COMPLIANCE COMMITTEE

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15 December 2009

Report of the centralized in-depth review of the fourth national communication of the European Community

Note by the secretariat

The report of the centralized in-depth review of the fourth national communication of the European Community was published on 8 December 2009. 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 decision 4/CMP.4), the report is considered received by the secretariat on the same date. This report, FCCC/IDR.4/EC, 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 centralized in-depth review of the fourth communication of the European Community

According to decision 4/CP.8, Parties included in Annex I to the Convention are requested to submit to the secretariat, in accordance with Article 12, paragraphs 1 and 2, of the Convention, a fourth national communication by 1 January 2006. This report presents the results of the in-depth review of the fourth communication of the European Community conducted by an expert review team in accordance with relevant provisions of the Convention and Article 8 of the Kyoto Protocol.

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I. Introduction and summary

A. Introduction

1. The European Community (EC) has been a Party to the Convention since 1993 and to its Kyoto Protocol since 2002. Under the Kyoto Protocol, the EC-15[1] committed itself to reducing its greenhouse gas (GHG) emissions by 8 per cent in relation to the 1990 level during the first commitment period from 2008 to 2012.[2] The EC is a regional economic integration organization to which its member States has transferred part of their sovereign powers including in the field of climate change. The EC is the only regional economic integration organization that is a Party to the Convention, as are all its member States separately. Since 2007, the European Union includes 27 member States (EU-27). This in-depth review report covers the EU-27, but focuses on the EC-15, unless otherwise stated.

2. This report covers the centralized in-depth review (IDR) of the fourth communication of the EC, hereinafter referred to as the NC4, coordinated by the UNFCCC secretariat, in accordance with decision 7/CP.11. The review took place from 11 to 16 May 2009 in Bonn, Germany, and was conducted by the following team of nominated experts from the UNFCCC roster of experts: Ms. Eglantina Bruci (Albania), Mr. Ture Hammar (Denmark), Ms. Erika Hasznos (Hungary), Ms. Eva Jernbaecker (Sweden), Ms. Inga Kindsigo (Estonia), Mr. Guy Midgeley (South Africa), Mr. Dennis Rudov (Belarus), Mr. Evren Turkmenoglu (Turkey), Ms. Katalin Zaim (UNDP) and Mr. Ji Zou (China). Ms. Bruci and Mr. Hammar were the lead reviewers. The review was coordinated by Mr. Harald Diaz-Bone (UNFCCC secretariat).

3. During the IDR, the expert review team (ERT) examined each part of the NC4. The ERT also evaluated the information contained in the EC's report demonstrating progress (RDP) in achieving its commitments under the Kyoto Protocol, and the supplementary information provided by EC under Article 7, paragraph 2, of the Kyoto Protocol as well as additional information provided by the Party during the review. Each of the member States' reports is also being reviewed, and the review of the EC's NC4 therefore focused on activities at the European Union (EU) level.

4. In accordance with the guidelines for review under Article 8 of the Kyoto Protocol (decision 22/CMP.1), a draft version of this report was communicated to the EC, which provided comments that were considered and incorporated, as appropriate, in this final version of the report.

B. Summary

5. The ERT noted that the NC4 complies in general with the UNFCCC reporting guidelines.[3] As required by decisions 22/CP.7 and 25/CP.8, the RDP provides clear and detailed information on the progress made by EC in achieving its commitments under the Kyoto Protocol. Supplementary information required under Article 7, paragraph 2, of the Kyoto Protocol[4] is provided both in the NC4 and the RDP. The ERT commended EC for its coherent and consistent reporting.

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[1] The 15 member States that formed the EC at the time of ratification of the Kyoto Protocol.

[2] The EC and its 15 member States, by a decision adopted on 25 April 2002, have 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 document FCCC/CP/2002/2).

[3] Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications (see document FCCC/CP/1999/7, pages 80–100).

[4] Decision 15/CMP.1, annex, chapter II (see document FCCC/KP/CMP/2005/8/Add.2).

1. Completeness

6. The ERT noted that the NC4 covers all of the sections required by the UNFCCC reporting guidelines. The EC has provided an explanation in its NC4 of why some of the mandatory elements are not reported. The ERT also noted the EC's RDP contains all parts stipulated by decisions 22/CP.7 and 25/CP.8. Furthermore, the ERT noted that the EC has provided the supplementary information required under Article 7, paragraph 2.

2. Timeliness

7. The NC4 was submitted on 10 February 2006 and the RDP on 22 December 2005. Decision 4/CP.8 requested Parties to submit their NC4 by 1 January 2006; decision 22/CP.7 set the same date for Parties to submit their RDP.

3. Transparency

8. The ERT acknowledged that the NC4 is comprehensive and transparent. However, the fact that the EC expanded from 15 to 25 member States in 2004, and further to 27 member States in 2007 has affected the transparency of the reporting, especially when presenting time-series on projections.

9. The NC4 provides clear information on all aspects of implementation. The ERT noted that the information contained in the NC4 is generally consistent with that contained in the RDP.

II. Technical assessment of the reviewed elements

A. National circumstances relevant to greenhouse gas emissions and removals

10. In its NC4, the Party has provided a description of its national circumstances, how these national circumstances affect GHG emissions and removals in the EC, and how national circumstances and changes in national circumstances affect GHG emissions and removals over time. The ERT noted that the main drivers of emission trends in the EC include increasing overall economic activity (gross domestic product), decreasing energy intensity, a strong growth in transport activity and annual variation in precipitation and winter temperatures (number of heating degree days). Table 1 illustrates the national circumstances of the EU-15 by providing some indicators relevant to GHG emissions and removals.

11. The EC has provided a summary of information on GHG emission trends for the period 1990–2003. This information is consistent with the 2005 national GHG inventory submission. Summary tables, including trend tables for emissions in carbon dioxide equivalent (CO_2 eq) (given in the common reporting format (CRF)), are also provided in an annex to the NC4.

12. Total GHG emissions excluding emissions and removals from land use, land-use change and forestry (LULUCF) decreased by 4.3 per cent between the base year and 2007, whereas total GHG emissions including net emissions or removals from LULUCF decreased by 5.6 per cent (see table 2). This was mainly attributed to methane (CH_4) and nitrous oxide (N_2O) emissions, which decreased by 30.2 per cent and 24.5 per cent respectively over this period. Emissions of perfluorocarbons (PFCs) also decreased by 80.1 per cent, while emissions of hydrofluorocarbons (HFCs) and carbon dioxide (CO_2) increased by 102.2 per cent and 0.9 per cent respectively. The majority of these changes was experienced after 1996 (trends for 1996–2007: CO_2 +0.8 per cent, CH_4 –24.8 per cent, N_2O –22.2 per cent, total GHGs –3.8 per cent). Emissions of fluorinated gases (F-gases) accounted for about 1.3 per cent of total GHG emissions in 1990 and 1.7 per cent in 2007. Table 2 provides an overview of GHG emissions by sector from the base year to 2007 (see also discussion of sectoral trends in chapter II B).

Table 1. Indicators relevant to greenhouse gas emissions and removals for the EC-15

	1990	1995	2000	2007	Change 1990–2000 (%)	Change 2000–2007 (%)	Change 1990–2007 (%)
Population (million)	366.02	372.73	377.99	391.20	3.27	3.49	6.88
GDP (2000 USD billion using PPP)	7 610.68	8 253.52	9 505.43	10 885.50	24.90	15.52	43.03
TPES (Mtoe)	1 324.22	1 385.16	1 471.53	1 524.29	11.12	3.59	15.11
GDP per capita (2000 USD thousand using PPP)	20.79	22.14	25.15	27.83	20.94	10.65	33.82
TPES per capita (toe)	3.62	3.72	3.89	3.90	7.61	0.09	7.70
GHG emissions without LULUCF (Tg CO_2 eq)	4 232.93	4 127.68	4 108.03	4 052.09	–2.95	–1.36	–4.27
GHG emissions with LULUCF (Tg CO_2 eq)	4 016.42	3 872.97	3 848.21	3 792.82	–4.19	–1.44	–5.57
CO_2 emissions per capita (Mg)	9.18	8.82	8.87	8.67	–3.35	–2.30	–5.58
CO_2 emissions per GDP unit (kg per 2000 USD using PPP)	0.44	0.40	0.35	0.31	–20.09	–11.71	–29.44
GHG emissions per capita (Mg CO_2 eq)	10.97	10.39	10.18	9.70	–7.22	–4.77	–11.65
GHG emissions per GDP unit (kg CO_2 eq per 2000 USD using PPP)	0.56	0.50	0.43	0.37	–22.30	–13.87	–33.07

Data sources: (1) GHG emissions data: European Community's 2009 greenhouse gas inventory submission; (2) Population, GDP and TPES data: International Energy Agency.
Abbreviations: GDP = gross domestic product, GHG = greenhouse gas, LULUCF = land use, land-use change and forestry, PPP = purchasing power parity, TPES = total primary energy supply.
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.

Table 2. Greenhouse gas emissions by sector in EC-15, 1990–2007

	GHG emissions (Tg CO_2 eq)						Change (%)		Shares[a] by sector (%)	
	1990	1995	2000	2005	2006	2007	1990–2007	2006–2007	1990	2007
A. Energy	3 256.7	3 178.1	3 227.6	3 313.1	3 301.1	3 233.0	–0.7	–2.1	76.9	79.8
A1. Energy industries	1 161.7	1 100.0	1 121.7	1 206.8	1 206.5	1 218.9	4.9	1.0	27.4	30.1
A2. Manufacturing industries and construction	621.0	567.6	558.4	535.4	537.4	525.0	–15.5	–2.3	14.7	13.0
A3. Transport	698.7	760.0	830.6	861.6	863.1	864.0	23.7	0.1	16.5	21.3
A4.–A5. Other	678.0	663.7	646.8	654.0	641.3	574.7	–15.2	–10.4	16.0	14.2
B. Fugitive emissions	97.2	86.6	70.0	55.2	52.7	50.4	–48.1	–4.4	2.3	1.2
2. Industrial processes	372.4	371.1	329.6	332.2	324.8	332.3	–10.8	2.3	8.8	8.2
3. Solvent and other product use	13.7	12.0	11.6	10.4	10.4	10.5	–23.7	0.7	0.3	0.3
4. Agriculture	418.9	401.9	403.0	377.0	372.8	371.5	–11.3	–0.4	9.9	9.2
5. LULUCF	–216.6	–254.8	–259.9	–296.1	–287.8	–259.4	19.8	–9.9	–5.1	–6.4
6. Waste	171.1	164.7	135.8	108.6	106.8	104.6	–38.8	–2.0	4.0	2.6
7. Other	NA, NO	NA, NO	NA, NO	NA, NO	NA, NO	NA, NO				
GHG total with LULUCF	4 016.3	3 873.0	3 847.7	3 845.2	3 828.2	3 792.5	–5.6	–0.9	94.9	93.6
GHG total without LULUCF	4 232.9	4 127.8	4 107.6	4 141.3	4 116.0	4 052.0	–4.3	–1.6	100.0	100.0

Abbreviations: GHG = greenhouse gas, LULUCF = land use, land-use change and forestry, NA = not applicable, NO = not occurring.
Note: The changes in emissions and the shares 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.
[a] The shares of sectors are calculated relative to GHG emissions without LULUCF; for the LULUCF sector, the negative values indicate the share of GHG emissions that was offset by GHG removals through LULUCF.

13. GHG emissions in the EC-15 peaked in 1991 and have been decreasing thereafter, despite strong economic growth. Gross domestic product increased by 43.0 per cent during 1990–2007, while GHG emissions unit decreased by 4.3 per cent. This indicates a decoupling between economic growth and GHG emissions.

B. Policies and measures

14. As required by the UNFCCC reporting guidelines, the EC has provided in its NC4 well-organized information on its package of policies and measures (PaMs) implemented, adopted and planned in order to fulfil its commitments under the Convention and its Kyoto Protocol. During the review the Party provided updated information on policies and measures. Each sector has its own textual

description of the principal PaMs, supplemented by summary tables on PaMs by sector. The EC has also provided information on how it believes its PaMs are modifying longer-term trends in anthropogenic GHG emissions and removals, consistent with the objective of the Convention. The ERT commended the EC for its complete and transparent reporting on EU-wide common and coordinated policies and measures.

15. The PaMs at the EC level are established in coordination between the relevant institutions of the Community and the member States. The EC has organized its work under the European Climate Change Programme (ECCP), while member States have organised their national programmes individually. Within the Commission, different Directorates-General, including those of Environment, Transport and Energy, Enterprise, Agriculture and Research, are responsible for the various PaMs. The ERT concludes that an even more coherent approach towards common and coordinated policies and measures could be achieved through further improving the coordination among the various Directorates-General.

16. Table 3 provides a summary of the reported information on the common and coordinated PaMs at EU level.

Table 3. Summary of information on policies and measures

Major policies and measures	Examples/comments
Framework policies and cross-sectoral measures	
Integrated Climate Programme	European Climate Change Programme ECCP – I (2000) and II (2005); 2005 Communication on Winning the Battle Against Global Climate Change; Environmental Technologies Action Plan (2004); EU monitoring mechanism (2004)
EU emissions trading for large-scale emitters	The EU emission trading scheme (ETS) for large-scale emitters had its first allocation 2005-2007. The second allocation 2008–2012, comprising 2.080 Mt CO_2 allowances, implies an emission reduction of 6 per cent below base year levels. The EU Linking Directive links the EU ETS to the Kyoto Protocol Mechanisms
Emission reduction in non-ETS sectors	EU is negotiating binding national commitments to reduce emissions outside the ETS sector
Energy supply	
Energy market restructuring	Continued development and new regulation of energy market [80-120 Mt CO_2 in 2010]
Directive for Electricity from RES (2001)	Preferences to RES and set up indicative targets for RES share in member States' electricity production [100–125 Mt CO_2]
New RES directive for 20 per cent target (2008)	Establish targets for member States in order to achieve the overall EU target of 20 per cent RES in 2020
Directive for Electricity from CHP (2004)	Preferences to cogeneration; requires that member States map out the potential to increase CHP
Energy efficiency	
Action Plan for Energy Efficiency "Doing More with Less" (October 2006)	Sets out 10 priority actions to realize up to 20 per cent energy savings by 2020
Energy Services Directive (2005)	Requires that each member State sets up a National Energy Efficiency Action Plan and settle the actions to achieve the targets of reducing energy consumption by 20 per cent towards 2020. The directive also introduces new energy efficiency commitments for energy companies
Directive of Energy-using Products (2005), Eco design of products	Regulates major categories of energy-using products, including electric appliances, boilers and motors
Energy Performance of Buildings (2002)	Strengthened energy requirements for new buildings
Motor Challenge Programme	Aimed at introducing more efficient motors
Financing Recovery Plan	European Investment Bank (EIB) and the Structural Funds to allocate investments in energy renovation of buildings, etc.
Transportation	
Biofuels Directive (2003)	Promote national targets for biofuel introduction in transport. The EU strategy aims at a 10 per cent share of renewable fuels for transport in 2020. Electricity from renewable energy sources is also seen as a contribution to this goal
Voluntary agreement with car manufacturers	Reduce specific emissions of passenger cars to 140 g CO_2 per km by 2008–2009 and to 120g CO_2 per km by 2012
Regulation on CO_2 emissions from cars	Set standards for CO_2 emissions from cars – beginning 2012
Fuel Quality Directive (revised)	Targets for reducing GHG emissions from the production of petrol and diesel

Major policies and measures	Examples/comments
Research & Development	
Energy Technology Strategy Plan (SET Plan)	Funding and implementation of energy-technology research, development and innovation is guided by this plan from 2008. The main goal is to accelerate the development and implementation of low carbon technologies, including renewable energy sources, energy efficiency, and carbon capture and storage
Industrial processes	
IPPC Directive	Integrated prevention and pollution control
HFC motor vehicle emissions (2006)	Reducing emission from air condition in passenger cars
Large Combustion Plant Directive	Regulates certain emissions from large plants
F-gas regulation and directive (2006)	Limit emissions of F-gases, including those from air-conditioning in cars. [40–50 $MtCO_2$ eq per annum by 2020] with full benefits of phase out of HFC-134a in air-conditioning
Agriculture	
	Common agricultural policy
	Nitrates Directive
Waste management	
	Directive on Waste
	Landfill Directive

Note: Numbers in square brackets indicate estimated mitigation effects.

1. Policy framework and cross-sectoral measures

17. Within the EC, the Directorate-General for Environment (DG ENV) is responsible for the overall coordination of the EU's climate change policy. The European Environment Agency (EEA), supported by the European Topic Centre on Air Quality and Climate Change (ETC-ACC) and in close cooperation with the statistical office of the EU (DG Eurostat) and the Joint Research Center (DG JRC) assists with the monitoring and evaluation of EU-wide activities aimed at meeting the commitments under the UNFCCC and the Kyoto Protocol. The Directorate-General on Transport and Energy (DG TREN) is responsible for the integration of EU climate policy in the energy and transport sector. Other important Directorates-General dealing with climate change aspects include those on research (DG RTD), agriculture (DG AGRI), as well as business and industry (DG ENTR) and regional development (DG REGIO). Implementation of EU laws is the responsibility of the member States. The ERT noted that the complex interaction between the EC and its member States makes it more difficult to monitor and assess EU-wide climate policy effects. Furthermore, the ERT encourages the EC to continue to ensure a close cooperation among the institutions involved in the implementation of the EU-wide common and coordinated policies and measures.

18. The ECCP is the main framework for policy action. The NC4 describes the development of the ECCP up to the launch of the new programme, "ECCP II", in autumn 2005. Since 2005, new policy actions have been proposed and adopted for implementation in the 2008–2012 period. Furthermore, several important decisions were taken within the EC on further development of the EU climate change strategy post 2012. This strategy development has also resulted in the strengthening of existing policies and the introduction of new policies compared to what is presented in the NC4. During the review the EC provided the ERT with updates on the most important policy actions taken since NC4 and this information has been incorporated in this report.

19. Since the publication of the NC4, there has been a substantial development in the EC's strategic basis for climate policy. First of all, the establishment of an EU-wide emission trading system (EU ETS) covering more than 40 per cent of total GHG emissions. On 23 January 2008, a proposal was adopted designed to amend the current EU ETS Directive. The proposal represented the outcome of discussions on the review of the directive. The revised Directive on the EU ETS was published on 5 June 2009. Secondly, policies have been established by a number of directives, regulations and agreements in the field of RES and energy efficiency. These directives and especially their implementation at the member State level – which in some cases has been lagging behind – may create a good basis for further reductions. The Party has informed the ERT of an on-going project to devise methodologies to quantify

ex-post the impacts of some of the main EC-wide PaMs.[5] The most important milestone on climate change inside the EU-27 is the adoption of the 2008 Climate Change and Energy Package,[6] setting targets for 2020, including a 20 per cent reduction in energy consumption, a 20 per cent share of renewable energy sources (RES), and at least a 20 per cent reduction in total GHG emissions below 1990 levels which could be scaled up to as much as 30 per cent under a new global climate change agreement if other developed countries make comparable efforts. The ERT noted that these ambitious targets will require active support not only from citizens, but also from member States and industry.

20. The EU has 'first mover' experience in setting up the EU ETS as the world's largest cap-and trade system, and the EU ETS will enter its third phase in 2013–2020 with a common market and extensive auctioning. Furthermore, the EC wants to promote the creation of a robust OECD-wide carbon market by 2015, to be further extended to more economically advanced developing countries by 2020. The ERT noted with interest the intention to put this new market-based mechanism at the centre of the EU's international climate policy and the actions taken in order to strengthen the requirements (by modifying the trading scheme policy itself and by integrating it within the broader 2008 Climate Change and Energy Package). The first period of the EU ETS showed that national cap setting, economic conditions, energy prices and other factors can be important in achieving the expected emissions reductions. Such parameters were taken into consideration in the revised ETS directive.

21. The EC and its member States have developed PaMs targeting certain technologies and subsectors. The PaMs promoting renewable and low-carbon energy are strengthened, thus complementing and interacting with the EU ETS. The ERT encourages the Party to provide a description of the findings of the on-going ex-post analysis project (see para. 19), in particular as regards the actual interplay between relevant sectoral PaMs and the EU ETS itself, if available in its next national communication. Beyond the EU ETS, national carbon taxation and subsidy schemes have also led to mitigation effects. The ERT noted that, along with market-based instruments that have been developed for the EU ETS sector, the EU could now focus further on developing additional PaMs for the non-ETS sector.

2. Policies and measures in the energy sector

22. Between 1990 and 2007, GHG emissions from **energy industries** increased by 4.9 per cent, mainly driven by growth in energy supply (+15 per cent), especially as a result of growing electricity demand. The trend shows notable decoupling due to fuel efficiency improvements, fuel shifts from coal to gas and to some extent the introduction of RES. For example, the use of coal was reduced by 26 per cent, while natural gas supply grew by 68 per cent during this period. The large emitters in energy industries will continue to be covered by the EU ETS.

23. The trend in GHG emissions from **fuel combustion** showed notable increase in transport (+23.7 per cent) while considerable decreases were observed in all other energy uses and GHG emitting sectors.

24. Emissions of CO_2 from **manufacturing industries** decreased by 15.5 per cent between 1990 and 2007 mainly due to efficiency improvements and structural change in Germany following reunification. The emissions have since stabilised despite increases in gross value added.

25. Emissions from **energy use in households and services** fluctuate around a rather stable emission level. The emissions were 0.7 per cent lower in 2006 compared to 1990 although the number of

[5] The study 'Quantification of the effects on GHG emissions of policies and measures' is scheduled to be completed in January 2010. It will be made available at <http://ec.europa.eu/environment/climat/studies.htm>.

[6] <http://ec.europa.eu/environment/climat/climate_action.htm>.

dwellings increased by 19 per cent during the period. The decoupling results from energy efficiency improvements due to thermal insulation, fuel switching and extended district heating.

26. The main driving force for the rapidly rising emissions from **transport** is the increasing use of road transport. Car ownership and car use are growing, as well as freight kilometres with an increasing share of trucks. The trend is to some extent offset by improved fuel efficiency of cars. Freight road transport is projected to increase more than passenger road transport. The market share for freight road transport is almost 80 per cent, and this share has grown steadily.

27. Important PaMs for energy supply include the restructuring of energy markets that has developed gradually over the last decades. The ERT noted that this restructuring, in combination with the EU ETS and increased shares of RES and combined heat and power (CHP) in electricity production (as a result of the implementation of the two directives in question), may lead to substantial reductions in GHG emissions.

28. The ERT noted that Community policies have been strengthened regarding binding national targets for **renewable energy sources** since the publication of the NC4: the new directive is estimated to achieve a 20 per cent share of RES in total primary energy supply by 2020, thus doubling the RES share. The directive also contains a binding target of 10 per cent RES for the transport sector and sets out sustainability criteria for biofuels. The ERT noted that this directive is more ambitious and stringent compared to the earlier EU renewable strategy.

29. The measures that need to be taken by member States to meet the requirements of the RES Directive interact strongly with the measures that need to be taken as a result of the lowering of the cap in the EU ETS and those that need to be taken by member States in meeting their respective emission reduction commitments outside the EU ETS. The ERT noted that the 2008 Climate Change and Energy Package aims to ensure coordination of these activities at EU level with the aim of increasing overall cost and environmental effectiveness.

30. The 2002 **Directive on Renewable Electricity** (RES-E) includes an indicative target of 21 per cent market share by 2010. During 1990–2006, the share of renewable electricity increased in the EU-15 from 12.9 to 15.2 per cent of the final electricity consumption. The NC4 states that the Party was not on track to meet its domestic target, projecting an 18–19 per cent share by 2010. In the NC4 the emission reduction potential of the RES-E Directive is estimated *ex-ante* at 100–125 Mt CO_2 equivalents in 2010. The European Commission still expects all member States to bring forward policies in order to meet their national indicative target. Given the new targets established for 2020, the 2010 targets could be interpreted as necessary minimum interim sectoral targets.

31. The RES Directive sets indicative targets for the proportion of RES for each member State, although the ERT noted that the effectiveness of the directive will depend largely on the details of its implementation. Member States have to transpose the directive into national law and are responsible for bringing forward concrete measures (e.g. green certificate schemes, feed-in tariffs, and other forms of subsidies) that will help to promote RES. In practice, a variety of measures have been used by different member States.

32. However, the ERT team notes that even if the **RES potential were to be realized under a fixed EU ETS cap**, it may not necessarily achieve additional emission reductions during the trading period. Instead the RES-E Directive and other policies addressing emissions from energy installations within the EU-ETS sector would primarily enhance the action taken within the energy sector. Therefore, energy PaMs that interact with the EU ETS may indirectly affect the prices of allowances downwards, depending on how additional GHG reductions are handled. Similar considerations are relevant when considering PaMs addressing energy efficiency and cogeneration. During the review, the Party clarified

that, according to preliminary results of an ex-post analysis (see para. 19), as in future years the cap for installations under the EU ETS sector will become more stringent, this will have a positive impact on the deployment of RES, as electricity production from RES will become more competitive.

33. Implementation of the **Directive on Cogeneration** may also help to reduce GHG emissions. The 1997 EC strategy to promote CHP set an overall indicative target of doubling the EU-15 share of electricity production from CHP, from 9 per cent in 1994 to 18 per cent in 2010. The ERT noted that meeting this target will be ambitious, as the EU-15 share of CHP generation in 2006 was still only 10.1 per cent. According to the NC4, the directive on the promotion of CHP and high efficiency cogeneration is estimated to have a (technical) emissions reduction potential of between 24–42 Mt CO_2 equivalent by 2010. The ERT noted that the CHP directive itself does not impose any particular concrete measures on member States or on electricity producers. However, the Commission has announced new initiatives in order to facilitate cogeneration as part of the recent EU Energy Efficiency Package (see para. 34 below).

34. On energy demand management, a number of steps have been taken since the publication of the NC4. In 2007, the EC established a voluntary target of improving **energy efficiency** by 20 per cent in 2020, mainly based on actions outlined in the Action Plan on Energy Efficiency from 2006, plus an additional Energy Efficiency Package was launched in 2008. The Community and its member States have been considering its implementation since.

35. The EC estimates that the implementation of existing EU directives will lead to **energy savings** of 13 per cent, if properly implemented by member States. These include Directives on Energy Services, Energy-Using Products (the Ecodesign Directive), Energy Performance of Buildings and voluntary initiatives such as the Motor Challenge and Energy Star programmes. The ERT noted that this implementation will require comprehensive action both at the Community and member State level. Also, support from industry and stakeholders will be important. For example, the voluntary Motor Challenge programme does not imply that the average efficiency of European electric motors will reach an ambitious level.

36. The European Commission has announced three initiatives, namely a follow up to the Energy Efficiency Action Plans (both at EC and at member State level, as required by the Directive on Energy Services), financing of energy efficiency projects, and the Energy Efficiency Package. The ERT found these initiatives promising and encouraged the Party to closely monitor the full implementation by the EC institutions and member States.

3. Policies and measures in the transport sector

37. In the transport sector, the **promotion of more fuel efficient cars** and the introduction of **biofuels** have been the most important EC policies. The ERT noted that the PaMs in this sector have been strengthened when compared with the status reported in the NC3, but more could be done, especially in the area of freight transport.

38. A key instrument to reduce emissions from passenger cars is the **voluntary commitment by European, Japanese and Korean car manufacturers** to reduce average specific CO_2 emissions from newly registered passenger cars. The target value of 140 g CO_2/km was to be met by 2008 for the European manufacturers and by 2009 for the Japanese and Korean manufacturers. According to a 2008 progress report by the Commission, this target was probably not met in time by all manufacturers. In 2007, the average emissions from new passenger cars were 157 g CO_2/km, which is 17 per cent below the 1995 level, and 12 per cent above the target value of 140 g CO_2/km for 2008/2009. Therefore, a new EU regulation on **CO_2 emissions from cars** was adopted in 2008 setting, amongst other, mandatory

standards on the average emissions from new passenger cars and light duty trucks starting in 2012 and a final target of 95 g CO_2/km for the year 2020.

39. The **Biofuels Directive** is described as one component of the European policy to safeguard energy supplies and promote sustainability. The directive, accompanied by the Energy Taxation Directive, sets targets for the biofuel share in the EU at 2 per cent by 2005 and 5.75 per cent by 2010, with member States setting their own indicative targets. In 2006, the share of biofuels was 1.8 per cent in EU-27. A **new Renewable Energy Directive** was adopted in 2008 and will enter into force in 2010. The new directive sets a mandatory target that is to be met in all member States: 10 per cent RES are to be used in all member States' transport sector by 2020. Biofuels used to meet this target have to fulfil certain sustainability criteria. In addition, the revised EU **Fuel Quality Directive** includes targets for reducing GHG emissions associated with the production of petrol and diesel. The ERT noted that this policy may interact with the EU ETS as the refineries are part of the EU ETS sector.

40. The **EU directive on charging of heavy goods vehicles for the use of certain infrastructures** (Eurovignette Directive) is under revision in order to allow the internalization of external costs for freight transport. According to NC4, this directive has a reduction potential of 40–60 Mt CO_2 after 2010. Additional EU-wide PaMs focus on programmes that would encourage modal shifts (e.g. the Marco Polo programme). The EU policies addressing **heavy goods transport** are not listed by member States as PaMs that contribute substantially to reductions of GHG emissions. **Aviation** will be part of EU ETS in 2012; 183 Mt CO_2 is estimated to be saved per year on the flights covered by the scheme by 2020 compared with business as usual.

4. Policies and measures in other sectors

41. In 2007 emissions from non-energy sectors accounted for 20.2 per cent of total GHG emissions excluding LULUCF. Between 1990 and 2007, GHG emissions from industrial processes (including solvent and other product use), agriculture and waste decreased by 16.1 per cent. Removals of GHG from LULUCF increased by 19.8 per cent between 1990 and 2007.

42. **Industrial processes** emissions mainly result from production of mineral products, chemical industry, metal production and consumption of halocarbons and sulphur hexafluoride (SF_6). Emissions from industrial processes decreased by 10.8 per cent between 1990 and 2007, mainly due to a decrease in N_2O emissions from chemical industry, HFCs from production of halocarbons and SF_6, and PFCs from metal production. The EC provided a list of sectoral PaMs. Implementation of the Integrated Pollution Prevention and Control (IPPC) Directive, which includes the promotion of energy efficiency and control of certain GHGs, has reduced emissions from industrial processes. Emissions of F-gases increased despite the substantial decrease in HFCs emissions from production of halocarbons. The main reason was the large increase of emissions from consumption of HFCs substituting ozone-depleting substances under the Montreal Protocol. A two-pillar approach was adopted by the EC: regulation on containment, recovery, training and certification, prohibitions, use bans and reporting of F-gases; and a directive on mobile air conditioning in passenger vehicles. The two instruments came into force on 4 July 2007.

43. The reduction of GHG emissions in **Agriculture** by 11.32 per cent reflects a decrease in CH_4 emissions from enteric fermentation by 10.0 per cent and a decrease in N_2O emissions from agricultural soils by 15.4 per cent. These reductions result from a decrease in use of fertilizers and capped agricultural production under the Common Agricultural Policy adopted in 1999. The NC4 provides mitigation potentials for future agriculture policies.

44. CO_2 removals from the **Forestry** sector increased by 17.4 per cent between 1990 and 2007. The EC introduced various sectoral PaMs, including the EU Forestry Strategy, the new Rural Development Regulation (which provides a basis for a fuller integration of forestry into rural

development), measures to support the protection of forests against fires and atmospheric pollution, and the Integrated Sink Enhancement Project, which resulted in the mentioned increase in removals from forests. The NC4 also provides mitigation potential of the forestry strategy until 2010.

45. Emissions from the **Waste** sector decreased by 38.8 per cent mainly due to a decrease in CH_4 emissions from solid waste disposal on land. The EC provided detailed information on PaMs for various waste related legislation, which is implemented at member State level, including the Landfill Directive, Directive on Waste Packaging, Directive on End-of-Life Vehicles, Directives on Waste Electrical and Electronic Equipment and Incineration of Waste. The NC4 provides estimates of the mitigation effects of the Landfill Directive and the Directive on Waste Packaging until 2010.

C. Projections and the total effect of policies and measures

1. Projections

46. The GHG emission projections provided by the EC in the NC4 include a 'with measures' and a 'with additional measures' scenario until 2010. It is stated that the emissions data have not been calibrated to the emissions reported in the inventory. Projections under the 'with measures' scenario are presented on a sectoral basis (although the sectoral categories are not identical to those used in the PaMs section), and on a gas-by-gas basis for the following GHGs: CO_2, CH_4, N_2O and F-gases. In addition, projections are provided in an aggregated format for each sector as well as for the EC total, using global warming potential (GWP) values. Emission projections related to fuel sold to ships and aircraft engaged in international transport were not reported separately. However, the ERT noted that the EC did not provide the following reporting elements required by the UNFCCC reporting guidelines: a 'with measures' projection, including currently implemented and adopted PaMs (para. 29) for 2015 and 2020, emission projections related to fuel sold to ships and aircraft engaged in international transport reported separately and not included in the totals (para. 36). The ERT recommends the EC to provide these reporting elements in its next communication and also suggests the reporting of the main differences in the assumptions, methods employed, and results between projections in the NC5 and those in the NC4. Table 4 and the figure below provide a summary of GHG emission projections for the EC.

47. The NC4 offers a comparison between the projections under a 'with measures' scenario, a 'with additional measures' scenario and a 'business as usual' (BaU) projection. It does not explain, however, what assumptions were used for the BaU projection and how this path was calculated. Nor are the methodology and assumptions used to produce the 'with measures' projections explained in detail; the report simply states that these are the aggregation of 23 member States projections. The ERT noted that the EC, as a supra-national entity, faces special difficulties in developing emissions projections and estimating expected effects of PaMs. However, the ERT encourages the EC to continue and scale up its efforts to create more transparent, comparable and complete information on the EU-wide emissions trends, while also producing longer term projections for 2015 and 2020.

Table 4. Summary of greenhouse gas emission projections for European Community

	Greenhouse gas emissions (Tg CO_2 eq per year)	Changes in relation to base year level (%)
Inventory data 1990[a]	4 232.9	–
Inventory data 2007[a]	4 052.1	–4.27
Kyoto Protocol base year[b]	4 265.5	–
Kyoto Protocol target[b]	3 924.3	–8
'With measures' projections for 2010[c]	4 109.0	–3.6
'With additional measures' projections for 2010[c]	3 939.0	–7.7

[a] *Data source*: European Community's 2009 greenhouse gas (GHG) inventory submission; the emissions are without land use, land-use change and forestry (LULUCF).
[b] Based on the initial review report contained in document FCCC/2007/IRR/EC.
[c] *Data sources*: European Environmental Agency (EEA) GHG data viewer.[7]

48. During the review, the Party provided updated information on projections from the European Environmental Agency (EEA) GHG data viewer[7]. According to this website and the EEA report,[8] aggregate projections based on existing domestic PaMs show that GHG emissions of the EU-15 will be 3.6 per cent below base-year levels by 2010. When including the use of the Kyoto Protocol mechanisms by member State governments (3 per cent) and total removal resulting from LULUCF activities under Article 3, paragraphs 3 and 4, (1.3 per cent), the Party expects to reduce its emissions by 8.0 per cent by 2010, thus reaching its target under the Kyoto Protocol. The implementation of additional PaMs is expected to result in additional reductions of 3.3 per cent.

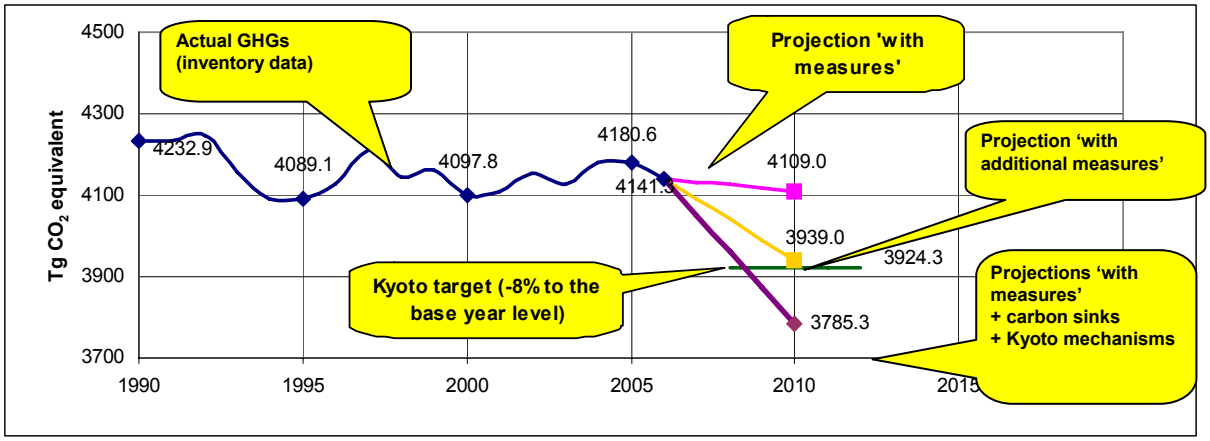
49. Also, the NC4 foresees the "closing of the Kyoto gap" by the use of carbon sinks, additional measures and Kyoto Protocol mechanisms. Information gathered from the member States shows that allowances for more than 100 Tg CO_2 eq per year may be acquired by the member States during the commitment period, and up to EUR 2,730 million have been allocated for this purpose.

50. The ERT noted that Parties are recommended to include projections on a quantitative basis for the years 2005, 2010, 2015 and 2020. Also bearing in mind the EU's more ambitious target for 2020 (see para 19), it would greatly enhance the quality and comparability of the future reports to include these projections. It is also strongly advisable to provide more detailed information on the assumptions and methods used to calculate the different pathways, notably the 'without measures' and the 'with measures' projections.

51. The EEA report provides projections for the period 2005–2020; these suggest that the overall EU-27 GHG emissions by 2020 will be 12 per cent below 1990 levels. However, these projections do not account for the effects of the PaMs included in the 2008 Climate Change and Energy Package. These projections, however, do not form part of the NC4 and there is no information on their compatibility and comparability with the findings in the NC4 in general.

[7] <http://dataservice.eea.europa.eu/PivotApp/pivot.aspx?pivotid=455>.
[8] EEA report No 5/2008. *Greenhouse gas emission trends and projections in Europe 2008.*

Greenhouse gas emission projections



Data sources: EEA GHG data viewer and EEA Report 5/2008.

2. Total effect of policies and measures

52. In the NC4, the EC presents, in graphical format only, the total effect of six key policy areas, including RES, the EU Landfill Directive, CHP, building standards, energy efficient appliances, and the ACEA agreement. The NC4 states that the PaMs in these key areas (including additional PaMs) are projected to deliver reductions of about 284 Mt CO_2 eq; of this, over one third comes from increased use of RES. The ERT noted, however, that these estimates for aggregated savings for existing PaMs were based on information from only 12 of the 15 member States and savings for additional PaMs were based on information from only 4 of the 15 member States.

53. The NC4 also presents relevant information on factors and activities for each sector for the years 1990 to 2010. However, the ERT noted that the EC did not provide the following reporting elements required by the UNFCCC reporting guidelines: the estimated and expected total effect of implemented and adopted PaMs for the EC-15 (para. 39), an estimate of the total effect of its PaMs, in accordance with the 'with measures' definition, compared with a situation without such PaMs, presented in terms of GHG emissions avoided or sequestered, by gas (on a CO_2 eq basis) in 1995 and 2000 (para. 40), relevant information on factors and activities for each sector for the years 1990 to 2020 (para. 48). Table 5 provides an overview of the total effect of PaMs as reported by the EC.

Table 5. Projected effects of planned, implemented and adopted policies and measures in 2010

Sector	Effect of implemented and adopted measures (Tg CO_2 eq)	Relative value (% of base year emissions)	Effect of planned measures (Tg CO_2 eq)	Relative value (% of base year emissions)
Energy (without CO_2 from transport)	NA	NA	NA	NA
Transport – CO_2	NA	NA	NA	NA
Industrial processes	NA	NA	NA	NA
Agriculture	NA	NA	NA	NA
Land-use change and forestry	57.5	1.3	NA	NA
Waste management	NA	NA	NA	NA
Total	**NA**	**NA**	**140.9**	**3.3**

Data source: NC4 and RDP.
Abbreviation: NA = not available.
Note: The total effect of implemented and adopted policies and measures is defined as the difference between the 'with measures' and 'with additional measures' scenarios.

54. According to the newest EEA GHG data viewer estimates provided by the Party, under the 'with measures' scenario, the EC's emissions would be 3.6 per cent below the base year in 2010 and 7.7 per cent below under the 'with additional measures' scenario. Though the estimated effect of adopted policies and additional policies is provided for six key sectors (principally energy, waste and transport) (reduction by 284 Mt CO_2 eq), the report does not provide a comprehensive picture of the total impact of PaMs, and the ratio between adopted and additional policies is not clarified. The EEA report contains an analysis on reductions by domestic, existing and additional measures, but due to a lack of information on methodology, compatibility with the inventory, etc. the ERT was unable to compare this analysis with the results of NC4 in general.

55. The ERT recommends the EC to follow the UNFCCC reporting guidelines more closely and provide an estimate of the total effect of its policies and measures, compared to a situation without such policies and measures. Although NC4 figures 1, 9 and 15 do contain a BaU pathway, without the accurate values and the explanation of the methodology, the ERT cannot give due consideration while looking for an estimate of the total impact of PaMs. The ERT encourages the EC to provide more details on the key policy areas and the total impact thereof when the results of its ex-post analysis (see para. 19) become available. The ERT reminds the Party that when other models or approaches are used, sufficient information should be reported in the national communication to allow the readers to obtain a basic understanding of such models and/or approaches.

D. Vulnerability assessment, climate change impacts and adaptation measures

56. In its NC4, the EC has provided the required information on the expected impacts of climate change in energy; health; agriculture; ecosystems and forestry; water resources, supply and quality; floods; drought. The ERT noted that the EC did not provide an outline of the action taken to implement Article 4, paragraph 1(b) and (e), of the Convention with regard to adaptation.[9] The NC4 reports that no large-scale studies on adaptation have been undertaken since the publication of the NC3. However, the Party provided some more recent documents during the review, including the EU White Paper on Adaptation[10] that indicates the EU approach to adaptation.

57. Table 6 summarizes the updated information on vulnerability to climate change (as presented in the NC4) and adaptation (as presented in the EU White Paper on Adaptation).

58. Knowledge of climate change impacts and vulnerability has grown in the EC. However, the ERT noted that an integrated view of the net impacts across sectors and across the region is currently lacking, and this may limit coherent and co-ordinated adaptation planning and responses. Nonetheless, the ERT noted the progress the EC has made on adaptation-related activities presented in the NC4 and the White Paper. Substantive efforts are under way to ensure more complete integration of adaptation responses into European climate policy. Adaptation is considered to be an ongoing process.

59. The ERT noted that reporting that attempts to integrate the assessment of risk across the EC, and that quantifies socio-economically relevant outcomes such as for regional food, water and energy security would greatly enhance the value of future national communications.

[9] See paragraph 49 of the UNFCCC reporting guidelines.
[10] <http://ec.europa.eu/environment/climat/adaptation/>.

Table 6. Summary of information on vulnerability and adaptation to climate change

Vulnerability area	Examples / comments / adaptation measures reported
Sea level rise	***Vulnerability:*** Up to 68 million people could be affected by sea level changes due to flooding, coastal erosion and loss of flat coastal regions. ***Adaptation:*** More strategic and long-term approach to spatial planning, including policies relating to transport, regional development, industry and tourism.
Energy	***Vulnerability:*** Seasonal temperature changes will have mixed effects on energy use, with decreases in winter energy demand for heating offset by increases in summer energy use for cooling; the pattern of changes in energy use will vary across Europe, with northern latitudes likely to experience more benefits. Hydropower production could increase by 5 per cent or more in Northern Europe and decrease by 25 per cent or more in Southern Europe. ***Adaptation actions:*** Consider climate change impacts in the Strategic Energy Review process; explore the possibility of making climate impact assessment a condition for public and private investment; assess the feasibility of incorporating climate impacts into construction standards, such as Eurocodes; develop guidelines by 2011 to ensure that climate impacts are taken into account in the Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA) Directives.
Health	***Vulnerability:*** More frequent and intense heat waves are projected during the 21st century; mortality due to heat is expected to increase, but rising temperatures will reduce human mortality in winter; by 2080, it is likely that much of Europe will no longer experience cold winters; both the scale and location of the population at risk of adverse health impacts of climate change is likely to increase; vector borne disease incidence increased in the Baltic region and central Europe between 1980 and 1995 and remain high; climate variability is shown to contribute to disease outbreaks. ***Adaptation:*** Develop guidelines and surveillance mechanisms on the health impacts of climate change by 2011; step up existing animal disease surveillance and control systems; assess the impacts and adaptation policies on employment and on the well-being of vulnerable social groups.
Agriculture	***Vulnerability:*** Agricultural activities in mid and Northern Europe are expected to benefit from warming and higher CO_2, leading to increased crop yields if water supply is maintained; in Southern Europe, agricultural activities are expected to be constrained by increased water stress, especially in hotter and dryer areas; poor harvests could become more common due increased climate variability (droughts, floods, storms, hail); crops with strong seasonal dependencies may be particularly susceptible; direct yield gain could be off-set by increasing losses due to pests and other diseases. ***Adaptation:*** Integrate adaptation into the 3 strands of rural development and give adequate support for sustainable production; examine the capacity of the Farm Advisory System to reinforce training, knowledge and adoption of new technologies that facilitate adaptation.
Ecosystems and forestry	***Vulnerability:*** Mixed impacts for wild species are expected, warmer winters may increase survival rate of many birds while vegetation growth may be enhanced; significant adverse impacts are expected especially for sensitive species (alpine species); adverse impacts are expected due to water shortages combined with greater summer peak temperatures. ***Adaptation****:* Explore potential to improve policies and develop measures which address biodiversity loss and climate change in an integrated manner to fully exploit co-benefits and avoid negative feedback of ecosystems ; develop guidelines by the end of 2009 to ensure that the River Basin Management Plans (RBMP) are climate-proofed.
Water resources, water supply and water quality	***Vulnerability:*** Precipitation is projected to increase, but accompanied by greater seasonal variations with strong regional differences between northern and southern countries; increased rainfall and annual river discharges expected in Northern Europe with the opposite expected in Southern Europe leading to greater water limitations; greater rainfall variability is expected to have adverse impacts on reliable power generation through limiting hydroelectric plant power production and cooling of other power plants in Southern Europe. ***Adaptation:*** Consider measures for adaptation and water management in rural development national strategies and programmes for 2007-2013; assess the need for further measures to enhance water efficiency in agriculture, households and buildings.
Drought	***Vulnerability:*** Southern Europe is expected to experience drought with projected decrease of up to 1 per cent per decade in annual precipitation and 5 per cent per decade possible in summer. ***Adaptation:*** Options for boosting the water storage capacity of ecosystems to increase drought resilience and reduce flood risks should be evaluated.
Floods	***Vulnerability:*** Annual flooding has increased during 1975–2001; flash floods are expected to increase in frequency and magnitude; with a 1.4°C temperature increase coastal floods are projected to increase the number of people at risk by 10 million, 3.2°C will place an additional 80 million people at risk. ***Adaptation:*** Take into account climate change in the implementation of the Floods Directive; develop EU-wide early warning systems for flood and forest fires.

E. Financial resources and transfer of technology

1. Financial resources

60. In its NC4, the EC has provided details of measures taken to give effect to its commitments under Article 4, paragraphs 3, 4 and 5, of the Convention. It indicates the 'new and additional' financial resources it has provided pursuant to Article 4, paragraph 3. The EC has also provided some information on the assistance it has made available to developing country Parties that are particularly vulnerable to the adverse effects of climate change. Furthermore, the Party has provided information on other financial resources related to the implementation of the Convention provided through bilateral, regional and other multilateral channels. However, the ERT noted that the EC did not provide clarification on how it has determined such resources as being 'new and additional' in its NC4.

61. Table 7 summarizes information on financial resources and technology transfer.

Table 7. Summary of information on financial resources and technology transfer

Official development assistance (ODA)	Total up to EUR 30 billion in 2003, providing more than half of total global ODA. Announcement/communication on further increasing ODA to 0.39 per cent of GNP by 2006 and 0.7 per cent by 2015.
Climate-related aid in bilateral ODA	Nearly 200 projects with total budget of EUR 300 million have been identified as containing climate change relevant elements.
Climate-related support programmes	Some data are provided in Table 22 of the NC4.
Contributions to GEF (USD million)	EC, as a whole, is not assumed to be a legal Party to GEF and no direct data related to financial contribution to GEF was reported. The data may be available from the NC4s of individual EC member States.
Pledge for third GEF replenishment	EC, as a whole, is not assumed to be a legal Party to GEF and no direct data related to financial contribution to GEF was reported. The data may be available from the NC4s of individual EC member States.
Activities implemented jointly	NA
JI and CDM under the Kyoto Protocol	In 2004, the European Investment Bank (EIB), as the European Union's long-term lending institution, and the World Bank signed a Memorandum of Understanding (MoU) in which the two organizations agreed to cooperate in the development of a Pan-European Carbon Fund (PECF). The PECF would complement carbon trading within the EU ETS, with purchases of GHG emission reductions through CDM and JI arrangements.
Other (bilateral/multilateral)	Some financial contribution has been made to multilateral institutes/organizations in the field of climate change. The data presented in the NC4 are not directed only to climate change when they are in such budget headings as economic infrastructure and service, agriculture, forestry, and fishing, general environmental protection, and water supply and sanitation; the totals (in million EUR) are 691.12, 639.19, and 1,570.85 in 2001, 2002, and 2003, respectively.

Abbreviations: CDM = clean development mechanism, GEF = Global Environment Facility, JI = joint implementation, NA = not available.

62. The EU announced at the Monterrey Conference in March 2002 its commitment to increase its official development assistance (ODA) from the current level of 0.33 per cent of gross national product (GNP) to 0.39 per cent until 2006, which amounts to an extra 7 billion EUR per year. In 2005, the Commission published a communication aimed at accelerating progress towards this target and to the United Nations target for ODA of 0.7 per cent of gross national income (GNI) by 2015. In addition, the EU Action Plan for Climate Change, in the context of development cooperation, reaffirms the commitment made in Bonn in July 2001 for the EU to provide USD 369 million annually for climate change funding for developing countries by 2005.

63. Although EU Action Plan for Climate Change in the context of development cooperation (NC4, pp. 122) has as one of its strategic objectives to increase visibility of EU climate change programmes and projects, a rigorous system of identification of projects is not in place. Consequently, the data presented in table 22 (NC4, pp 113–120) do not represent an exhaustive list of climate change related projects.

64. The ERT encourages EC to install a rigorous system of identification of projects with a view to presenting better information on the list of climate change projects in its next communication.

2. Transfer of technology

65. In its NC4, the EC has provided details of measures related to the promotion, facilitation and financing of the transfer of, or access to, environmentally sound technologies. It also reports activities related to technology transfer, and its activities for financing access by developing countries to 'hard' or 'soft' environmentally sound technologies. Furthermore, the EC has reported on steps taken by governments to promote, facilitate and finance transfer of technology, and to support development and enhancement of endogenous capacities and technologies of developing countries. However, the ERT noted that the Party did not make a clear distinction between activities undertaken by the public sector and those undertaken by the private sector (para. 54). The ERT recommends that the EC provide a clear distinction between activities undertaken by the public sector and those undertaken by the private sector (para. 54) in the context of technology transfer under UNFCCC in its next communication.

F. Research and systematic observation

66. The EC has provided information on its actions relating to research and systematic observation, and a summary of information on activities under the Global Climate Observing System (GCOS). In addition, the EC has submitted its second report on Community actions regarding global climate observing systems in November 2008.[11] The EC notes that competency for direct GCOS participation resides with individual members States. The EC has however provided a summary of information on proposed future developments in GCOS activities, including the establishment of the Global Earth Observation System of Systems (GEOSS). The NC4 also details action taken to support related capacity-building in developing countries. Some additional documents developed since the publication of the NC4 that were provided by the Party during the review**,** indicate that the EC is taking action regarding global climate observing systems (GLOBCOVER project).[12] Research at the EC level has provided a significant contribution to the IPCC assessments.

67. Through the Framework Programmes, the EC has supported a wide spectrum of projects related to research on climate science, the impacts of climate change, socio-economic analysis, mitigation and adaptation technologies. The budget for the thematic area that covers climate change in the 7th Framework Programme is EUR 2,535 million (2007–2013). The ERT noted a significant number of research projects funded by the European Commission on adaptation in developing countries. The NC4 also details the future developments in the field of systematic and global climate observations.

68. The ERT noted the substantive investment by the EC in research and systematic observation.

G. Education, training and public awareness

69. In the NC4, the EC has provided information on its actions relating to education, training and public awareness, as required by the UNFCCC reporting guidelines (para. 65).

70. The objectives of the Community's information policy (CIP) in relation to environment and climate change are listed. Under the CIP, the following means of increasing public awareness are used: an information centre, an Internet site, a publication programme, cooperation with the press and audiovisual sectors, cooperation with business, NGOs and networks, and conferences. A list of financed projects to raise awareness is also provided.

[11] <http://ec.europa.eu/environment/climat/pdf/sec_2008_2927.pdf>.
[12] Report to the UNFCCC on European Community actions regarding global climate observing systems.

71. The EC emphasized that the information it provides to the public is focused on raising public awareness, while most education and training activities are conducted at member State level. The EU member States support programmes have been undertaken in the context of Article 6 of the Convention. The NC4 reports the endorsement of the New Delhi Work Programme. Financial contributions of some member States (France and the United Kingdom of Great Britain and Northern Ireland) of EUR 100,000 to support the development of an Internet-based Information Clearing House are also reported.

72. Public participation is implemented through a number of conference events. General information on updates and outcomes of such programmes and projects are provided through the relevant organizations' Internet sites.

III. Evaluation of information contained in the report demonstrating progress and of supplementary information under Article 7, paragraph 2, of the Kyoto Protocol

A. Information contained in the report demonstrating progress

73. The RDP of the EC includes four chapters, which contain all of the information required by decisions 22/CP.7 and 25/CP.8. The ERT found the information contained in the RDP to be consistent with that provided in the NC4.

74. The EC launched the ECCP and adopted a series of Community-wide policies and measures which are implemented by all member States to meet the provisions of Kyoto Protocol. The legal instruments include binding regulations, directives and decisions, as well as non-binding recommendations and options. The Commission has the mandate to take legal action against member States that have failed to fulfil an obligation. The most notable measure is the EU ETS which provides cost-effective means of mitigation to industries and creates incentives for emission reduction projects outside the EU.

75. The EC adopted various policies and measures to tackle climate change that go beyond the Kyoto Protocol targets. Under the EU burden-sharing agreement, the member States made significant progress in achieving their individual targets under the Kyoto Protocol. Nonetheless, according to the RDP, additional policies and measures would be needed to meet the reduction targets of some member States. During the review, the Party provided updated information on its progress made, indicating that the Kyoto Protocol target will be met when accounting for emission reductions from existing domestic policies and measures, use of carbon sinks and use of Kyoto Protocol mechanisms are fully realized.

76. Eleven out of 27 EU member States plan to use the Kyoto Protocol mechanisms to reach their Kyoto Protocol target. The NC4 contains information on the projected use of such mechanisms and LULUCF activities. The use of the Clean Development Mechanism (CDM) and Joint Implementation (JI) is estimated to reduce emissions by a further 3.0 per cent of total GHG emissions; LULUCF activities are estimated to result in a further 1.4 per cent reduction. If all the projected reductions from domestic policies and measures, LULUCF activities and Kyoto Protocol mechanisms were achieved, the EU-15 could reach a level of emissions 11.3 per cent below the base-year emissions, therefore surpassing its 8 per cent reduction target by 3.3 per cent. The EC expects to see Kyoto Protocol mechanisms resulting in 126.5 Mt CO_2 eq per year between 2008 and 2012. The total amount of CO_2 removals resulting from use of sinks projected between 2008 and 2012 is 57.5 Mt CO_2 per year for the EU−15.

B. Supplementary information under Article 7, paragraph 2, of the Kyoto Protocol

77. The EC has provided most of the supplementary information under Article 7, paragraph 2, of the Kyoto Protocol in its NC4 and RDP. This information reflects the steps taken by the Party to implement

the relevant provisions of the Kyoto Protocol. The supplementary information is placed in different sections of the NC4 and RDP. Table 8 provides references to the NC4 and RDP chapters in which supplementary information is provided.

Table 8. Overview of supplementary information under Article 7, paragraph 2, of the Kyoto Protocol

Supplementary information	Reference
Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17	RDP chapter 3, NC4 chapter 3
Policies and measures in accordance with Article 2	RDP chapters 1 and 2, NC4 chapter 3
Domestic and regional programmes and/or legislative arrangements and enforcement and administrative procedures	RDP chapter A.1
Information under Article 10	RDP chapter 4, NC4 chapter 3
Financial resources	RDP chapter 4, NC4 chapter 6

Abbreviations: CDM = clean development mechanism, GEF = Global Environment Facility, JI = joint implementation, NA = not available.

78. The ERT noted that the EC did not report the following elements of the supplementary information required under Article 7, paragraph 2, of the Kyoto Protocol: a description of the national registry; information on provisions to make legislative arrangements and enforcement and administrative procedures, established pursuant to the implementation of the Kyoto Protocol publicly accessible; and information on financial contributions to the Adaptation fund. However, the Party provided additional information on its national registry during the review. The ERT recommends that the EC provide complete supplementary information under Article 7, paragraph 2, in its future communications.

79. The EC is not a member of the International Civil Aviation Organization (ICAO) or the International Maritime Organization (IMO) and, therefore, has no obligations to report on its steps taken to address emissions from aviation and maritime bunker fuels.

IV. Conclusions

80. The EC has adopted an effective energy and climate change policy. If all the projected reductions from domestic policies and measures, LULUCF activities and Kyoto Protocol mechanisms are achieved, the EU-15 could reach a level of emissions 11.3 per cent below the base-year emissions, therefore surpassing its 8 per cent reduction target by 3.3 per cent. Furthermore, the 2008 Climate Change and Energy Package sets clear targets for the EU-27 to develop towards 2020 by reducing GHG emissions by at least 20 per cent below 1990 levels, which could be scaled up to as much as 30 per cent under a new global climate change agreement if other developed countries make comparable efforts, and sets parallel targets for energy efficiency and renewable energy sources.

81. In its NC4, the EC provided a description of its national circumstances, the GHG emission trends and the effects of policies and measures. The ERT noted that main drivers for historic emission trends are increased economic activity, rapid growth in the transport sector, and annual variation in precipitation and winter temperatures (number of heating degree days). However, the energy intensity of the EC economy has constantly been reduced, and these efficiency improvements have contributed to the reduction in GHG emissions.

82. Since the publication of the NC4, there has been a substantial development in the EC's strategic basis for climate policy. First of all, the establishment of an EU-wide emission trading system (EU ETS) covering more than 40 per cent of total GHG emissions. Second, policies have been established in the field of renewable energy and energy efficiency. These EU-wide policies and especially their implementation at the member State level – which in some cases has been lagging behind – may create a good basis for further reductions. The most important milestone on climate change within the EU-27 is

the adoption of the 2008 Climate Change and Energy Package, setting targets for 2020, including a 20 per cent reduction in energy consumption, a 20 per cent share of renewable energy, and at least a 20 per cent reduction in total GHG emissions below 1990 levels which could be scaled up to as much as 30 per cent under a new global climate change agreement if other developed countries make comparable efforts.

83. In the course of the review, the ERT made a number of recommendations relating to the completeness and transparency of the EC's reporting under the Convention and its Kyoto Protocol. The key recommendations[13] are that EC in its next communication:

(a) Provide more transparent projections by making clear distinctions between the EU-15 and the EU-27;

(b) Provide an estimate of the total effect of its policies and measures, compared to a situation without such policies and measures;

(c) Provide further reporting on emission trading, as the EU ETS is set at the centre of the EU-wide climate policy, and as experience has been gathered already from the first trading periods;

(d) Provide more information on the interaction of PaMs, in particular with the EU ETS;

(e) Provide a clear distinction between activities undertaken by the public sector and those undertaken by the private sector in the context of technology transfer;

(f) Provide complete supplementary information under Article 7, paragraph 2, of the Kyoto Protocol.

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

Annex

Documents and information used during the review

A. Reference documents

"Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications". FCCC/CP/1999/7. Available at <http://unfccc.int/resource/docs/cop5/07.pdf>.

"Guidelines for the preparation of 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>.

FCCC/IDR.3/EC. Report on the in-depth review of the third national communication of the EC. Available at < http://unfccc.int/resource/docs/2005/idr/eng/ec03.pdf>.

FCCC/SBI/2006/INF.2. Synthesis of reports demonstrating progress in accordance with Article 3, paragraph 2, of the Kyoto Protocol. Available at <http://unfccc.int/resource/docs/2006/sbi/eng/inf02.pdf>.

FCCC/SBI/2007/INF.6. Compilation and synthesis of fourth national communications. Available at <http://unfccc.int/resource/docs/2007/sbi/eng/inf06.pdf>.

FCCC/SBI/2007/INF.7. Compilation and synthesis of supplementary information incorporated in fourth national communications submitted in accordance with Article 7, paragraph 2, of the Kyoto Protocol. Available at <http://unfccc.int/resource/docs/2007/sbi/eng/inf07.pdf>.

FCCC/ARR/2007/EC. Report of the individual review of the greenhouse gas inventory of EC submitted in 2006. Available at <http://unfccc.int/resource/docs/2008/arr/ec.pdf>.

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

Fourth national communication of EC. Available at <http://unfccc.int/resource/docs/natc/eunce4.pdf>.

Report demonstrating progress of EC. Available at <http://unfccc.int/resource/docs/dpr/eur1.pdf>.

2009 GHG inventory submission of EC. Available at <http://unfccc.int/files/national_reports/annex_i_ghg_inventories/national_inventories_submissions/application/zip/euc_2009_crf_27may.zip>.

B. Additional information provided by the Party

Responses to questions during the review were received from Ms. Agnieszka Janowska (DG Enviroment), including additional material on updated policies and measures, GHG projections, the national registry and recent climate policy developments in the EC. The following documents were also provided by the EC:

Commission of the European Communities. 1.4.2009. WHITE PAPER *Adapting to climate change: Towards a European framework for action.* Brussels, COM (2009) 147 final. Available at <http://ec.europa.eu/environment/climat/adaptation/>.

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