

The Kyoto Protocol

The Kyoto Protocol is an agreement made under the United Nations Framework Convention on Climate Change (UNFCCC). Countries that ratify this protocol commit to reducing their emissions of carbon dioxide and five other greenhouse gases (GHG), or engaging in emissions trading if they maintain or increase emissions of these gases.

The Kyoto Protocol now covers more than 170 countries globally but only 60% of countries in terms of global greenhouse gas emissions. As of December 2007, the US and Kazakhstan are the only signatory nations not to have ratified the act. The first commitment period of the Kyoto Protocol ends in 2012, and international talks began in May 2007 on a subsequent commitment period.[4]

At its heart, the Kyoto Protocol establishes the following principles:

- Kyoto is underwritten by governments and is governed by global legislation enacted under the UN's aegis.
- Governments are separated into two general categories: developed countries, referred to as Annex I countries (who have accepted greenhouse gas emission reduction obligations and must submit an annual greenhouse gas inventory), and developing countries, referred to as Non-Annex I countries (who have no greenhouse gas emission reduction obligations but may participate in the Clean Development Mechanism).
- Any Annex I country that fails to meet its Kyoto obligation will be penalized by having to submit 1.3 emission allowances in a second commitment period for every ton of greenhouse gas emissions they exceed their cap in the first commitment period (i.e., 2008-2012).
- As of January 2008, and running through 2012, Annex I countries have to reduce their greenhouse gas emissions by a collective average of 5% below their 1990 levels (for many countries, such as the EU member states, this corresponds to some 15% below their expected greenhouse gas emissions in 2008). While the average emissions reduction is 5%, national limitations range from an 8% average reduction across the European Union to a 10% emissions increase for Iceland; but, since the EU's member states each have individual obligations,[5] much larger increases (up to 27%) are allowed for some of the less developed EU countries (see below #Increase in greenhouse gas emission since 1990). [2] Reduction limitations expire in 2013.
- Kyoto includes "flexible mechanisms" which allow Annex I economies to meet their greenhouse gas emission limitation by purchasing GHG emission reductions from elsewhere. These can be bought either from financial exchanges, from projects which reduce emissions in non-Annex I economies under the Clean Development Mechanism (CDM), from other Annex 1 countries under the JI, or from Annex I countries with excess allowances. Only CDM Executive Board-accredited Certified Emission Reductions (CER) can be bought and sold in this manner. Under the aegis of the UN, Kyoto established this Bonn-based Clean Development Mechanism Executive Board to assess and approve projects ("CDM Projects") in Non-Annex I economies prior to awarding CERs. (A similar scheme called "Joint Implementation" or "JI" applies in transitional economies mainly covering the former Soviet Union and Eastern Europe).

In practice this means that Non-Annex I economies have no GHG emission restrictions, but when a greenhouse gas emission reduction project (a "Greenhouse Gas Project") is implemented in these countries the project will receive Carbon Credits, which can then be sold to Annex I buyers.

These Kyoto mechanisms are in place for two main reasons:

- there were fears that the cost of complying with Kyoto would be expensive for many Annex I countries, especially those countries already home to efficient, low greenhouse gas emitting industries, and high prevailing environmental standards. Kyoto therefore allows these countries to purchase (cheaper) carbon credits on the world market instead of reducing greenhouse gas emissions domestically, and
- this is seen as a means of encouraging Non-Annex I developing economies to reduce greenhouse gas emissions through sustainable development, since doing so is now economically viable because of the investment flows from the sale of Carbon Credits.

All the Annex I economies have established Designated National Authorities to manage their greenhouse gas portfolios under Kyoto. Countries including Japan, Canada, Italy, the Netherlands, Germany, France, Spain and many more are actively promoting government carbon funds and supporting multilateral carbon funds intent on purchasing Carbon Credits from Non-Annex I countries. These government organizations are working closely with their major utility, energy, oil & gas and chemicals conglomerates to try to acquire as many Greenhouse Gas Certificates as cheaply as possible.

Virtually all of the Non-Annex I countries have also set up their own Designated National Authorities to manage the Kyoto process (and specifically the "CDM process" whereby these host government entities decide which Greenhouse Gas Projects they do or do not wish to support for accreditation by the CDM Executive Board).

The objectives of these opposing groups are quite different. Annex I entities want Carbon Credits as cheaply as possible, whilst Non-Annex I entities want to maximize the value of Carbon Credits generated from their domestic Greenhouse Gas Projects.

Objectives Kyoto is intended to cut global emissions of greenhouse gases.

The objective is to achieve "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system."^[6]

The Intergovernmental Panel on Climate Change (IPCC) has predicted an average global rise in temperature of 1.4°C (2.5°F) to 5.8°C (10.4°F) between 1990 and 2100.^[7]

Proponents also note that Kyoto is a first step^{[8][9]} as requirements to meet the UNFCCC will be modified until the objective is met, as required by UNFCCC Article 4.2(d).^[10]

Status of the agreement Participation in the Kyoto Protocol: green indicates states parties, yellow indicates states with ratification pending, and red indicates those that signed but declined ratification of the treaty.

The treaty was negotiated in Kyoto, Japan in December 1997, opened for signature on March 16, 1998, and closed on March 15, 1999. The agreement came into force on February 16, 2005 following ratification by Russia on November 18, 2004. As of November 2007, a total of 175 countries and other governmental entities have ratified the agreement (representing over 61.6% of emissions from Annex I countries).^{[1][2]}

According to article 25 of the protocol, it enters into force "on the ninetieth day after the date on which not less than 55 Parties to the Convention, incorporating Parties included in Annex I which accounted in total for at least 55% of the total carbon dioxide emissions for 1990 of the Parties included in Annex I, have deposited their instruments of ratification, acceptance, approval or accession." Of the two conditions, the "55 parties" clause was reached on May 23, 2002 when Iceland ratified. The ratification by Russia on 18 November 2004 satisfied the "55%" clause and brought the treaty into force, effective February 16, 2005. Details of the agreement

According to a press release from the United Nations Environment Programme: "The Kyoto Protocol is an agreement under which industrialized countries will reduce their collective emissions of greenhouse gases by 5.2% compared to the year 1990 (but note that, compared to the emissions levels that would be expected by 2010 without the Protocol, this limitation represents a 29% cut). The goal is to lower overall emissions of six greenhouse gases - carbon dioxide, methane, nitrous oxide, sulfur hexafluoride, hydrofluorocarbons, and perfluorocarbons - averaged over the period of 2008-2012. National limitations range from 8% reductions for the European Union and some others to 7% for the US, 6% for Japan, 0% for Russia, and permitted increases of 8% for Australia and 10% for Iceland.^[11]

It is an agreement negotiated as an amendment to the United Nations Framework Convention on Climate Change (UNFCCC, which was adopted at the Earth Summit in Rio de Janeiro in 1992). All parties to the UNFCCC can sign or ratify the Kyoto Protocol, while non-parties to the UNFCCC cannot. The Kyoto Protocol was adopted at the third session of the Conference of Parties to the UNFCCC (COP3) in 1997 in Kyoto, Japan.

Most provisions of the Kyoto Protocol apply to developed countries, listed in Annex I to the UNFCCC. Emission figures exclude international aviation and shipping.

Common but differentiated responsibility

The United Nations Framework Convention on Climate Change agreed to a set of a "common but differentiated responsibilities." The parties agreed that:

- the largest share of historical and current global emissions of greenhouse gases has originated in developed countries;
- per capita emissions in developing countries are still relatively low, and
- the share of global emissions originating in developing countries will grow to meet their social and development needs.^[12]

In other words, China, India, and other developing countries were not included in any numerical limitation of the Kyoto Protocol because they were not the main contributors to the greenhouse gas emissions during the pre-treaty industrialization period. However, even without the commitment to reduce according to the Kyoto target, developing countries do share the common responsibility that all countries have in reducing emissions.

Financial commitments

The Protocol also reaffirms the principle that developed countries have to pay billions of dollars, and supply technology to other countries for climate-related studies and projects. This was originally agreed in the UNFCCC.

Emissions trading Main article: Emissions trading

Kyoto is a 'cap and trade' system that imposes national caps on the emissions of Annex I countries. On average, this cap

requires countries to reduce their emissions 5.2% below their 1990 baseline over the 2008 to 2012 period. Although these caps are national-level commitments, in practice most countries will devolve their emissions targets to individual industrial entities, such as a power plant or paper factory. One example of a 'cap and trade' system is the 'EU ETS'. Other schemes may follow suit in time.

This means that the ultimate buyers of credits are often individual companies that expect their emissions to exceed their quota (their Assigned Allocation Units, AAUs or 'allowances' for short). Typically, they will purchase credits directly from another party with excess allowances, from a broker, from a JI/CDM developer, or on an exchange.

National governments, some of whom may not have devolved responsibility for meeting Kyoto obligations to industry, and that have a net deficit of allowances, will buy credits for their own account, mainly from JI/CDM developers. These deals are occasionally done directly through a national fund or agency, as in the case of the Dutch government's ERUPT programme, or via collective funds such as the World Bank's Prototype Carbon Fund (PCF). The PCF, for example, represents a consortium of six governments and 17 major utility and energy companies on whose behalf it purchases Credits.

Since allowances and carbon credits are tradeable instruments with a transparent price, financial investors can buy them on the spot market for speculation purposes, or link them to futures contracts. A high volume of trading in this secondary market helps price discovery and liquidity, and in this way helps to keep down costs and set a clear price signal in CO₂ which helps businesses to plan investments. This market has grown substantially, with banks, brokers, funds, arbitrageurs and private traders now participating in a market valued at about \$60 billion in 2007[13]. Emissions Trading PLC, for example, was floated on the London Stock Exchange's AIM market in 2005 with the specific remit of investing in emissions instruments.

Although Kyoto created a framework and a set of rules for a global carbon market, there are in practice several distinct schemes or markets in operation today, with varying degrees of linkages among them.

Kyoto enables a group of several Annex I countries to join together to create a market-within-a-market. The EU elected to be treated as such a group, and created the EU Emissions Trading Scheme (ETS). The EU ETS uses EAUs (EU Allowance Units), each equivalent to a Kyoto AAU. The scheme went into operation on 1 January 2005, although a forward market has existed since 2003.

The UK established its own learning-by-doing voluntary scheme, the UK ETS, which ran from 2002 through 2006. This market existed alongside the EU's scheme, and participants in the UK scheme have the option of applying to opt out of the first phase of the EU ETS, which lasts through 2007[citation needed].

The sources of Kyoto credits are the Clean Development Mechanism (CDM) and Joint Implementation (JI) projects. The CDM allows the creation of new carbon credits by developing emission reduction projects in Non-Annex I countries, while JI allows project-specific credits to be converted from existing credits within Annex I countries. CDM projects produce Certified Emission Reductions (CERs), and JI projects produce Emission Reduction Units (ERUs), each equivalent to one AAU. Kyoto CERs are also accepted for meeting EU ETS obligations, and ERUs will become similarly valid from 2008 for meeting ETS obligations (although individual countries may choose to limit the number and source of CER/JIs they will allow for compliance purposes starting from 2008). CERs/ERUs are overwhelmingly bought from project developers by funds or individual entities, rather than being exchange-traded like allowances.

Since the creation of Kyoto instruments is subject to a lengthy process of registration and certification by the UNFCCC, and the projects themselves require several years to develop, this market is at this point largely a forward market where purchases are made at a discount to their equivalent currency, the EUA, and are almost always subject to certification and delivery (although up-front payments are sometimes made). According to IETA, the market value of CDM/JI credits transacted in 2004 was EUR 245 m; it is estimated that more than EUR 620 m worth of credits were transacted in 2005.

Several non-Kyoto carbon markets are in existence or being planned, and these are likely to grow in importance and numbers in the coming years. These include the New South Wales Greenhouse Gas Abatement Scheme, the Regional Greenhouse Gas Initiative and Western Climate Initiative in the United States, the Chicago Climate Exchange and the State of California's recent initiative to reduce emissions.

These initiatives, taken together may create a series of partly-linked markets, rather than a single carbon market. The common theme across most of them is the adoption of market-based mechanisms centered on carbon credits that represent a reduction of CO₂ emissions. The fact that some of these initiatives have similar approaches to certifying their credits makes it conceivable that carbon credits in one market may in the long run be tradeable in other schemes. This would broaden the current carbon market far more than the current focus on the CDM/JI and EU ETS domains. An obvious precondition, however, is a realignment of penalties and fines to similar levels, since these create an effective ceiling for each market.

Revisions

The protocol left several issues open to be decided later by the sixth Conference of Parties (COP). COP6 attempted to resolve these issues at its meeting in the Hague in late 2000, but was unable to reach an agreement due to disputes between the European Union on the one hand (which favoured a tougher agreement) and the United States, Canada, Japan and Australia on the other (which wanted the agreement to be less demanding and more flexible).

In 2001, a continuation of the previous meeting (COP6bis) was held in Bonn where the required decisions were adopted. After some concessions, the supporters of the protocol (led by the European Union) managed to get Japan and Russia in as well by allowing more use of carbon dioxide sinks.

COP7 was held from 29 October 2001 through 9 November 2001 in Marrakech to establish the final details of the protocol.

The first Meeting of the Parties to the Kyoto Protocol (MOP1) was held in Montreal from November 28 to December 9, 2005, along with the 11th conference of the Parties to the UNFCCC (COP11). See United Nations Climate Change Conference.

The 3rd of December 2007, Australia ratified the protocol during the first day of the COP13 in Bali.

Enforcement

If the Enforcement Branch determines that an Annex I country is not in compliance with its emissions limitation, then that country is required to make up the difference plus an additional 30%. In addition, that country will be suspended from making transfers under an emissions trading program.[14]

Current positions of governments Carbon emissions from various global regions during the period 1800-2000 AD
See also: List of Kyoto Protocol signatories

Australia

Despite Australia being one of the biggest emitters on a per capita basis[15][16] (albeit the lowest on a per square kilometre basis due to low overall population density), the country was granted a limitation of an 8% increase. This was because of considerations specified in Article 4, section 8(h) of the Convention.

The Australian Prime Minister at the time, John Howard (Liberal Party), declined to ratify the Agreement, arguing that the protocol would cost Australians jobs,[17] due to countries with booming economies and massive populations such as China and India not having any reduction obligations. Further, it was claimed that Australia was already doing enough to cut emissions; having pledged \$300 million to reduce Greenhouse gas emissions over three years.[citation needed]

Australia's new government formed by the Australian Labor Party after the November 2007 election fully supports the protocol[18] and Prime Minister Kevin Rudd signed the instrument of ratification immediately after assuming office on 3 December 2007, just before the meeting of the UN Framework Convention on Climate Change [19]; it took effect in March, 2008.[20] When still in Opposition, Kevin Rudd commissioned Professor Ross Garnaut to report into the economic issues of reducing greenhouse gas emissions. Garnaut's report is due to be handed to the Australian Government in September 2008, with a draft in June 2008.

Analysis has projected Australia's greenhouse gas emissions at 109% of the 1990 emissions level over the period 2008–12, calculated including the effects of Land use, land-use change and forestry (LULUCF). This is slightly above its 108% Kyoto Protocol limitation. As of 2007, the UNFCCC is reporting that Australia's 2004 greenhouse gas emissions were at 125.6% of 1990 levels, calculated without the LULUCF correction.
http://unfccc.int/files/inc/graphics/image/gif/graph3_2007_ori.gif

The previous Australian Government, along with the United States, agreed to sign the Asia Pacific Partnership on Clean Development and Climate at the ASEAN regional forum on 28 July 2005. Furthermore, the Australian state of New South Wales (NSW) commenced The NSW Greenhouse Gas Abatement Scheme (GGAS).[21] This mandatory greenhouse gas emissions trading scheme commenced on 1 January 2003 and is currently being trialled by the state government in NSW alone. Uniquely this scheme allows Accredited Certificate Providers (ACP) to trade emissions from householders in the state. As of 2006 the scheme is still in place despite the outgoing Prime Minister's clear dismissal of emissions trading as a credible solution to climate change. Following the example of NSW, the National Emissions Trading Scheme (NETS) has been established as an initiative of State and Territory Governments of Australia, all of which have Labor Party governments.[22] The focus of NETS is to bring into existence an intra-Australian carbon trading scheme and to coordinate policy developments to this end. According to the Constitution of Australia,[23] environmental matters are under the jurisdiction of the States, and the NETS is intended to facilitate ratification of the Kyoto Protocol by the incoming Labor Government.

Greenpeace have called Clause 3.7 of the Kyoto Protocol the "Australia Clause", as Australia was the major beneficiary. The clause allows for Annex 1 countries with high rates of land clearing in 1990 to consider that year a base level. Greenpeace argues that Australia had extremely high levels of land clearing in 1990, and that this meant that Australia's "baseline" was unusually high compared to other countries.[24]

Canada

On December 17, 2002, Canada ratified the treaty that came into force in February 2005, requiring it to reduce emissions to 6% below 1990 levels during the 2008-2012 commitment period. At that time, numerous polls showed support for the Kyoto protocol at around 70%.[25][26] Despite strong public support, there was still some opposition, particularly by the Canadian Alliance, precursor to the governing Conservative Party, some business groups,[27] and energy concerns, using arguments similar to those being used in the US. In particular, there was a fear that since US companies would not be affected by the Kyoto Protocol that Canadian companies would be at a disadvantage in terms of trade. In 2005, the result was limited to an ongoing "war of words", primarily between the government of Alberta (Canada's primary oil and gas producer) and the federal government. As of 2003, the federal government claimed to have spent or committed 3.7 billion dollars on climate change programmes.[28] By 2004, CO2 emissions had risen to 27% above 1990 levels (which compares unfavorably to the 16% increase in emissions by the United States during that time).[29]

In January 2006, a Conservative minority government under Stephen Harper was elected, who previously has expressed opposition to Kyoto, and in particular to the plan to participate in international emission trading. Rona Ambrose, who replaced Stéphane Dion as the environment minister, has since endorsed some types of emission trading, and indicated interest in international trading.[30] On April 25, 2006, Ambrose announced that Canada would have no chance of meeting its targets under Kyoto, and would look to participate in U.S. sponsored Asia-Pacific Partnership on Clean Development and Climate. "We've been looking at the Asia-Pacific Partnership for a number of months now because the key principles around [it] are very much in line with where our government wants to go," Ambrose told reporters.[31] On May 2, 2006, it was reported that environmental funding designed to meet the Kyoto standards had been cut, while the Harper government develops a new plan to take its place.[32] As the co-chair of UN Climate Change Conference in Nairobi in November 2006, Canada and its government received criticism from environmental groups and from other governments for its climate change positions.[33] On January 4, 2007, Rona Ambrose moved from the Ministry of the Environment to become Minister of Intergovernmental Affairs. The Environment portfolio went to John Baird, the former President of the Treasury Board.

Canada's federal government has introduced legislation to set mandatory emissions targets for industry, but it will not take effect until an estimated 2050. The government has since begun working with opposition parties to improve the legislation.

A private member's bill,[34] was put forth by Pablo Rodriguez, Liberal, aiming to force the government to "ensure that Canada meets its global climate change obligations under the Kyoto Protocol." With the support of the Liberals, the New Democratic Party and the Bloc Québécois, and with the current minority situation, the bill passed the House of Commons on 14 February 2007 with a vote of 161-113,[35] and is now being considered by the Senate. If passed, the bill would give the government 60 days to form a detailed plan of action. The government has flatly refused to abide by the bill, which may spark a constitutional crisis, lawsuit, or non-confidence motion once the bill becomes law, as is expected.[36]

In May 2007 Friends of the Earth sued the Canadian federal government for failing to meet its Kyoto Protocol obligations to cut greenhouse gas emissions linked to global warming. This was based on a clause in the Canadian Environmental Protection Act that requires Ottawa to "prevent air pollution that violates an international agreement binding on Canada".[37] Canada's obligation to the treaty began in 2008.

Regardless of the national position, some individual provinces are pursuing policies to restrain emissions, including Quebec[38] and British Columbia and Manitoba as part of the Western Climate Initiative.

People's Republic of China See also: Energy policy of China

In 2004 the total greenhouse gas emissions from the People's Republic of China were about 54% of the USA emissions.[39] However, China is now building on average one coal-fired power plant every week, and plans to continue doing so for years.[40][41] Various predictions see China overtaking the US in total greenhouse emissions between late 2007 and 2010,[42][43][44] and according to many other estimates, this already occurred in 2006.[45][46][47]

The Chinese government insists that the gas emissions level of any given country is a multiplication of its per capita emission and its population. Because China has put into place population control measures while maintaining low emissions per capita, it claims it should therefore in both of the above aspects be considered a contributor to the world's environment. In addition, the country's energy intensity - measured as energy consumption per unit of GDP - was lowered by 47 per cent between 1991 and 2005; from 1950 to 2002, China's carbon dioxide emissions from fossil sources accounted for only 9.33% of the global total in the same period, and in 2004, its per-capita emission of carbon

dioxide from fossil sources was 3.65 tons, which is 87% of the world average and 33 per cent of that of Organization for Economic Co-operation and Development countries.[48]

In June of 2007, China unveiled a 62-page climate change plan and promised to put climate change at the heart of its energy policies but insisted that developed countries had an "unshirkable responsibility" to take the lead on cutting greenhouse gas emissions and that the "common but differentiated responsibility" principle, as agreed up in the UNFCCC should be applied.[49][50]

In response to critics of the nation's energy policy, China responded that those criticisms were unjust[51], while studies of carbon leakage suggest that nearly a quarter of China's emissions result from exports for consumption by developed countries[52].

In the first semester of 2008, it was officially reported that China is now the country that pollutes the environment more than any other country in the world, a position previously occupied by the United States. The U.S. now is the second most polluting country in the world.

European Union

On May 31, 2002, all fifteen then-members of the European Union deposited the relevant ratification paperwork at the UN. The EU produces around 22% of global greenhouse gas emissions, and has agreed to a cut, on average, by 8% from 1990 emission levels. On 10 January 2007, the European Commission announced plans for a European Union energy policy that included a unilateral 20% reduction in GHG emissions by 2020.

The EU has consistently been one of the major nominal supporters of the Kyoto Protocol, negotiating hard to get wavering countries on board.

In December 2002, the EU created an emissions trading system in an effort to meet these tough targets. Quotas were introduced in six key industries: energy, steel, cement, glass, brick making, and paper/cardboard. There are also fines for member nations that fail to meet their obligations, starting at €40/ton of carbon dioxide in 2005, and rising to €100/ton in 2008. Current EU projections suggest that by 2008 the EU will be at 4.7% below 1990 levels.

Transport CO2 emissions in the EU grew by 32% between 1990 and 2004. The share of transport in CO2 emissions was 21% in 1990, but by 2004 this had grown to 28%.

The position of the EU is not without controversy in Protocol negotiations, however. One criticism is that, rather than reducing 8%, all the EU member countries should cut 15% as the EU insisted a uniform target of 15% for other developed countries during the negotiation while allowing itself to share a big reduction in the former East Germany to meet the 15% goal for the entire EU. Also, emission levels of former Warsaw Pact countries who now are members of the EU have already been reduced as a result of their economic restructuring. This may mean that the region's 1990 baseline level is inflated compared to that of other developed countries, thus giving European economies a potential competitive advantage over the U.S.

Both the EU (as the European Community) and its member states are signatories to the Kyoto treaty.

Greece, however was excluded from the Kyoto Protocol on Earth Day (April 22, 2008) due to unfulfilled commitment of creating the adequate mechanisms of monitoring and reporting emissions, which is the minimum obligation, and delivering false reports by having no other data to report.

Germany

Germany has reduced greenhouse gas emissions by 17.2% between 1990 and 2004.[53] On June 28, 2006, the German government announced it would exempt its coal industry from requirements under the EU internal emission trading system. Claudia Kemfert, an energy professor at the German Institute for Economic Research in Berlin said, "For all its support for a clean environment and the Kyoto Protocol, the cabinet decision is very disappointing. The energy lobbies have played a big role in this decision." [54]

United Kingdom

The energy policy of the United Kingdom fully endorses goals for carbon dioxide emissions reduction and has committed to proportionate reduction in national emissions on a phased basis. The United Kingdom is a signatory to the Kyoto Protocol.

On March 13, 2007, a draft Climate Change Bill was published after cross-party pressure over several years, led by environmental groups. Informed by the Energy White Paper 2003,[55] The Bill aims to put in place a framework to achieve a mandatory 60% cut in the UK's carbon emissions by 2050 (compared to 1990 levels), with an intermediate target of between 26% and 32% by 2020.[56] If approved, the United Kingdom is likely to become the first country to set

such a long-range and significant carbon reduction target into law.

The UK currently appears on course to meet its Kyoto limitation for the basket of greenhouse gases, assuming the Government is able to curb rising carbon dioxide emissions between now (2007) and the period 2008-2012.[57] Although the UK's overall greenhouse gas emissions have fallen, annual net carbon dioxide emissions have risen by around 2% since The Labour Party came to power in 1997.[57] As a result it now seems highly unlikely that the Government will be able to honour its manifesto pledge to cut carbon dioxide emissions by 20% from 1990 levels by the year 2010,[57] unless immediate and drastic action is taken under after the passing of the Climate Change Bill.

France

In 2004, France shut down its last coal mine, and now gets 80% of its electricity from nuclear power[58] and therefore has relatively low CO2 emissions.[citation needed]

Norway

Between 1990 and 2006, Norway's carbon emissions increased by almost 8%. [3] Norway, a European country on the Scandinavian Peninsula made its own idea to maintain green-house gas stability. Norway's idea for carbon neutrality, (which is still legal under the Kyoto Protocol,) is that they will finance for reforestation in China.

India

India signed and ratified the Protocol in August, 2002. Since India is exempted from the framework of the treaty, it is expected to gain from the protocol in terms of transfer of technology and related foreign investments. At the G-8 meeting in June 2005, Indian Prime Minister Manmohan Singh pointed out that the per-capita emission rates of the developing countries are a tiny fraction of those in the developed world. Following the principle of common but differentiated responsibility, India maintains that the major responsibility of curbing emission rests with the developed countries, which have accumulated emissions over a long period of time. However, the U.S. and other Western nations assert that India, along with China, will account for most of the emissions in the coming decades, owing to their rapid industrialization and economic growth.

Russia

Vladimir Putin approved the treaty on November 4, 2004 and Russia officially notified the United Nations of its ratification on November 18, 2004. The issue of Russian ratification was particularly closely watched in the international community, as the accord was brought into force 90 days after Russian ratification (February 16, 2005).

President Putin had earlier decided in favour of the protocol in September 2004, along with the Russian cabinet,[59] against the opinion of the Russian Academy of Sciences, of the Ministry for Industry and Energy and of the then president's economic adviser, Andrey Illarionov, and in exchange to EU's support for Russia's admission in the WTO.[60] As anticipated after this, ratification by the lower (22 October 2004) and upper house of parliament did not encounter any obstacles.

The Kyoto Protocol limits emissions to a percentage increase or decrease from their 1990 levels. Since 1990 the economies of most countries in the former Soviet Union have collapsed, as have their greenhouse gas emissions. Because of this, Russia should have no problem meeting its commitments under Kyoto, as its current emission levels are substantially below its limitations.

It is debatable whether Russia will benefit from selling emissions credits to other countries in the Kyoto Protocol.[61]

United States

The United States (U.S.), although a signatory to the Kyoto Protocol, has neither ratified nor withdrawn from the Protocol. The signature alone is symbolic, as the Kyoto Protocol is non-binding on the United States unless ratified. The United States was, as of 2005, the largest single emitter of carbon dioxide from the burning of fossil fuels.[62]

On July 25, 1997, before the Kyoto Protocol was finalized (although it had been fully negotiated, and a penultimate draft was finished), the U.S. Senate unanimously passed by a 95–0 vote the Byrd-Hagel Resolution (S. Res. 98),[63][64] which stated the sense of the Senate was that the United States should not be a signatory to any protocol that did not include binding targets and timetables for developing as well as industrialized nations or "would result in serious harm to the economy of the United States". On November 12, 1998, Vice President Al Gore symbolically signed the protocol. Both Gore and Senator Joseph Lieberman indicated that the protocol would not be acted upon in the Senate until there was participation by the developing nations.[65] The Clinton Administration never submitted the

protocol to the Senate for ratification.

The Clinton Administration released an economic analysis in July 1998, prepared by the Council of Economic Advisors, which concluded that with emissions trading among the Annex B/Annex I countries, and participation of key developing countries in the "Clean Development Mechanism" — which grants the latter business-as-usual emissions rates through 2012 — the costs of implementing the Kyoto Protocol could be reduced as much as 60% from many estimates. Other economic analyses, however, prepared by the Congressional Budget Office[citation needed] and the Department of Energy[citation needed], Energy Information Administration (EIA)[66], demonstrated a potentially large loss to GDP from implementing the Protocol of up to 4.2% (EIA).

The current President, George W. Bush, has indicated that he does not intend to submit the treaty for ratification, not because he does not support the Kyoto principles, but because of the exemption granted to China (the world's largest emitter of carbon dioxide[67]). Bush also opposes the treaty because of the strain he believes the treaty would put on the economy; he emphasizes the uncertainties which he believes are present in the climate change issue.[citation needed] Furthermore, the U.S. is concerned with broader exemptions of the treaty. For example, the U.S. does not support the split between Annex I countries and others. Bush said of the treaty:

This is a challenge that requires a 100% effort; ours, and the rest of the world's. The world's second-largest emitter of greenhouse gases is the People's Republic of China. Yet, China was entirely exempted from the requirements of the Kyoto Protocol. India and Germany are among the top emitters. Yet, India was also exempt from Kyoto … America's unwillingness to embrace a flawed treaty should not be read by our friends and allies as any abdication of responsibility. To the contrary, my administration is committed to a leadership role on the issue of climate change … Our approach must be consistent with the long-term goal of stabilizing greenhouse gas concentrations in the atmosphere." [68]

In June 2002, the United States Environmental Protection Agency (EPA) released the "Climate Action Report 2002". Some observers have interpreted this report as being supportive of the protocol, although the report itself does not explicitly endorse the protocol.[citation needed] At the G-8 meeting in June 2005 administration officials expressed a desire for "practical commitments industrialized countries can meet without damaging their economies". According to those same officials, the United States is on track to fulfill its pledge to reduce its carbon intensity 18% by 2012.[69] The United States has signed the Asia Pacific Partnership on Clean Development and Climate, a pact that allows those countries to set their goals for reducing greenhouse gas emissions individually, but with no enforcement mechanism. Supporters of the pact see it as complementing the Kyoto Protocol while being more flexible, but critics have said the pact will be ineffective without any enforcement measures.[citation needed]

The Administration's position is not uniformly accepted in the U.S. For example, Paul Krugman notes that the target 18% reduction in carbon intensity is still actually an increase in overall emissions.[70] The White House has also come under criticism for downplaying reports that link human activity and greenhouse gas emissions to climate change and that a White House official, former oil industry advocate and current Exxon Mobil officer, Philip Cooney, watered down descriptions of climate research that had already been approved by government scientists, charges the White House denies.[71] Critics point to the Bush administration's close ties to the oil and gas industries. In June 2005, State Department papers showed the administration thanking Exxon executives for the company's "active involvement" in helping to determine climate change policy, including the U.S. stance on Kyoto. Input from the business lobby group Global Climate Coalition was also a factor.[72]

In 2002, Congressional researchers who examined the legal status of the Protocol advised that signature of the UNFCCC imposes an obligation to refrain from undermining the Protocol's object and purpose, and that while the President probably cannot implement the Protocol alone; Congress can create compatible laws on its own initiative.[73]

Local governments

As of January 18, 2007, eight Northeastern US states are involved in the Regional Greenhouse Gas Initiative (RGGI),[74] which is a state level emissions capping and trading program. It is believed that the state-level program will indirectly apply pressure on the federal government by demonstrating that reductions can be achieved without being a signatory of the Kyoto Protocol.

- Participating states: Maine, New Hampshire, Vermont, Connecticut, New York, New Jersey, Delaware, Massachusetts, and Maryland (these states represent over 46 million people).
- Observer states and regions: Pennsylvania, District of Columbia, Rhode Island.

On August 31, 2006, the California Legislature (representing over 33 million Californians) reached an agreement with Governor Arnold Schwarzenegger to reduce the state's greenhouse-gas emissions, which rank at 12th-largest in the world, by 25% by the year 2020. This resulted in the Global Warming Solutions Act which effectively puts California in line with the Kyoto limitations, but at a date later than the 2008-2012 Kyoto commitment period.

As of December 4, 2007, 740 US cities in 50 states, the District of Columbia and Puerto Rico, representing over 76 million Americans support Kyoto after Mayor Greg Nickels of Seattle started a nationwide effort to get cities to agree to

the protocol. On October 29, 2007, it was reported that Seattle met their target reduction in 2005, reducing their greenhouse gas emissions by 8 percent since 1990.[75]

- Large participating cities: Albany, New York; Albuquerque, New Mexico; Alexandria, Virginia; Ann Arbor, Michigan; Arlington, Texas; Atlanta, Georgia; Austin, Texas; Baltimore, Maryland; Berkeley, California; Boston, Massachusetts; Charleston, South Carolina; Chattanooga, Tennessee; Chicago, Illinois; Cincinnati, Ohio; Columbus, Ohio; Dallas, Texas; Denver, Colorado; Des Moines, Iowa; Fairfield, Connecticut; Fayetteville, Arkansas; Hartford, Connecticut; Honolulu, Hawaii; Indianapolis, Indiana; Jersey City, New Jersey; Lansing, Michigan; Las Vegas, Nevada; Lawrence, Kansas; Lexington, Kentucky; Lincoln, Nebraska; Little Rock, Arkansas; Los Angeles, California; Louisville, Kentucky; Madison, Wisconsin; Miami, Florida; Milwaukee, Wisconsin; Minneapolis, Minnesota; Nashville, Tennessee; New Orleans, Louisiana; New York, New York; Oakland, California; Omaha, Nebraska; Pasadena, California; Philadelphia, Pennsylvania; Phoenix, Arizona; Pittsburgh, Pennsylvania; Portland, Oregon; Providence, Rhode Island; Richmond, Virginia; Sacramento, California; Salt Lake City, Utah; San Antonio, Texas; San Francisco, California; San Jose, California; Santa Ana, California; Santa Fe, New Mexico; Seattle, Washington; Sioux City, Iowa; St. Louis, Missouri; Tacoma, Washington; Tallahassee, Florida; Tampa, Florida; Topeka, Kansas; Tulsa, Oklahoma; Vancouver, Washington; Virginia Beach, Virginia; Washington, D.C.; West Palm Beach, Florida; Wilmington, North Carolina.

- Full list of cities and mayors:[76]

Support

Advocates of the Kyoto Protocol state that reducing these emissions is crucially important, as carbon dioxide is causing the earth's atmosphere to heat up. This is supported by attribution analysis.

No country has passed national legislation requiring compliance with their treaty obligation. The governments of all of the countries whose parliaments have ratified the Protocol are supporting it. Most prominent among advocates of Kyoto have been the European Union and many environmentalist organizations. The United Nations and some individual nations' scientific advisory bodies (including the G8 national science academies) have also issued reports favoring the Kyoto Protocol.

An international day of action was planned for 3 December 2005, to coincide with the Meeting of the Parties in Montreal. The planned demonstrations were endorsed by the Assembly of Movements of the World Social Forum.

A group of major Canadian corporations also called for urgent action regarding climate change, and have suggested that Kyoto is only a first step.[77]

In the United States, there is at least one student group, Kyoto Now!, which aims to use student interest to support pressure towards reducing emissions as targeted by the Kyoto Protocol compliance.

Opposition

Some public policy experts who are skeptical of global warming see Kyoto as a scheme to either slow the growth of the world's industrial democracies or to transfer wealth to the third world in what they claim is a global socialism initiative. Others argue the protocol does not go far enough to curb greenhouse emissions (Niue, The Cook Islands, and Nauru added notes to this effect when signing the protocol).[78]

Some environmental economists have been critical of the Kyoto Protocol.[79][80] [81] Many see the costs of the Kyoto Protocol as outweighing the benefits, some believing the standards which Kyoto sets to be too optimistic, others seeing a highly inequitable and inefficient agreement which would do little to curb greenhouse gas emissions.[82] Finally, some economists as Gwyn Prins and Steve Rayner think that an entirely different approach needs to followed than the approach suggested by the Kyoto-protocol. [83]

Further, there is controversy surrounding the use of 1990 as a base year[citation needed], as well as not using per capita emissions as a basis. Countries had different achievements in energy efficiency in 1990. For example, the former Soviet Union and eastern European countries did little to tackle the problem and their energy efficiency was at its worst level in 1990; the year just before their communist regimes fell. On the other hand, Japan, as a big importer of natural resources, had to improve its efficiency after the 1973 oil crisis and its emissions level in 1990 was better than most developed countries. However, such efforts were set aside, and the inactivity of the former Soviet Union was overlooked and could even generate big income due to the emission trade. There is an argument that the use of per capita emissions as a basis in the following Kyoto-type treaties can reduce the sense of inequality among developed and developing countries alike, as it can reveal inactivities and responsibilities among countries.

Cost-benefit analysis

Economists have been trying to analyze the overall net benefit of Kyoto Protocol through cost-benefit analysis. There is disagreement due to large uncertainties in economic variables.[84] Some of the estimates indicate either that observing the Kyoto Protocol is more expensive than not observing the Kyoto Protocol or that the Kyoto Protocol has a marginal net

benefit which exceeds the cost of simply adjusting to global warming.[citation needed] However, a study in Nature[85] found that "accounting only for local external costs, together with production costs, to identify energy strategies, compliance with the Kyoto Protocol would imply lower, not higher, overall costs."

The recent Copenhagen consensus project found that the Kyoto Protocol would slow down the process of global warming, but have a superficial overall benefit. Defenders of the Kyoto Protocol argue, however, that while the initial greenhouse gas cuts may have little effect, they set the political precedent for bigger (and more effective) cuts in the future.[86] They also advocate commitment to the precautionary principle. Critics point out that additional higher curbs on carbon emission are likely to cause significantly higher increase in cost, making such defense moot. Moreover, the precautionary principle could apply to any political, social, economic or environmental consequence, which might have equally devastating effect in terms of poverty and environment, making the precautionary argument irrelevant. The Stern Review (a UK government sponsored report into the economic impacts of climate change) concluded that one percent of global GDP is required to be invested in order to mitigate the effects of climate change, and that failure to do so could risk a recession worth up to twenty percent of global GDP.[87]

Discount rates

One problem in attempting to measure the "absolute" costs and benefits of different policies to global warming is choosing a proper discount rate. Over a long time horizon such as that in which benefits accrue under Kyoto, small changes in the discount rate create very large discrepancies between net benefits in various studies. However, this difficulty is generally not applicable to "relative" comparison of alternative policies under a long time horizon. This is because changes in discount rates tend to equally adjust the net cost/benefit of different policies unless there are significant discrepancies of cost and benefit over time horizon.

While it has been difficult to arrive at a scenario under which the net benefits of Kyoto are positive using traditional discounting methods such as the Shadow Price of Capital approach,[88] there is an argument that a much lower discount rate should be utilized; that high rates are biased toward the current generation. This may appear to be a philosophical value judgment, outside the realm of economics, but it could be equally argued that the study of the allocation of resources does include how those resources are allocated over time.

Increase in greenhouse gas emission since 1990

Below is a list of the change in greenhouse gas emissions from 1990 to 2004 for some countries that are part of the Climate Change Convention as reported by the United Nations.[89] Country Change in greenhouse gas Emissions (1990-2004)

excluding LULUCF Change in greenhouse gas Emissions (1990-2004)

including LULUCF EU Assigned Objective

for 2012 Treaty Obligation 2008-2012 Germany -17% -18.2% -21% -8% Canada +27% +26.6% N/A -6% Australia +25% +5.2% N/A +8% Spain +49% +50.4% +15% -8% United States +16% +21.1% N/A -7%* Norway +10% -18.7% N/A +1% New Zealand +21% +17.9% N/A 0% France -0.8% -6.1% 0% -8% Greece +27% +25.3% +25% -8% Ireland +23% +22.7% +13% -8% Japan +6.5% +5.2% N/A -6% United Kingdom -14% -14.8% -12.5% -8% Portugal +41% +28.9% +27% -8% EU-15 -0.8% -2.6% N/A -8%

* Since the US did not ratify the treaty, the emissions targets are not a treaty obligation.[90]

Below is a table of the changes in CO2 emission of some other countries which are large contributors, but are not required to meet numerical limitations.[91] Country Change in greenhouse gas Emissions (1990-2004) China +47% India +55%

Comparing total greenhouse gas emissions in 2004 to 1990 levels, the US emissions were up by 16%,[92] with irregular fluctuations from one year to another but a general trend to increase.[93] At the same time, the EU group of 23 (EU-23) Nations had reduced their emissions by 5%.[94] In addition, the EU-15 group of nations (a large subset of EU-23) reduced their emissions by 0.8% between 1990 and 2004, while emission rose 2.5% from 1999 to 2004. Part of the increases for some of the European Union countries are still in line with the treaty, being part of the cluster of countries implementation (see objectives in the list above).

As of year-end 2006, the United Kingdom and Sweden were the only EU countries on pace to meet their Kyoto emissions commitments by 2010. While UN statistics indicate that, as a group, the 36 Kyoto signatory countries can meet the 5% reduction target by 2012, most of the progress in greenhouse gas reduction has come from the stark decline in Eastern European countries' emissions after the fall of communism in the 1990s.[95]

Successor Main article: Post-Kyoto Protocol negotiations on greenhouse gas emissions

In the non-binding 'Washington Declaration' agreed on February 16, 2007, Heads of governments from Canada, France,

Germany, Italy, Japan, Russia, United Kingdom, the United States, Brazil, China, India, Mexico and South Africa agreed in principle on the outline of a successor to the Kyoto Protocol. They envisage a global cap-and-trade system that would apply to both industrialized nations and developing countries, and hoped that this would be in place by 2009.[96][97]

On June 7, 2007, leaders at the 33rd G8 summit agreed that the G8 nations would 'aim to at least halve global CO2 emissions by 2050'. The details enabling this to be achieved would be negotiated by environment ministers within the United Nations Framework Convention on Climate Change in a process that would also include the major emerging economies.[98]

A round of climate change talks under the auspices of the United Nations Framework Convention on Climate Change (UNFCCC) (Vienna Climate Change Talks 2007) concluded in 31 August 2007 with agreement on key elements for an effective international response to climate change.[99]

A key feature of the talks was a United Nations report that showed how energy efficiency could yield significant cuts in emissions at low cost.

The talks are meant to set the stage for a major international meeting to be held in Nusa Dua, Bali, which started on 3 December, 2007.[100]

Asia Pacific Partnership on Clean Development and Climate See also: Asia Pacific Partnership on Clean Development and Climate

The Asia Pacific Partnership on Clean Development and Climate is an agreement between six Asia-Pacific nations: Australia, China, India, Japan, South Korea, and the United States. The partnership had its official launch in January 2006 at a ceremony in Sydney, Australia. Within the past year, the six nations have initiated nearly 100 projects aimed at clean energy capacity building and market formation. Building on these activities, long-term projects are scheduled to deploy clean energy and environment technologies and services. The pact allows those countries to set their goals for reducing greenhouse gas emissions individually, but with no enforcement mechanism. Supporters of the pact see it as complementing the Kyoto Protocol whilst being more flexible while critics have said the pact will be ineffective without any enforcement measures and ultimately aims to void the negotiations leading to the Protocol called to replace the current Kyoto Protocol (negotiations started in Montreal in December 2005).