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COMMISSION OF THE EUROPEAN COMMUNITIES

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**COMMUNICATION FROM THE COMMISSION**

**FIFTH NATIONAL COMMUNICATION FROM THE EUROPEAN COMMUNITY  
UNDER THE UN FRAMEWORK CONVENTION ON CLIMATE CHANGE  
(UNFCCC)**

**(required under Article 12 of the United Nations Framework Convention on Climate  
Change)**

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## 1. EXECUTIVE SUMMARY

This is the 5<sup>th</sup> National Communication of the European Community (EC) under Article 12 of the United Nations Framework Convention on Climate Change (UNFCCC).

The EC and its 27 Member States, both individually and jointly, have been active on action against climate change now for a number of years. This action took a significant step forward in 2008, when an integrated and ambitious package of policies and measures to tackle energy and climate change was agreed for the EC. The package contains proposals covering: renewable energy, the emissions trading scheme (EU ETS), shared efforts of Member States to reduce emissions from sectors outside the EU ETS, and geological storage of carbon dioxide and sets specific targets for 2020. The package also contains a legally binding commitment to a reduction in greenhouse gas emissions of 20 % compared to 1990 levels by 2020. At the same time as the energy and climate change package was agreed, a regulation setting emission performance standards for new passenger cars was passed, and an obligation was agreed for fossil fuel suppliers to reduce greenhouse gas emissions from their entire fuel production chain. Other important recent developments are the inclusion of aviation activities into the EU ETS and a new directive to promote clean and energy-efficient road transport vehicles.

The EC is active in implementing policies and in continuously developing new ones to meet the changing circumstances. These policy developments are supported by research on the climate system, the understanding of the impacts of climate change and the identification of options for mitigation and adaptation. A set of projects focuses on technologies and strategies to reduce GHG emissions from specific economic sectors, such as energy and transport.

The policies already in place are having an effect, for example, since 2003, EU-27 per capita energy consumption has declined slowly. In the period 1990-2007, greenhouse gas emissions also decreased. Primary energy intensity has continued a downward trend since 1996. The use of renewable forms of energy has also increased substantially.

With existing measures and the use of Kyoto mechanisms the EU-15 is expected to meet its Kyoto target. Moving forward to 2020; with existing measures EU-15 projected emissions (excluding LULUCF<sup>1</sup>) are expected to plateau at around 2010 levels, whilst EU-27 emissions as a whole are expected to decrease slightly before returning to 2005 levels by 2020. However, with additional measures in place it is projected that EU-27 emissions will continue to decrease steadily to 2020, a reduction of 15 % compared to 1990 levels (although many Member State projections do not yet account for the full impact of the newly proposed climate policies).

Concerning LULUCF, data available from twenty Member States show that net removals generally increased over the period 1990 to 2007. However, the net uptake of carbon from LULUCF is expected to decrease rapidly up to 2020, returning to 1990 levels. Therefore, net GHG emissions from LULUCF may increase up to 2020.

While reducing emissions of greenhouse gases is of paramount importance to avoid dangerous climate change, the EC also recognises that some impacts are unavoidable because

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<sup>1</sup> Land-Use, Land-Use Change and Forestry

of past emissions. The EC has therefore undertaken research and taken action to understand these impacts, develop adaptation responses and assist developing countries in strengthening their capacity to cope with climate change. This action includes a more coordinated approach on policy development through a White Paper to define the policy direction of the EC in the forthcoming years.

As well as action domestically on climate change, the EC is strongly committed to assisting developing countries in the fight against poverty and the achievement of the UN Millennium Development Goals. Combating climate change forms an integral part of this agenda. In recent years specific cooperation on climate change has been strengthened significantly across a range of different frameworks. EC financial contributions related to climate change have steadily increased over the last few years.

The importance of public awareness and education and training on climate change is recognized by the EC. As part of the preparation of this Communication a 6 week consultation was held, inviting feedback from European organisations with a relationship to the climate change agenda. This feedback helped improve the presentation of certain information in this Communication. In addition, a range of views were given on the recent progress of EU climate policy. Whilst these were largely positive, particularly with respect to the recent Energy and Climate package, they also raised some concerns and indicated areas where stakeholders felt further action is needed.

Moving beyond 2012, the EC's agreed objective is to limit the average global temperature increase to less than 2°C compared to pre-industrial levels. If current emission trends continue, this threshold may already be crossed in 2050. Significant adaptation efforts will be required even if global average temperature increase is kept below 2°C.

The EC believes that there are three key challenges to achieving this: targets and actions; financing; and building an effective global carbon market. The post-2012 international agreement must be sufficiently ambitious and comprehensive, providing for comparable reductions by all developed countries, and including appropriate action by developing countries to limit emissions. If such an agreement is secured the EC has a firm commitment to increase its reduction target to 30 % from the binding 20 % target that is already in place.

## **1.1. National Circumstances**

### Population

- The EU now comprises 27 Member States following the accession of Bulgaria and Romania on 1st January 2007. The EU-27's population has continued to grow, at around 0.3 % per annum, a similar trend as in the 4<sup>th</sup> National Communication (NC).

### Economy

- EU-27 GDP has grown steadily (at around 2.3 % from 1995-2007), driven primarily by strong growth in the services sector.

### Energy

- Total primary and final energy consumption grew over the period from 1990-2007 (around 0.5 % per annum), although this has stabilized in recent years.
- The trend reported in the 4<sup>th</sup> NC of a shift in the primary fuel mix from coal to gas has continued. However, the rate of growth in renewables (driven largely by wind and biomass) has increased from 2002 onwards.
- The EU's dependence on imported fossil fuels has increased more rapidly in the period since the 4<sup>th</sup> NC, leading to concerns about energy security.

## Transport

- The rise in final energy consumption has been driven to a large extent by continued growth in demand for energy in transport.
- Both freight and passenger transport has continued to grow strongly since 1990. Growth in passenger transport is beginning to show a slight decoupling from economic growth.

## Land-use, agriculture and forestry

- In general the share of land used for agriculture has declined in most Member States by around 10 % from 1990 to 2005. Forested area (excluding other wooded land) has increased by around 8 % over the same period.

### 1.2. Inventory

- Total GHG emissions in the EU-27 (without LULUCF) decreased by 9.3 % from 1990 to 2007. In the EU-15 total GHG emissions decreased by 4.3 % over the same period. In both EU-27 and EU-15 the biggest relative change has been in the waste sector where the emissions of CH<sub>4</sub> from managed solid waste landfills decreased substantially.
- Averaged over the latest five years, EU-15 emissions (without LULUCF) were 3.1 % below their base year level.
- Emissions of total greenhouse gases decreased by 1.2 % in the EU-27 and 1.6 % in the EU-15 in 2007 compared with 2006. This was largely due to the reduction in CO<sub>2</sub> emissions from the household and service sectors, because of the warmer weather conditions in 2007 compared to the previous year and due to shifts in types of fuel purchased (from 2007 to 2006 and 2008) because of fuel price variations.

### 1.3. Policies and Measures

- Many existing EC-level policies and measures are being strengthened to meet the goals from the integrated package on energy and climate change.
- The EC has made a commitment to reduce greenhouse gas emissions by at least 20 % compared to 1990 by 2020, with a firm commitment to increase this target to 30 % in the event of a satisfactory international agreement being reached.
- The EC has committed to supplying 20 % of total EU gross final energy consumption from renewable sources (including electricity, heat and transport) by 2020, supplemented by a target requiring the share of energy from renewable sources in all forms of transport in 2020 to be at least 10 % of final consumption of energy in transport.
- The EC has committed to a 20 % reduction of total primary energy consumption by 2020, compared to a Business as Usual baseline.

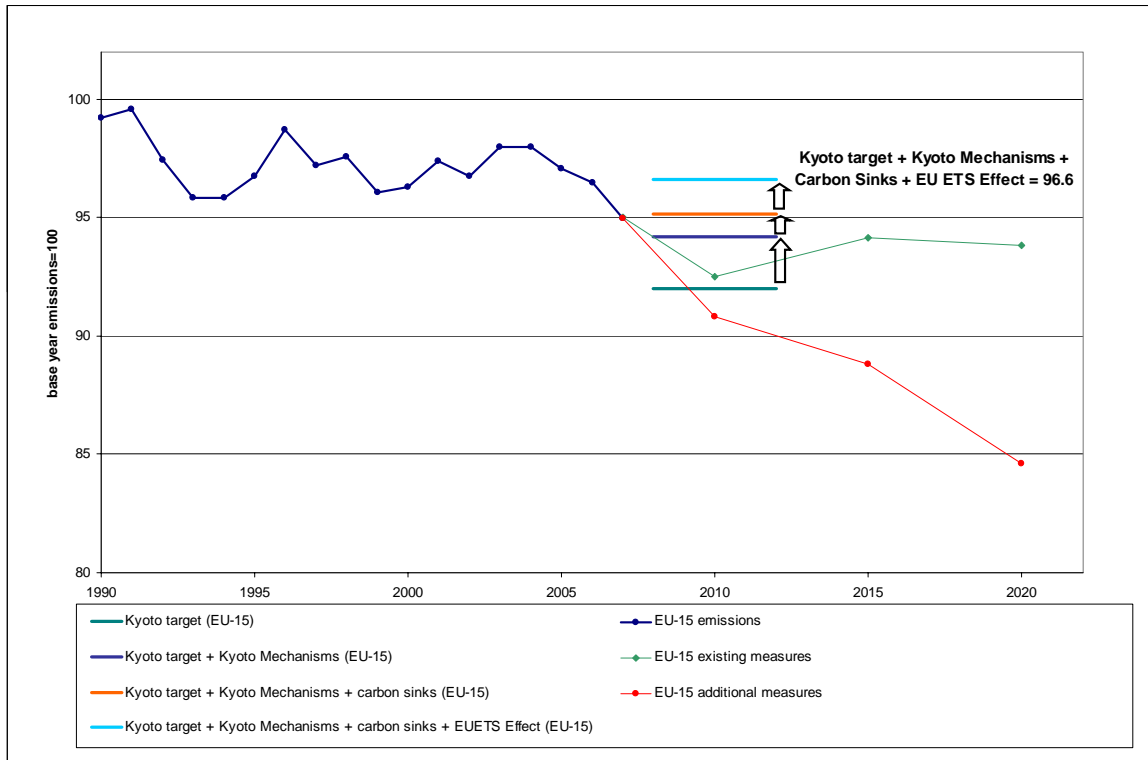
- The EU Emissions Trading Scheme is now into its second phase (2008-2012), strengthened by lessons learned from the first (2005-2007). Further strengthening and expansion is planned for Phase III, including the incorporation of the aviation sector into the scheme (already from 2012).
- Recent developments include also new legislation concerning reduction of GHG emissions from sectors not covered by the EU ETS, carbon capture and storage, emission performance standards for new passenger cars, production of transport fuels and energy-efficient road transport vehicles.
- A successful conclusion to the international climate change negotiations at Copenhagen in December 2009 is a key priority for the EC.

#### 1.4. Projections

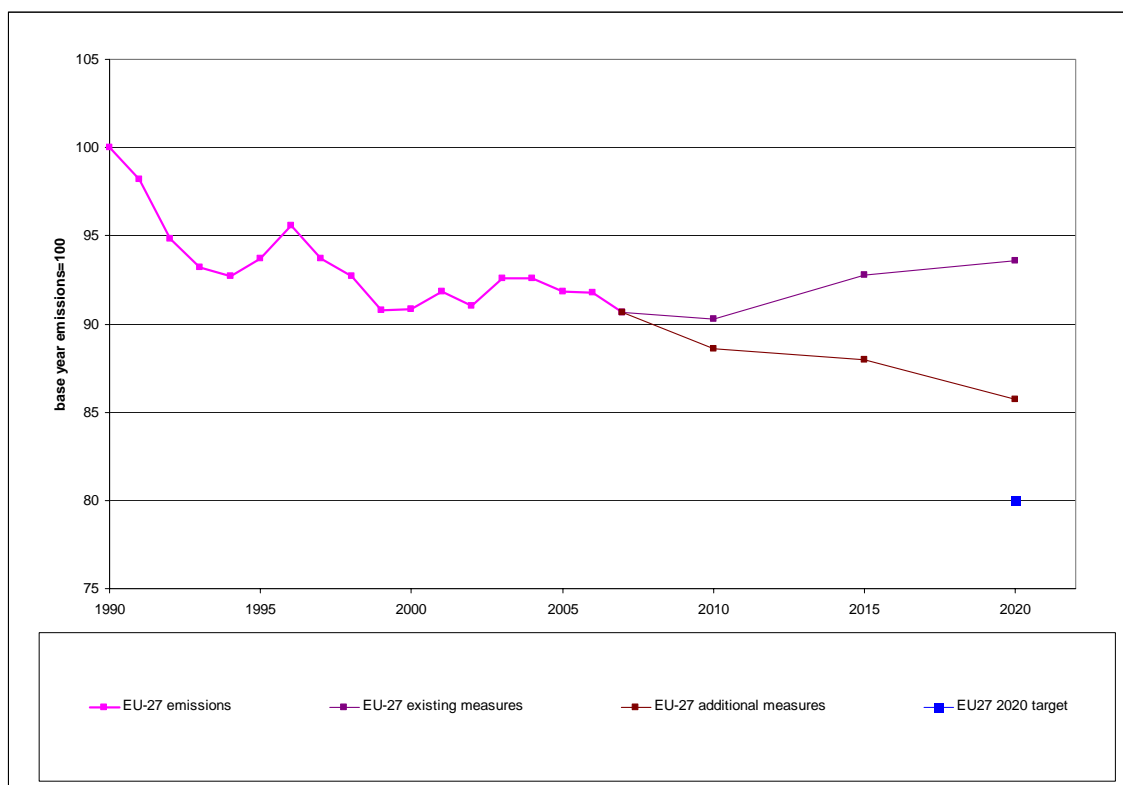
- Under the Kyoto Protocol, the EU-15 has adopted a target to reduce emissions by 8 % on average between 2008 and 2012, compared to base-year emissions. Emissions of GHG in the EU-15 are projected to be 7.5 % below base year emissions in 2010 (existing measures reduce emissions by 320 Mt against base year emissions of 4266 Mt). The implementation of additional measures is projected to reduce EU-15 emissions to 9.2 below base year emissions (additional measures reduce emissions by a further 73 Mt against base year emissions) in 2010. EU-15 emissions in 2010, considering the expected impact of domestic policies and measures, are therefore projected to be 1.2 percentage points below the Kyoto target in 2010.
- The intended use of flexible mechanisms by the EU Member States is expected to increase the projected emission rights for the EU-15 in the commitment period by a *further* 2.2 % against base year emissions to 94.2 % (93 Mt), while use of carbon sinks is expected to increase this *further* by 1.0 % to 95.2 % (42 Mt) against base year emissions. In addition the acquisition of emission credits stemming from flexible mechanisms by the EU ETS operators is expected to increase the projected emission rights in the commitment period by a *further* 1.4 % to 96.6 % (61.2 Mt) against base year emissions.

**Illustration - 1** Greenhouse gas emissions and projections in the EU-15 (excluding LULUCF) for the 'with measures and 'with additional measures' scenarios, EU-15 1990 – 2020





**Illustration – 2** Greenhouse gas emissions and projections in the EU-27 (excluding LULUCF) for the 'with measures and 'with additional measures' scenarios



**Note:** The index on the vertical axis refers to the base year for the EU-15, that is 1990 emissions for CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O and 1995 emissions for the F gases (with the exception of Austria, France and Italy where the base year for F gases is 1990). This means that the value for 1990 is not exactly 100 for the EU-15. As the EU-27 does not have a collective Kyoto target and therefore no collective base year, the index on the vertical axis refers to 1990 emissions for the EU-27.

- Considering Member States' intended use of Kyoto mechanisms, carbon sinks and EU ETS effect, in addition to the effect of domestic measures, the EU-15 is expected to overshoot its target by 5.8 percentage points in 2010 (with emissions projected to be 3677 Mt).
- Emissions of GHG in the EU-27 are projected to be 9.7 % below 1990 levels in 2010 as a result of implemented measures and 11.4 % below 1990 levels in 2010 when planned measures are also considered.
- EU-27 emissions are currently projected to be 6.4 % below 1990 levels in 2020 under the "with existing measures" scenario and 14.3 % below 1990 levels under the "with additional measures" scenario, compared to the EU's target to reduce emissions by 20 % compared to 1990. However, most Member States (16) have not yet accounted for the EU's 2020 Climate and Energy Package in their projections estimates.
- 20 Member States have not considered the impact of the financial crisis in their latest projections estimates.

## 1.5. Impacts, vulnerability and adaptation

- Since the 4th National Communication, there has been much progress on assessing the impacts of climate change and developing adaptation policy in Europe.
- The Fourth Assessment Report (4AR) of Intergovernmental Panel on Climate Change (IPCC) issued in 2007 provided conclusive evidence that climate change is caused by man made emissions of greenhouse gases and provided new impetus to climate change research and policy development in Europe. European researchers have made a significant contribution to this effort by supporting the process and providing new scientific evidence that has fed in to the assessment.
- Since the IPCC 4AR publication, greater rates of change have been observed. Reports by the European Environment Agency (EEA), the EC Joint Research Centre (JRC-IES) and EC funded projects from the Framework Programme for Research have provided new evidence that climate change will have significant implications across Europe and beyond. A number of new research programmes are being funded to improve our understanding of adaptation.
- The EC has adopted a more coordinated approach on policy development and has published a White Paper on adaptation to climate change to define the policy direction of the EC in the forthcoming years. The EC is currently working on the design of an Adaptation Framework to reduce the EU's vulnerability to the impacts of climate change. This framework will complement and strengthen the actions taken by the EU Member States. The White Paper on Adaptation was released in April 2009.
- The EC has advanced a number of initiatives to support developing countries in their efforts to adapt to climate change. For instance, the Global Climate Change Alliance, launched in 2007 to deepen cooperation between the EC and developing countries, renews the EC's commitment to mainstream climate change into development cooperation and provides technical and financial support for adaptation in the Least Developed Countries (LDCs) and Small Island Developing States (SIDS).
- The European Commission is developing a European "Clearing house" of the most up-to-date and state-of-the-art information - an IT tool and database on climate change impact, vulnerability and best practices on adaptation.
- Adaptation to climate change is hampered by large uncertainties in the future climatic conditions – precipitation, sunshine, temperature – at a local level. A long-term sustainable system for observing the planet is a necessary condition for reducing these uncertainties. The EC is in the process of setting up such a system

through the Global Monitoring for Environment and Security initiative<sup>2</sup> and the European Marine Observation and Data Network<sup>3</sup>

## 1.6. Financial resources and transfer of technology

- Since the 4th National Communication, more accurate and detailed categorisation of the nature of climate change projects have been used to provide a clearer picture of the level of financial contributions dedicated to different climate change activities, with increased use of the Rio Markers to identify the climate change element in projects.
- EC financial contributions<sup>4</sup> from external cooperation programme development projects related to climate change in developing countries have steadily increased from €160 million in 2004 to €318 million in 2007<sup>5</sup>. These projects are not Clean Development Mechanism projects.
- The importance of actions on adaptation to climate change has continuously grown, as indicated by the increasing financial resources<sup>6</sup> committed to this area.
- The Communication 'Stepping up international climate finance: A European blueprint for the Copenhagen deal', adopted on 10th September 2009 presents a blueprint for scaling up international finance to help developing countries combat climate change. It recognises that the financing issue is central to prospects for reaching an ambitious agreement in Copenhagen.
- There are a number of new financial mechanisms and initiatives to support this increased focus on climate change, such as the Global Energy Efficiency and Renewable Energy Fund (GEEREF), the Global Climate Change Alliance (GGCA) and the EU-ACP Energy Facility, the latter of which has a different scope but contributes equally significantly to the fight against climate change.
- Climate change kept a prominent role within the (7th) European Framework Programme for Research, including a number of initiatives and projects having the specific objective of assisting developing countries with climate change related issues. Institutions from non-Annex I Parties benefited from €19.3 million of EC funding for research activities since 2004.

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<sup>2</sup> Global Monitoring for Environment and Security (GMES): we care for a safer planet Brussels, 12.11.2008, COM(2008) 748 final

<sup>3</sup> Building a European marine knowledge infrastructure: Roadmap for a European Marine Observation and Data Network, SEC (2009) 499 (final), 4th April 2009

<sup>4</sup> From funding from European Commission - DG AIDCO project database.

<sup>5</sup> These figures include funds directed to three (Russia, Ukraine and Turkey) Annex I countries (UNFCCC), where an EU instrument covers both non-Annex 1 and Annex 1 countries. For 2004, this amounts to €3.95m, for 2005 it amounts to €2.8m, for 2006 it amounts to €4.3m and for 2007, it amounts to €22m

<sup>6</sup> These figures represent the projects that are adaptation specific and do not include mitigation projects that also have an element of adaptation. Consequently, the total figure for all adaptation activities is likely to be higher.

## 1.7. Research and systematic observation

- Since the 4th National Communication, there have been key developments in climate change research at the EC level, particularly in the 7th Framework Programme (FP7) for Research and Technological Development which started in 2007:
- The total budget of FP7 amounts to €50.52 billion over the period (2007-2013) which represents an increase of 65 % compared to FP6 budget in average annual terms. The structure of FP7 is larger and more integrated, with four main areas – “Cooperation”, “People”, “Ideas”, and “Capacities” (with a fifth, Euratom €2.75 billion, dedicated to nuclear research). Sustainable development has been mainstreamed as a component and objective of all EC research.
- The main area , “Cooperation” (64 % of FP7 budget), consists of ten themes, comprising “Environment (including climate change)”<sup>7</sup> which is granted €1.89 billion over the period 2007-2013, and of which 14 % funded since 2007 is related to climate research projects. on the climate system, the understanding of the impacts of climate change and the identification of options for mitigation and adaptation.
- Research projects funded in themes such as Space and Global Monitoring for Environment and Security (GMES), Energy, Transport, Agriculture and Fisheries in the "Cooperation" component of FP7 contribute to research on the climate system, the understanding of the impacts of climate change and the identification of options for mitigation and adaptation. Additional climate relevant research projects are granted in the “People”, “Ideas”, and “Capacities” components of FP7. Since 2003, expenditures on climate research in the EC Framework Programme are estimated to nearly €570 million.
- Research projects funded in the areas of GMES (€1.43 billion in FP7), Energy (€2.35 billion), Transport (€1.16 billion), Agriculture and Fisheries (€1.93 billion) are instrumental to supporting research relevant to the implementation of mitigation and adaptation measures including the development of relevant technologies. A large proportion of the research undertaken in those areas relates the reduction of GHG emissions.
- The European Union has adopted a strategic plan to accelerate the development and deployment of cost-effective low carbon technologies through joint strategic planning and a more effective implementation of programmes.
- Under the Strategic Energy Technology Plan (SET-Plan), adopted in 2007, research into low-carbon technologies is focussed on those technologies that can best support achieving the EU's "20-20-20" targets (20 % more energy efficiency, 20 % more renewables, 20 % less GHG emissions) by 2020. The SET-Plan calls

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<sup>7</sup> Under FP6, climate change research was funded mainly under the thematic sub-priority area “Sustainable development, global change and ecosystems”. Specific measures in support of “international cooperation” also supported a large number of international collaborations in relation to environmental and ecosystem sustainability and food security issues of direct relevance to climate change in developing countries.

primarily on FP7 ("Energy") funds. Beyond standard FP7 contributions, in 2009, wind (€65 million) and CCS (€1050 million) research have additional approved budget under the European Economic Recovery Plan, to be used by end 2010. Further proposals for supplements to the SET-Plan funding are in the pipeline.

- Under FP7, a new tool - known as Joint Technology Initiatives (JTIs)<sup>8</sup> – that combines private sector investment and/or national and European public funding has been introduced. The Clean Sky, and Hydrogen and Fuel Cell JTIs directly aim at reducing GHG emissions in aeronautic, surface transport and stationary applications.
- In FP7 international cooperation has been mainstreamed, with any third country researcher or institution being able to participate in FP7 calls. In addition, under the cooperation programme, there are projects dedicated specifically to international cooperation. So far about 6 % of all participants are from third countries, including developing countries.
- Climate research undertaken in the EC Joint Research Centre (total budget of €1.75 billion in FP7) provided support EC climate change policies and enhancement of scientific knowledge on climate change.
- Last, the European Research Council (ERC) has been established, with the aim of encouraging groundbreaking science proposed by leading researchers themselves. ERC, which will effectively work as a national research council at the EC level, will also take responsibility for project implementation.

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

Major developments that have occurred in the EC since the 4th National Communication include:

- Public awareness campaigns on climate change:
- Climate Change Campaign (2006-2009)
- Sustainable Energy Europe Campaign (2005-2011)
- Climate Action Campaign (2007-2009)
- Covenant of Mayors on energy and climate (2008 onwards)
- New Lifelong Learning Programme (2007-2012) with an increasing number of education and training projects related to climate change
- Eurobarometer surveys on Europeans' attitudes towards climate change (2008 and 2009)

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<sup>8</sup> The dedicated structures implementing the JTIs are independent legal entities, with a dedicated budget and staff. The European Commission is a founding member of each JTI and enjoys a veto right on a number of pre-defined items.

- Eco Agents website for children (2008 onwards)
- Development of a large range of online resources and tools to raise public awareness and educate on climate change
- The European Institute of Innovation and technology (EIT) was created in 2009 to support new ways of creating and promoting innovation in Europe. Sustainable energy and climate change mitigation and adaptation are amongst EIT's priorities.

The full text of the EC's 5th National Communication is included in the Staff Working Document consisting of four volumes (Part 1, 2a, 2b and 3).