ACM) are responsible for compiling these national projections into EU projections. Quality assurance/quality control (QA/QC) procedures that consist of a number of checks against quality criteria such as completeness, consistency, comparability, accuracy and transparency of reported data have been applied through communications between EEA, ETC/ACM, and member States to clarify or correct identified QA/QC issues. To address emission trends where data from some member States are missing for certain time periods for the WEM scenario (e.g. if national projections covered only the period to 2020), or in the event of a new member State, such as Croatia, the EU-28 2013 climate policy 'baseline with adopted measures' (BAM) scenario is used for gap-filling purposes. The gap-filling technique was also used by the EU to compile an aggregated data set for the EU-28 because not all member States reported a WAM scenario. A detailed explanation of the gap-filling technique is provided in section 5.4.1 of the BR1 as an annex to the NC6.

78. The key parameter assumptions of individual member States submitted in 2013 to the EU were aggregated to obtain information relating to the EU-15 and the EU-28, reflecting recent economic development. The EC provided member States with recommended parameter values for the evolution of the EU ETS CO<sub>2</sub> price; the international oil, coal and gas price; and default values for GDP and population to improve consistency of member State projections. In national projections, these EU-level assumptions were used to a varying extent. In the case of different national assumptions, member States were invited to use the recommended values for sensitivity analysis.

79. The EU conducted a sensitivity analysis following recommendations from the IDR/NC5. The ERT commends the EU for its improved transparency by conducting the sensitivity analysis on key assumptions for projections. The EU mentioned in the NC6 that a traditional sensitivity analysis in which there is a variation of key parameters is not applicable for the aggregation of 28 individual member State projections. As an alternative, the EU-28 BAM scenario, which is based on a combination of EU-wide sectoral models provided by the EUCLIMIT project for the EU DG for Climate Action, was adopted as a sensitivity analysis for the EU-28 WEM projection. The results of the sensitivity analysis suggest that achievement of the projected 2020 GHG target will not be affected.

## 2. Results of projections

80. Under the Kyoto Protocol, the EU-15 has agreed to reduce its GHG emissions by 8 per cent compared with the base year level during the first commitment period of the Kyoto Protocol (2008–2012). Based on the latest inventory data, total GHG emissions (without LULUCF) of the EU-15 were on an annual average 14.9 per cent below the base year level for 2011 and 12.2 per cent below the base year level over the first commitment period based on provisional data for 2012. Furthermore, when including the use of Kyoto Protocol mechanisms (1.9 per cent offset of emissions), and the total removal of carbon sinks due to activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol (1.5 per cent emissions reduction), the EU-15 is expected to reduce its emissions by 15.5 per cent over the first commitment period.

81. For the second commitment period of the Kyoto Protocol (2013–2020), the EU-15 member States will not have a common GHG reduction target as they had during the first commitment period. Instead, there is a commitment by the EU-28 to reduce emissions by



20 per cent by 2020 compared with the 1990 GHG emissions level (equivalent to a 14 per cent reduction compared with 2005). The EU-28 plans to meet the target through efforts divided among member States in both EU ETS and non-ETS sectors as follows: (1) a 21 per cent reduction by 2020 compared with 2005 in EU ETS sector emissions; and (2) a 10 per cent reduction by 2020 compared with 2005 under the ESD for the sectors that are not covered by the EU ETS. The EU ETS covers more than 12,000 power plants and manufacturing installations in the EU-28 member States, as well as three non-EU countries including Iceland, Norway and Liechtenstein. In addition, since 2012, aviation emissions from flights within the EU and participating countries are included in the EU ETS. The ESD mainly covers emissions from transportation, buildings, small businesses and services, agriculture and waste. Under the second commitment period of the Kyoto Protocol target for the EU-28, emissions and removals from the LULUCF sector are included in the non-ETS sector under the ESD. The EU reported in its NC6 that there are no final decisions within the EU in regard to the supplementary use of Kyoto Protocol mechanisms for the second commitment period.

82. Under the Convention, the EU-28 communicated an independent quantified economy-wide emission reduction target of 20 per cent by 2020 below the 1990 level. The EU-28 plans to meet the 2020 target through efforts divided among its member States. The joint EU-28 target is implemented through binding legislation known as the climate and energy package, which was adopted in 2009. Major measures to achieve the 2020 target as identified in the climate and energy package include EU ETS phase three; implementation of the ESD for non-ETS sectors; renewable energies and energy efficiency legislation; legislative proposals on 2020 targets for CO<sub>2</sub> from cars and vans; and F-gas regulations. The climate and energy package allows CERs and ERUs to be used for compliance purposes, subject to a number of restrictions, including a limit of 50 per cent of the required reduction below 2005 levels for those sectors under the EU ETS. Under the Convention target for the EU-28, emissions and removals from the LULUCF sector are excluded in the non-ETS sector effort under the ESD.

83. The ERT noted that aviation emissions between the EU and three countries not belonging to the EU (Norway, Iceland and Liechtenstein) are included under the EU ETS, though some of these flights are considered international aviation in terms of GHG accounting rules. The ERT recommends that the EU present the contribution of these emissions from international aviation separately to align with the UNFCCC reporting guidelines for national GHG inventories. Due to the complexity and uniqueness of the EU target and its compliance system, the ERT encourages the EU to include additional summary information presenting a more complete representation and description of the target, including the breakdown of the target by member States, to improve transparency.

84. The most significant GHG emission reductions in the EU-15 WEM scenario from 1990 to 2020 are projected to occur in the energy sector (625,000 kt CO<sub>2</sub> eq), followed by the waste sector (86,000 kt CO<sub>2</sub> eq) and the industrial sector (85,000 kt CO<sub>2</sub> eq). GHG emissions in the transport sector are projected to increase by 75,000 kt CO<sub>2</sub> eq (10.8 per cent) by 2020 compared with the 1990 emissions level. If additional measures are considered (WAM scenario), the pattern of sectoral proportions changes slightly, where the energy sector remains the most prominent source of reductions, followed by the industrial sector and the waste sector. The emissions growth in the transport sector in the EU-15 for this scenario is less prominent (38,000 kt CO<sub>2</sub> eq increase, or 5.4 per cent by 2020 compared with 1990 levels).

85. The most significant GHG emission reductions in the EU-28 WEM scenario from 1990 to 2020 are projected to occur in the energy sector (1,051,000 kt CO<sub>2</sub> eq), followed by the agriculture sector (140,000 kt CO<sub>2</sub> eq), and the industrial sector (101,000 kt CO<sub>2</sub> eq). GHG emissions in the transport sector are projected to increase by 139,000 kt CO<sub>2</sub> eq (18.0

per cent) by 2020 compared with the 1990 emission levels. If additional measures are considered (WAM scenario), the pattern of sectoral proportions of emission reductions remains the same, while the emissions growth in the transport sector in the EU-28 is less prominent (97,000 kt CO<sub>2</sub> eq increase, or 12.6 per cent by 2020 compared with 1990 levels).

86. Reductions in CO<sub>2</sub> emissions are expected to contribute the most to the overall emission reductions in the EU-15. Under the WEM scenario for the EU-15, CO<sub>2</sub> contributes to approximately 65.2 per cent of the aggregate GHG emission reductions in 2020 compared with 1990 (518,000 kt CO<sub>2</sub> eq), followed by CH<sub>4</sub> with 21.7 per cent of emission reductions, (172,000 kt CO<sub>2</sub> eq) and N<sub>2</sub>O with 13.1 per cent of emission reductions (134,000 kt CO<sub>2</sub> eq). Under the WAM scenario for the EU-15, CO<sub>2</sub> contributes to approximately 70.6 per cent of the aggregate GHG emission reductions in 2020 compared with 1990 (687,000 kt CO<sub>2</sub> eq), followed by CH<sub>4</sub> with 18.1 per cent of emission reductions (176,000 kt CO<sub>2</sub> eq), and N<sub>2</sub>O with 11.3 per cent of emission reductions (138,000 kt CO<sub>2</sub> eq).

87. Similarly to the EU-15, reductions in CO<sub>2</sub> emissions are expected to contribute most to the overall emission reductions in the EU-28. Under the WEM scenario for the EU-28, CO<sub>2</sub> contributes to approximately 69.7 per cent of the aggregate GHG emission reductions in 2020 compared with 1990 (869,000 kt CO<sub>2</sub> eq), followed by CH<sub>4</sub> with 18.6 per cent of emission reductions (232,000 kt CO<sub>2</sub> eq), and N<sub>2</sub>O with 11.7 per cent of emission reductions (182,000 kt CO<sub>2</sub> eq). Under the WAM scenario for the EU-28, CO<sub>2</sub> contributes to approximately 72.7 per cent of the aggregate GHG emission reductions in 2020 compared with 1990 (1,054,000 kt CO<sub>2</sub> eq), followed by CH<sub>4</sub> with 16.6 per cent of emission reductions, (240,000 kt CO<sub>2</sub> eq) and N<sub>2</sub>O with 12.9 per cent of emission reductions (187,000 kt CO<sub>2</sub> eq).

88. The reported projections in the NC6 suggest that the EU-28 is expected to collectively achieve its 2020 targets. Under the WEM scenario, total GHG emissions (excluding international aviation) are projected to be 22.2 per cent lower in 2020 than in 1990 and 24.4 per cent lower in 2030 than in 1990. Under the WAM scenario, total GHG emissions (excluding international aviation) are projected to be 25.9 per cent lower in 2020 than in 1990 and 30 per cent lower in 2030 than in 1990. During the review, the EU presented the progress individual member States are making in achieving their portion of the joint 2020 targets. Based on this information, it was shown that additional efforts will be needed by approximately a third of EU member States to achieve their portion of the joint 2020 targets. The ERT encourages the EU to provide more information on the monitoring of the progress of member States in achieving the target in its next NC.

89. The projected emission levels under different scenarios and information on the Kyoto Protocol targets and quantified economy-wide emission reduction target are presented in table 5 and the figure.

Table 5  
**Summary of greenhouse gas emission projections for the European Union**

|  | <i>Greenhouse gas emissions<br/>(kt CO<sub>2</sub> eq per year)</i> | <i>Changes in relation to<br/>the base year<sup>a</sup> level (%)</i> | <i>Changes in relation to<br/>the 1990 level (%)</i> |
|--|---|---|--|
| <b>EU-15</b>   |   |   |  |
| Kyoto Protocol base year <sup>b</sup>                                | 4 265 518.00  | 0.0   | 0.3  |
| Kyoto Protocol target for the first<br>commitment period (2008–2012) | 3 924 276.00  | –8.0  | –8.0   |
| Inventory data 1990 <sup>c</sup>                                     | 4 254 503.89  | –0.3  | 0.0  |

|   | <i>Greenhouse gas emissions<br/>(kt CO<sub>2</sub> eq per year)</i> | <i>Changes in relation to<br/>the base year<sup>a</sup> level (%)</i> | <i>Changes in relation to<br/>the 1990 level (%)</i> |
|---|---|---|--|
| Inventory data 2011 <sup>c</sup>  | 3 630 657.34  | -14.9   | -14.7  |
| Average annual emissions for<br>2008–2011 <sup>c</sup>                                | 3 780 087.37  | -11.4   | -11.2  |
| ‘With measures’ projections for<br>2020 <sup>d</sup>                                  | 3 460 503.89  | -18.9   | -18.7  |
| ‘With additional measures’<br>projections for 2020 <sup>d</sup>                       | 3 281 503.89  | -23.1   | -22.9  |
| <b>EU-28</b>  |   |   |  |
| Kyoto Protocol base year  | Not available yet   |   |  |
| Kyoto Protocol target for the<br>second commitment period<br>(2013–2020) <sup>e</sup> | Not available yet   |   | -20.0  |
| Quantified economy-wide<br>emission reduction target <sup>f</sup>                     | Not available yet   |   | -20.0  |
| Inventory data 1990 <sup>g</sup>  | 5 606 117.83  |   | 0.0  |
| Inventory data 2011 <sup>g</sup>  | 4 578 596.79  |   | -18.3  |
| Average annual emissions for<br>2008–2011 <sup>g</sup>                                | 4 781 168.08  |   | -14.7  |
| ‘With existing measures’<br>projections for 2020 <sup>d</sup>                         | 4 359 150.59  |   | -22.2  |
| ‘With additional measures’<br>projections for 2020 <sup>d</sup>                       | 4 156 343.92  |   | -25.9  |
| ‘With existing measures’<br>projections for 2030 <sup>d</sup>                         | 4 238 897.02  |   | -24.4  |
| ‘With additional measures’<br>projections for 2030 <sup>d</sup>                       | 3 922 351.00  |   | -30.0  |

<sup>a</sup> “Base year” in this column refers to the base year used for the targets under the Kyoto Protocol, while for the target under the Convention it refers to the base year used for that target.

<sup>b</sup> The Kyoto Protocol base year level of emissions is provided in the initial review report contained in document FCCC/IRR/2007/EC.

<sup>c</sup> GHG emissions data: the EU’s 2013 GHG inventory (re)submissions for the EU-15.

<sup>d</sup> The European Union’s sixth national communication and/or first biennial report.

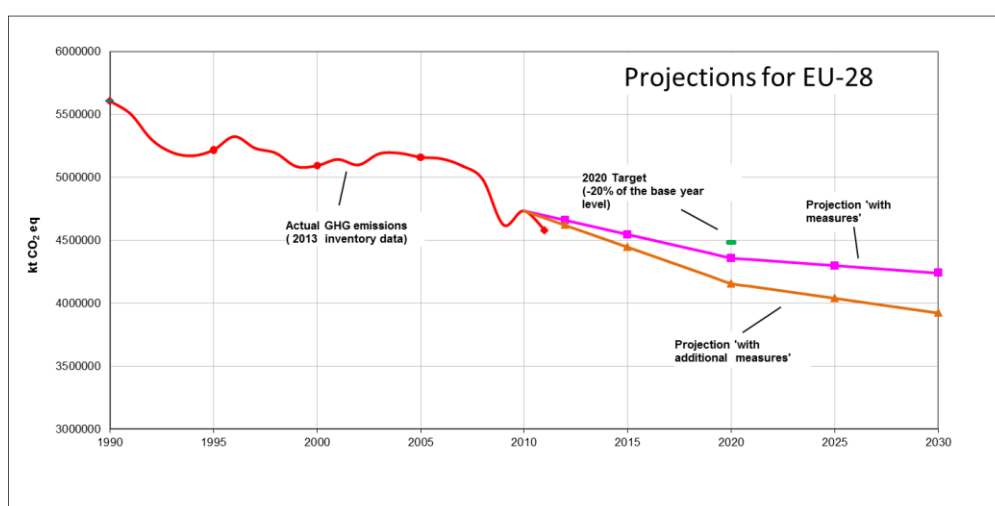
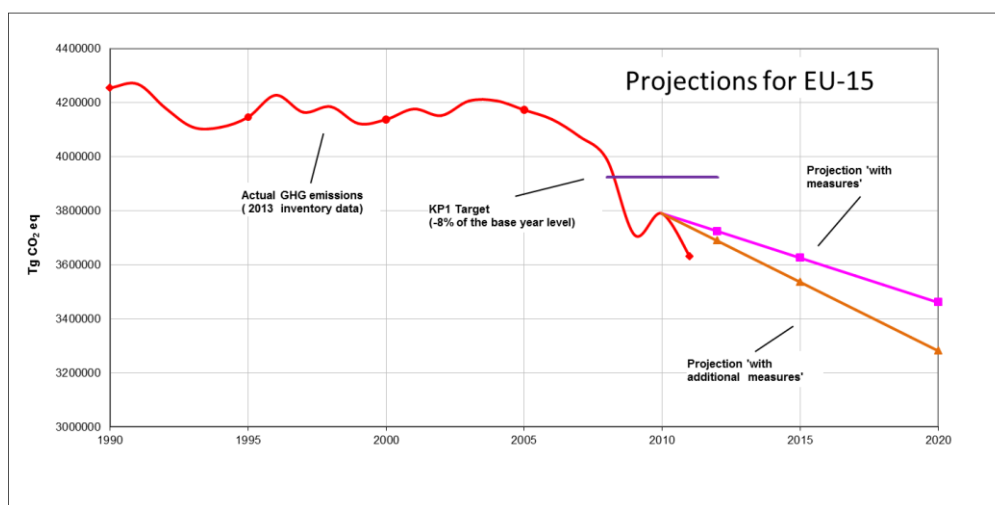
<sup>e</sup> The Kyoto Protocol target for the second commitment period (2013–2020) is a joint target for the European Union and its 28 member States and Iceland. The target is to reduce emissions by 20 per cent by 2020 compared with the base year level.

<sup>f</sup> The 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.

<sup>g</sup> GHG emissions data: the European Union’s 2013 GHG inventory (re)submissions for the EU-15, the EU-12 (the EU-27 minus the EU-15) and Croatia.

*Abbreviation:* EU = European Union, GHG = greenhouse gas.

### Greenhouse gas emission projections



Sources: (1) Data for the years 1990–2011: the European Union’s 2013 GHG inventory (re)submissions for the EU-15, the EU-12 (the EU-27 minus the EU-15) and Croatia; the emissions are without land use, land-use change and forestry (LULUCF); (2) Data for the years 2011–2020 (EU-15) and 2011–2030 (EU-28): the European Union’s sixth national communication and/or first biennial report; the emissions are without LULUCF.

Note: The first figure is for the EU-15 and the second figure is for the EU-28.

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

### 3. Total effect of policies and measures

90. In the NC6/BR1, the EU presents the estimated total effect of implemented and adopted PaMs, the estimated total effect of planned PaMs, and the aggregate total effect of all PaMs (implemented, adopted and planned) for the EU-15 and the EU-28. Information is presented in terms of GHG emissions avoided or sequestered, by gas (on a CO<sub>2</sub> eq basis), for 2015 and 2020 for the EU-15, and 2015, 2020, 2025 and 2030 for the EU-28. The total effects of PaMs were calculated using two methodological approaches since the EU projections are an aggregation of individual projections from member States. The total effect of adopted and implemented PaMs was estimated using a bottom-up approach aggregating the expected savings from individual policies and measures as reported by

member States and aggregated by the EEA in a PaM database; whereas the total effect of planned PaMs was estimated using a top-down approach where for a given year, projected WEM GHG emissions were subtracted from projected WAM GHG emissions. However, the sector split differs between the approaches, making the sector policy effects in WEM and WAM not fully comparable. The ERT encourages the EU to apply consistent approaches to the estimates of GHG emissions under the WEM and WAM scenarios to improve the quality of the analysis for the total effect of PaMs.

91. The NC6 does not include information on the total effect of PaMs in accordance with the WEM definition for 1995, 2000, 2005 and 2010. The ERT recommends that the EU provides an estimate of the total effect of its adopted and implemented PaMs, compared with a situation without such PaMs for one historic year.

92. The EU reported that the total estimated effect of adopted and implemented PaMs is 671,000 kt CO<sub>2</sub> eq for the EU-15 in 2020. According to the information reported in the NC6, PaMs implemented in the energy sector will deliver the largest emission reductions, followed by the effect of PaMs implemented in the waste sector and the industrial sector. For the EU-28, the total estimated effect of adopted and implemented PaMs is 906,000 kt CO<sub>2</sub> eq in 2020 and 642,000 kt CO<sub>2</sub> eq in 2030. According to the information reported in the NC6, PaMs implemented in the energy sector will deliver the largest emission reductions, followed by the effect of PaMs implemented in the agriculture and industrial processes sectors.

93. The most effective PaMs and drivers behind GHG emission reductions are described in chapter II.B above. Table 6 provides an overview of the total effect of PaMs as reported by the EU-28.

Table 6  
**Projected effects of planned, implemented and adopted policies and measures in 2020 and 2030 for the EU-28**

| Sector                       | Effect of implemented and adopted measures (kt CO <sub>2</sub> eq) |                | Relative value (% of 1990 emissions) |             | Effect of implemented and adopted measures (kt CO <sub>2</sub> eq) |                | Relative value (% of 1990 emissions) |            |
|------------------------------|--|----------------|--------------------------------------|-------------|--|----------------|--------------------------------------|------------|
|                              | 2020   | 2030           | 2020                                 | 2030        | 2020   | 2030           | 2020                                 | 2030       |
| Energy (without transport)   | 544 000  | 390 000        | 12.6                                 | 9.0         | 143 000  | 214 000        | 3.3                                  | 5.0        |
| Transport                    | 126 000  | 111 000        | 16.2                                 | 14.3        | 42 000   | 70 000         | 5.4                                  | 9.0        |
| Industrial processes         | 22 000   | 18 000         | 4.8                                  | 3.9         | 6 000  | 17 000         | 1.3                                  | 3.7        |
| Agriculture                  | 49 000   | 31 000         | 8.1                                  | 5.1         | 4 000  | 8 000          | 0.7                                  | 1.3        |
| Land-use change and forestry | NA   | NA             | NA                                   | NA          | NA   | NA             | NA                                   | NA         |
| Waste management             | 54 000   | 7 000          | 26.4                                 | 3.4         | 6 000  | 6 000          | 2.9                                  | 2.9        |
| Other/Cross cutting          | 111 000  | 85 000         | NA                                   | NA          | 0  | 0              | NA                                   | NA         |
| <b>Total</b>                 | <b>906 000</b>   | <b>642 000</b> | <b>16.1</b>                          | <b>11.5</b> | <b>201 000</b>   | <b>315 000</b> | <b>3.6</b>                           | <b>5.6</b> |

Source: The European Union’s sixth national communication and/or first biennial report.

Note: The total effect of implemented and adopted policies and measures is defined as the difference between the ‘without measures’ and ‘with measures’ scenarios; the total effect of planned policies and measures is defined as the difference between the ‘with measures’ and ‘with additional measures’ scenarios.

Abbreviation: NA = not available.

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

94. The EU in its NC6 provided information on how the use of the mechanisms under Articles 6, 12 and 17 of the Kyoto Protocol by member States is supplemental to domestic action. The ERT noted that the EU plans to use the market-based mechanisms to meet its Kyoto Protocol targets for both the first and second commitment periods.

95. The EU explained that in defining supplementarity it took into account 50 per cent of the difference between the projected emissions and the Kyoto Protocol target (average annual emissions for the period 2008–2012). The ERT noted the EU's decision on purchasing CERs and ERUs for the purpose of compliance in the first commitment period of the Kyoto Protocol, although the EU-15 GHG emissions for 2011 are already below its target.

### **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**

96. In its NC6, the EU provided information on provision of support required under the Convention and its Kyoto Protocol. Information on financial resources of the EU's member States can be found in their respective national communications. The ERT commends the EU for its clear reporting on trends and patterns in its commitment of public financial flows.

97. In its NC6, the EU 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 information required under Article 7 of the Kyoto Protocol”. In its NC6, the EU defines “new and additional” resources as any resources that were committed after the NC5 reporting period (i.e. since 2008), and indicates what “new and additional” financial resources it has provided pursuant to Article 4, paragraph 3, of the Convention.

98. However, the EU did not include a clear explanation of how it determined that the funds committed since the NC5 were “new and additional” in its NC6. During the review, the EU provided detailed information on how it determines its resources as being “new and additional”. Specifically, the EU stated that because EU budgets are determined on an annual basis, each annual commitment cycle represents “new and additional” resources. The financial support reported in the NC6 concerns these annual commitments from 2008 to 2012. The ERT recommends the EU to include this information in its next NC.

99. The NC6 does not include some information required by the UNFCCC reporting guidelines on NCs. Although a textual explanation is provided, the EU did not complete tables 3 and 4 of the UNFCCC reporting guidelines on NCs on multilateral contributions to the financial mechanism, and contributions to multilateral institutions. To increase the completeness of reporting, the ERT recommends that the EU include table 3 in its next NC, and encourages the EU to include table 4 in its next NC.

100. In its NC6, the EU reported on its approach to using the Organisation for Economic Co-operation and Development Development Assistance Committee system of Rio markers to track the provision of climate finance. As part of this system, the EU classifies activities as ‘principally’ or ‘significantly’ related to climate change mitigation and/or adaptation and

assigns percentages to the activities that are used to calculate climate finance support. If an aid activity is marked as significant for mitigation or adaptation, then only 40 per cent of the support is considered and reported as climate finance. The EU did not provide a transparent description as to why 40 per cent was used in these calculations. During the review, the EU provided additional information on how activities are determined to be ‘significant’, and included examples of such ‘significant’ activities. The ERT encourages the EU to provide more information on methodologies for translating the Rio marker data into estimated climate finance flows in its next NC.

101. The EU has reported detailed information on the assistance it has provided to developing country Parties that are particularly vulnerable to the adverse effects of climate change to help them to meet the costs of adaptation to those adverse effects. Furthermore, the EU has provided information on financial resources related to the implementation of the Convention provided through bilateral channels. However, because the EU has classified all of its assistance as ‘bilateral’ for the purposes of reporting, it reported in the NC6 that it provided no multilateral financial resources, except to the Convention and its Kyoto Protocol.

102. The information provided in the NC6 shows that the highest level of support goes to cross-cutting projects (those projects which impact more than one sector) and to the energy sector. The support provided to the agriculture sector has shown an increasing trend throughout the reporting period. In addition, the EU has been increasing its support to adaptation in both absolute and relative terms. In 2012, support to adaptation and mitigation was approximately at the same level. The EU has also been making efforts to ensure that its climate change mitigation and adaptation projects cover key sectors, particularly those included in the reporting guidelines (Energy, Transport, Forestry, Agriculture, Waste Management/Water and Sanitation, and Industry) and capacity-building, coastal zone management and other vulnerability assessments.

103. In regard to the most recent financial contributions, particularly those under fast-start finance, to enhance the implementation of the Convention by developing countries, the EU committed USD 2.6 billion during the years 2010 to 2012. Table 7 summarizes information on financial resources.

Table 7  
**Summary of information on financial resources for 2008–2012**  
 (United States dollars)

| <i>Allocation channel of public financial support</i>                           | <i>Years of disbursement</i> |               |             |             |             |
|---|------------------------------|---------------|-------------|-------------|-------------|
|   | <i>2008</i>                  | <i>2009</i>   | <i>2010</i> | <i>2011</i> | <i>2012</i> |
| Climate- specific contributions through bilateral, regional, and other channels | 459 937 000                  | 1 002 904 000 | 752 074 000 | 873 952 746 | 943 114 000 |
| Contributions to UNFCCC   | 693 042                      | 796 740       | 792 647     | 816 499     | 825 372     |

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

104. The EU has provided in its NC6 information on activities related to the transfer of technology. Information on transfer of technology by the EU’s member States can be found in their respective national communications. 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.

105. In its NC6, the EU reported in textual format on the general steps taken to promote, facilitate and finance the transfer of technology, and to support the development of technologies in developing countries. The NC6 describes some of the programmes and initiatives that the EU supports. At the United Nations level, the EU supports the Climate

Technology Centre and Network. The EU reported that it funds technology transfer through research programmes and development aid cooperation projects for climate change. However, the NC6 recognizes that in most cases it is not possible within programmes to determine a breakdown of the technology transfer activities and related resources.

106. Other programmes reported include the EU's 7th Framework Programme (FP7) for research and technological development, which ran from 2007 through 2013. According to the NC6, this programme was the most important EU mechanism to support research on climate change and the development of technologies in both EU and other countries. Between 2007 and 2013, FP7 committed EUR 32.40 billion under its cooperation programme, 1.89 billion of which was for the environment, including climate change. The EU also reported on the European Strategic Energy Technology Plan and the Near-zero Emissions Power Generation Technology through Carbon Dioxide Capture and Storage project, which has the goal of demonstrating carbon capture and storage technology in China.

107. In its NC6, the EU does not clearly distinguish between activities undertaken by the public sector and those undertaken by the private sector, as required by the UNFCCC reporting guidelines on NCs. Therefore, the ERT recommends that the EU include this information in its next NC. The ERT also encourages the EU to indicate in what way it has encouraged private sector activities that result in the transfer of technology and how these activities help meet the commitments of Parties under Article 4, paragraphs 3, 4 and 5, of the Convention.

108. The NC6 does not include information on steps taken by the EU to support the development and enhancement of endogenous capacities and technologies of developing countries, as required by the UNFCCC reporting guidelines on NCs. During the review, the EU did provide additional information on efforts to promote endogenous capacities in non-Annex I Parties, including an example on mobility schemes such as CAAST-Net, which helps the integration of scientists and research institutes from countries outside the EU into the European Research Area. The ERT recommends that the EU include information on measures to support the development and enhancement of endogenous capacities and technologies of non-Annex I Parties in its next NC.

109. The NC6 does not include success and failure stories related to technology transfer. The ERT recommends that the EU include this information in its next NC, or explain why this is not feasible. In addition, the ERT encourages the EU to complete table 6 of the UNFCCC reporting guidelines on NCs to facilitate the provision of this information, as well as to provide more detailed information on the specific projects and programmes related to technology transfer (including recipient country, sector, total funding, years in operation, technology transferred and the impact on greenhouse gas emissions or sinks).

110. While the NC6 does contain general information about broad initiatives, programmes and plans to promote, facilitate and finance the transfer of technologies to developing countries, it was not transparent how these activities led to financing access by developing countries for 'hard' or 'soft' environmentally sound technologies. During the review, the EU provided additional information. The ERT recommends that the EU report transparently how its activities lead to financing access by developing countries for 'hard' or 'soft' environmentally sound technologies in the next NC.

### **3. Information under Article 10 of the Kyoto Protocol**

111. In its NC6, the EU has provided information on the fulfilment of its commitments under Article 10 of the Kyoto Protocol. This information was complete and transparent and all reporting requirements were met.



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

112. In its NC6, the EU 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

| <i>Vulnerable area</i>              | <i>Examples/comments/adaptation measures reported</i>   |
|-------------------------------------|---|
| Agriculture and food security       | <p><i>Vulnerability:</i> Increased water demand and periods of water deficit, loss of soil carbon content, erosion, lower harvestable yield and higher yield variability, new pests, plant diseases and crop damage, reduction in suitable areas of traditional crops, shift in production from southern to northern Europe without significantly curtailing overall production</p> <p><i>Adaptation:</i> Promote 'greening' of instruments and schemes that support production, taking into account water and land use, investments and management practices</p> |
| Biodiversity and natural ecosystems | <p><i>Vulnerability:</i> Habitat fragmentation and loss, over-exploitation, pollution of air, water and soil, and spread of invasive species</p> <p><i>Adaptation:</i> Promote the connectivity between habitats in ecological networks to increase the resilience of biodiversity to climate change</p>  |
| Energy                              | <p><i>Vulnerability:</i> Supply, generation, transmission and distribution of energy (mainly electricity) is challenged by higher magnitude and frequency of extreme weather events</p> <p><i>Adaptation:</i> Promote energy efficiency in small- and medium-sized enterprises, housing and public buildings; production and distribution of renewable energy; low-carbon strategies for urban areas</p>  |
| Economy                             | <p><i>Vulnerability:</i> Rising temperatures and erratic weather patterns will reduce the land and natural capital productivity in many areas. More frequent and intense heat waves, and altered transmission seasons and geographic range of important vector-borne diseases, will lower labour productivity</p> <p><i>Adaptation:</i> Promote reform of education and training systems, adaptation of skills and qualifications, as well as up skilling of the labour force</p>   |
| Water resources and fisheries       | <p><i>Vulnerability:</i> Water availability, frequency and intensity of floods and droughts and their environmental and economic damage</p> <p><i>Adaptation:</i> Promote trans boundary coastal management, with emphasis on densely populated deltas and coastal cities</p>   |
| Forests                             | <p><i>Vulnerability:</i> Forest fires likely to dominate in southern Europe and enhanced risk of significant pest and disease impacts</p> <p><i>Adaptation:</i> Promote sustainable management of water; combating desertification and forest fires in drought-prone areas</p>  |
| Human health                        | <p><i>Vulnerability:</i> Effects on infectious diseases, and air quality, with negative consequences for respiratory and cardiovascular diseases</p> <p><i>Adaptation:</i> Strengthening health security capacities and structures in order to more effectively protect European Union citizens against outbreaks</p>   |
| Infrastructure and economy          | <p><i>Vulnerability:</i> Precipitation in its various forms causing damage to transport</p> <p><i>Adaptation:</i> Promote mainstreaming adaptation into urban land use planning, building layouts and natural resources management</p>  |

| <i>Vulnerable area</i>     | <i>Examples/comments/adaptation measures reported</i>   |
|----------------------------|---|
| Construction and buildings | <p><i>Vulnerability:</i> Building vulnerability influenced by the design (low resistance to storms) and location (e.g. in areas prone to floods, landslides, avalanches)</p> <p><i>Adaptation:</i> Capacity-building for climate-proofed investments and adaptation planning, technical assistance, and guidance, etc. to strengthen the capacity of authorities and planners</p> |

*Note:* The impacts of climate change will vary throughout different geographic regions of Europe.

113. In 2012, the EEA published the report “Climate change, impacts and vulnerability in Europe 2012”, which summarizes the main observed and projected climate change impacts for the major regions in Europe. Research results within the EU’s 6th Framework Programme (FP6) and FP7 for research and technological development and other programmes at transnational and national levels have provided improved insights into the impacts and vulnerabilities of climate change in Europe and potential adaptation responses. The ERT noted that a significant amount of related research has been conducted at the EU level, but only a few member States have conducted vulnerability assessments at the State level.

114. The EU has an important role to develop an EU-wide framework for adaptation efforts. The EC has recognized that planning for adaptation requires a strategic approach to ensure timely, efficient and effective adaptation actions coherently across different sectors and levels of governance, and it has acted accordingly. The development process for an adaptation framework began with the adoption of a green paper in 2007, which was a concept document outlining adaptation actions that can be taken by the EU. This was followed by the adoption of a white paper (2009)<sup>16</sup> that identified the necessary steps to be taken in preparing an EU strategy. Finally, the EU strategy on adaptation to climate change was adopted by the EC in April 2013. The adaptation strategy promotes and supports actions by member States by promoting adaptation in key vulnerable sectors at the EU level and by ensuring better-informed decision-making, enhancing the preparedness and capacity to respond to the impacts of climate change at local, regional, national and EU levels, and by developing a coherent approach. Adaptation has been mainstreamed at the EU level in sectors such as agriculture, marine waters, forestry and transport; and in important policy instruments such as inland water, biodiversity and migration and mobility, and moves to mainstream climate change adaptation into EU policies will be pursued in other priority issues such as energy in transport in the future.

115. The EEA maintains Climate-ADAPT, a web-based tool for dissemination of information on adaptation in the EU that shares information on expected climate change in Europe; current and future vulnerability; national and transnational adaptation strategies, case studies, and tools that support adaptation planning. The ERT commends the EU for developing such a platform for information sharing on vulnerability and adaptation in the EU. The ERT noted that at the time of the review, 16 member States had adopted national adaptation strategies but that they contained little information on implementation. However, Climate-ADAPT could facilitate the progress of member States in their vulnerability assessments and adaptation measures.

116. The EU established the Global Climate Change Alliance (GCCA) in 2007, which works to support least-developed countries and small island developing States, which are the most vulnerable to climate change, by building the human, technical and financial capacity needed to address it. There are many examples of actions funded by the GCCA,

<sup>16</sup> “Adapting to climate change: Towards a European framework for action”  
<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2009:0147:FIN:EN:PDF>.

ranging from mangrove restoration in Guyana, to increased land tenure security in Rwanda, to improved early warning and monitoring in Vanuatu. By the end of 2012, more than 45 GCCA programmes were either implemented or being developed in more than 35 countries and 8 sub regions within a budget of EUR 290 million.

## **F. Research and systematic observation**

117. The EU has provided information on its actions relating to research and systematic observation (RSO), 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 Intergovernmental Panel on Climate Change. The NC6 also reflects action taken to support related capacity-building in developing countries. Furthermore, the EU has provided a summary of information on GCOS activities.

118. Climate change research at the EU level has been carried out in past framework programmes and continued during FP7, which was the EU’s main instrument for funding research in Europe for the period 2007–2013. FP7 was a multi-annual regional programme that relied on contributions from the 28 member States of the EU and 14 associated countries. In principle, FP7 was open to international cooperation, and many countries (especially developing countries and countries with economies in transition) were eligible for EU funding. A new EU Framework Programme for Research and Innovation (Horizon 2020) has been established for the period 2014–2020, in which climate research will be the central focus. The ERT commends the EU for its work on RSO and its plan to include climate research as a central component of Horizon 2020.

119. The NC6 provides two examples of research collaboration between the EU and other countries (including developed countries):

(a) The African Monitoring of the Environment for Sustainable Development initiative and its successor, Monitoring of Environment and Security in Africa project;

(b) The collaboration between the Joint Research Centre (of the EC), National Aeronautics and Space Administration (NASA) and the South African National Space Agency, which has been in place since 2011, for the exploitation of data generated by the Multi-angle Imaging Spectro Radiometer on board the NASA Terra platform.

120. Regarding participation in GCOS, the EU contributes to the collection of atmospheric, oceanic and terrestrial essential climate variables through Copernicus, the European system for monitoring the Earth. The Copernicus Climate Change service is made up of three main components: a sustained network of in situ and satellite-based observations, reanalysis of the Earth’s climate with a variety of models driven by observations, and modelling scenarios based on a variety of climate projections. These three components allow for a range of climate indicators (e.g. temperature increase, sea level rise, ice sheet melting, ocean acidification and warming of the ocean) and climate indices (e.g. those based on records of temperature, precipitation and drought events) for both the identified climate drivers and the expected climate impacts. During the review, the EU presented the web portal for Copernicus and the functions of the site.

121. The ERT noted that the EU addressed the encouragement of the IDR/NC5 report on improving the structure of the information on RSO. The EU may consider including a summary or overview table of the many instruments, tools and programmes that are carried out by the EU for RSO in its next NC to provide a concise description of the wide range of actors and research areas covered.

## **G. Education, training and public awareness**

122. In the NC6, the EU has provided information on its actions relating to education, training and public awareness. Compared with the NC5, the Party provided more information on the use of the Internet and social media tools, in addition to live interaction with the public through videos, seminars and workshops.

123. In the EU, the responsibility for education and training policy lies with individual member States. The EU's role is to support the improvement of national systems through complementary EU-level tools, mutual learning, exchange of good practices and financial support. The EU has implemented a lifelong learning programme targeting not only students and learners, but also teachers and trainers to take part in stimulating learning experiences on environment, sustainability, and climate change related activities. The actions include exchanges, study visits and networking activities. The EEA has also developed a website for children to educate them on climate change issues, and has held workshops for children to develop educational environmental material on climate change, biodiversity and sustainable lifestyles.

124. The EU campaign "A world you like, with a climate you like" made use of the Internet and social media tools such as Facebook, Twitter, YouTube, Flickr and Pinterest to reach a wide audience with limited resources. The EU has used these tools to continue communicating with the public even after the campaign concluded. The ERT commends the EU for the use of Internet and social media tools to communicate with the public and for its efforts to do so on a continuing basis. The EU may consider, where possible, reporting on the monitoring of the impact of public awareness campaigns and develop ways of assessing the effectiveness of awareness-raising tools used, and include this information in its next NC.

## **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 the EU under Article 7, paragraph 2, of the Kyoto Protocol in its NC6 is mostly complete and 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 sections in which this information is provided.

126. The EU has not reported the following elements of the supplementary information required under Article 7, paragraph 2, of the Kyoto Protocol: the designated representative with overall responsibility for the national inventory of the EU and the results of the key category analysis; the name and contact information of the registry administrator designated by the EU to maintain the national registry; a description of the procedures employed in the national registry to minimize discrepancies in the issuance, transfer, acquisition, cancellation and retirement of ERUs, CERs, tCERs, ICERs, AAUs and/or RMUs, and replacement of tCERs and ICERs, and of the steps taken to terminate the transaction where a discrepancy is notified and to correct problems in the event of a failure to terminate the transaction; an overview of security measures employed in the national registry to prevent error and of how these measures are kept up to date; a list of the information publicly accessible by means of the user interface to the national registry, and the Internet address of the interface to its national registry; and national legislative

arrangements and administrative procedures that seek to ensure that the implementation of activities under Article 3, paragraph 3, and elected activities under Article 3, paragraph 4, of the Kyoto Protocol also contribute to the conservation of biodiversity and the sustainable use of natural resources. 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 the EU include these reporting elements in its next national communication.

Table 9

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

| <i>Supplementary information</i>   | <i>Reference to the sixth national communication</i>                       |
|--|--|
| National registry  | Section 3.4  |
| National system  | Section 3.3  |
| Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17                                   | Sections 4.3.2, 4.3.3, 5.5   |
| Policies and measures in accordance with Article 2   | Section 4.3.4  |
| Domestic and regional programmes and/or legislative arrangements and enforcement and administrative procedures | Section 4.2.5  |
| Information under Article 10   | Sections 3.3, 4.4 – 4.10, 6.4, 7.2, 7.3, 7.4, 7.6, 7.7, 8.2, 8.3, 9.3, 9.7 |
| Financial resources  | Sections 7.2, 7.3, 7.4   |

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

127. The EU 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, the EU 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 the EU for the additional information provided. The ERT noted that the EU could continue exploring and reporting on the adverse impacts of the response measures.

128. The 2013 national inventory report and the additional information provided during the review presented several initiatives of the EU aimed at minimizing adverse impacts, including cooperating in the development of technologies, assisting developing country Parties that are highly dependent on the export of fossil fuels in diversifying their economies, and conducting relevant research.

**IV. Conclusions and recommendations**

129. The ERT conducted a technical review of the information reported in the NC6 of the EU according to the UNFCCC reporting guidelines on NCs. The ERT concludes that the NC6 provides a good overview of the national climate policy of the EU. The information provided in the NC6 includes most elements of the supplementary information under

Article 7 of the Kyoto Protocol with the exception of some information on: the national system, the national registry, and domestic and regional programmes and/or legislative arrangements and enforcement and administrative procedures.

130. For the EU-15, total GHG emissions for 2011 were estimated to be 14.7 per cent below its 1990 level excluding LULUCF and 16.1 per cent below including LULUCF. Total GHG emission decreases were driven mainly by CO<sub>2</sub> emissions (constituting 82.7 per cent of total GHG emissions in 2011), which decreased by 10.8 per cent over this period. Over the same period, CH<sub>4</sub> emissions decreased by 34.0 per cent, while N<sub>2</sub>O emissions decreased by 34.1 per cent. The decrease in CO<sub>2</sub> emissions in the EU-15 from 1990 to 2011 was mainly driven by fossil fuel switching and better energy efficiency in the manufacturing industries and construction sector, as well as the public electricity and heat production sector. The decrease in CH<sub>4</sub> emissions was driven by reductions in managed waste disposal on land mainly caused by the increased use of recycling and incineration of waste with energy recovery and reductions in coal mining. The decrease in N<sub>2</sub>O emissions were driven by emission reduction measures in adipic acid production and nitric acid production.

131. For the EU-28, total GHG emissions for 2011 were estimated to be 18.3 per cent below the 1990 level excluding LULUCF and 19.9 per cent below including LULUCF. Similar to the EU-15, this decrease in total GHG emissions was mainly attributed to CO<sub>2</sub> emissions (constituting 82.2 per cent of total GHG emissions in 2011), which decreased by 15.0 per cent over this period. Over the same period, CH<sub>4</sub> emissions decreased by 35.0 per cent, while N<sub>2</sub>O emissions decreased by 35.7 per cent. The decrease in CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O emissions in the EU-28 are defined by the same drivers as the EU-15, as well as a decrease in cattle production (CH<sub>4</sub>) and a decreased use of fertilizer and manure on agricultural soils (direct and indirect N<sub>2</sub>O soil emissions).

132. The total emissions of F-gases in the EU-15 and the EU-28 increased by 42.9 per cent and 52.6 per cent respectively from 1990 to 2011. This increase in emissions was driven solely by HFCs, as they were the only group of F-gases for which emissions increased between 1990 and 2011. Specifically, this increase in emissions from HFCs was due to the consumption of halocarbons resulting from the phase-out of ozone-depleting substances such as chlorofluorocarbons under the Montreal Protocol, and the replacement of these substances with HFCs (mainly in refrigeration, air conditioning, foam production and aerosol propellants). Conversely, HFC emissions from the production of halocarbons decreased substantially. The decrease started in 1998 and was most prominent in 1999 and 2000 as the result of reducing HFC-23 by-production by destroying this substance as part of the process.

133. In the NC6, the EU presents GHG projections for the period 2010–2020 for the EU-15 and the EU-28, and the period 2020–2030 for the EU-28. The WEM and WAM scenarios are included (in relation to the base year). For the EU-15, the projected reductions in GHG emissions under the WEM and WAM scenarios are 18.9 per cent and 23.1 per cent for 2020, respectively. For the EU-28, the projected reductions in GHG emissions under the WEM and WAM scenarios are 22.2 and 25.9 per cent for 2020 and 24.4 and 30.0 per cent for 2030, respectively. Based on the comparison with the target and the average annual emissions for 2008–2011, the EU-15 is in a position to meet its Kyoto Protocol target for the first commitment period (8 per cent reduction). The projections indicate that the EU-28 can meet its Kyoto Protocol target for the second commitment period (20 per cent reduction below 1990), even under the WEM scenario, and GHG emissions are not expected to exceed the Kyoto Protocol target even by 2020.

134. The NC6 contains information on how the EU's use of the mechanisms under Articles 6, 12 and 17 of the Kyoto Protocol is supplemental to domestic action. The EU is

planning to make use of the Kyoto Protocol mechanisms to meet its first commitment period and second commitment period targets.

135. The EU reported on its PaMs that have been adopted, implemented and elaborated in achieving its commitments under the Convention and the Kyoto Protocol. Many of the overarching cross-sectoral PaMs in the EU are outlined in the climate and energy package adopted in 2009, including the revised EU ETS and the ESD; renewable energies and energy efficiency legislation; and legislative proposals on 2020 targets for CO<sub>2</sub> from cars and vans. These cross-sectoral PaMs are supplemented by a number of other cross-sectoral and sector-specific policies and programmes such as the CCS Directive, and the general programmes for environment conservation, namely the 7th EAP and CAPP. The financial support for their implementation is provided under the Structural Fund and the Cohesion Fund.

136. The EU 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, the EU has provided information on financial resources related to the implementation of the Convention provided through bilateral channels for the years 2008 through 2012. The highest level of support goes to cross-cutting projects (those projects which impact more than one sector) and to the energy sector. In addition, the EU has been increasing its support to adaptation in both absolute and relative terms; in 2012, the difference between adaptation and mitigation narrowed substantially.

137. The EEA report “Climate change, impacts and vulnerability in Europe 2012” and other research under FP7 has provided insights into the impacts and vulnerability of climate change in the EU. Impacts of and vulnerabilities to climate change vary across Europe, in terms of regions, territories and sectors affected, but some key sectors are agriculture, forestry, water resources and fisheries, energy, construction and buildings, biodiversity, health, food security, economic activity and employment, and other social issues. The EU strategy on adaptation to climate change, adopted by the EC in April 2013, promotes and supports actions by member States by promoting adaptation in key vulnerable sectors as mentioned above at the EU level and by ensuring better-informed decision-making, by filling knowledge gaps through research initiatives like Horizon 2020, and identifying relevant tools and methodologies to address them.

138. The EU’s main instrument for funding research in Europe for the period 2007–2013 was the FP7. According to the NC6, this programme was the most important EU mechanism to support research on climate change and the development of technologies in both EU and other countries. Between 2007 and 2013, FP7 committed EUR 32.40 billion under its cooperation programme, 1.89 billion of which was for the environment, including climate change. The EU also reported on the European Strategic Energy Technology Plan and the Near-zero Emissions Power Generation Technology through Carbon Dioxide Capture and Storage project, which has the goal of demonstrating carbon capture and storage technology in China. A new EU Framework Programme for Research and Innovation (Horizon 2020) has been established for the period 2014–2020, in which climate research will be the central focus.

139. 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 the EU in its 2013 annual submissions and it is complete and transparent.

140. In the course of the review, the ERT formulated several recommendations relating to the completeness and transparency of the EU's reporting under the Convention and its Kyoto Protocol. The key recommendations<sup>17</sup> are that the EU:

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

- (i) The designated representative with overall responsibility for the national inventory of the EU;
- (ii) The results of the key category analysis;
- (iii) The name and contact information of the registry administrator designated by the EU to maintain the national registry;
- (iv) A description of the procedures employed in the national registry to minimize discrepancies in the issuance, transfer, acquisition, cancellation and retirement of ERUs, CERs, tCERs, ICERs, AAUs and/or RMUs, and the replacement of tCERs and ICERs, and of the steps taken to terminate the transaction where a discrepancy is notified and to correct problems in the event of a failure to terminate the transaction;
- (v) An overview of security measures employed in the national registry to prevent error and of how these measures are kept up to date;
- (vi) A list of the information publicly accessible by means of the user interface to the national registry, and the Internet address of the interface to its national registry;
- (vii) The national circumstances of the EU in regards to the implementation of activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol that contribute to the conservation of biodiversity and sustainable use of natural resources;
- (viii) An estimate of the total effect of the PaMs, in accordance with the WEM definition, compared with a situation without such PaMs for at least one historic year;
- (ix) Table 3, as required by the UNFCCC guidelines on NCs on multilateral contributions to the financial mechanism;
- (x) Measures to support the development and enhancement of endogenous capacities and technologies of non-Annex I Parties;
- (xi) Success and failure stories related to technology transfer or an explanation as to why this information cannot be reported;

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

- (i) A summary table on the principal PaMs;
- (ii) The contribution of international aviation to the projections, namely of Norway, Iceland and Liechtenstein, presented separately, in line with the GHG emissions accounting rules established under the UNFCCC reporting guidelines for national GHG inventories;
- (iii) An explanation clarifying how resources have been determined as being "new and additional";
- (iv) More detail on technology transfer activities undertaken by the public sector while clearly distinguishing those undertaken by the private sector, as required by the UNFCCC reporting guidelines on NCs;

<sup>17</sup> The recommendations are given in full in the relevant sections of this report.



- (v) How initiatives, programmes and plans to promote, facilitate and finance the transfer of technologies led to financing access by developing countries for 'hard' or 'soft' environmentally sound technologies.

## **V. Questions of implementation**

141. 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.

## 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>>.

FCCC/SBI/2011/INF.2. Compilation and synthesis of supplementary information incorporated in fifth national communications submitted in accordance with Article 7, paragraph 2, of the Kyoto Protocol. Note by the secretariat. Available at <<http://unfccc.int/resource/docs/2011/sbi/eng/inf02.pdf>>.

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FCCC/IDR.5/EU. Report of the in-depth review of the fifth national communication of the European Union. Available at <<http://unfccc.int/resource/docs/2011/idr/eu05.pdf>>.

Sixth national communication of the European Union. Available at  
 <[https://unfccc.int/files/national\\_reports/annex\\_i\\_natcom\\_/application/pdf/eu\\_nc6.pdf](https://unfccc.int/files/national_reports/annex_i_natcom_/application/pdf/eu_nc6.pdf)>.

2013 GHG inventory submission of the European Union. Available at  
 <[https://unfccc.int/national\\_reports/annex\\_i\\_ghg\\_inventories/national\\_inventories\\_submissions/items/7383.php](https://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/7383.php)>.

2014 GHG inventory submission of the European Union. Available at  
 <[https://unfccc.int/national\\_reports/annex\\_i\\_ghg\\_inventories/national\\_inventories\\_submissions/items/8108.php](https://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/8108.php)>.

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

Responses to questions during the review were received from Ms. Ana Danila (European Commission), including additional material on updated policies and measures, greenhouse gas projections, the national registry and recent climate policy developments in the European Union. The following documents<sup>1</sup> were also provided by the European Union:

European Commission. 2013. *Progress towards Achieving the Kyoto and EU 2020 Objectives*. Brussels: European Commission. Available at  
 <[http://ec.europa.eu/clima/policies/g-gas/docs/com\\_2013\\_698\\_en.pdf](http://ec.europa.eu/clima/policies/g-gas/docs/com_2013_698_en.pdf)>.

European Environment Agency. *Trends and Projections in Europe 2013 – Tracking Progress towards Europe’s Climate and Energy Targets until 2020*. Copenhagen: EEA. Available at <<http://www.eea.europa.eu/publications/trends-and-projections-2013>>.

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