

on a BAU trajectory and on a path towards stabilization at 550ppm CO₂e, the Stern Review estimated “the excess of benefits over costs, in net present value terms, from implementing strong mitigation policies this year, shifting the world onto the better path: the net benefits would be of the order of \$2.5 trillion.”

The Stern Review also states that “innovation driven by strong policy will ultimately reduce the carbon intensity of our economies, and consumers will then see reductions in the prices that they pay as low-carbon technologies mature.”

The Stern Review, summarizing the results of analyses based on these three approaches, presented a simple conclusion: the benefits of strong, early action on climate change considerably outweigh the costs.”

There is criticism of the Stern Review that the “discount rate” applied to economic model estimates

has been set too low and this might have resulted in an overestimation of long-term impacts of climate change. Since many of the preceding economic analyses applied higher discount rates based on the observations of actual behaviors of people, certain researchers consider the Stern Review inappropriate. In contrast, in the Stern Review, Lord Stern argued that the discount rate should be set low and the long-term benefits should be given greater importance regarding the natural system affected by global warming and the human system that depends on the former for its subsistence.

Sources: Asia-Pacific Integrated Modeling (AIM) Team and the executive summary of the “Stern Review: The Economics of Climate Change” (translated by the National Institute for Environmental Studies)

Section 3 Global Movement on Climate Change

Damage from Climate Change has already started emerging, and it is necessary to take appropriate measures for mitigation and minimize the cost of damage. But only Japan's efforts cannot halt climate change, even if it sets an ambitious reduction target. No country can

deal with this problem alone. Persistent discussions are ongoing in international negotiations, where the short-term interests clash between developed and developing countries, among developed countries or among developing countries.

1 The International Community's Responses So Far to Climate Change

The Kyoto Protocol adopted at the third session of the Conference of the Parties (COP3) to the United Nations Framework Convention on Climate Change (UNFCCC) in 1997 based on the UNFCCC committed developed countries to embark on international efforts to reduce greenhouse gas emissions and set numerical targets for greenhouse gas emission cuts by developed countries during the first commitment period (2008-2012). However, the Kyoto Protocol, which the United States does not ratify and developing countries are not subject to reduction targets, covers only about 28% of total global emissions of carbon dioxide from energy sources as of 2007. Global emissions of greenhouse gases are expected to continue to increase in tandem with economic development of developing countries with no reduction obligations. Under these circumstances, in order to reduce emissions of greenhouse gases effectively in the future, it is necessary to strive for measures to address climate change by the entire world, including the United States, which is yet to ratify the Kyoto Protocol, and China and other emerging economies whose energy consumption is expected to increase.

Regarding international negotiations on the post-2012 framework, the COP13 held in Bali, Indonesia, in

December 2007 adopted the Bali Action Plan and decided to finalize the post-2012 framework by COP15 in 2009 with the participation of all parties to the UNFCCC.

Meanwhile, at the Group of Eight (G8) Hokkaido Toyako Summit held in 2008, the G8 leaders reached common understanding that they seek to share with all Parties to the Framework Convention on Climate Change the vision of, and together with them to consider and adopt in the UNFCCC negotiation, the goal of achieving at least 50% reduction of global emissions by 2050. At the G8 Summit in L'Aquila, Italy, in July 2009, the G8 leaders reaffirmed the goal of reducing global emissions by at least 50% by 2050, and as part of this, supported a goal of developed countries reducing emissions of greenhouse gases in aggregate by 80% or more by 2050 and also recognized the broad scientific view that the increase in global average temperature above pre-industrial levels ought not to exceed 2 degrees Celsius. Subsequently, then Prime Minister Yukio Hatoyama announced in a speech at the Summit on Climate Change in September 2009 that “For its mid-term goal, Japan will aim to reduce its emissions by 25% by 2020, if compared to the 1990 level, consistent with what the science calls for in order to halt global warming,” which is premised on the establishment

of a fair and effective international framework in which all major economies participate and on agreement by those economies on ambitious targets. Further, in the Japan-U.S. Joint Message on Climate Change

Negotiations issued by the Japanese and U.S. leaders, the two countries said they “aspire to reduce our own emissions by 80% by 2050 and endorse a global goal of reducing emissions by 50% by that year.”

2 Achievements of COP15 and Remaining Problems

Regarding reductions of greenhouse gas emissions after the first commitment period of the Kyoto Protocol, Japan took the initiative toward COP15 through setting ambitious reduction targets in pursuit of the establishment of a fair and effective international framework in which all major economies participate and agreement on ambitious targets by all the major economies, and announcing its scaled-up support for developing countries under the “Hatoyama Initiative.” Japan participated in negotiations on political agreement at COP15 in pursuit of agreement on a fair and effective framework in which major economies, including the United States and China, participate, and strove to pave the ground for assistance to developing countries in such areas as adaptation and capacity-building.

In negotiations at COP15 and the Fifth Session of the Meeting of the Parties to the Kyoto Protocol (CMP5), etc. held in Copenhagen, Denmark, December 7-19, 2009, as a result of consultations and negotiations at the leader level of nearly 30 countries and organizations from the night of December 17 and late night of December 18, following ad hoc working group discussions by negotiators in the first half of the session and ministerial-level consultations, the Copenhagen Accord was developed, and it was decided at a plenary meeting the following day that “the Conference of the Parties takes note of the Copenhagen Accord.” It was also decided that the Ad Hoc Working Group on Long-term Cooperative Action under the Convention (AWG-LCA), which was due to disband at the end of 2009, will continue its work, along with the Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol (AWG-KP).

The process in the COP15 negotiations is as follows. In the first half of the negotiations, the AWG-KP chairman proposed that the Annexes to the Kyoto Protocol be revised to set the next set of reduction targets for developed countries. Many developing countries that call for the revision of the Annexes welcomed the chairman’s proposal, but developed countries opposed to the chairman’s proposal, arguing that the Kyoto Protocol alone is not sufficient to reduce greenhouse gas emissions globally and that a comprehensive and effective legal framework should be established to cover a developed country that has not ratified the Kyoto Protocol (the United States) and developing countries with no reduction obligations under the Kyoto Protocol (such as China and India).

The AWG-LCA chairman also presented another proposal, which drew the line among developed countries between the United States and the parties to the Kyoto Protocol. Later, when the COP chairman stated that she wanted to bring the discussions forward by presenting a new document based on the reports from the two ad hoc working groups, major developing countries such as

China, India and Brazil rejected the idea, asserting that negotiations should be conducted on the basis of the reports from the two AWGs. Developed countries requested a meeting among a few countries and the presentation of a new proposal by Denmark, the COP host country, but developing countries continued to insist on the discussions on the basis of the proposals from the chairmen of the AWG-LCA and AWG-KP. Both sides remained as far apart as ever, threatening to jeopardize any progress in the negotiations.

Representing Japan, Prime Minister Hatoyama and Minister of the Environment Sakihito Ozawa again explained that Japan aims to reduce its emissions by 25% by 2020, if compared to the 1990 level, which is premised on the establishment of a fair and effective international framework in which all major economies participate and on agreement by those economies on ambitious targets, and announced the “Hatoyama Initiative” , which provides financial assistance of approximately ¥1.75 trillion (about \$15 billion), of which public finance comprises approximately ¥1.30 trillion (about \$11 billion), giving an impetus to the progress in the negotiations in the negotiations in order to support a broad range of developing countries which are taking measures of mitigation, as well as those which are vulnerable to the negative impacts of climate change.

Amid these moves, a leader-level meeting among a small number of countries was held after a leaders’ banquet at the night of December 17. The leaders from nearly 30 countries and organizations, took part in the meeting, including Prime Minister Hatoyama, U.S. President Barack Obama, British Prime Minister Gordon Brown, Australian Prime Minister Kevin Rudd, German Chancellor Angela Merkel and French President Nicolas Sarkozy as well as the leaders of China, India, Brazil, South Africa and representatives from developing regions, such as Alliance of Small Island States and African Group. Late at night on December 18, these countries hammered out the “Copenhagen Accord.”

When the Copenhagen Accord was presented to the COP plenary session early on December 19, many countries, including developed countries, Alliance of Small Island States and least developed countries, endorsed the accord and sought the adoption on it, but a few countries opposed the adoption on the grounds that the preparation process of preparing the accord was not transparent. Ultimately, it was decided that the Conference of the Parties “takes note of the Copenhagen Accord.”

The gist of the Copenhagen Accord is as follows:

- (i) Recognize the scientific view that the increase in global temperature should be below 2 degrees Celsius, and enhance long-term cooperative action to combat climate change;

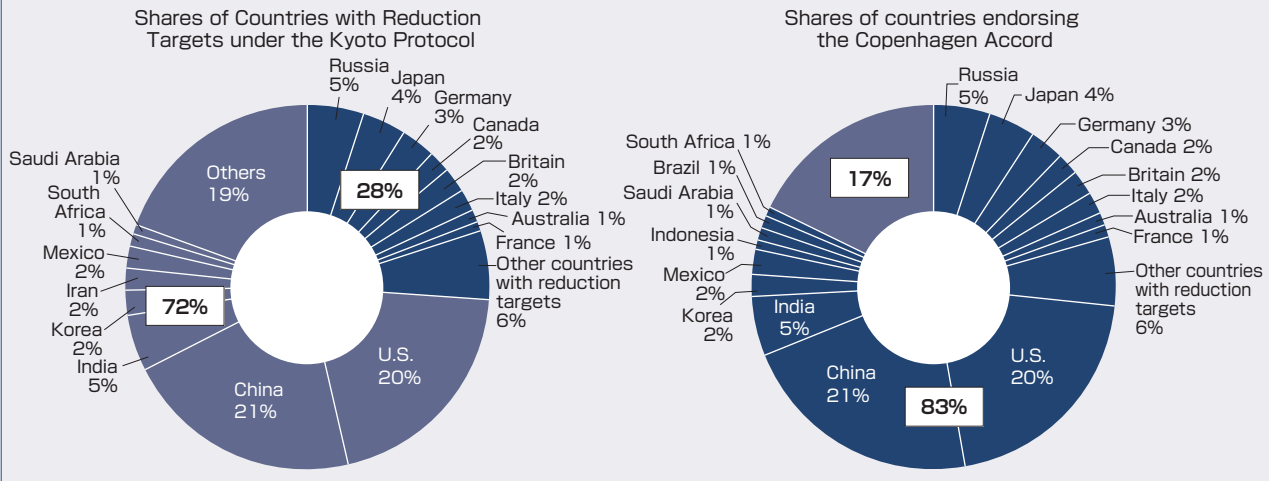
Figure2-3-1 Emissions Reduction Targets of Major Economies

Country	Emissions reduction in 2020	Base year
Japan	Reduce 25%, premised on the establishment of a fair and effective international framework in which all major economies participate and on agreement by those economies on ambitious targets	1990
U.S.	Reduce in the range of 17%, in conformity with anticipated U.S. energy and climate legislation, recognizing that the final target will be reported to the Secretariat in light of enacted legislation (Note 1)	2005
Canada	Reduce 17%, to be aligned with the final economy-wide emissions target of the United States in enacted legislation	2005
Russia	Reduce 15-20% (Prerequisite: appropriate accounting of the potential of Russia's forestry in frame of contribution in meeting the obligations of the anthropogenic emissions reduction, and undertaking by all major emitters the legally binding obligations to reduce anthropogenic GHG emissions)	1990
Australia	Reduce 5% up to 15% or 25% (Note 2)	2000
EU	Reduce 20%/30% (Note 3)	1990

Country	Emission targets/Mitigation actions
China	China will endeavor to lower its carbon dioxide emissions per unit of GDP by 40-45% by 2020 compared to the 2005 level, increase the share of non-fossil fuels in primary energy consumption to around 15% by 2020 and increase forest coverage by 40 million hectares from the 2005 level. These are autonomous actions.
India	Endeavour to reduce the emissions intensity of its GDP by 20-25% by 2020 compared with the 2005 level (excluding the agricultural sector). Mitigation actions are voluntary, and thus not legally binding
Brazil	Expects to reduce emissions by 36.1-38.9% compared with BAU. Specific actions include reduction in rain forests degradation; reduction in "Cerrado" (a type of vegetation in savanna regions) degradation; restoration of grain-growing land; improvement in energy efficiency; increased use of biofuels; increase in hydraulic power generation; alternative energy sources; and enhancement of the steelmaking industry, etc.
South Africa	Take mitigation action to reduce emissions 34% by 2020 compared with BAU, and 42% by 2025 compared with BAU. These actions require support from developed countries as well as the finalization of an ambitious, fair, effective and binding multilateral agreement at the meeting in Mexico under the Convention and the Kyoto Protocol. With international support, South Africa's emissions are likely to peak between 2020 and 2025, plateau for about a decade, and then decline
Korea	Reduce greenhouse emissions by 30% by 2020 from the level of BAU emissions

Note 1: U.S.) The pathway set forth in pending legislation would entail a 30% reduction in 2025 and a 42% reduction in 2030, in line with the goal to reduce emissions 83% by 2050
 Note 2: Australia) Will reduce its greenhouse gas emissions by 25% on 2000 levels by 2020 if the world agrees to an ambitious global deal capable of stabilizing levels of greenhouse gases in the atmosphere at 450 ppm CO₂-eq or lower. It will unconditionally reduce emissions by 5% below 2000 levels by 2020, and by up to 15% by 2020 if there is a global agreement under which major developing economies commit to substantially restrain emissions and advanced economies take on commitments comparable to Australia's.
 Note 3: EU) EU reiterates its conditional offer to move to a 30% reduction by 2020 compared to 1990 levels, provided that other developed countries commit themselves to comparable emission reductions and that developing countries contribute adequately according to their responsibilities and respective capabilities

Figure2-3-2 CO₂ Emissions from Energy Sources (2007)



- (ii) Annex I Parties (developed countries) submit emission reduction targets for 2020 and non-Annex I Parties (developing countries) submit mitigation actions, in the formats given in Appendix I and Appendix II, respectively, to the Secretariat by 31 January 2010;
- (iii) Actions taken by Annex I Parties will be subject to measurement, reporting and verification (MRV). Mitigation actions taken by Non-Annex I Parties will be subject to international consultations and analysis after domestic MRV and mitigation actions taken with international support will be subject to international MRV.
- (iv) Developed countries will collectively commit to provide new and additional resources approaching \$30 billion for the period of 2010-2012, and also commit to a goal of mobilizing jointly \$100 billion a year by 2020. The Parties decide that the "Copenhagen Green Climate Fund" shall be established as an operating

- entity of the financial mechanism of the Framework Convention on Climate Change.
- (v) The Parties call for an assessment of the implementation of the Copenhagen Accord to be completed by 2015.

Over 110 countries which have already associated with the Copenhagen Accord account for over 80% of global emissions. Thus, it is important to position the Copenhagen Accord as an important basis for negotiations going forward (Figure 2-3-1, 2-3-2).

Under the Copenhagen Accord, Japan in January 2010 submitted to the UNFCCC Secretariat as the emission reduction in 2020 "25% reduction compared with the 1990 level, which is premised on the establishment of a fair and effective framework with the participation of all the major emitting countries and their agreement on

In this column, we listen to what Prof. Yukari Takamura of Ryukoku University, who is a member of the Global Environment Committee of the Central Environment Council, has to say about COP15 and post-Copenhagen negotiations on climate change.

How should we evaluate the Copenhagen Accord of which the Copenhagen Conference (COP15) has decided to “take note”. As COP15 fell short of officially adopting it and only decided to “take note,” the Copenhagen Accord became a political accord that is binding on only countries that consent to it. The fact that a majority of countries supported it does not automatically make the Copenhagen Accord the basis for negotiations on the next framework. This appears to be the basic difference from the case where the COP had officially adopted the Copenhagen Accord.

In light of the negotiations held so far, the Copenhagen Accord does represent progress in several areas. First of all, the Copenhagen Accord describes emission reduction efforts by industrialized countries and those by developing countries in the same document, making it an agreement that goes beyond the previous bipartite structure of “industrialized countries that make commitment” and “developing countries that avoid commitment.” In response to the entirely new situation of the appearance of emerging economies that increased emissions rapidly over the past decade or so, the Copenhagen Accord offers prospects for transcending the dogmatic dichotomy and establishing an effective framework for prevention of global warming. Secondly, mitigation efforts by developing countries were promised concretely and institutionally, and their progress and effects will be subject to international verification. Unlike developed countries that are committed to the implementation of mitigation targets, developing countries implement mitigation actions and communicate their actions. Mitigation actions with international support will be subject to measurement, reporting and verification in accordance with international guidelines, while mitigation actions by developing countries not supported internationally will be subject to their domestic measurement, reporting and verification and they will communicate information on the implementation of their actions for international consultations and analysis. However, the extent and effects of international verification hinge on guidelines

to be worked out going forward. Thirdly, there was agreement on the collective commitment of funding by developed countries at present and toward future. Developed countries will provide new and additional resources of \$30 billion during the period of 2010-2012 with balanced allocation between mitigation and adaptation by developing countries. In the context of meaningful mitigation actions and transparency on implementation, developed countries also commit to a goal of jointly mobilizing \$100 billion a year by 2020 to address the needs of developing countries, with the funding coming from a wide variety of sources, public and private.

Despite these positive developments, however, there seem to remain many problems. Above all, other than the aforementioned mitigation actions and funding goal, many of the matters that should form the basis of the next framework and on which agreement was expected at COP15 still remain unsettled. The Copenhagen Accord does not specify the ultimate legal form of the next framework, or whether commitments are legally binding commitments or not.

Furthermore, under the Copenhagen Accord, developed countries voluntarily decide emission reduction targets and make commitments to them, instead of determining reduction targets through international negotiations among states as was the case with negotiations on the Kyoto Protocol. It is deemed unclear whether this method of voluntary commitments as a whole can ensure the reductions by the levels enabling the achievement of the ultimate objective of preventing global warming or ensure the “comparability of mitigation efforts” over which Japan and other developed countries, other than the United States, have concerns.

The Copenhagen Accord worked out by the world’s leaders and supported by a majority of countries in the international community, including the United States and emerging economies, provides a valuable hold to hang onto in advancing slow-moving negotiations on climate change. Key to negotiations on climate change going forward is how to forge final agreement on the next framework by reflecting matters agreed on under the Copenhagen Accord in documents of continuing negotiations and pushing forward negotiations on matters that are not yet sufficiently clear and matters on which there is no agreement yet.

ambitious targets.” Japan presented its bold emission target in order to encourage other major economies to make ambitious efforts on measures to address climate change.

Going forward, regarding the post-2012 framework,

Japan, based on the Copenhagen Accord, will take the initiative in pursuit of the establishment of a fair and effective framework in which all the major economies participate and the agreement by those economies on ambitious targets.