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Kyoto Protocol

What is the Kyoto Protocol?

The United Nations Framework Convention on Climate Change (UNFCCC) and its Kyoto Protocol provide the only international framework for combating climate change.[1]

The UNFCCC, the first international measure to address the problem, was adopted in May 1992 and came into force in March 1994. It obliges all its signatories to establish national programmes for reducing greenhouse gas emissions and to submit regular reports, and demands that the industrialised signatory countries[2], as opposed to developing countries, stabilise their greenhouse gas emissions at 1990 levels by the year 2000. This goal, however, is non-binding.

By differentiating between industrialised and developing countries, the UNFCCC recognises that industrialised countries are responsible for most of the global greenhouse gas emissions and also have the institutional and financial capacities for reducing them. The Parties meet annually to review progress and discuss further measures, and a number of global monitoring and reporting mechanisms are in place to keep track of greenhouse gas emissions.

It was already recognised in 1994 that the initial UNFCCC commitments would not be enough to halt the global increase in greenhouse gas emissions. On 11 December 1997, governments took a further step and adopted a protocol to the UNFCCC in the Japanese town of Kyoto. Building on the UNFCCC framework, the Kyoto Protocol sets legally binding limits on greenhouse gas emissions in industrialised countries and envisages innovative market-based implementation mechanisms aimed at keeping the cost of curbing emissions low.

Under the Kyoto Protocol, industrialised countries are required to reduce the emissions of six greenhouse gases (CO_2, which is the most important one, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride) on average by 5.2 % below the 1990 levels during the first "commitment period" from 2008 to 2012. There are no emission targets for developing countries.

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[1] Comprehensive information on the UNFCCC and the Kyoto Protocol can be found at http://unfccc.int.

[2] The UNFCCC divides countries into two main groups: As of 1 July 2002, 186 countries were Parties to the Convention, out of which 40 industrialised countries were listed in the Convention's Annex I, and the remaining 146 were known as non-Annex I countries. Annex I countries include the 24 relatively wealthy industrialised countries that were members of the organisation for Economic Co-operation and Development (OECD) in 1992, the 15 EU Member States and 11 countries with economies in transition to a market economy, including Russia.

A five-year commitment period was chosen rather than a single target year to smooth out annual fluctuations in emissions due to uncontrollable factors such as weather. International negotiations on a second commitment period under the Kyoto Protocol after 2012 are to start in 2005.

The commitments will become legally binding once the Kyoto Protocol enters into force. The rules for entry into force demand that at least 55 Parties to the UNFCCC ratify the Protocol and that those include industrialised countries (Annex I countries) accounting for at least 55% of the CO_2 emissions in 1990. Thus far, 121 countries have ratified the Kyoto Protocol, so the first threshold has been attained. However, the Annex I countries among them represent only 44.2% of the CO_2 emissions[3]. (The EU's share is 24.2%.)

There are five Annex I countries that have not ratified yet: Australia, Liechtenstein, Monaco, Russia and the United States. But only ratification by Russia, which is responsible for 17.4% of the global 1990 CO_2 emissions, or the US, responsible for 36.1%, will make a difference as the three remaining countries together account for only 2.1%. After the United States withdrew from the Kyoto Protocol in early 2001, Russia now holds the key for the Protocol's entry into force. It has announced that it will ratify soon.

After the Kyoto Protocol was adopted, negotiations on the details of the mechanisms that it envisages and on the rules of implementation continued. The final negotiations were concluded with the Marrakech Accords in 2001. The EU played a major role in bringing the negotiations on the Kyoto Protocol to a successful conclusion, in particular after the US withdrawal.

Progress in implementing the Kyoto Protocol in the EU

Under the Kyoto Protocol, the EU committed itself to reducing its greenhouse gases emissions by 8% during the first commitment period from 2008 to 2012. This target is shared between the Member States under a legally binding burden-sharing agreement, which sets individual emissions targets for each Member State[4]. On 31 May 2002, the EU and all its Member States ratified the Kyoto Protocol.

Economic analyses of the Kyoto Protocol and its implications for the EU show that the overall compliance costs are difficult to estimate and can greatly vary, depending on a range of factors. Provided that cost-effective policies are given full priority, the compliance costs to the EU economy are estimated at around 0.06% of GDP or €3.7 billion annually between 2008 and 2012.

The ten accession countries scheduled to join the EU in May 2004 all have ratified the Kyoto Protocol and have their own Kyoto targets of between –6% and –8%. The EU's 8% target only refers to the current 15 Member States, and this will not change after enlargement.

The EU met its UNFCCC commitment to stabilise its greenhouse gas emissions at 1990 levels by 2000, by reducing its emissions by 3.3% between 1990 and 2000. This reduction also means that the EU made progress towards reaching its 8% Kyoto emission reduction target. However, emissions went up by 0.3% between 1999 and 2000, and by 1% between 2000 and 2001. So, in 2001, the latest year for which figures are available, the EU's greenhouse gas emissions stood at 2.3% below their levels in 1990.

[3] See http://unfccc.int/resource/kpthermo_if.html
[4] Council Decision 2002/358/EC of 25 April 2002

A considerable part of the initial progress was due to large cuts in emissions in Germany (by 18.3%, about half of which is estimated to be the consequence of economic restructuring in former East Germany) and the UK (by 12%, part of which is due to the move from coal to gas) as well as Luxembourg (by 44.2%, much of which is a result of the restructuring of the steel industry). Ten of the 15 Member States are a long way off the track towards meeting their obligations under the EU burden-sharing arrangement. (See Annex for further details.)

In terms of sectors, since 1990 emissions have been reduced in the manufacturing industries, the energy sector (electricity and heat production) and from small combustion installations, including households. By contrast, CO_2 emissions from transport increased by 18% between 1990 and 2000, with a share in total greenhouse gas emissions of 21%.

These figures show that significant further efforts are required by the EU and its individual Member States to meet their obligations under the Kyoto Protocol. The EU emissions trading system is expected to play an important role in bringing the less well performing EU Member States back on track.

Kyoto's market-based flexible mechanisms

The Kyoto Protocol envisages three market-based "flexible mechanisms": emissions trading, Joint Implementation and the Clean Development Mechanism. These are to allow industrialised countries to meet their targets through trading emission allowances between themselves and gaining credits for emission-curbing projects abroad. Joint Implementation refers to projects in countries that, too, have emission targets, and the Clean Development Mechanism refers to projects in developing countries with no targets.

The rationale behind these three mechanisms is that greenhouse gas emissions are a global problem and that the place where reductions are achieved is of less importance. In this way, reductions can be made where costs are lowest, at least in the initial phase of combating climate change.

Detailed rules and supervisory structures have been set up to ensure that these mechanisms are not abused.

Emissions trading

While the implementation of the three flexible mechanisms at international level will become possible only once the Kyoto Protocol comes into force, the EU is moving ahead with its own internal emissions trading system. The Directive was approved by the European Parliament on 2 July 2003,and the Council on 22 July. Emissions trading will start in 2005 and cover the Member States of the enlarged European Union. The EU scheme will be the first multi-national emissions trading scheme in the world and is considered a forerunner of the international emissions trading scheme under the Kyoto Protocol.

Under the EU emissions trading scheme, the EU Member States will set limits on CO_2 emissions from energy-intensive companies (more than 10,000 steel factories, power plants, oil refineries, paper mills, and glass and cement installations) by issuing allowances as to how much CO_2 these companies are allowed to emit. Reductions below the limits will be tradable. Companies that achieve reductions can sell them to companies that have problems staying within their limits or for which emissions reduction measures are too expensive in comparison with what the allowances will cost. Any company may also increase its emissions above the level of allowance it is issued by acquiring more allowances from the market.

This scheme will induce companies to make emission cuts where they are cheapest, thereby ensuring that reductions are made at the lowest possible cost to the economy and that innovation is fostered.

It is estimated that the companies currently participating in the scheme account for almost half of the EU's total CO_2 emissions. Other sectors, such as aluminium producers, the chemicals industry and the transport sector, might be brought in later.

The EU Member States now must prepare their National Allocation Plans setting out the allowances that each sector and company will be issued. The Plans need to be submitted to the Commission by April 2004.

The EU has also indicated its willingness to link the EU scheme to trading schemes in other countries that have ratified the Kyoto protocol.

Joint Implementation and the Clean Development Mechanism

Under the Kyoto Protocol, Joint Implementation (JI) and the Clean Development Mechanism (CDM) will allow industrialised countries to achieve part of their emission reduction commitments by conducting emission-reducing projects abroad and counting the reductions achieved toward their own commitments. JI will allow for projects in other industrialised countries with Kyoto targets, while CDM will take place in countries without targets, i.e. developing countries. A condition for the issue of credits in respect of the reductions achieved is that the projects result in real, measurable and long-term climate change benefits.

Building on these provisions and the EU emissions trading system, the Commission on 23 July 2003 adopted a proposal that links credits from JI and CDM projects with the emissions trading system. Under this proposal, European companies covered by the EU emissions trading system will be allowed to convert credits from JI and CDM projects for use towards meeting their commitments under the trading system. (Governments will be allowed to use credits from JI and CDM projects towards meeting their commitments under the Kyoto Protocol during the first Kyoto commitment period 2008-2012, provided that the Protocol enters into force.)

The reasoning behind JI and CDM is similar to the one behind emissions trading: It does not matter where emissions reductions are achieved as climate change is a global problem. The important thing is that they take place and are achieved in the most cost-effective way. It is estimated that the linking of project credits to the emissions trading system will lower the annual compliance costs for companies covered by the scheme, which include companies in the ten accession countries, by about a quarter. JI and CDM will also transfer environmentally sound technology to countries with economies in transition (JI) and developing countries (CDM), which will help them move onto a sustainable path of development.

The Commission's proposal takes into account the obligation for Parties to the Kyoto Protocol to achieve a significant part of their Kyoto targets through emission reductions in the European Union, so that the use of the Kyoto flexible mechanisms is supplementary to domestic efforts. It therefore envisages the triggering of a review once JI and CDM project credits equivalent to 6% of the total quantity of allowances issued for the trading period 2008-2012 enter the emissions trading scheme. If and when triggered, this review will consider placing a limit on the credits that can be converted during the remainder of the trading period.

The proposal excludes nuclear projects in line with the Kyoto Protocol's rules and "carbon sinks." Carbon sinks - planting forests to soak up CO_2 - have been a contentious issue at UN level because they do not bring technology transfer, they are inherently temporary and reversible, and uncertainty remains about the effects of emission removal by carbon sinks. In addition, international negotiations on what types of forestry projects might be acceptable to governments have not yet been completed.

The Kyoto Protocol and the EU

Combating climate change is one of the main commitments under the EU's sustainable development strategy as endorsed by the European Council in Göteborg in 2001, which also reaffirmed the EU's commitment to meeting its Kyoto target. The Brussels European Council of 20/21 March 2003 invited the Member States to accelerate progress towards meeting the Kyoto Protocol targets. Climate change is also one of the four priority areas under the Community's 6th Environmental Action Programme, which calls for full implementation of the Kyoto Protocol as a first step towards reaching a long-term target of 70% in emission cuts.[5]

The backbone of the Commission's effort to implement the Kyoto Protocol is the "European Climate Change Programme" (EECP), which was launched in March 2000. The ECCP's goal is, with all the relevant stakeholders, to identify and develop cost-effective measures that will help the EU meet its 8% Kyoto target, complementing the efforts of the Member States. Since the ECCP was launched, more than 200 stakeholders have been involved in eleven different working groups.

The findings of the Second ECCP Progress Report issued in April 2003 suggest that plenty of cost-effective measures exist to meet the EU's Kyoto target.[6] Forty-two potential emission reduction measures at a cost of less than €20 per tonne of CO_2 equivalent have been identified with a total emission reduction potential of up to 700 million tonnes of CO_2 equivalent. The emission reduction needed to meet the EU's Kyoto target is estimated at around 340 million tonnes of CO_2 equivalent.

While the emissions trading scheme is the measure with most potential, the Council and the European Parliament have adopted several other initiatives, such as legislation to promote renewables in electricity production and bio-fuels in road transport, and legislation on the energy efficiency of buildings. Other measures have been proposed by the Commission, such as the Directive linking JI/CDM to the EU's emission trading system and a Directive to promote combined heat and power. Further proposals are in the pipeline, for example legislation on regulating fluorinated gases. The European Commission has also negotiated an agreement with all European, Japanese and Korean carmakers to cut average CO_2 emissions of new cars in the order of 25% below 1995 levels by 2008/2009.

[5] Decision 1600/2002/EC of the European Parliament and the Council of 22 July 2002.
[6] Second ECCP Progress Report - "Can we meet our Kyoto targets?", April 2003.

But even the initiatives that have been adopted still need to be implemented, so it remains to be seen how far they will help curb emissions in practice. Impact assessments are always based on many assumptions and variables and whether the full potential of a measure is realised depends on a broad range of factors.

Impacts of climate change

According to the Third Assessment Report of the Intergovernmental Panel on Climate Change (IPPC) that brings together the world's leading experts in this field, the globally averaged surface temperature is projected to increase by between 1.4 and 5.8°C from 1990 to 2100 under business-as-usual, and sea levels are expected to rise by between 9 and 88 centimetres over the same period. If nothing is done to reduce these changes, they will have major consequences for the ecosystem and our economies.

These consequences will include geographic shifts in the occurrence of different species and/or the extinction of species. Changes in rainfall patterns will put pressure on water resources in many regions, which will in turn affect both drinking water supplies and irrigation. Extreme weather events and floods will become more frequent with their well-known economic costs and human suffering. Warm seasons will become dryer in most mid-latitude continental interiors, increasing the frequency of droughts and land degradation. This will be particularly serious for areas where land degradation, desertification and droughts are already severe. Developing countries will suffer particularly, and tropical diseases will extend their geographic range. Globally, the 1990s were the warmest decade since 1861.

The following figures and tables give details, for each Member State and the EU as a whole, of trends in emissions of the six greenhouse gases up to 2001. Emissions from international aviation and shipping, and emissions from/removals by land use change and forestry, are not covered.

Figure 1: Total EU greenhouse gas emissions in relation to the Kyoto target

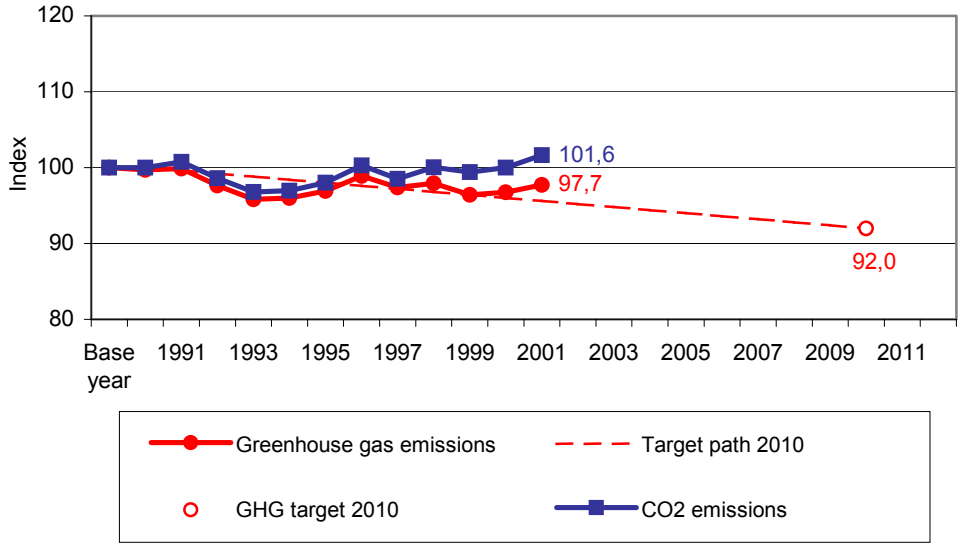

Table 1: Greenhouse gas emission trends and Kyoto Protocol targets for 2008-2012

MEMBER STATE	Base year [1] (million tonnes)	2001 (million tonnes)	Change 2000–2001 (%)	Change base year–2001 (%)	Targets 2008–12 under Kyoto Protocol and "EU burden sharing" (%)
Austria	78,3	85,9	4,8%	9,6%	-13,0%
Belgium	141,2	150,2	0,2%	6,3%	-7,5%
Denmark [2]	69,5	69,4	1,8%	-0,2% (-10,7%)	-21,0%
Finland	77,2	80,9	7,3%	4,7%	0,0%
France	558,4	560,8	0,5%	0,4%	0,0%
Germany	1216,2	993,5	1,2%	-18,3%	-21,0%
Greece	107,0	132,2	1,9%	23,5%	25,0%
Ireland	53,4	70,0	2,7%	31,1%	13,0%
Italy	509,3	545,4	0,3%	7,1%	-6,5%
Luxembourg	10,9	6,1	1,3%	-44,2%	-28,0%
Netherlands	211,1	219,7	1,3%	4,1%	-6,0%
Portugal	61,4	83,8	1,9%	36,4%	27,0%
Spain	289,9	382,8	-1,1%	32,1%	15,0%
Sweden	72,9	70,5	2,2%	-3,3%	4,0%
United Kingdom	747,2	657,2	1,3%	-12,0%	-12,5%
EU-15	**4204,0**	**4108,3**	**1,0%**	**-2,3%**	**-8,0%**

[1] Base year for CO_2, CH_4 and N_2O is 1990; for fluorinated gases 1995 is used as the base year, as allowed for under the Kyoto Protocol. This reflects the preference of most Member States.

[2] For Denmark, data that reflect adjustments in 1990 for electricity trade (import and export) and for temperature variations are given in brackets. This methodology is used by Denmark to monitor progress towards its national target under the EU "burden sharing" agreement. For the EU emissions total non-adjusted Danish data have been used.