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## **Climate change: Questions and answers on the Communication Analysis of options to move beyond 20% greenhouse gas emission reductions and assessing the risk of carbon leakage**

### **What are the objectives of the Communication?**

In 2007 the EU made a unilateral commitment to reduce its greenhouse gas (GHG) emissions to 20% below 1990 levels. This commitment, together with a 20% renewable energy target for the EU by 2020, was translated into EU legislation through the 'climate and energy package', which was agreed by Council and Parliament at the end of 2008.

EU leaders in 2007 also made a conditional commitment to scale up the EU's GHG emissions reduction for 2020 from 20% to 30% if other developed countries commit themselves to comparable emission reductions and economically more advanced developing countries contribute adequately to a global effort according to their responsibilities and respective capabilities.

These conditions have not yet been met and therefore the Communication does not propose that the EU should move to a 30% target now. What the Communication does is provide an analysis of the costs, benefits and options of moving to a 30% reduction for the EU, as seen from today's perspective, taking into account recent developments such as the economic crisis.

The Communication also responds to a request contained in the climate and energy package for the Commission to assess the competitive situation of energy-intensive sectors in the light of the outcome of the December 2009 Copenhagen climate conference, and to make any appropriate proposals necessary to address the risk of 'carbon leakage' (relocation of production from the EU to countries with laxer carbon constraints). The GHG emissions of these energy-intensive sectors are regulated through the EU Emission Trading System (EU ETS).

## What are the key points of the Communication?

### Lower costs of meeting the 20% and 30% targets

- The costs of meeting the 20% GHG reduction target<sup>1</sup> have fallen by one-third. In 2008 the costs in 2020 were estimated at at least €70 billion a year. Now, they are estimated at €48 billion. However, not only costs have decreased - because of the crisis so has the short term capacity of economic operators to invest in low-carbon technologies.
- The additional costs in 2020 of stepping up from the 20% to the 30% reduction target are estimated at €33 billion a year. The carbon price in the EU ETS in 2020 would increase from €16 per tonne of CO<sub>2</sub> under a 20% reduction target to €30. The total costs of a 30% reduction, including the costs of the 20% target, are estimated at €81 billion a year in 2020.
- The greatest potential for emission reductions is found in the ETS sectors. Under a 30% reduction target, the cap on EU ETS emissions would be set at 34% below the 2005 level instead of at 21% below as now under the 20% target. The emissions reduction from sectors not covered by the EU ETS would be 16% below the 2005 level, rather than the current 10% reduction.
- Further efforts in the ETS could be obtained by reducing the amount of allowances for auctioning. A reduction equal to 1.4 billion allowances in the period 2013-2020 could be sufficient. This would increase auctioning revenues for Member States. In addition, businesses that showed themselves to be top performers or fast movers in innovation could be rewarded with extra unallocated free allowances.
- Geographically, the potential for further emission reductions is proportionally higher in poorer Member States. EU's cohesion policy can be an important instrument to mobilise the necessary public and private finance.
- CO<sub>2</sub> taxes which target fuels or products to reflect their CO<sub>2</sub> component can strengthen the incentive to lower emissions and their revenues can be reinvested in the economy to promote green growth and jobs.
- Achieving a 30% reduction target would reduce imports of oil and gas by some €40 billion a year in 2020.
- Going from a 20% to a 30% reduction target would reduce costs related to air pollution by €6.5-11 billion per year.

### Reduced risk of carbon leakage

- The risk of carbon leakage with a 20% target in current circumstances is comparatively lower than assumed in 2008. EU energy-intensive sectors as a whole would be in a slightly better position if all pledges under the Copenhagen accord were fully implemented. However, continued uncertainties about the implementation of the Copenhagen Accord justify maintaining the measures already agreed to help energy-intensive EU industries – free allowances and access to international credits.
- The incremental impact on carbon leakage of going from 20% to 30% would be limited, as long as free allocation and access to international credits stay in place. But access to international credits could be more targeted, promoting sectoral crediting or limiting the use of CDM credits from energy-intensive sectors in developing countries (other than the LDCs) or from countries which are not participating adequately in international climate efforts.

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<sup>1</sup> Including the costs of achieving the 20% renewable energy target

- An additional option could be to include in the EU ETS imports into the EU from energy intensive industries. This would pose a number of practical issues and would need to be very carefully designed to ensure that it is fully compatible with WTO requirements.

### **Where does the EU stand today on achieving its 20% reduction target?**

The EU reduced GHG emissions from 7% below 1990 levels in 2005 to 10% below in 2008. This progress was due to increased climate policy action and high energy prices. Since 2008 the crisis has accelerated the reduction in emissions. In 2009, EU emissions were around 14% below 1990.

A certain rebound in emissions can be expected as the economy recovers but projections of future emissions show that with the measures already implemented today EU emissions would be at -14% compared to 1990 in 2020. The EU could even meet the 20% reduction target through domestic action alone, with additional policies to meet the 20% renewable energy target and limited additional regulatory and fiscal measures, and without recourse to international credits.

### **How have the costs of achieving the 20% reduction target changed, and why?**

In 2008, costs related to the climate and energy package (to achieve both the 20% GHG reduction target and the 20% renewable energy target in 2020) were estimated to be at least €70 billion a year in 2020. This represented 0.45% of projected 2020 GDP at the time. These costs are not a loss to GDP but rather the increased expenditures needed to redirect the economy towards lower-carbon activities.

Since 2008 three factors have reduced these costs. Firstly, lower economic growth has depressed GHG emissions, effectively reducing the stringency of the 20% target. Secondly, high energy prices and the expectation that they will remain high has spurred energy efficiency investments, decreasing projected energy demand and thus GHG emissions. Thirdly, allowances not used for compliance in the EU ETS due to the crisis are being carried forward into the 2013–2020 trading period, lowering expected carbon prices and costs in 2020.

Due to the interplay of these factors, the estimated cost of the climate and energy package is now put at €48 billion a year in 2020, or one third less than estimated when it was proposed in 2008. This represents 0.32% of projected 2020 GDP.

The carbon price in the ETS is estimated at €16 (2008 prices) in 2020, significantly lower than expected before the crisis. With lower carbon prices, government revenue from auctioning of emission allowances could also be halved, adding to pressure on public finances and reducing another potential source of public funds for combating climate change.

### **What are the costs of moving to a 30% emissions reduction?**

The additional direct costs for the EU of moving from the current 20% GHG reduction target to 30% are estimated at around €33 billion in the year 2020, or an additional 0.2% of GDP.

It is projected that domestic emissions would fall to 25% below 1990 levels by 2020 while international credits and banked ETS allowances would contribute the remainder of the 30% reduction. The carbon price in the EU ETS in 2020 would increase to some €30 per tonne of CO<sub>2</sub>, similar to price estimates in 2008 to achieve the 20% GHG reduction.

The total cost of the 30% reduction, including the cost of the 20% target, is now estimated at €81 billion, or 0.54% of GDP, in 2020. This is about a fifth higher than the 2008 estimate of 0.45% of GDP in 2020 for reaching the 20% target.

But while the additional costs of moving to 30% have clearly decreased, the reduced profitability of companies, spending power of consumers and access to bank loans have – at least in the short term - also weakened the capacity for investment in low carbon technologies.

### **What are the benefits of moving to 30%?**

The lower cost of meeting the 20% target and the lower than expected carbon price in the EU ETS have reduced the incentives for innovation generated by the climate and energy package.

Moving to a 30% target would restore these incentives for innovation. Acting earlier rather than later would have significant long-term benefits for Europe's competitiveness by maintaining a strong EU position in a rapidly growing global market for low-carbon technologies. Furthermore it would put EU emissions onto a trajectory compatible with achieving our objective of a 80-95% reduction below 1990 levels by 2050.

Moving from a 20% to a 30% target would also have other major economic and environmental benefits. It would strengthen the EU's energy security by reducing dependence on energy imports. Compared to taking no action at all, achieving a 30% emissions reduction would reduce oil and gas imports by some €40 billion a year in 2020 (assuming an oil price of US\$ 88 per barrel in 2020). This saving is included in the €81 billion cost estimate of the 30% reduction set out above.

Air pollution would also be reduced, bringing health-related benefits estimated at some €3.5 to €8 billion per year (in 2020). Related air pollution control costs would also be around €3 billion a year lower in 2020. These air quality savings are not reflected in the cost estimate of the 30% reduction set out above.

### **How would a 30% greenhouse gas target be shared between sectors?**

The 20% reduction target was translated in the climate and energy package into distinct reduction targets for the EU ETS, on the one hand, and for the sectors not covered by the EU ETS, on the other.

Under the package the ETS (not including aviation) will contribute a 21% reduction between 2005 and 2020. The non-ETS sectors will cut their overall emissions by 10% over the same period. The reduction undertaken through the ETS is higher because it costs relatively less to reduce emissions from sectors covered by the system.

For a 30% reduction target, the cost-effective split between efforts in the ETS and non-ETS sectors would remain similar - the ETS would still need to deliver around double the percentage reduction of the non-ETS sectors. In 2020, the ETS cap (including aviation) would be 34% below the level of 2005 emissions, while the overall target for sectors not covered by the ETS would be an emissions reduction of 16% over the same period.

### **Where in the EU can the extra reductions needed for a 30% target be achieved, and what are the implications for funding such reductions?**

In moving from a 20% reduction target to 30%, the less costly emissions reduction potential will continue to be found in the poorer Member States. Several of these are projected to overachieve their 2020 targets for emissions from the non-ETS sectors

without additional efforts beyond business as usual. This means a significant emissions reduction potential remains untapped, even after implementation of the climate and energy package.

To capture this potential in a move to 30% it will be necessary to mobilise public and private financial resources to increase emission reductions without jeopardising economic growth. The EU's cohesion policy is an important instrument in this regard. By directing a greater volume of cohesion policy funding towards green investments Member States, regions and cities, also in poorer Member States, can step up their low-carbon investment.

### **What would a 30% target mean for the EU Emissions Trading System?**

The aim of the EU Emissions Trading System (EU ETS) is to help the EU and its Member States achieve their commitments to reduce GHG emissions in a cost-effective way. Allowing participating companies to buy or sell emission allowances means that emission cuts can be achieved at least cost.

Not surprisingly, the economic crisis has had a major impact on ETS emissions. Verified emissions in 2009 were 11.6% below the 2008 level (see [IP/10/576](#)). The carbon price is now lower than was estimated in 2008, when the climate and energy package was agreed. Furthermore, the carbon price is not expected to recover by 2020 to a level sufficient to drive innovation in new technologies such as carbon capture and storage.

As the primary tool to drive emission reductions in the EU, the ETS should be the starting point for measures to go beyond the 20% target. As mentioned above, in the case of moving to a 30% target, the ETS cap in 2020 would be 34% below 2005 emissions rather than the 21% reduction currently planned.

### **Why should the number of allowances auctioned be reduced under a 30% target?**

For the EU ETS to make a contribution to a 30% reduction target the number of allowances put in circulation in 2013 to 2020 would have to be reduced. This can be done in two ways, either by lowering the number of allowances auctioned or by allocating fewer allowances for free to industrial installations.

The introduction of large-scale auctions of emission allowances offers a practical way to start moving beyond 20% in the ETS. An increase in the reduction target could be achieved by setting aside a share of the allowances planned for auctioning in the period up to 2020, thus reducing the amount of allowances available. This would have the effect of strengthening the incentive for ETS businesses to reduce their emissions further.

Auctioning fewer allowances at a higher price could increase overall revenues for Member States: under a 30% reduction target the ETS carbon price is projected to increase from €16 to €30 per allowance, increasing revenues by one third in 2020.

If a decision is taken to move to a 30% reduction target, continuing to auction allowances at the pace currently foreseen under the 20% target may unduly disrupt the carbon market if the amount of allowances auctioned was adjusted only after the amended legislation was adopted and in force. Setting aside some auctioned allowances before the legislation was amended would allow the market to adjust smoothly.

## **Could the EU Emissions Trading System contribute further to innovation?**

Further incentives for innovation could be provided through the benchmarking system for free allocation, which provides an opportunity to identify those businesses which make rapid progress in improving performance and to reward them extra with unallocated free allowances. This would be a way to release extra finance to companies ready to innovate.

The operational rules of such an 'innovation accelerator' programme could be similar to those currently drawn up for the implementation of the demonstration programme for carbon capture and storage and innovative renewables technologies, which is funded by 300 million allowances from the new entrant reserve.

## **Is the EU in the lead on green technology?**

Europe still leads on green technology development in many areas. Europe's share of global new investment in renewable energy and energy efficiency was more than 40% in 2008. But since then investments in other countries, particularly China, have been growing rapidly. Europe's potential to lead cannot be taken for granted as global competition becomes fiercer.

- Europe's automobile sector is in the vanguard of efforts to cut CO<sub>2</sub> emissions from new cars. 17% of all new cars sold in 2008 in the EU emitted less than 120g/km. But similar progress is being made by other manufacturers, who are leapfrogging traditional engine technologies and moving to hybrid and electric vehicles.
- Some US states and China have rapidly increased investment opportunities for renewable energy, challenging the EU's lead. In 2009, China topped the global league table for wind power installation, and China and Taiwan now produce most of the world's photovoltaic panels for generating electricity from solar power. Chinese and Indian wind turbine manufacturers have appeared in the top 10 global producers.
- Regarding carbon capture and storage (CCS) technologies, the EU has taken important steps by putting in place a financial support scheme for the first CCS demonstration projects. But the deployment and commercial viability of CCS is heavily dependent on the price signal delivered by the carbon market. The lower than expected carbon price in the ETS acts as a much less powerful incentive for moving to CCS technologies, and for innovation in new technologies generally.

## **What technical options are there to reduce emissions?**

The greatest potential for further emission reductions is in electricity generation. This potential comprises a combination of power savings by industrial users and households, reduced transmission losses through more efficient grids and greater investment in low-carbon means of electricity production such as renewable energy. Some 61% of new electricity generation capacity installed in the EU in 2009 was based on renewable energy. Some industrial sectors in the ETS also still have a significant cost-effective reduction potential, such as oil refineries.

In the non-ETS sectors, households and services are important to reduce CO<sub>2</sub> emissions, mainly from heating. The agricultural sector is responsible for about half of all non-CO<sub>2</sub> emissions and has further potential to reduce methane and nitrous oxide emissions from intensive farming.

## **How can CO<sub>2</sub> taxation help to achieve the 30% target?**

Taxation can give a carbon price signal in those sectors that are not included in the ETS. The tax system can be calibrated to reflect the CO<sub>2</sub> component of fuels or products and thus give incentives to reduce emissions. It is one of the options some Member States already apply, for instance to exploit the large reduction potential in heating, reduce the carbon intensity of the car fleet and increase transport efficiency.

A tax also generates revenues for Member States, which could be used for low-carbon investments which in turn can create domestic green jobs. Macro-economic assessment of a 30% reduction indicates for instance that the net effects on GDP and employment could be positive if revenues were used to reduce labour costs.

## **Can we use the EU reduction better to leverage change in international crediting rules?**

Under the Clean Development Mechanism (CDM) emission-saving projects are undertaken in developing countries. The projects generate emission reduction credits that can then be bought by business or governments in industrialised countries to comply with their reduction targets. The CDM has led to several thousand projects worldwide, often involving very cost-effective reductions. However, it now seems more appropriate for advanced developing countries to undertake some of these reductions themselves.

Several options exist to use the leverage of international credits to aid the EU reduction effort.

A 'multiplier' could be introduced for acceptance in the EU ETS of conventional CDM credits from countries which do not participate adequately in international climate efforts. This could for instance take the form of a requirement to surrender two CDM credits, instead of only one, per tonne of CO<sub>2</sub> emitted in the EU ETS. This multiplier could be applied to certain types of very cost effective projects which in the EU's view should be undertaken by advanced developing countries themselves, such as industrial gas destruction projects.

Sectoral crediting could also be introduced alongside the project-based approach of the CDM. Sectoral credits would be generated once a whole sector in an advanced developing country met an ambitious pre-agreed emission threshold reflecting the level of action appropriate for that country.

In addition, a more targeted approach to international credits could also further address the risk of carbon leakage by not accepting CDM credits from projects in energy-intensive sectors that are deemed within the EU to be exposed to a significant risk of carbon leakage.

What would the objective be of an EU/China pilot initiative on sectoral crediting in the steel sector?

The EU has for some time been advocating a transition from project-based offsetting under the CDM towards sector-based crediting against ambitious crediting thresholds, in particular for advanced developing countries.

This position has triggered an active debate among stakeholders about the pros and cons of sectoral crediting schemes and the design challenges to ensure they succeed. Pilot initiatives are increasingly in focus as they would make it possible to move the debate forward by putting the idea into practice. This would enrich the debate in relevant UN fora and inform subsequent design decisions. The Commission considers a pilot initiative with the Chinese steel sector as a promising avenue to pursue in this regard.

## **Could land use, land use change and forestry (LULUCF) contribute to achieving the 30% target?**

Estimates of emissions from, and emission removals by, land use, land use change and forestry are characterised by significant uncertainty. However, it is clear that some LULUCF activities could make a limited contribution to reducing emissions in 2020. Due to the generally long time lag between the undertaking of LULUCF measures and their impact, the mitigation potential is greater in the longer term, eg in 2030.

## **What impact do the emission pledges made under the Copenhagen Accord have on the risk of carbon leakage?**

So far 125 Parties including the EU have officially associated themselves with the Copenhagen Accord<sup>2</sup> reached last December, representing more than 80% of global GHG emissions. All large emitters have submitted pledges of targets or actions to mitigate their emissions.

The Accord is not a legally binding treaty so negotiations to reach a UN climate agreement for the post-2012 period are continuing. This makes a definitive assessment of the outcome of the international negotiations difficult at this stage.

Nevertheless the Commission's analysis indicates that, if all emission pledges made under the Copenhagen Accord were fully implemented, the energy-intensive sectors in the EU would in general be in a slightly better position than if the EU implemented its 20% reduction without others taking any action. The fact that the 20% target is now less costly and the carbon price will be lower than originally thought has also reduced the risk of carbon leakage.

However, since uncertainties over the actual implementation of the Copenhagen Accord persist, the safeguards granted to energy-intensive industries that are deemed to be at risk of carbon leakage remain justified for the time being. These safeguards involve the allocation of free emission allowances, based on benchmarks, and the use of international credits.

## **If the GHG reduction target were raised to 30%, should additional or alternative measures be taken to prevent carbon leakage?**

The macro-economic analysis shows that, compared with the climate and energy package, the incremental impact of stepping up the EU's emissions reduction target to 30% while other Parties remain at their low pledges under the Copenhagen Accord would be limited for energy-intensive EU industry, as long as the safeguards mentioned above stay in place.

Given the uncertainties surrounding the Copenhagen pledges, moving to the 30% target could be accompanied by additional or alternative steps to address the risk of carbon leakage.

For example, as mentioned above, the EU should consider applying a more targeted approach to the nature and recognition of international credits in the ETS. Consideration should be given to requiring a higher level of environmental integrity of CDM credits from countries which are not participating adequately in international climate efforts.

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<sup>2</sup> For more information, see <http://www.unfccc.int/>



As set out in the current legislation, there would also be the option of including imports in the ETS. This implies that allowances would have to be bought on the market to cover the emissions from the production of certain imported goods. However, this would raise broader issues about EU trade policy and our overall interest in an open global trade system. A number of emerging economies have already signalled their concerns regarding this issue and any system would have to recognise that industrialised and developing country efforts to mitigate emissions will not run at the same pace. Such a measure would need to be very carefully designed to ensure that it is fully compatible with WTO requirements and to address other practical issues.

It could be hard to implement a system which sought to define in detail the carbon content of each individual category of goods, but such precision might be required. This suggests that the system could at best be envisaged for only a very limited number of standardised commodities, such as steel or cement. Secondly, for each category of goods an average EU carbon content would have to be defined. This could become an administrative burden, and would require agreement on such an average, which is likely to involve a difficult and protracted process. Thirdly, it would seem challenging to verify the emissions performance of individual installations in third countries without a highly sophisticated monitoring and reporting system in place at installation level.

### **Are the pledges under the Copenhagen Accord enough to keep global warming below 2°C?**

The high end pledges put forward by countries under the Copenhagen Accord, if fully implemented, constitute an important step towards putting global emissions on a trajectory compatible with keeping global warming below 2°C, but they are not sufficient.

Many industrialised country targets are conditional on others taking similar action, while many developing country pledges of action are conditional on receiving further international financial or technical support. This conditionality introduces further uncertainty over whether they will be implemented.

Industrialised countries' current emission targets collectively add up to at best an 18% reduction below 1990 levels by 2020 (high pledges) and at worst a 12% reduction (low pledges). This range is well below the 25-40% reduction in industrialised country emissions which the Intergovernmental Panel on Climate Change (IPCC) has said is needed by 2020 to put global emissions on a trajectory that has a 50/50 chance of keeping global warming below 2°C above the pre-industrial temperature. A collective reduction of 12-18% is also far below the 30% cut that the EU expects of industrialised countries overall.

Moreover, the ambition level of the current pledges would be substantially reduced if certain accounting issues under the Kyoto Protocol are not addressed, such as how to deal with the surplus of Assigned Amount Units from the first Kyoto commitment period and accounting rules for LULUCF. A potential solution for new EU Member States would be to replace their surplus AAUs with EU cohesion funding after 2012.

**What are the next steps?**

The Communication and the analysis contained in its Staff Working Documents will be forwarded to the Council, European Parliament, Committee of the Regions and Economic and Social Committee to inform their discussions on a potential move to a 30% GHG emission reduction target. The Commission will prepare further analysis to inform these discussions in the light of the international negotiations. The Commission will also continue to monitor the risk of carbon leakage.

**Where can I find further information?**

The Communication and Staff Working Documents are posted online at [http://ec.europa.eu/environment/climat/future\\_action\\_com.htm](http://ec.europa.eu/environment/climat/future_action_com.htm)