COMMISSION OF THE EUROPEAN COMMUNITIES

Brussels, 10.1.2007
COM(2007) 2 final

COMMUNICATION FROM THE COMMISSION TO THE COUNCIL, THE EUROPEAN PARLIAMENT, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

Limiting Global Climate Change to 2 degrees Celsius
The way ahead for 2020 and beyond

{SEC(2007) 7}
{SEC(2007) 8}

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1. EXECUTIVE SUMMARY

Climate change is happening. Urgent action is required to limit it to a manageable level. The EU must adopt the necessary domestic measures and take the lead internationally to ensure that global average temperature increases do not exceed pre-industrial levels by more than 2°C.

This Communication and the accompanying impact assessment show that this is technically feasible and economically affordable if major emitters act swiftly. The benefits far outweigh the economic costs.

This Communication is addressed to the Spring 2007 European Council which should decide on an integrated and comprehensive approach to the EU's energy and climate change policies. It follows up on the 2005 Communication "Winning the Battle against Global Climate Change", *which provided concrete recommendations for EU climate policies and set out key elements for the EU's future climate strategy. In deciding the next steps in our climate change policy the European Council should take decisions which will enhance the conditions for reaching a new global agreement to follow on from the Kyoto Protocol's first commitments after 2012.*

This Communication proposes that the EU pursues in the context of international negotiations the objective of 30 % reduction in greenhouse gas emissions (GHG) by developed countries by 2020 (compared to 1990 levels). This is necessary to ensure that the world stays within the 2ºC limit. Until an international agreement is concluded, and without prejudice to its position in international negotiations, the EU should already now take on a firm independent commitment to achieve at least a 20 % reduction of GHG emissions by 2020, by the EU emission trading scheme (EU ETS), other climate change policies and actions in the context of the energy policy. This approach will allow the EU to demonstrate international leadership on climate issues. It will also give a signal to industry that the ETS will continue beyond 2012 and will encourage investment in emission reduction technologies and low carbon alternatives.

After 2020, developing country emissions will overtake those of the developed world. In the meanwhile, the rate of growth of overall developing country emissions should start to fall, followed by an overall absolute reduction from 2020 onwards. This can be achieved without affecting their economic growth and poverty reduction, by taking advantage of the wide range of energy and transport related measures that not only have a major emissions reduction potential, but also bring immediate economic and social benefits in their own right.

By 2050 global emissions must be reduced by up to 50 % compared to 1990, implying reductions in developed countries of 60-80 % by 2050. Many developing countries will also need to significantly reduce their emissions.

Market based instruments such as the EU ETS will be a key tool to ensure that Europe and other countries reach their targets at least cost. The post-2012 framework should enable comparable domestic trading schemes to be linked with one another, with the EU ETS as the pillar of the future global carbon market. The EU ETS will continue to be open after 2012 to carbon credits from the Clean Development Mechanism and Joint Implementation projects under the Kyoto Protocol.

The EU and its Member States should decide on a very significant increase in investment in research and development in the areas of energy production and saving.

2. THE CLIMATE CHALLENGE: REACHING THE 2°C OBJECTIVE

Strong scientific evidence shows that urgent action to tackle climate change is imperative. Recent studies, such as the Stern review, reaffirm the enormous costs of failure to act. These costs are economic, but also social and environmental and will especially fall on the poor, in both developing and developed countries. A failure to act will have serious local and global security implications. Most solutions are readily available, but governments must now adopt policies to implement them. Not only is the economic cost of doing so manageable, tackling climate change also brings considerable benefits in other respects.

The EU's objective is to limit global average temperature increase to less than 2°C compared to pre-industrial levels. This will limit the impacts of climate change and the likelihood of massive and irreversible disruptions of the global ecosystem. The Council has noted that this will require atmospheric concentrations of GHG to remain well below 550 ppmv CO_2 eq. By stabilising long-term concentrations at around 450 ppmv CO_2 eq. there is a 50 % chance of doing so. This will require global GHG emissions to peak before 2025 and then fall by up to 50 % by 2050 compared to 1990 levels. The Council has agreed that developed countries will have to continue to take the lead to reduce their emissions between 15 to 30 % by 2020. The European Parliament has proposed an EU CO_2 reduction target of 30 % for 2020 and 60 to 80 % for 2050.

This Communication identifies options for realistic and effective measures in the EU and globally that will allow the 2ºC objective to be met. The GHG emissions trajectory set out in the impact assessment represents a cost-effective scenario to meet the 2ºC objective. It supports an emissions reduction target for developed countries of 30 % by 2020 compared to 1990 emission levels. It also shows that emissions reductions by developed countries alone will not be sufficient. Developing country emissions are projected to surpass those of developed countries by 2020, which will more than offset any reductions possible in developed countries beyond that date. Effective action on climate change therefore requires reduced growth in the GHG emissions of developing countries and reversing emissions from deforestation.

Furthermore a sustainable and efficient forest policy enhances the contribution of forests to the overall reductions of GHG concentrations.

3. THE COSTS OF INACTION AND ACTION

The Commission's 2005 Communication "*Winning the battle against global climate change*" demonstrated that the benefits of limiting climate change outweigh the costs of action. Recent research confirms the broad range of impacts of climate change, including on agriculture, fisheries, desertification, biodiversity, water resources, heat and cold related mortality, coastal zones and damages from floods.

The distribution of impacts of climate change is likely to be uneven. Some regions in the EU will suffer disproportionately. For instance in Southern Europe, climate change is likely to decrease crop productivity, increase heat related mortality and have a negative impact on tourism conditions during summer.

The Stern Review makes the point that climate change is the result of the greatest market failure the world has ever seen. The failure to include the costs of climate change in market prices that guide our economic behaviour carries huge economic and social costs. The costs of inaction, estimated by the Stern Review at 5 to 20 % of global GDP, would fall disproportionately on the poorest with the least capacity to adapt, exacerbating the social impacts of climate change.

By 2030, world GDP is projected to be almost double that of 2005. GDP growth in main developing country emitters will remain higher than that of developed countries. The impact assessment shows that global action on climate change is fully compatible with sustaining global growth. Investment in a low-carbon economy will require around 0.5 % of total global GDP over the period 2013–2030. This would reduce global GDP growth by only 0.19 % per year up to 2030, a fraction of the expected annual GDP growth rate of 2.8 %. This is an insurance premium to pay, and would significantly reduce the risk of irreversible damages resulting from climate change. Most importantly, it greatly overstates the effort since no correction is made for associated health benefits, greater energy security, nor does it account for reduced damages from avoided climate change.

4. THE BENEFITS OF ACTION, RELATIONSHIP WITH OTHER POLICY AREAS

Oil and gas prices have doubled over the past three years, with electricity prices following. Energy prices are expected to remain high and to increase over time. The Commission's recent *Action Plan for Energy Efficiency* demonstrates that there is a solid economic case for policies that increase overall resource use efficiency, even without taking the accompanying emissions reductions into account.

The impact assessment shows that EU action to tackle climate change would significantly increase the EU's energy security. Oil and gas imports would each decrease by around 20 % by 2030 compared to the business as usual case. Integrating climate change and energy policies will therefore ensure that they are mutually reinforcing.

Action on climate change also reduces air pollution. For example, reducing CO_2 emissions in the EU by 10 % by 2020 would generate enormous health benefits (estimated at € 8 to 27 billion). Such policies will therefore make it easier to attain the objectives of the EU's strategy on air pollution.

Similar benefits exist in other countries. By 2030, the US, China and India are projected to import at least 70 % of their oil. Geopolitical tensions could rise as resources become scarcer. At the same time, air pollution is increasing, in particular in developing countries. Reducing GHG emissions in other countries will improve their energy security and air quality.

5. ACTION IN THE EU

(a) Defining emissions reduction targets

There is still a large potential for reducing GHG emissions in the EU. The Strategic EU Energy Review proposes measures that will unlock much of this potential. Moreover, the measures adopted under the European Climate Change Programme and other policies that are currently being implemented will continue to deliver emissions reductions after 2012.

The EU can only achieve its climate change objectives by pursuing an international agreement. EU domestic action has shown that it is possible to reduce GHG emissions without jeopardising economic growth and that the necessary technologies and policy instruments already exist. The EU will continue to take domestic action to fight climate change. This will allow the EU to show the way in the international negotiations.

The Council should decide that the EU and its Member States propose a 30 % reduction in greenhouse gas emissions by developed countries by 2020 as part of an international agreement aimed at limiting global climate change to 2ºC above pre-industrial levels. Until an international agreement is concluded, and without prejudice to its position in international negotiations, the EU should already now take on a firm independent commitment to achieve at least a 20% reduction of GHG emissions by 2020 compared to 1990 through the EU ETS, other climate change policies and actions in the context of the energy policy. This will signal to European industry that there will be a significant demand for emission allowances beyond 2012, and will provide incentives for investment in emission reduction technologies and low carbon alternatives.

(b) Actions resulting from the EU's energy policy

In line with the Strategic EU Energy Review, the following concrete actions will ensure a competitive, more sustainable and secure energy system and a significant reduction of GHG emissions in the EU by 2020:

- Improve the EU's energy efficiency by 20 % by 2020.
- Increase the share of renewable energy to 20 % by 2020.

- Adopt an environmentally safe carbon capture and geological storage (CCS) policy, including the construction of twelve large-scale demonstration plants in Europe by 2015.

(c) Strengthening the EU ETS

45 % of the EU's CO_2 emissions are covered by the EU ETS. A greater proportion should be covered from 2013. At least the following options strengthening the role of the scheme should be considered in the review of the EU ETS:

- Make allocations for more than five years in order to provide predictability for long-term investment decisions.

- Extend the scheme to other gases and sectors.

- Recognise carbon capture and geological storage.

- Harmonise allocation processes across Member States to achieve undistorted competition across Europe, including through a wider use of auctioning.

- Link the EU ETS to compatible mandatory schemes (e.g. in California and Australia).

(d) Limiting transport emissions

EU transport emissions have continued to grow, cancelling out a large part of the reductions made in waste, manufacturing and energy sectors. In order to tackle transport emissions:

- Council and Parliament should adopt the Commission's proposal to include aviation in the EU ETS.

- Council should adopt the Commission's proposal to link taxes on passenger cars to CO_2 emission levels.

- Further measures to tackle CO_2 emissions from cars will be outlined in the forthcoming Communication in order to reach through a comprehensive and consistent approach the target of 120 g CO_2/km by 2012. Options for further reductions after 2012 will also be explored.

- Demand-oriented measures, such as those outlined in the White Paper on European Transport policy for 2010 and its review should be strengthened.

- GHG emissions from road freight transport and shipping should be further limited bearing in mind the international dimension.

- Life-cycle emissions of CO_2 in transport fuels must be reduced, including through accelerating the development of sustainable biofuels and, in particular, second generation biofuels.

(e) GHG emission reductions in other sectors

Residential and commercial buildings

Energy use of buildings can be reduced by up to 30 % by expanding the scope of the Directive on energy performance of buildings and introducing EU performance requirements promoting very low energy buildings (leading to their widespread use by 2015). As climate change will affect the less advantaged parts of society, governments should envisage special energy policies for social housing.

Non-CO_2 gases

In order to tackle emissions of non-CO_2 GHG, responsible for 17 % of the EU's emissions, a range of measures should be put forward that include:

- reinforcing implementation of the measures under the Common Agricultural Policy and the EU Forest Action Plan to reduce emissions from EU agriculture, and to promote biological sequestration;
- setting limits for methane emissions from gas engines, and from coal, oil and gas production or their inclusion in the EU ETS;
- further restricting or prohibiting uses of fluorinated gases;
- reducing emissions of nitrous oxide from combustion, and including those from large installations into the EU ETS.

(f) Research and technological development

Under the Community's 7th Framework Programme, the budget for environment, energy and transport research in the period 2007-2013 has increased to € 8.4 billion. This should be used early so as to promote the development of clean energy and transport technologies for earliest possible deployment and further strengthen knowledge of climate change and its impacts. Moreover, the research budget should be increased again after 2013 which should be mirrored by similar national efforts. The Strategic Energy Technology Action Plan and the Environment Technology Action Plan should be fully implemented and public-private partnerships should be further promoted.

(g) Cohesion policy

The strategic guidelines on cohesion, adopted in October 2006, promote sustainable transport and energy as well as environmental technologies and eco-innovations through financial assistance under the Structural Funds and the Cohesion Fund. These measures should be included in the operational programmes.

(h) Other measures

The EU should examine all possible ways of reducing GHG emissions and of ensuring the environmental and economic consistency of the measures to be adopted. The Second Report of the High Level Group on Competitiveness, Energy and the

Environment stated that the feasibility of all potential policy measures that could provide the necessary incentive to encourage the EU's trading partners to undertake effective measures to abate greenhouse gas emissions should be analysed[1].

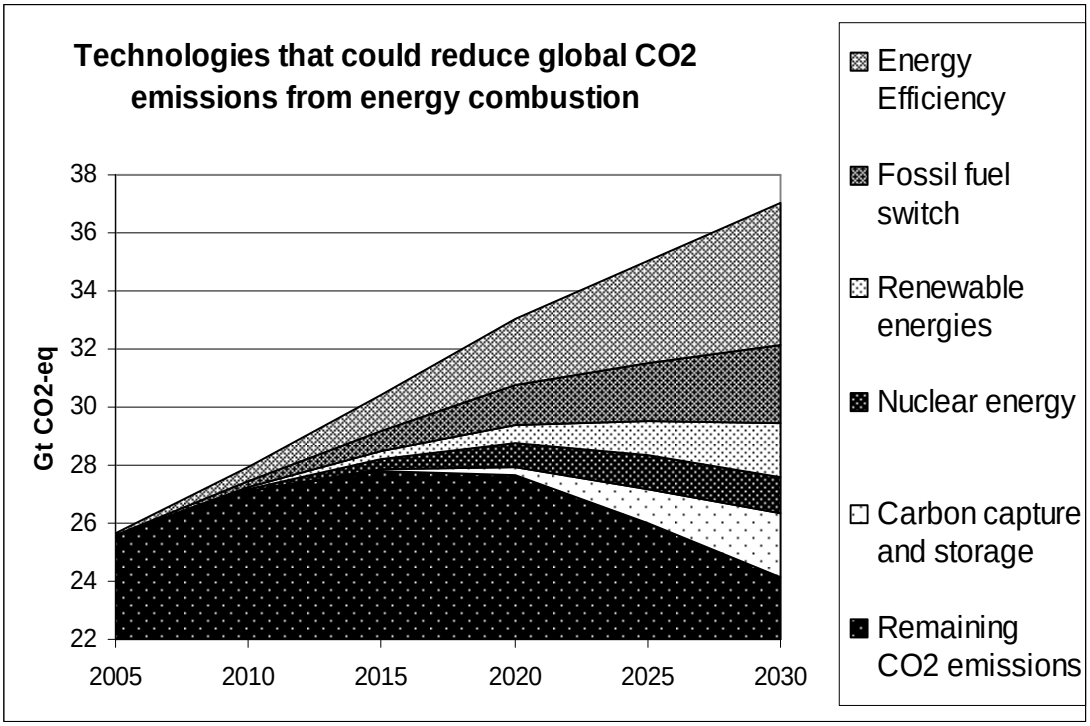
The EU should also further strengthen public awareness by sensitising the general public to the climate change impacts of their actions and engaging it in efforts to reduce these impacts.

6. INTERNATIONAL ACTION IN THE GLOBAL FIGHT AGAINST CLIMATE CHANGE

The battle against climate change can only be won through global action. But to reach the 2ºC objective, international discussions must move beyond rhetoric towards negotiations on concrete commitments. The EU should make such agreement its overarching international priority and organise itself so as to present a single EU position and policy and a convincing and consistent approach over the years that this effort will require, so that the EU pulls its full weight. This will require different working methods in terms of coordination and international action.

The basis for reaching such agreement is there. In countries like the US and Australia that have not ratified the Kyoto Protocol, there is a growing awareness of the dangers of climate change leading to regional initiatives to curb GHG emissions. Business, more than some governments, is taking a long-term view and is becoming a driving force in the fight against climate change, asking for a coherent, stable and efficient policy framework to guide investment decisions. Most technologies to reduce GHG emissions either exist or are at an advanced stage of preparation and can reduce emissions (see Graph 1). What is needed is support from major emitters for a long-term agreement to ensure their deployment and further development.

[1] The Commission's Strategic Energy Review adopted at the same time as this Communication also refers to trade policy measures contributing to this.



Source: JRC-IPTS, POLES

6.1. Action by developed countries

Developed countries are responsible for 75 % of the current accumulation of industrial GHG in the atmosphere and 51 % if deforestation (largely in developing countries) is included. They also have the technological and financial capacity to reduce their emissions. Developed countries should therefore make most of the effort over the next decade.

Even more than the EU, those developed countries that have not ratified Kyoto have significant potential to reduce their GHG emissions. In order to attain the 2°C objective, and as part of an international post-2012 agreement, the EU should propose that developed countries commit to a 30 % reduction of their emissions by 2020, compared to 1990 levels. Emissions trading schemes will be a key tool to ensure that developed countries can reach their targets cost-effectively. Schemes such as the EU ETS are being developed elsewhere. Domestic trading schemes with comparable levels of ambition should be linked and cut the costs of meeting targets.

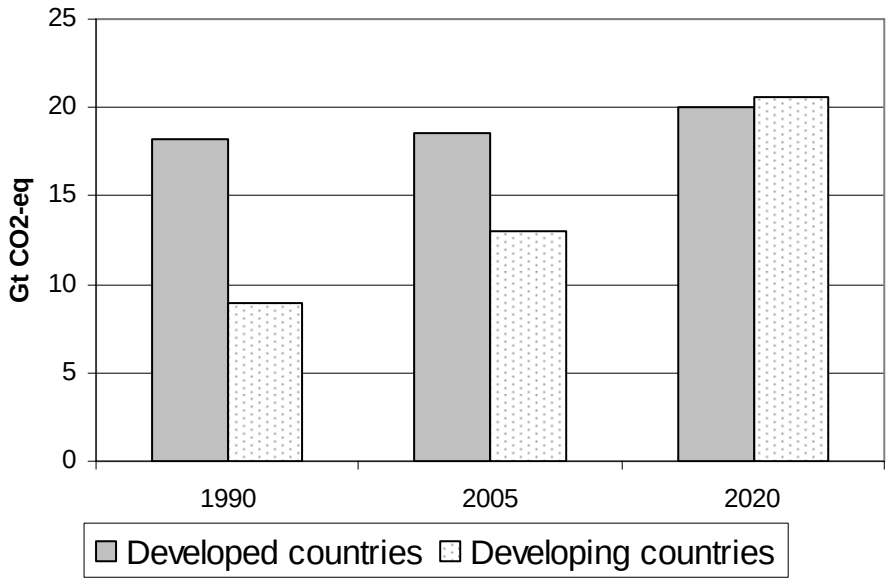
The post-2012 framework must contain binding and effective rules for monitoring and enforcing commitments so as to build the confidence that all countries will live up to them, and that there will be no backsliding as recently observed.

6.2. Action in developing countries

In the immediate future, developed countries should take substantive action to reduce their emissions. As developing country economies and emissions grow in absolute and relative terms they will, by 2020, account for more than 50 % of global emissions (see Graph 2). Further action by developed countries alone will therefore not only lose its efficacy but simply not suffice even if their emissions were to be

drastically reduced. It is therefore indispensable that developing countries, in particular the major emerging economies, start reducing the growth of their emissions as soon as possible and cut their emissions in *absolute* terms after 2020. In addition, a major effort should be made to halt emissions resulting from deforestation. This is perfectly feasible without jeopardising economic growth and poverty reduction. Economic growth and tackling GHG emissions are fully compatible. The impact assessment estimates that overall GDP of developing countries "with climate policy" in 2020 should be a tiny fraction (1 %) lower than GDP "without climate change policy". In reality, the difference is even smaller, probably even negative as it does not take into account the benefits of avoided climate change damage. Over the same period, GDP is projected to double in China and India and increase by around 50 % in Brazil. We will be more convincing in our efforts to engage developing countries to take action, if all major developed country emitters substantially reduce their emissions.

Graph 2: Projected greenhouse gas emissions
(industry and energy, business as usual scenario)



Source: JRC-IPTS, POLES

Many developing countries are already making efforts that result in significant reductions in the growth of their GHG emissions, through policies addressing economic, security or local environmental concerns. There are many policy options for developing countries, where benefits outweigh the costs.

- Address low productivity of energy use and hence reduce growing concerns about energy costs and security.
- *Renewable energy policies* are often cost-effective, including for meeting rural electricity needs.
- *Air quality policies* improve peoples' health.

- *Methane* captured from landfills, coal beds, decomposing organic waste and other sources is a cheap source of energy.

Such policies can be strengthened by sharing good practice in policy design and planning and technology co-operation. This will enable developing countries to play a greater part in global reduction efforts. The EU will continue and increase its co-operation efforts in this respect.

There are various options for engaging developing countries to take further action.

(a) A new approach to the CDM

The Kyoto Protocol's CDM should be streamlined and expanded. The CDM currently generates credits for investments in emissions reduction projects in developing countries, which can be used by developed countries to meet their targets, generating considerable flows of capital and technology. The scope of the CDM could be expanded to cover entire national sectors, generating emissions credits if the whole national sector exceeds a pre-defined emission standard. However, an expanded CDM can only function if there is increased demand for credits, and this will only happen if all developed countries take on substantial reduction obligations.

(b) Improved access to finance

Investment in new electricity generation in developing countries is projected to reach more than € 130 billion per year in order to support economic growth. The great majority of these resources will be generated by the major developing countries themselves. This new equipment will be in place for several decades and will determine GHG emissions beyond 2050. It should be "state-of-the-art" and therefore presents a unique opportunity for reducing emissions in developing countries.

Strongly reducing CO_2 emissions in the power sector will require an additional investment of around € 25 billion per year. This gap can neither be filled through the CDM, even if expanded as suggested above, nor by development aid. Instead, it will require a combination of the CDM, development aid, innovative financing mechanisms (like the EU Global Energy Efficiency and Renewable Energy Fund), targeted loans from international financial institutions and efforts by those developing countries that have the means. The earlier this gap can be filled, the less developing country emissions will grow.

(c) Sectoral approaches

Another option is the introduction of sector-wide company-level emissions trading in sectors where the capacity exists to monitor emissions and ensure compliance particularly for energy-intensive sectors such as power generation, aluminium, iron, steel, cement, refineries and pulp and paper, most of which are exposed to international competition. Such schemes would be either global or national; if national, schemes in developing countries should be linked with schemes in developed countries, with targets for each sector covered being gradually strengthened until they were similar to those set in developed countries. This would also limit the transfer of high-emission installations from countries where they are subject to reduction commitments to countries where they are not.

(d) Quantified emission limits

Countries that reach a level of development similar to that of developed countries should take on reduction commitments in accordance with the country's level of development, its per capita emissions, its potential to reduce emissions and its technical and financial capacity to implement further emissions limitation and reduction measures.

(e) No commitments for least developed countries

Least developed countries will suffer disproportionately from the impacts of climate change. Because of their low level of GHG emissions, they should not be subject to obligatory emissions reductions. The EU will further enhance its co-operation with Least Developed Countries to help them tackle climate change challenges, inter alia through measures to reinforce food security, capacities to monitor climate change, disaster risk management, preparedness as well as disaster response. Whilst development assistance will be required to integrate climate change concerns, additional support will be required to allow the most vulnerable among them to adapt to climate change. The EU and others should also help them to increase their access to the CDM.

6.3. Further elements

A future international agreement should also address the following:

- Technological change requires further *international research and technology cooperation*. The EU should significantly step up its research and technology co-operation with third countries. This should include setting up large-scale technology demonstration projects in key developing countries, in particular on carbon capture and geological storage. International research cooperation should also assist the quantification of regional and local impacts of climate change as well as the development of appropriate adaptation and mitigation strategies. Furthermore, it should address, inter alia, the interaction between oceans and climate change.

- Emissions resulting from the net loss of forest cover must come to a complete halt within two decades and be reversed afterwards. Options to *tackle deforestation* include effective international and domestic forest policies coupled with economic incentives. Large scale pilot schemes are required soon to explore effective approaches combining national action and international support.

- Measures to assist countries to adapt to the unavoidable consequences of climate change will have to be an integral part of the future global climate agreement. The need to adapt to the impacts of climate change should be taken into account in public and private investment decisions. Building on the implementation of the EU action Plan on climate change and development, to be reviewed in 2007, the EU should enhance its alliance-building with developing countries in the areas of climate change adaptation and mitigation.

- An *international agreement on energy efficiency standards* engaging key appliance producing countries will benefit market access and help reduce GHG emissions.