Bali Roadmap to New Framework of Climate Change and the Role of Japan*

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Energy security and climate change are particular policy objectives of the contemporary world to achieve sustainable development. Upon 10th anniversary of the Kyoto Protocol, the U.N. climate change conference in Bali, Indonesia (COP13) adopted the "*Bali Roadmap*" on December 15, 2007. It sets out time schedule to agree on the Post-Kyoto Protocol (PKP) framework that will chart a path after 2112 to reduce greenhouse gas emission at the COP 15 scheduled in Copenhagen at the end of 2009, two years from now. Thus, the 2008 G8 summit meeting in Japan (Hokkaido-Toyako Summit, July 2008) and the COP 14 meeting (Poland, end of 2008) are set to be important intermediate stages to discuss reduction of the global CO_2 emissions. Although the final paper was not more than what had been expected, it was "a good beginning" (U.N. Secretary-General Ban Ki-moon) in the sense that the two mega-emission countries notably the United States and China were present and stayed in positive posture.

As even outline of the image on the new agreement is yet to be formed, it is the ultimate goal of the PKP framework to establish a comprehensive global system to reduce green house gas emission taking in all stakeholders in particular mega emission countries such as the Unites States and China, and chart a feasible path for long-term cooperative action. Although quantitative expressions such as cutting emissions of the developed countries by 25 to 40 % of the 1990 levels by 2020 or cutting the global emissions less than half by 2050 were not included in the final paper, discussion heated up to an extremities. As some quantitative goal may be necessary in the final agreement, it is needless to say that the solution should be realistic, practical and effective technically and economically. Otherwise, it would become just a nicely-look cake on a picture.

1. World Energy Outlook

As fundamental information for such discussion, the following summarizes the energy outlook to 2030 run by The Institute of Energy Economics, Japan (IEEJ) in October 2008.[1]

In the Reference Case projection, world energy consumption will increase 60% by 2030 from 10.3 billion toe in 2005 to 16.5 billion toe in 2030 as shown in Figure 1. While energy consumption of the OECD countries is forecast to increase 26% in 25 years and the U.S. 30%, and Japan remains at the same quantity, energy consumption of the non-OECD countries will double in the same period. Three quarters of the incremental energy consumption will occur in the non-OECD developing countries, and 80% of which occurs in East Asian countries. It should be noted that Southeast Asian countries are also increasing energy consumption rapidly in addition to

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[1] The Institute of Energy Economics, Japan "Asia/World Energy Outlook 2007 – Focusing on China and India –", October 2007.

China and India. China will overtake the U.S. before 2030 to become the world most energy consuming country.[2]

Figure 1 World energy Outlook: IEEJ2007

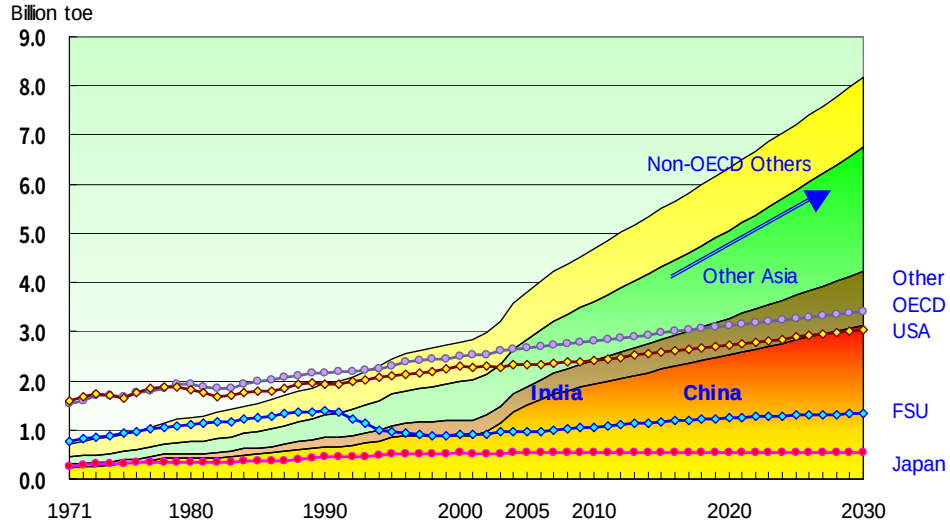


Table 1 World Energy Outlook: IEEJ 2007

	2005	2030	05-->30	2005	2030
	Btoe	Btoe	%	%	%
OECD	5.5	7.0	126	53.8	42.3
USA	2.3	3.0	130	22.7	18.4
Japan	0.5	0.5	100	5.1	3.2
Non-OECD	4.8	9.5	199	46.2	57.7
China	1.5	3.1	209	14.5	19.0
India	0.4	1.1	289	3.7	6.6
Other Asia	1.0	2.5	262	9.4	15.4
World	10.3	16.5	160	100.0	100.0

On the supply side, the world will continue to heavily dependent on fossil fuels. Although renewable energy supply is expected to increase substantially in absolute quantity, its share remains merely at 4%. Among non-fossil energy sources, nuclear may face political and technical difficulties and could increase least. Thus the world CO_2 emission is forecast to increase 4.2 billion carbon ton or 56% during the projected period, almost in parallel with energy consumption growth. CO_2 emission will increase most in Asia by 2,324 million carbon ton (Mt-c), or 55% of the world increase, followed by Other Areas at 865 Mt-c, North America 571 Mt-c and Europe 431 Mt-c, respectively. The CO_2 emission of China increases by 1180 Mt-c (1,467 Mt-c to 2,647 Mt-c), or 50% of the total Asian increase, while India increases 514 Mt-c (329 Mt-c to 843 Mt-c) or 22% of the Asian total. During the same period, Japan decreases emission from 342 Mt-c to 297 Mt-c. In terms of global climate change issue, Asia in particular China and India will be the hottest place.

[2] This forecast is not directly comparable with the IEA world energy Outlook 2007 as non-commercial energy such as biomass and wastes are excluded in the IEEJ projection. However, the projected overall energy trend is almost same though views on energy supply pattern are different; IEA expects that the world will depend more on coal as IEEJ projects greater natural gas role.

Figure 2 Primary Energy Supply and CO_2 Emission of the World

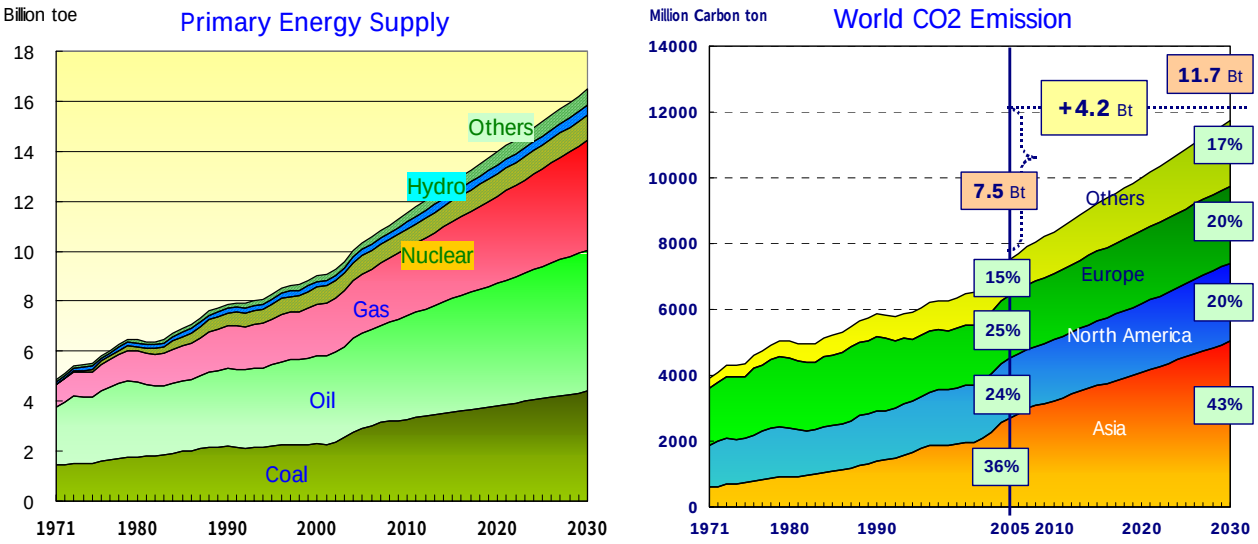


Table 2 Outlook of Primary Energy supply

	2005	2030	05-->30	2005	2030
	Btoe	Btoe	%	%	%
Coal	2.89	4.40	152	28.0	26.7
Oil	3.83	5.65	148	37.1	34.3
Natural Gas	2.36	4.40	186	22.9	26.7
Nuclear	0.72	1.00	138	7.0	6.0
Hydro	0.25	0.39	153	2.4	2.3
Others	0.26	0.65	251	2.5	4.0
Total	10.31	16.48	160	100.0	100.0

2. World Oil Production and Oil Peak

Apart from the climate change issues, stable oil supply is another serious problem in the long run. In November 2007, Japan Petroleum Development Association (JPDA) announced its assessment of the global hydrocarbon reserves. According to the report, the estimated amount of the proved remaining recoverable reserve of conventional oil at the end of 2005 is 1113.8 billion barrels, which is generally in the same range with other predictions as shown in Table 3.

Table 3 Estimation of Hydrocarbon Reserves

		JPDA	OGJ	World Oil	BP	OPEC	IHSE	ASPO	Cedigas
Oil	Billion Barrels	1114	1293	1120	1201	1154	1242	788	--
Natural Gas	Trillion cubic Feet	6137	6124	6227	6359	6362	7135	--	6381

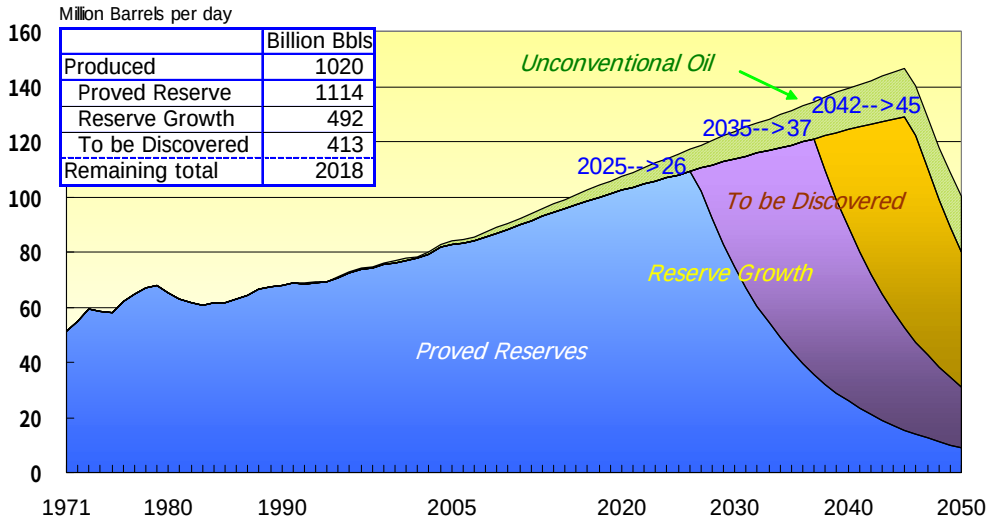
Source: JPDA. IHS Energy is a prominent oil and gas information service consultant and ASPO is The Association for the Study of Peak Oil and Gas.

The report also says that human being has already produced and consumed 1019.6 billion barrels, while there will be potential of reserve growth of 492.0 billion barrels at existing oils fields and

reserves to be newly discovered of 412.6 billion barrels. The total amount of the ultimate recoverable reserve amounts to 3.38 trillion barrels, which is in the same range with various other predictions such as those made by the US DOE and USGS. The report also says that there would be potential of 1.5 to 2 trillion barrels of unconventional oil such as heavy oil, oil sands and shale oil.

Applying the above demand forecast and resource prediction, Figure 3 illustrates how the remaining reserves of easy oil would be consumed with an assumption of reserve/production ratio at 10 years. Suppose that the current demand trend continues to be unchecked and fully supplied, easy oil production would peak out in 2025, or with reserve growth in 2035 or further with additional discoveries in 2042. Were the R/P ratio to be kept at 20 years, peak oil appears seven to nine years earlier in 2017, 2028 and 2038, respectively. This anticipation is casting substantial pressure on the contemporary oil market. Pressure may be mitigated by development of unconventional oil such as heavy oil, oil sands and shale oil, or enhancement of gas to liquid (GTL) and coal to liquid (CTL). Though some of them are already in production, there are various issues to be conquered in terms of environment protection, technology and geopolitics in order to fully develop them. To alleviate pressures from oil peaking, we need time to sort out these issues. Despite such efforts, however, suppose that unconventional oil production would exceed 10 million barrels per day by 2030 and reach 20 million barrels per day by 2050, its effect is yet limited to push forward the peak only by two to three years as illustrated in figure 3. Thus, unchecked demand growth would not be feasible for the world.

Figure 3 Oil Peak is not a very remote possibility

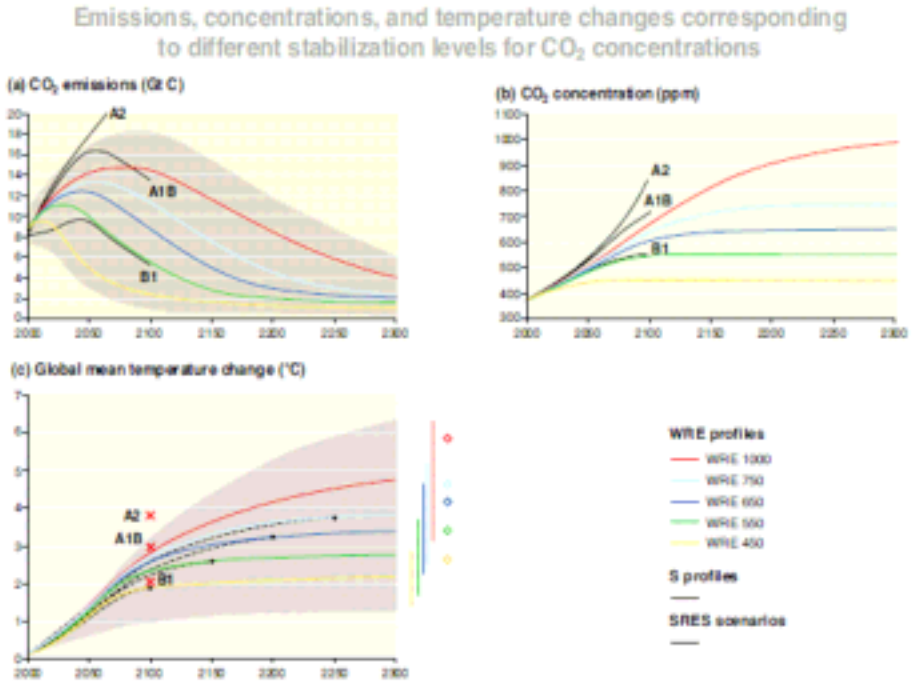


3. Stabilizing Global Warming

The United Nation's Framework Convention on Climate Change (UNFCCC) adopted the Kyoto Protocol in 1997, which was the first comprehensive international agreement with numerical goal of limiting the greenhouse gas emission. Since then, the UN Intergovernmental Panel for Climate Change (IPCC) has made several important reports on the climate change verifying that greenhouse gas concentration in the air would incur substantial increase in the global temperature

bringing serious damages to the earth climate system, and that in order to slow the warming rate it is necessary to stabilize CO_2 concentrations reducing its emission substantially below current level. After decades of discussion, this recognition is now widely accepted.

Figure 4 IPCC Third Report Scenarios for Stabilizing CO_2 Concentration



Source: IPCC "Climate Change 2001 – Synthesis Report"

However, the United States pulled out of the Koto Protocol in 2001, while 175 parties ratified it. Since then, Europe and Japan have struggled to find out solutions. Their efforts have recorded substantial progress, for example, start of EUETS and development of CDM/JI projects, though effects are still limited without having mega-emission countries that will play substantially greater role on the issue in the long run.

In 2006, Asia-Pacific Partnership (APP) [3] was organized including mega-emission countries such as the U.S., China and India, who are not obliged to GHG reduction under the Kyoto Protocol. Under the APP regime, dialogue has started on sectoral approach on improving energy efficiency. Thus, the world is today trying to tackle with climate change in two groups, the top down approach under the Kyoto Protocol (KP) and the bottom up approach under the APP. As the Kyoto Protocol regime applies top-down approach or "cap and trade" obligating quantitative target of emission reduction, APP takes bottom-up approach or "pledge and review" to improve energy efficiency in

[3] Asia-Pacific Partnership for Clean Development and Climate:
The first ministerial meeting was held in January 2006 in Sydney. Six countries of US, Australia, China, India, South Korea and Japan were the participants and there are eight task force groups on 1) cleaner fossil fuel, 2) renewable energies and scattered power source, 3) power generation and transmission, 4) steel, 5) aluminum,6) cement, 7) coal mining and 8) building and electric appliances. However, the activity range is limited to major industrial sectors and transportation sector is not included. Thus the activity does not cover the GHG emission fully. Canada joined APP in 2007.

each sector under the concept of "a voluntary, non-legally binding framework". In addition, as Kyoto Protocol aims at reduction of GHG by institutional measures such as Joint Implementation (JI), Clean Development Mechanism (CDM) and Emission Right Trade (ET), APP focuses on technology such as promoting technology development and diffusion of available technologies, to find out clue to solution of the global warming issues based upon regional cooperation. Although approaches are different, Kyoto Protocol and APP, when combined together, cover about 2/3 of the world GHG emission.[4]

At the 2007 G-8 Summit held at Heiligendam, it was agreed that member countries will "consider seriously the decision made by the European Union, Canada and Japan which include at least a halving of global emissions by 2050". To this end, the G-8 countries are going to organize a forum to explore for possible structuring; the interim report will be submitted at the next Summit meeting in Japan and the final report will be made in 2009 in Italy.

The COP13/CMP3 meeting held in Bali, Indonesia, in December 2007 reconfirmed this time schedule as *Bali Roadmap* to set out the Post-Kyoto Protocol (PKP) framework by 2009. The 2008 G8 Summit meeting in Japan (Hokkaido - Toyako Summit) will become an important intermediate stage to discuss the path to the final agreement.

Table 4 Characteristics of CO_2 Stabilization Scenarios

Category	CO_2 concentration at stabilization (2005 = 379 ppm) [b]	CO_2-equivalent Concentration at stabilization including GHGs and aerosols (2005 = 375 ppm) [b]	Peaking year for CO_2 emissions [a, c]	Change in global CO_2 emissions in 2050 (% of 2000 emissions) [a, c]	Global average temperature increase above pre-industrial at equilibrium, using 'best estimate' climate sensitivity [d, e]	**Global average sea level rise above pre-industrial at equilibrium from thermal expansion only [f]**	Number of assessed scenarios
	ppm	ppm	Year	Percent	°C	**metres**	
I	350 – 400	445 – 490	2000 – 2015	-85 to -50	2.0 – 2.4	**0.4 – 1.4**	6
II	400 – 440	490 – 535	2000 – 2020	-60 to -30	2.4 – 2.8	**0.5 – 1.7**	18
III	440 – 485	535 – 590	2010 – 2030	-30 to +5	2.8 – 3.2	**0.6 – 1.9**	21
IV	485 – 570	590 – 710	2020 – 2060	+10 to +60	3.2 – 4.0	**0.6 – 2.4**	118
V	570 – 660	710 – 855	2050 – 2080	+25 to +85	4.0 – 4.9	**0.8 – 2.9**	9
VI	660 – 790	855 – 1130	2060 – 2090	+90 to +140	4.9 – 6.1	**1.0 – 3.7**	5

Source: IPCC Assessment Report 4 (2007)

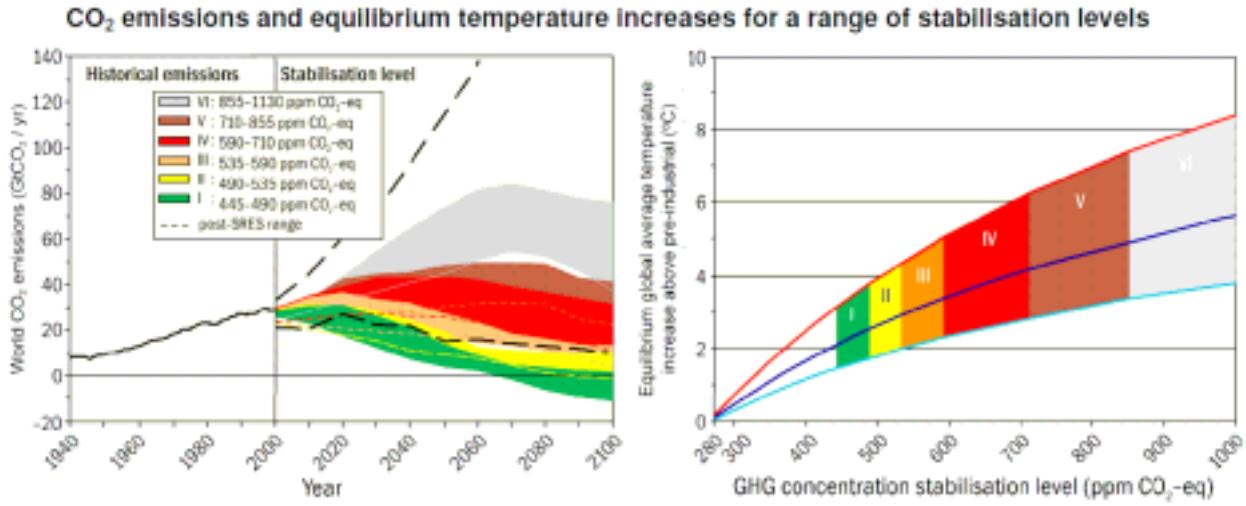
An important note here is that, when the earlier technical assessment reports were made, it was thought that global warming would be stabilized within 2 degree C should CO_2 concentration be controlled at 550 ppm or within double of the pre-industrial level of 280 ppm. However, Stern Review of UK in 2006 reported that, in view of recent rapid increase of emission, "the stabilization would be more appropriate at 450 – 550 ppm".[5] Yet, IPCC Assessment Report Four (AR4) of

[4] In 2004, top 25 countries covered 82.2 % of the global CO2 emission according to IEA. Other major countries not included in either group as obligatory party are Russia (5.8%), Mexico (1.4%), Iran (1.4%), South Africa (1.3%), Indonesia (1.3%), Saudi Arabia (1.2%), Brazil (1.2%), Ukraine (1.1%), Poland (1.1%), economy of Taiwan (1.0%), Turkey (0.8%), Thailand (0.8%) and Netherlands (0.8%).

[5] "The risks of the worst impacts of climate change can be substantially reduced if greenhouse gas level in the atmosphere can be stabilized between 450 and 550 ppm CO_2 equivalent (CO_2e). The current level is

2007 stated that stabilization should be achieved by CO_2 concentration of 350-570 ppm and CO_2-e concentration of 445-710 ppm.

Figure 5 CO_2 Emissions and Equilibrium Temperature



Source: IPCC Assessment Report 4 (2007)

Other important findings of Stern Review are as follows.

1) It would already be very difficult and costly to aim to stabilize at 450 CO_2e.
2) The annual costs of achieving stabilisation between 500 and 550 CO_2e are around 1% of global GDP, if we take strong action now. If we don't act, the overall costs and risks will be at least 5% of GDP, now and forever, which could rise to 20% if a wider range of risks and impacts is taken into account.
3) Even if the rich world takes on responsibility for absolute cuts in emissions of 60-80% by 2050, developing countries must take significant action too.
4) The power sector around the world would need to be at least 60% decarbonised by 2050 for atmospheric concentrations to stabilize at or below 550ppm CO_2e.
5) Fossil fuels could still make up over half of global energy supply in 2050. Coal will continue to be important in the energy mix around the world, including fast-growing economies. Extensive carbon capture and storage (CCS) will be necessary to allow the continued use of fossil fuels without damage to the atmosphere.

IPCC also estimates global macro-economic costs of mitigation as shown in Table 5, indicating that reducing the CO_2 concentration below 535ppm would be costly.

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430 ppm CO_2e today, and it is rising at more than 2ppm each year. Stabilisation in this range would require emissions to be at least 25% below current levels by 2050, and perhaps much more. Ultimately, stabilisation – at whatever level – requires that annual emissions be brought down to more than 80% below current level."("Stern Review on the economics of climate change" Office of Climate Change, UK Cabinet Office, 2006)

Table 5 IPCC Estimation of Global Macro-economic Costs in 2030 and 2050

Stabilisation levels (ppm CO_2-eq)	Median GDP reduction [a] (%)		Range of GDP reduction [b] (%)		Reduction of average annual GDP growth rates (percentage points) [c], [d]	
	2030	2050	2030	2050	2030	2050
445 – 535 [d]	Not available		< 3	< 5.5	< 0.12	< 0.12
535 – 590	0.6	1.3	0.2 to 2.5	slightly negative to 4	< 0.1	< 0.1
590 – 710	0.2	0.5	-0.6 to 1.2	-1 to 2	< 0.06	< 0.05

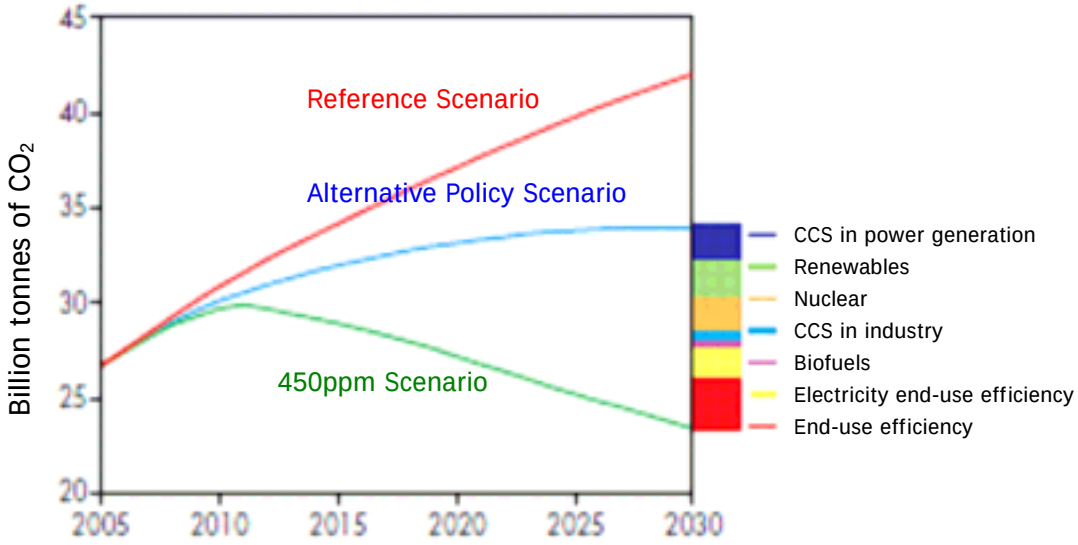
Source: IPCC Fourth Assessment Report, Climate change 2007: Synthesis Report

IEA also examined an ambitious target of "450ppm Scenario" in its World Energy Outlook 2007. To realize this scenario, "energy-related CO_2 emissions would need to peak in 2012 at around 30Gt and then decline to 23 GT in 2030 – 19 Gt less than in the Reference Scenario and 11 Gt less than in the Alternative Policy Scenario" as shown in Figure 6. The analysis is made with a backcasting rather than forecasting method and concludes that

1) Cleaner and more advanced technologies should be deployed quickly
2) Technologies that are not yet financially viable, including CO_2 capture and storage and second-generation biofuels technologies, should be widely deployed, and
3) Existing energy-using capital would be prematurely retired at substantial cost.

As a reality, the world is not prepared to peak out the CO_2 emission by 2012 deploying non-commercial technologies nor replacing the existing facilities to a substantial extent, though the above conditions could be considered as objectives of long-term energy policy.

Figure 6 CO_2 Emissions in the 450 Stabilization Case



Source: IEA World Energy Outlook 2007

4. Elements to be considered in Post Kyoto Consensus

The COP13 has, at least, framed a consensus with Bali Roadmap that the Post-Kyoto Protocol framework on climate change should be set up at the United Nations based on the UNFCCC principle of common but differentiated responsibilities of nations. Although it is now recognized

that urgent response against climate change is necessary to assure sustainable development, worldwide discussions greatly diverse on its goal, path and responsibility. Following discussion at the Heiligendam Summit, Japanese Prime Minister Mr. Abe proposed "Cool Earth 50" in May 2007, Prime Minister Mr. Fukuda reaffirmed this in January 2008, that the world should aim to reduce greenhouse gas emission 50% by 2050. Stern Review indicated that developed countries would be required to take much stronger actions than previously discussed. Yet, draft of practical goal, path and responsibility need to be designed before start of discussion toward framework setting, as IPCC has so far shown us simulation results only. In order to avoid same embarrassment experienced in 2001 when the U.S. evacuated from the Kyoto Protocol, we need to prepare meaningful discussion, based on the present reality, toward a practical and equitable solution.

To sort out such solution, we may need to intensively discuss on the following points.

1) The final goal of the greenhouse gas concentration and time schedule to reach the goal
2) Participation of all the major nations, especially the U.S., China and India
3) Fair and equitable responsibilities of nations
4) Institutional system consistent with sustainable development
5) Appropriate and effective enforcement system

Among them, goal setting may be the most controversial agenda. It should be discussed in a posture to find out a realistic, technically and economically feasible goal. For example, in order to control the concentration below 500ppm, it is necessary to peak out CO_2 emission by 2015, which is practically impossible unless a crush landing. Therefore, possibility of adaptation should be carefully studied to identify reprieve period and considered in setting the goal. At the same time, in order to assure feasibility of policy action, we should draw up roadmap with intermediate goals through the final goal, as we need to design reasonable and realistic allocation of capital, technology and resources identifying steps and goals for strategic research, technology development and implementation.

It is needless to say that participation of major emitting nations is indispensable to make the agreement thorough and effective. At least participation of core 15 countries (EU + APP + Russia + some others) may be necessary. Climate Dialogue at Pocantigo, where Pew Center plays core role, requests participation of 25 countries that would cover 83% of GHG emission, 71% of the population and 86% of GDP of the world. The U.S. insists at least more than 80% of emitters should participate. Then, as an idea to consider the common but differentiated responsibilities, participants may be divided into three groups, 1) developed countries with binding commitment, 2) emerging countries subject to pledge and peer review based on globally common and objective criteria, and 3) others (developing countries) subject to individual pledge with peer review with support of the other nations.

In order to indicate fair and equitable responsibilities, it is at first necessary to establish a system to accurately evaluate the greenhouse gas statistics. Then, a practical and highly objective *metrics* should be agreed upon, such as per capita CO_2 emission.[6] Then, based on equitable

[6] This does not necessarily mean application of same number across the board. However, it is necessary to set out fair and transparent criteria to create equitable index for differentiation.

starting points to be agreed, various approaches should be examined and formulated to reach the goal. They are, in the order of easier concurrence, 1) bottom up approach focusing on technology development, 2) pledge and peer review without binding, 3) sectoral approach with top-runner standard and trade restriction, 4) introduction of internationally common standard such as CAFÉ, 5) cap & trade with CO_2 pricing or taxation. It should be noted that sectoral analysis on energy efficiency is essential in order to set out goal of each nation for facilitating cap & trade system. Therefore, sectoral approach should be incorporated in the PKP framework complimentary with other measures.

Institutional system to facilitate reduction of greenhouse gas should be consistent with sustainable development of the world economy. In this context, it should be consistent with 1) energy security and energy selection of each nation based on development stage and geopolitical position. Other important factors may be 2) promoting development and diffusion of technologies to curb energy demand and to increase use of clean energy, 3) utilization of market mechanism for cost cutting of greenhouse gas reduction, 4) creation of incentives to participate in technology, product and market development relating to emission reduction. In particular, low-carbon technology development will have substantial impact on the emission reduction in the long run. Technologies on energy efficiency and conservation, clean coal technology (CCT), nuclear technology and development of new and renewable energies and carbon capture and sequestration (CCS) technology should be highlighted. In their application, pricing mechanism including taxation should be fully mobilized to realize fair and reasonable application.

Finally, appropriate and effective enforcement system is essential to materialize the agreement and the goal. In considering this, it is important to recognize that climate change response is not a process of profit distribution but allocation of negative public goods or public pains. In order to effectively materialize the goal, we need to establish global system under which every stakeholder should take responsibility equitable among nations as well as generations. They should commit to *Ethics* that will play great role in facilitating the global system. In order to smoothly coordinate various factors behind the problem, economic principles and pricing mechanism should be utilized to a maximum extent.

5. Way to Post-Kyoto Consensus

To find out the path to the Post-Kyoto Protocol Framework, the Japanese Prime Minister Mr. Fukuda requested at the 2008 Davos conference that the United Nations should examine strategies and measures to make global greenhouse gas emissions to peak in the next 10 to 20 years and be reduced by at least half by 2050. He also told that as the chair of the G8 Summit he is “resolved to take on the responsibility in working towards the establishment of a framework in which all major emitters participate as well as the setting of fair and equitable emissions target”.[7]

[7] The Ministry of Foreign Affairs of Japan. At the annual meeting of the World Economic Forum held in Davos, Switzerland, on 26 January 2008, he also proposed that 1) Japan will set a quantified national target for the greenhouse gas emissions reduction, 2) the whole world must make efforts to maximize the improvement of energy efficiency and should set a global target of 30% improvement of energy efficiency by 2020, 3) Japan will establish a new financial mechanism “Cool Earth Partnership” to assist developing countries on the scale of US$10 billion, 5) in the quest for low-carbon planet, Japan will invest over the next five years approximately US$ 30 billion in technology research and development.

With Bali Roadmap, the world is now set to consider the climate change in double tracks at UNFCCC. Participants are many and they greatly diverse in background and interest. It is not easy even to agree on how to start discussion, yet we need to agree on goal, path and responsibility as soon as possible in order to establish measures to cope with this urgent problem.

The immediate and most important issue is to set forth the final goal of the world on greenhouse gas emission, identifying equitable starting points and practical paths to reach it. This may be discussed separately for developed countries and developing countries. It is necessary to carefully examine if the IPCC AR4 could be the starting point of the discussion; perhaps, as Mr. Fukuda requested, much more scientific verification with realistic strategies and measures would be necessary. Then, the matter may be divided into goals of developed countries and developing countries. Among the developed countries, agreement of three cores, the U.S., Europe and Japan, is necessary. Major issues are if the U.S. could agree to any quantified target and if Japan could find a realistic and equitable goal rather than the symbolic Kyoto Protocol obligation. At first, it is necessary to find out an agreeable method or metrics to indicate the goal. Then, huge amount of scientific study would be required to set out the reasonable goal.

On the side of emerging and developing countries, it is first necessary to study and agree on the method of defining differentiated responsibility and participation. Then, as an implementation procedure, multi-stage approach may be an idea to be examined such that in Stage-1 parties have no quantitative commitment, in stage-2 they have to comply with dynamic “intensity targets” and in Stage-3 they comply to absolute emission targets. But, in view of the urgency of the matter, they should not be allowed to stay in the Stage-1 for longer time. In order to facilitate such goal setting, it is necessary to prepare viewpoints and approaching methods easy to understand and to provide policy development assistances for them. And, as a starting point, it is necessary to conduct energy survey and setup database to grasp the real position and potential of developing nations. All of them are time consuming processes.

At the 2008 G8 *Toyako Summit* Meeting, being an intermediate step between Gleneagles Summit, Heiligendam Summit and Italian Summit, the most important role expected on global climate change is to sort out *a method to set forth the long-term goal*. This is the first bridge we should cross before starting discussion on the quantitative goal as scheduled under the Bali Roadmap, while it seems extremely difficult to find a reasonable solution within limited time. However the matter is urgent, the bridge should be built firm and safe before everybody could cross it. Japan is expected to play an important role to coordinate dialogues among major players toward meaningful agreement, as the United States is expected to come back to the UNFCCC dialogue and China is needed to become an important participant in the Post-Kyoto framework. It is needless to say that energy security, another side of the same coin, is also an important long-term issue.

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