

September 29, 2001

CREST/SEEPS/NIES "Global Environmental Issues and Global Research Network"
"Global Environmental Issues and Global Co-operation in research field, IPCC
Activities and Future Problems to be tackled with."

"Science (IPCC research activities) and Democracy"

YAMAGUCHI, Mitsutsune
Professor of Economics
Keio University

It is a great honor to be here today to be able to give a short presentation. I understand that most attendants are experts on climate change and actively participated for the completion of IPCC TAR as either coordinating lead authors or lead authors. Also I understand there are many climate-change modeling experts here. Though I have participated as one of lead authors of WG3 chapter 6 (PAMs), I am no expert in modeling field. Therefore I would like to talk about what I usually think on climate change issues, that is "the relationship of Science and Democracy". Here science means IPCC research works. My conclusion today is that, though science tells us what will happen if we do not introduce effective measures to cope with climate change as soon as possible, and though some politicians try to persuade general public to pay attention to scientists' advice, democracy will not allow us, especially for climate change issues that are invisible and will not affect current generation directly, to follow scientists' suggestion promptly, and we have to wait until people really realize what scientists say. Another point we should be aware is that we should not stick to the short-term target too rigidly in order to proceed our long-term efforts to cope with climate change.

Prologue -- US withdrawal from Kyoto Protocol

In March, US President George W. Bush gave a big surprise to the rest of the world by announcing formally that US will withdraw from Kyoto Protocol and will not ratify it. However for me it was no surprise. It means simply that US will not be able to implement their commitment under Kyoto Protocol even if they ratify it. Just after then-President Clinton's proposal to introduce BTU tax had failed, President Clinton newly introduced "the Climate Change Action Plan" in October 1993. This plan consisted of many partnership programs between the Government and various industries. I highly appreciate a voluntary agreement as one of the policies and measures to cope with climate change. Just take several examples: German industries climate change

voluntary commitment, Dutch covenants on energy efficiency and Japanese industries' voluntary action plan (called "Keidanren voluntary action plan", please check with TAR WG3 chapter 6). However these voluntary programs will work as expected only when they are regularly reviewed. For example, German voluntary commitment is reviewed by RWI yearly, and Japanese action plan is reviewed by a government committee as well as by industries themselves and the outcome is disclosed yearly (<http://www.keidanren.or.jp>). In contrast to these action plans, no such review had been made in the US and, as a result, no outcome was published. In addition, the target of the plan was to stabilize US CO2 emissions to 1990 level by the year 2000 in order to implement US obligation under FCCC¹. In this sense, US did not have action plan to comply with Kyoto Protocol Commitment. In my view, US should have introduced much more stringent action plan just after Kyoto Agreement in 1997 to cope with the new situation. However, maybe because of Byrd-Hagel resolution at the US Senate that clearly states the Senate will not ratify any climate change agreement without significant participation of the developing countries (and Kyoto Protocol did not have any such wordings in it), the administration did not (or could not) introduce a revised action program. This means until now, the US did not have any effective action plan to implement their commitment under the Kyoto Protocol. Now, US CO2 emission in 1998 increased by 11.5% in comparison to that in 1990, it is almost impossible for the US to reduce their Green House Gases (GHGs) emissions by 7% by the year 2010 without serious pain to the economy, after their argument for sink and unlimited international emission trading was rejected at COP 6 at The Hague last November.

Current situation in EU and Japan

Though once failed at COP 6 in The Hague, resumed COP 6 held in Bonn this summer showed that enthusiasm and momentum to cope with climate change globally still remain unaffected. Especially, European politicians played crucial role for the success of the conference. Those politicians surely have understood what IPCC report meant and they have firm political will to achieve their goal despite adverse effect, if any, to their economy. However as I will explain later, not only for US but for both EU and Japan it's not easy to achieve their goals under Kyoto Protocol. What is important here is that they should not lose voters' support in pursuing their goals.

Let's look first at European situation with regard to climate change.

¹ More strictly speaking, US obligation is not to stabilize their CO2 emission of year 2000 to 1990 level, but to return their emission to earlier level by 2000.

According to EU website, EU emission of GHGs and CO₂ in 1999 is -4.0% and -1.6% respectively in comparison to base year of 1990. The emission reduction of both Germany and UK contributed greatly to total EU reduction. As everyone knows, reductions of these two countries were caused mainly by fuel switching (from coal to natural gas) and by improving energy efficiency in ex-East German territory. As these are so-called one chance reduction, a 1999 paper by EU² predicts that total EU emission of CO₂ in 2010, without additional measures, will exceed by 6% over their 1990 level. This means EU with its 8% reduction targets must reduce its emission by 14%. Under these situations, the Green Paper³ published in 2000 proposed unlimited emission trading within the territory of EU. Another paper⁴ issued the same year listed priority policies and measures to be introduced in several sectors such as energy supply, manufacturing, transport, domestic household etc. and proposed to implement these measures in parallel to emission trading (EU paper called this strategy as "twin track approach"). The most recent EU paper changed their prospect that, without additional measures, EU emission of GHGs will be around -1.4% to 0% therefore additionally 6.6%-8% reduction is necessary to comply with their commitment of 8% reduction.

Let's look at Japanese situation. Japan may be one of very few countries that had concrete policies and measures, just before Kyoto conference, to stabilize CO₂ emissions by the year 2010 at the 1990 level. Business as usual scenario showed that Japanese CO₂ emission increases by 20% (60 MT/C) by 2010. Therefore to stabilize it by 2010, it was necessary to reduce 60 MT/C in various sectors. One month before COP 3 at Kyoto, Japanese government and parties concerned agreed to the reduction plan. For example, in industry sector, mainly by combination of the Keidanren Voluntary Action Plan and strengthening energy efficiency standards, it was expected to reduce 16.5 MT/C. In household and commercial sectors, improving energy efficiency of electric appliance etc. as well as technology development and changing people's life style were main measures. By utilizing these measures 27.3 MT/C of emission reduction was expected in this sector. In transport sector, by improving fuel efficiency of cars, introducing clean-energy cars, integrating transport system etc. 12.7 MT/C emission reduction was expected. Adding 3.5 MT/C reduction from energy supply side made the total reduction equal to 60 MT/C. At COP3 however, as Japanese government accepted 6% reduction, another measures had to be added to make total reduction to 6%. But CO₂ stabilization plan still remain as the key program. To implement this

² "Preparing for implementation of the Kyoto Protocol", COM (1999) 230

³ "EU policies and measures to reduce greenhouse gas emissions: Towards a European Climate Change Programme", COM (2000) 88

plan, government enacted one law and also revised (strengthened) energy efficiency standards. The former took effect in 1998 and the latter in 1999.

In February 2001, a government committee reviewed the plan and found that without any additional measures, total CO₂ emission in 2010 would exceed by 7% (20 MT/C). According to this committee's study, it would be possible to reduce 15 MT/C by further improving energy efficiency and introducing renewable energies (wind, solar etc.). Another 5 MT/C could be reduced by fuel switching at power plant, however the committee found it very hard to do so.

Another government committee found that BaU scenario of Japanese GHG emission will increase by 5-8%. This committee pointed out that there are many technologies that could be introduced with minus cost. Also the same committee said by charging tax on average ¥30,000 (approximately \$250) per carbon, 2% reduction in comparison to 1990 level could be achieved and GDP loss due to introduction of carbon tax will be 0.06-0.72%.

In any case, to achieve 6% reduction of GHG emission will cause pain to the Japanese economy that has continually been suffered seriously and was in deteriorating situation for the past 10 years (lost 10 years). Japanese prime minister Junichirou Koizumi has promised to implement his "structural reform with pain". It is expected, at least for some time period, numbers of unemployed will increase and social insurance coverage will be shrunk. Climate change mitigation cost will add another pain to the economy and people.

From above descriptions, it should be noticed that, not only for the US but both for EU and Japan, it is not an easy task to attain our goals. Politicians need voters' support to proceed.

IPCC and International Politics

Since established in 1988 by UNEP and WMO, IPCC played significant role to persuade international society toward concluding treaties on climate change. The first IPCC assessment report warned us that we needed to reduce by 60% of CO₂ emissions immediately to stabilize CO₂ concentration at current level and that, without taking additional measures, global average temperature will rise by 3% and sea level rise by 65 cm that will cause serious damage to human health and eco-system. Two years later, the FCCC was adopted and took effect in March 1994.

Second Assessment Report issued in 1995 showed us that "the balance of

⁴ "Green Paper on greenhouse gas emissions trading within the European Union", COM (2000) 87

evidence suggests that there is discernible human influence on global climate". The report assured us that we must take concrete steps to mitigate (and adapt) climate change, followed by the adoption of the Kyoto Protocol.

I do not think there is any similar case, except for the IPCC assessment reports, where science and scientists have effectively influenced international politics and diplomacy. In this sense IPCC achieved a great success for which I, as one of the lead authors of TAR, am very pleased and highly appreciate. However it will be the time each countries have to implement domestic policies and measures. Under the situation, what will happen if science begins to affect people's everyday life rather seriously.

Science and democracy

Climate change has one peculiar characteristic that is quite different from traditional pollution damage. Take air pollution for example. People suffer from asthma and some may even die. People can see how painful the disease is. There is no need to explain why we have to take measures to tackle air pollution. People sometimes dare to forget cost effectiveness of the measures. It will be social morale with which people will unite. However when it comes to climate change, people do understand serious nature of the problem but as they think not them but future generation will suffer, their reaction is slow. Ordinary people may not wish to sacrifice their current comfortable life style until they will face real danger of climate change. What is important here is that they are voters. Politicians with lofty ideals and firm political will have to be elected by this kind of people.

IPCC TAR tells us that, for human beings to enjoy sustainable development, it is absolutely necessary to limit increase of global GHG emissions and at some point to turn to reduce them substantially for coming 100 years. From this viewpoint, Quantitative Emission Reduction and Limitation Commitments (QERLC) for Annex 1 countries as agreed in Kyoto Protocol is quite insufficient. Calculation based on the IEA (International Energy Agency) projection shows that developing countries GHG emissions in 2010 will be 213.8% of that of 1990. Even if Annex 1 countries complied with their obligation (that is 5.2% reduction), global emission will increase by 30%. QERLCs will be only a drop in the bucket.

On the other hand, if we take into account the "hot-air" of Economies in Transition, Annex B countries emission reduction at year 2010 will be as large as 30% in comparison to BaU. One can easily imagine how hard it will be, especially when people do not suffer directly from climate change. In addition, the largest emitter

of GHG, the United States, may not participate the scheme. In this case European and Japanese firms will be in disadvantageous position in international competition against US firms. At this moment we do not hear much about business communities opposition, but once they face loss of competitiveness, they may press their politician to adjust the situation. Without positive possibilities of US participation in near future, this means they will press their government to revise the Protocol. Even a drop in the bucket is hard to achieve.

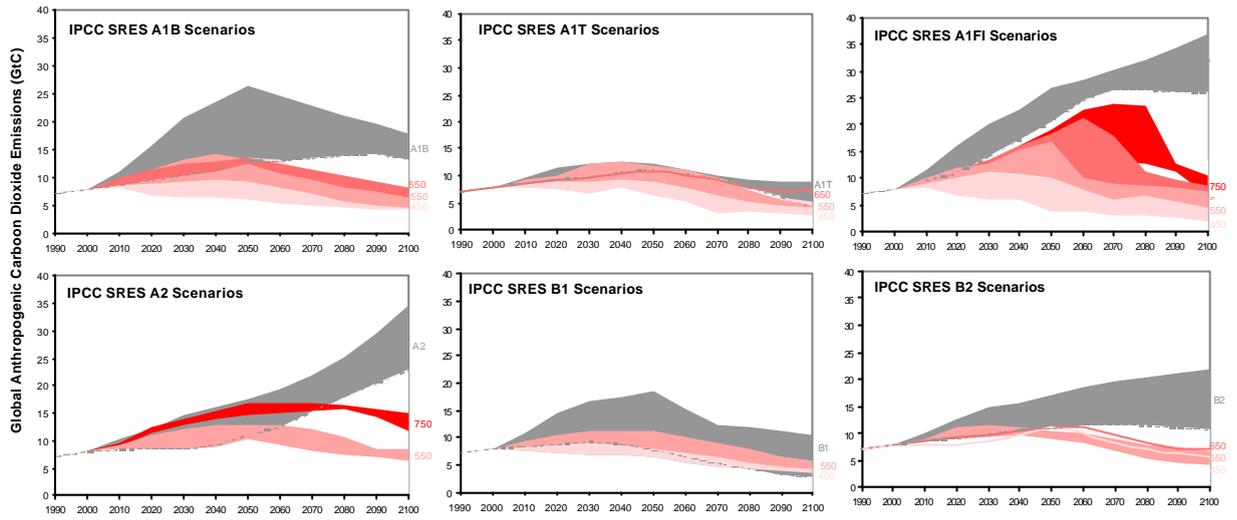
Even if other Annex B countries than US succeed to persuade voters to try to implement their commitments, they have to negotiate by 2005 for second budget period commitments.

What is important here, I think, is not stick to short period commitments too much. As the Economist magazine said in its November 27, 1997 edition, it will be "better a strong weak agreement that has a good chance of being honoured than a weak strong agreement that is likely to collapse". We should recognize that "democracies can proceed only as fast as voters will permit" (FT Aug. 21, 2000). What is necessary is that, bearing in mind what science (IPCC report) tells us, to proceed slowly so that politicians become confident of persuading voters and the commitments not to collapse. And though the Kyoto Protocol has become more flexible since Bonn this year, it should be stressed that we should not treat countries that will become unable to comply their commitments too rigidly. If we do so, politicians of those countries would be forced to press general public to attain their goals and loose voters' confidence. Then the protocol will become a weak strong agreement. (Another important aspect is that the door should be open for future (possibly from second budget period) US participation. US participation is essential for the global cooperation toward mitigation of climate change to continue for a long way to go).

Finally I would like to add one thing. The negotiations of climate change treaty on reduction target and mitigation policies and measures, though valuable as a first step of global cooperation, are not necessarily the most important issues on climate change. As all of you notice from SRES and TAR, future emission scenario differs substantially from each emission families and scenarios (see the chart below). What is really important is that toward what kind of society we should aim at. The reference and stabilization scenarios shown in Figure SPM 1 will give inexhaustible suggestions for us.

We should aim at a society with which human beings can enjoy sustainable development and can stabilize GHG concentration in 100 years at a reasonable cost. That is decoupling of economic growth and fossil fuel consumption.

Comparison of reference and stabilization scenarios (IPCC /TAR/WG3)



CREST/SEEPS/NIES “Global Environmental Issues and Global Research Network”

September 29, 2001 Kyoto, Japan

"Global Environmental Issues and Global Co-operation in research field, IPCC Activities and Future Problems to be tackled with."

"Science (IPCC research activities) and Democracy"

YAMAGUCHI, Mitsutsune
Professor of Economics
Keio University

Structure

- Prologue -- US withdrawal from Kyoto Protocol
- Current Situation in EU and Japan
- IPCC and International Politics
- Science and Democracy

Prologue -- US withdrawal from Kyoto Protocol

President Clinton's Climate Change Action Plan, 1993

- About 50 voluntary programs
- No regular review
- To stabilize US CO₂ emissions by 2000 at 1990 level
- No action plan for Kyoto Protocol

Current situation in US

- 1998 CO₂ emission is 111.5% of 1990 level and continues to grow
- Impossible to achieve 7% reduction without serious pain to US economy after US argument on sink and IET were rejected at The Hague (COP6)
- Hence comes President Bush announcement

Current situation in EU and Japan

It is not easy to achieve Kyoto commitments

- Especially if US will not ratify
- Politicians need voters' support

Situation in EU

- Emissions in 1999/1990
GHGs -4.0% , CO₂ -1.6%
- BAU Emissions of CO₂ in 2010/1990
 $+6.0\%$ COM(1999)230
- Must reduce further 14% COM(1999)230
- Twin Track Approach COM(2000)87/88
(Unlimited ET within EU and Prioritization of policies)

Situation in Japan

- BAU emissions of CO₂ in 2010/1990
+20% (60MT/C)
- CO₂ stabilization Plan was formally approved in November 1997
- Next slide shows detail

Japanese action plan to stabilize CO₂ emission at 1990 level

Unit: carbon equivalent million tons

Industry Sector	Residential & commercial sector	Transportation sector
Reinforcement of energy conservation law and Keidanren voluntary action plan (14.3)	of electric goods improvement Enforcement efficiency (9.7)	t of automobile Reinforcement of fuel efficiency (3.2)
Energy conservation at SME (1.2)	Improvement in the performance of energy conservation of the housing (2.8) Improvement in the performance of energy conservation of the building (7.5)	Promotion of clean energy cars (0.5) Efficiency improvement of individual car (0.6)
Future technology development (1.0)	Future technology development (2.4)	Future technology development (0.3)
	Drastically changing citizen's lifestyle (5.0)	Counter measure for the Smoothing traffic (3.1) Drastically changing citizen's lifestyle (1.4)
		Others (4.1)
Industry 16.5	Res. & Com. 27.3	Transportation 12.7
Energy Supply 3.5		
Total CO₂ Reduction 60 MT/C		

Additional 6% reduction

Methane etc.	– 0.5%
Technological Innovation	– 2.0%
HFC, PFC, SF6	+ 2.0%
Kyoto mechanism	– 1.8%
Sink	– 3.7%
TOTAL	– 6.0%

Measures taken so far

Regulations and voluntary action plan

- Strengthening energy standards (1999)
- Law Concerning the Promotion of the Measures to Cope with Global Warming (1998)
- Keidanren Voluntary Action Plan (1997)

Recent findings

- Committee of METI: 7% (20 MT/C) increase of CO₂, hard to achieve
- Committee of ME: 5-7% increase, can reduce up to 2% below 1990 level by carbon tax of ¥30,000 (\$250) per ton
- Would add pain to economy in addition to pain due to Japan's structural reform
- Need voters' support to proceed

IPCC and International Politics

FAR in 1990

- Temperature and sea level will rise
- Will cause serious damage to human health and eco-system
- Need to reduce 60% of CO₂ emission immediately to stabilize CO₂ concentration at current level

FAR played significant role

- Adoption of FCCC in 1992
- FCCC took effect in March 1994

SAR (1995) also played an important role

- “the balance of evidence suggests that there is discernible human influence on global climate”
- Adoption of the Kyoto Protocol in 1997

IPCC (science) played significant role

- No other scientific institutions or scientists have influenced international politics and diplomacy as effective as IPCC
- But what if it becomes clear that the Kyoto target will affect peoples' everyday life?

Science and Democracy

Kyoto target is a drop in the bucket

- TAR tells us we need to reduce emissions substantially in 100 years
- Even if 5.2% reduction is achieved, global emission will increase by 30%

But Kyoto target is very hard to achieve

- BAU emission of OECD countries in 2010 is estimated as 124.9%. Must reduce more than 30%
- Loss of international competitiveness
- Industries may push government
- Voters are reluctant (damages are invisible)
- What should politicians do?

Not to stick short-term commitment too much (1)

- “Better a strong weak agreement that has a good chance of being honoured than a weak strong agreement that is likely to collapse”

The Economist November 27, 1997

- “Democracies can proceed only as voters will permit”

Financial Times August 21, 2000

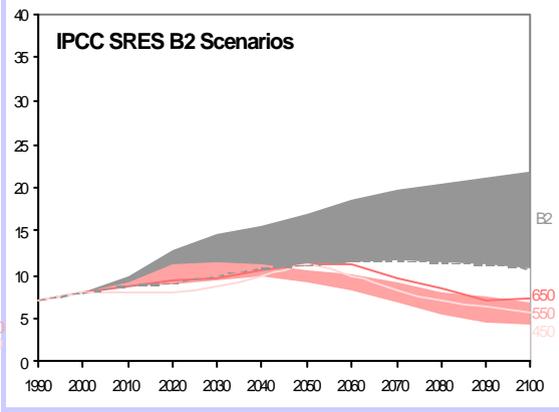
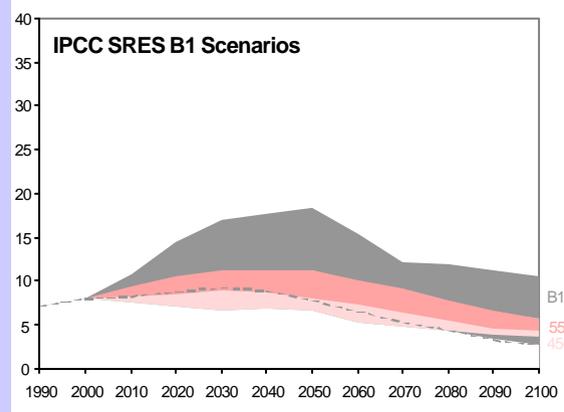
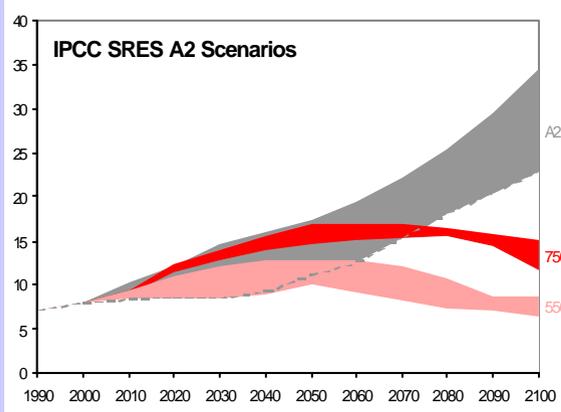
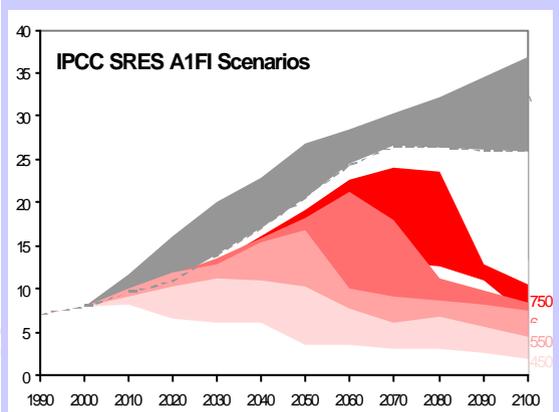
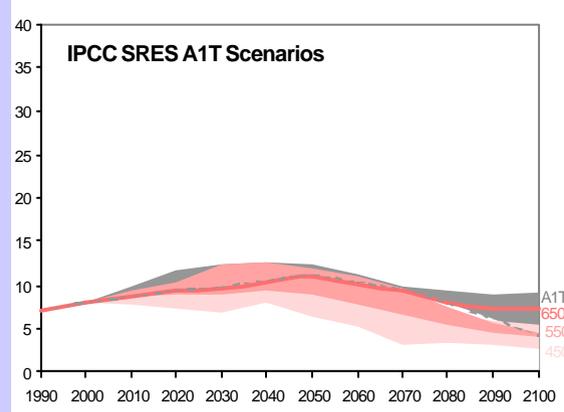
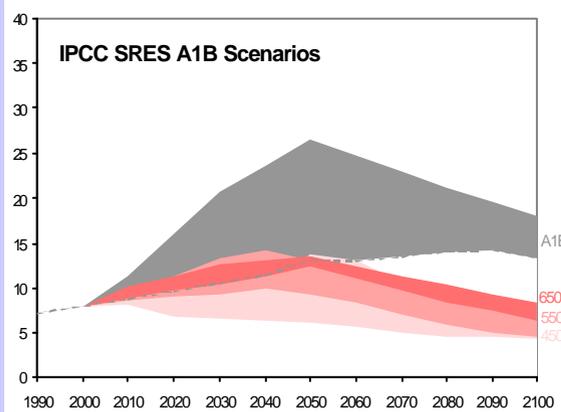
Not to stick short-term commitment too much (2)

- Kyoto Protocol is the first step
- Though flexible enough, should not kill it by treating the countries that would be unable to comply their targets so rigidly
- Politicians of those countries can not have voters' support anymore

What kind of society should we aim at

- The reference and stabilization scenarios shown in Figure SPM 1 of WG3 report will give us inexhaustible suggestions

Global Anthropogenic Carbon Dioxide Emissions (GtC)



We should aim at society with which we can stabilize GHG concentration in 100 years at a reasonable cost

- Decoupling of economic growth and fossil fuel consumption