

Chapter 1

Earth's Future Built on the Kyoto Protocol

<Summary of Chapter 1>

The Kyoto Protocol entered into force in February 2005. Developed countries and countries with economies in transition that have committed to curbing greenhouse gas emissions are legally bound to meet their quantified emission limitation or reduction commitments. The Kyoto Protocol is only a first step taken by mankind on a long road to stabilizing the concentrations of atmospheric greenhouse gases. Steady efforts to meet the commitments of the Kyoto Protocol are essential in the building of a low carbon society.

Section 1 Kyoto Protocol Set in Motion

1. Kyoto Protocol's Entry into Force

The Kyoto Protocol was adopted unanimously at the 3rd Conference of the Parties (COP3) to the United Nations Framework Convention on Climate Change (hereinafter referred to as "Convention" in this Chapter) held in Kyoto in December 1997, with Japan as the host country. In February 2005, the Kyoto Protocol entered into force.

The Kyoto Protocol is a groundbreaking achievement in that it successfully committed, for the first time ever, developed countries and countries with economies in transition (Annex I Parties) to specific quantified targets to limit or reduce their greenhouse gas (GHG) emissions. The Protocol's commitments are based on the principle of "common but differentiated responsibilities and respective capabilities" and on the idea that "the developed country Parties should take the lead in combating climate change," as stipulated by the Convention.



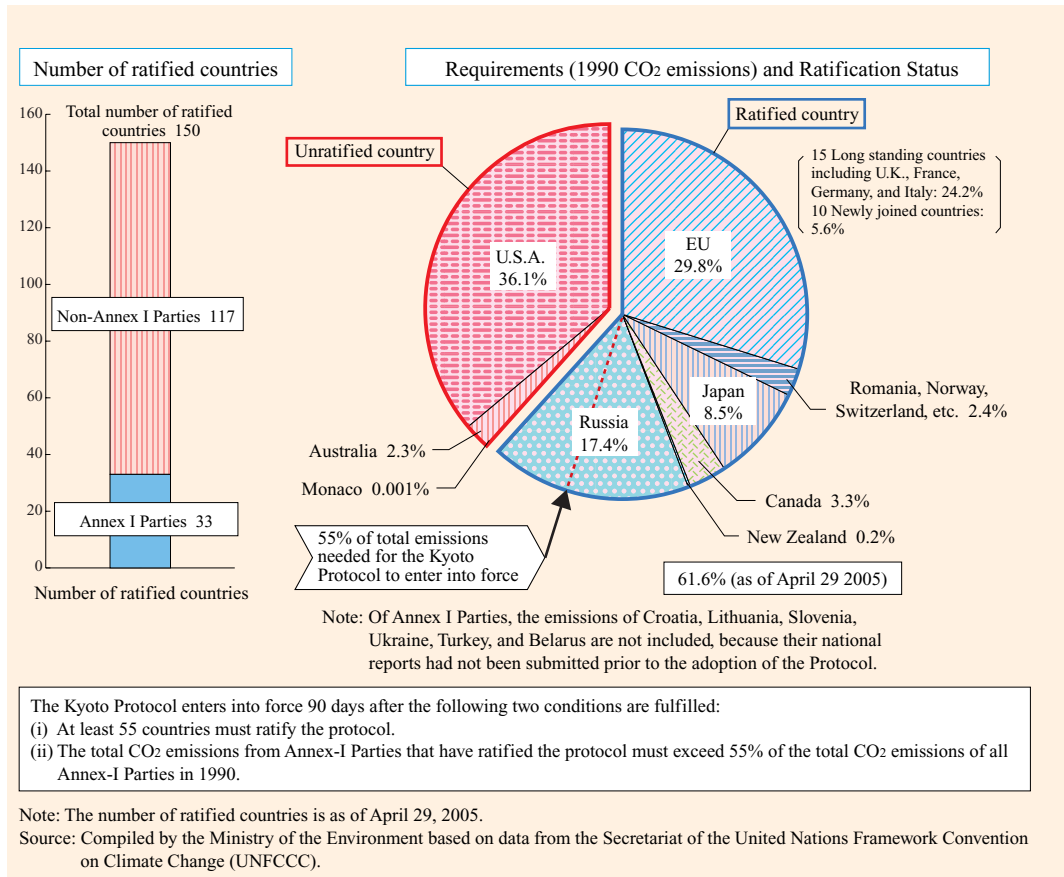
H.E. Ms. Wangari Maathai, Kenyan Deputy Environment Minister, presenting a keynote speech at the Commemorative Event to Mark the Entry into Force of the Kyoto Protocol

Outline of Kyoto Protocol

Targeted gases	CO ₂ , CH ₄ , N ₂ O, HFCs, PFCs, SF ₆
Sinks	Amount of CO ₂ absorbed by forests and other sinks is calculated.
Base year	1990 (For HFCs, PFCs, SF ₆ , base year can be 1995.)
Commitment period	5 years between 2008 and 2012
Targets	An aggregated reduction of at least 5% by developed countries: Japan -6%, United States -7%, and EU -8%
Kyoto Mechanisms	Systems to achieve emission targets in a cost-effective manner through international cooperation <ul style="list-style-type: none"> • Clean Development Mechanism (CDM) A developed country implements projects in a developing country and earns abatement credits for use against its own GHG emissions. • Joint Implementation (JI) Developed countries jointly implement projects and share earned abatement credits for use against their own GHG emissions. • Emissions Trading A developed country that has achieved emission reductions transfers (trades) the excess to other developed countries.
Obligation of the Parties	<p>Obligations for All Parties</p> <ul style="list-style-type: none"> ○ Create, report, and update inventory of GHG emissions and removals ○ Formulate, implement and publish national programmes, including mitigation and adaptation measures, etc. <p>Obligations for Annex I Parties</p> <ul style="list-style-type: none"> ○ Achieve quantified limitation or reduction targets ○ Develop national systems for estimating GHG emissions and removals by 2007 ○ Make voluntary financial contributions to the Adaptation Fund to support efforts in developing countries

Source: Ministry of the Environment

Requirements for the Kyoto Protocol to Enter into Force and Ratification Status



2. Significance of the Entry into Force of the Kyoto Protocol

With the entry into force of the Kyoto Protocol, the Annex-I Parties became legally bound to meet the quantified emission requirements. The commitment of the Kyoto Protocol is a “commitment to the international community,” also a “commitment to the Earth” to protect the earth’s ecosystem as a whole, and a “commitment to the future” with future generations.

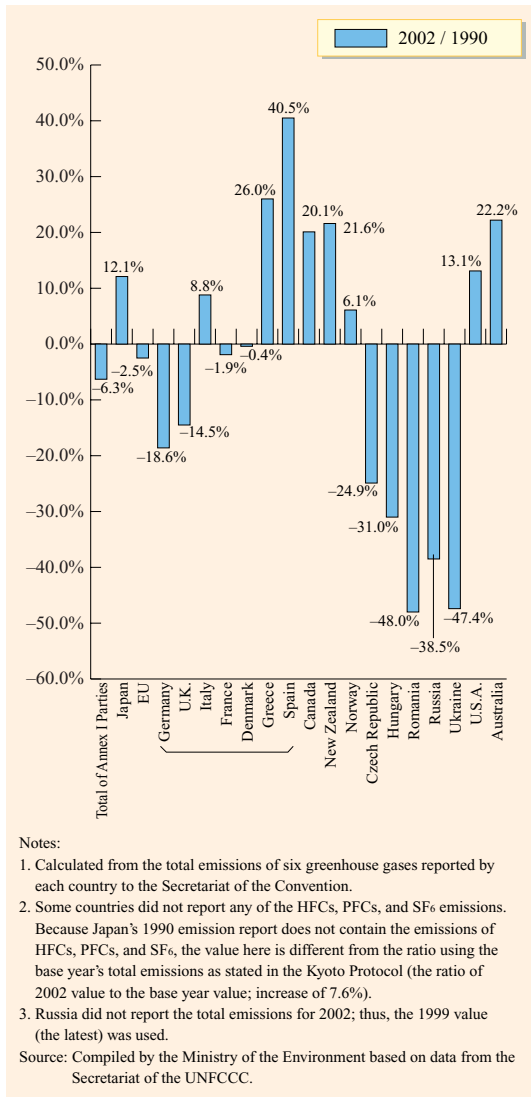
When the latest emissions of greenhouse gases by developed countries are compared to those recorded in 1990, the emissions of Japan and Canada, as well as countries that have not ratified the Kyoto Protocol such as the United States and Australia, have increased. Emissions of the overall EU have slightly decreased, and countries with economies in transition, such as Russia, have seen a drastic decline.

Quantified GHG Emission Limitation or Reduction Commitments of Annex-I Parties

EU (15 countries), Bulgaria, Czech Republic, Estonia, Latvia, Liechtenstein, Lithuania, Monaco, Romania, Slovak Republic, Slovenia, Switzerland	- 8%
U.S.A.	- 7%
Canada, Hungary, Japan, Poland	- 6%
Croatia	- 5%
New Zealand, Russia, Ukraine	0%
Norway	+ 1%
Australia	+ 8%
Iceland	+ 10%

Source: Compiled by the Ministry of the Environment based on data from the Secretariat of the UNFCCC.

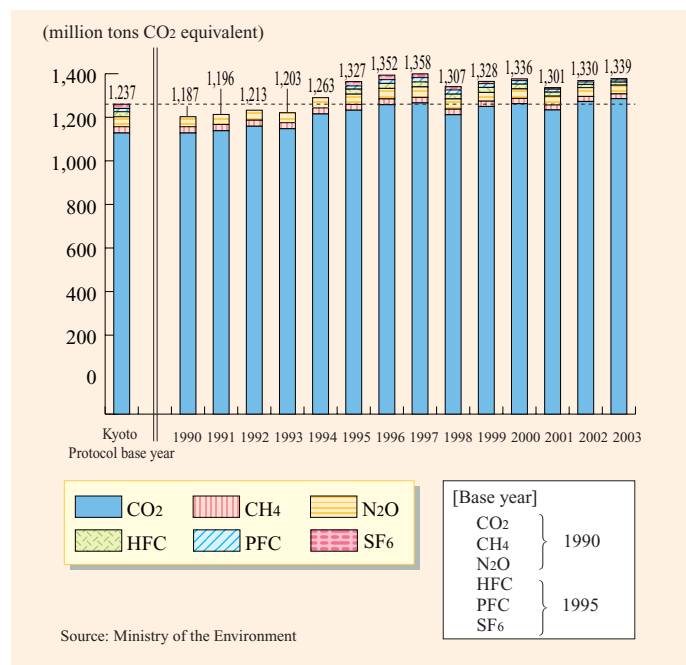
Changes in the GHG Emissions by Major Developed Countries



In FY 2003, Japan's total GHG emissions reached 1,339 million tons*, 8.3% increase from 1,237 million tons* of 1990, which is the base year of the Kyoto Protocol. The base year for HFCs, PFCs and SF₆ is 1995. Since the quantified commitment of Japan for the first commitment period is a 6% reduction, the gap has widened to 14.3%.

* CO₂ equivalent

Japan's Greenhouse Gas Emissions



Section 2 Impacts of Global Warming

The Intergovernmental Panel on Climate Change (IPCC) *Third Assessment Report* published in 2001 reports that the global mean surface temperature has increased by approximately 0.6 °C, and the global mean sea level has risen approximately 10–20cm over the 20th century. Various climate changes have been observed, as exemplified by the higher frequency of heavy rainfall at mid-to-high latitudes in the northern hemisphere.

Although there might be positive effects in some areas or fields as long as temperature increases caused by global warming remain slight; the risk would increase as temperatures rise, the report also warns.

In Japan, mean surface temperature has risen by about 1 °C during the 20th century. In recent years, changes in

Changes Observed in Recent Years

Index	Changes Observed
Global mean surface temperature	Increased by approximately 0.6 °C over the 20th century
Global mean sea level	Increased by 10–20cm over the 20th century
Hot days/Heat index	Increased (likely)
Cold/frost days	Decreased for nearly all land areas during the 20th century
Heavy precipitation events	Increased at mid- and high latitudes in the northern hemisphere
Drought	Increased frequency in some areas
Glacier	Receded in wide areas
Snow cover	Decreased in area by 10 % since the 1960s (very likely)

Source: Compiled by the Ministry of the Environment based on the IPCC *Third Assessment Report*.

ecological distribution have been observed: habitat ranges of some alpine flora have decreased; habitat ranges of insects and animals have changed; the flowering dates of cherry blossoms and foliage season of maple leaves have shifted. Also increased frequency of heavy downpours is observed. Global warming has been pointed out as one of the causes of such meteorological and ecological changes. However, relationship between the observed phenomena and anthropogenic climate change has not been fully established on a firm scientific basis. Progress in further research is expected to shed more light on the issue.

Projected Impacts of Global Warming

Index	Projected Effects
Global mean surface temperature	Increase of 1.4 –5.8 from 1990 to 2100
Global mean sea level	Rise of 9–88cm from 1990 to 2100
Impacts on meteorological phenomenon	Increase in floods and droughts
Impacts on human health	Heat stroke patients increase; infectious diseases, such as Malaria, become widespread
Impacts on ecosystem	Extinction of some fauna and flora, shift in ecosystem ranges
Impacts on agriculture	Grain production decreases in many areas. Some areas may experience increases in the near future.
Impacts on water resources	Further decrease in water resources and degradation of water quality, in many areas experiencing water shortage
Impacts on the market	Developing countries dependent upon the production of primary products will suffer immense economic loss.

Source: Compiled by the Ministry of the Environment based on the IPCC *Third Assessment Report*.

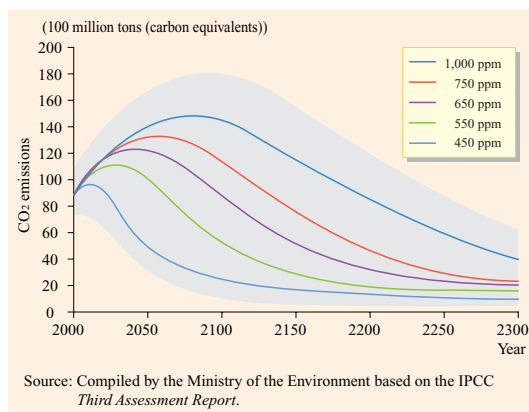
Section 3 Ultimate Goal of the Kyoto Protocol

1. In Pursuit of the Ultimate Objective of the Convention

The ultimate objective of the Convention is the “stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.” Stabilization of GHG concentrations in the atmosphere means maintaining the gas concentrations at certain levels by balancing the amounts of gases emitted into the atmosphere with the amounts absorbed by the oceans and terrestrial ecosystems. Any eventual stabilization level is governed by the accumulated greenhouse gas emissions until the time of stabilization. From now on, it is necessary to scientifically assess the level of global warming that is likely to take place, at what probability, and what the impacts will be, and to determine in terms of policy measures how much emissions should be reduced and by when it should be achieved.

No international consensus has been reached on the eventual stabilization levels of GHG concentrations. According to the projection of the IPCC *Third Assessment Report*, the CO₂ emission must be drastically reduced (50–80%) in order to stabilize the atmospheric GHG concentrations.

Changes in CO₂ Emissions in Different Stabilization Scenarios



2. Beyond the Kyoto Protocol

In order to stabilize the atmospheric GHG concentrations, it is necessary to curb their emissions on a long-term, continuous basis even after the first commitment period of the Kyoto Protocol is over. To that end, measures should be taken not only from the perspective of meeting short-term goals, such as the numerical targets stipulated by the Kyoto Protocol, but also from a mid-to-long term perspective.

To achieve the ultimate objective, we must accumulate scientific knowledge and intensively carry out studies to answer the questions, such as at what levels should the concentrations be stabilized, by when should the world’s overall emissions of greenhouse gases start to decrease, and how much should the total emissions be at that time. In view of the characteristics of global warming issues, we need to seek to change our awareness, reform the social systems, and

develop, disseminate and invest in technology. We also need to envision, from a mid-to-long term perspective, what kind of society we want to build and take actions toward that vision. As early as 1996, the EU agreed, focusing on the long term, on the goal of maintaining the global temperature so that it would not increase by more than 2 °C from the pre-Industrial Revolution level. This agreement was reconfirmed by the European Council in March 2005. Each individual EU country has also begun to set up their own specific long-term goals.

Measures Taken by Selected EU Countries

Country and Date of Measure	Announced by or in:	Mid-term Targets	Long-term Targets
Germany (October 2003)	German Advisory Council on Global Change (WBGU)	• Reduce 45 – 60 % (from the 1990 level) of the world's CO ₂ emissions by 2050.	• Limit the maximum increase of surface temperature to 2 °C from the pre-Industrial Revolution level and less than 0.2 °C in 10 years. • Control the CO ₂ concentration at no more than 450 ppm.
United Kingdom (February 2003)	Energy White Paper	• Reduce 60% of CO ₂ emissions from current level by 2050.	• Control the CO ₂ concentration in the atmosphere at no more than 550 ppm.
France (March 2004)	Interministerial Task-Force on Climate Change	• Limit the per capita annual CO ₂ emissions to 0.5 ton (carbon eq.) by 2050. • Reduce the world's overall annual emissions to 3 billion tons (carbon eq.) by 2050.	• Stabilize the CO ₂ concentration in the atmosphere at no more than 450 ppm.
Sweden (November 2002)	Swedish Environmental Protection Agency	• Limit per capita GHG emissions in developed countries to 4.5 tons (carbon eq., currently 8.3 tons) by 2050, and then further reduce the emission gradually.	• Stabilize the concentrations of GHGs (6 gases stipulated by the Kyoto Protocol) in the atmosphere at 550 ppm. (About 500 ppm in the CO ₂ concentration.)

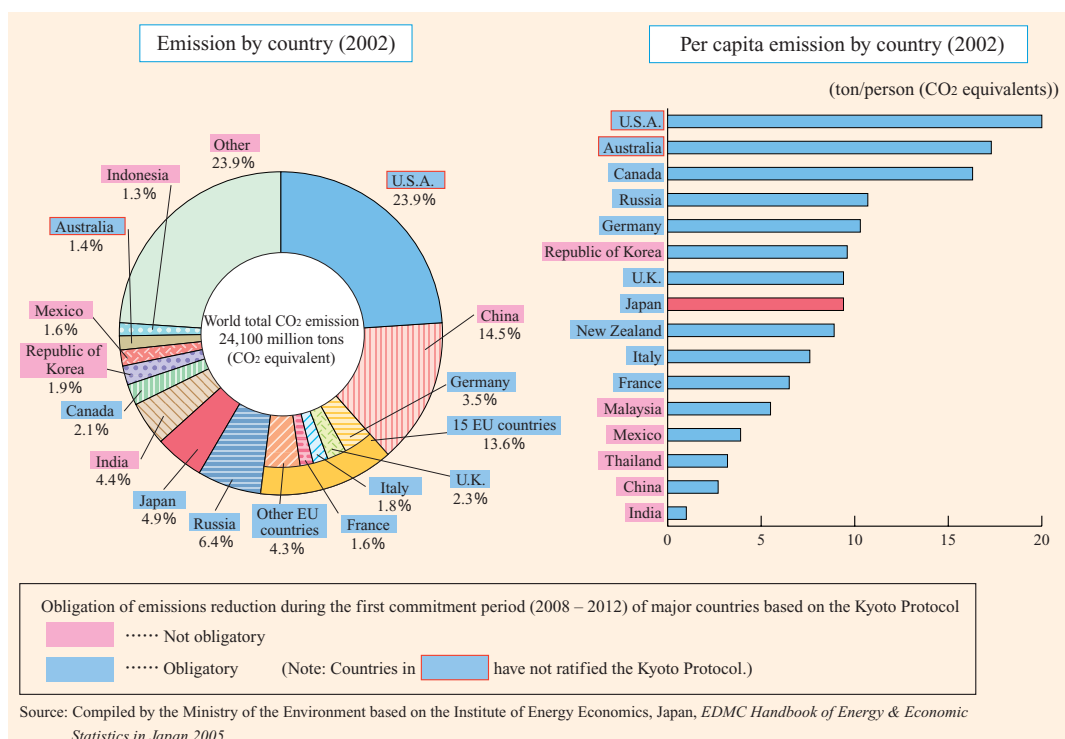
Source: Compiled by the Ministry of the Environment

3. The Next Framework

In order to build an equitable and effective framework when the first commitment period ends in 2012, it is important to set up common rules to which all countries, including the U.S. and developing countries, would adhere.

The United States, which currently does not support the Kyoto Protocol, is the largest emitter of greenhouse gases in the world. For the next framework to be an effective international undertaking in mitigating global warming, the

Total CO₂ Emissions and Per Capita CO₂ Emissions by Country



participation of the United States is indispensable.

Per capita emissions in developing countries are still low compared to that in developed countries, and the majority of the world's greenhouse gas emissions in the past and present were emitted by developed countries. In addition, the state and capacity of each country in combating global warming is different. Under these circumstances, developed countries must cooperate in and support global warming countermeasures undertaken by developing countries. As the emissions of greenhouse gases by developing countries are expected to exceed those of the developed countries as soon as in 2010, the next framework must also incorporate effective measures to control the actual emissions of the developing countries.

4. Japan's Challenge of Building a Low Carbon Society

To achieve the ultimate objective of stabilizing the concentrations of greenhouse gases in the atmosphere stipulated by the convention, the world must work at reducing the emissions on a long-term and continuous basis. Under this circumstance, Japan must take the lead in building a society that emits little greenhouse gases, or a low carbon society.

What specifically is the low carbon society we are going to build? The destination of our long journey is a question now posed on us.

Projected CO₂ Emissions of Developed and Developing Countries

