How Can We Halve Global CO_2 Emissions?

By Noboru HATAKEYAMA

[**Continued from Publisher's Note**]

IT is absolutely necessary to include developing countries in the quantified target system.

Certainly, under the Bali Action Plan announced last December, it was decided to have developing countries address mitigation actions without mentioning "quantified emission reduction objectives," which were referred to in the case of developed countries. The difference may be reflecting the principle of "common but differentiated responsibilities" confirmed many times since the Earth Summit held in Rio de Janeiro back in 1992 on the basis of the UN Framework Convention on Climate Change.

However, many developing countries have developed tremendously since then. Therefore quantified emission reduction objectives do not make sense unless at least major developing countries share such objectives. For example, China's economy has kept expanding for the last 30 years and will continue to do so at least in the near future. According to a report on BRICs published by Goldman Sachs in 2003, China will overtake Japan by 2015 in terms of the size of GDP in US dollar terms. Let's assume that China's GDP will expand at the same rate as in the report each year from 2008 and its CO_2 emissions will increase at the same rate as GDP growth. Then, in 2021 China's CO_2 emissions alone will exceed 13.55 billion tons, the target amount of the "halving plan" in 2050.

Developing countries, including China, keep contending that it is unfair for developed countries to propose worldwide reduction of CO_2 emissions now after they had emitted a huge amount of CO_2 since the Industrial Revolution in the 18th century. On this point, there is a study jointly conducted by the Research Institute of Innovative Technology for the Earth and the Institute of Applied Energy. According to the study, certainly it was true that between 1900 and 2000 the United States and Western Europe contributed to global warming by 22% and 16% respectively. However, China contributed 8% during the same period whereas Japan did so only 3%. Therefore it is also unfair to assume that all developed countries as of now had emitted a huge amount of CO_2 since the Industrial Revolution.

The clean development mechanism (CDM) prescribed in the Kyoto Protocol enables a company of a developed country to construct a plant in a developing country to reduce CO_2 emissions and make use of the reduction amount to comply with the company's quantified emission reduction commitment in its home country. However, this entire process can be like pouring water into a bottomless bucket because since the developing country is not committed to a quantified target thus far, it is absolutely free to construct another inefficient plant there as a new CDM project.

More generally speaking, if a developing country does not commit itself to a quantified emission reduction target, many companies in developed countries with obligations to abide by such targets in their home countries will invest in the developing country to construct factories. Thus the fact that a developing country is not committed to a quantified emission reduction target not only distorts market mechanism by giving developing countries a special advantage, but also allows them to emit as much CO_2 as they want, thereby completely nullifying the efforts to reduce CO_2 emissions in developed countries.

We have to face the reality squarely and have to tell developing countries that global warming is literally a global issue and therefore even developing countries are not exempt from the damage it brings about and likewise from the obligations to introduce a respective quantified target.

Having written this, however, it is very important to assist developing countries as much as possible on this issue. In this respect, I would like to point out the following as measures to assist developing countries to grow their economies smoothly even under the condition that they accept quantified targets.

The first measure is to give technology assistance for energy efficiency. According to the IEA, Japan's energy efficiency was 6.7 times better than that of non-OECD countries. If Japan can transfer those energy efficient or saving technologies by selling them or offering them in the form of ODA to developing countries, the fuel efficiency of recipient countries will improve a lot.

The second measure is to differentiate the start of obligation for developing countries by, for example, delaying it five years. In this case, the quantified obligation of developing countries will start from 2018 rather than 2013. If this were the case, this would be quite a

concession on the part of developed countries because most of them have been and will be obliged quantitatively already by the Kyoto Protocol during the period between 2005 and 2012 in terms of CO_2 emissions.

4. International Allocations

In the case of the Kyoto Protocol, each target for a developed country or a region was decided through negotiations. The results included 8%, 7% and 6% reduction targets of greenhouse gas emissions for the EU, the United States and Japan respectively. These numbers were determined politically. In the post-Kyoto Protocol world, each target for every country and region for the UN to allocate should be decided by a comprehensive, predictable and reasonable formula that applies to all countries and the EU. Each country's quantified target per se should not be determined through negotiations. What should be decided in the negotiations is what kind of formula we should adopt.

Photo: Kiko Network (from website of Japan Center for Climate Change Actions)

The United Nations Climate Change Conference in Bali, 2007

Fundamental elements to be included in such a formula should be ratios of a country to the world in terms of its GDP and population. A country that produces more GDP tends to emit more CO_2 than others. A country with a large population has a potential to emit more CO_2 than others. If we decide to adopt a GDP ratio alone, most developing countries will be opposed to it, criticizing that rich developed countries will become richer by getting more allowances for CO_2 emissions! If we decide to adopt a population ratio alone, of course less populated countries will complain. Therefore the rule of distributing CO_2 emission to each country has to adopt a combination of each country's ratios of GDP and population to the world total. There are two fundamental ideas.

The first one is an idea to distribute more CO_2 allowance to a country with smaller per capita GDP. It means that CO_2 allowance will be distributed in accordance with the reciprocal of per capita GDP of each country. The logic of the idea is that since developed countries have emitted huge amounts of CO_2 since the 18th century, it will be the turn of developing countries to do so. However, the idea leads to punish countries with high productivity, which is against the progress of economy. Therefore I think this idea should not be adopted.

The second idea on a formula for international distribution is to base it on a ratio of a country to the world in terms of half population and half GDP. For example, if this formula is adopted, Japan will be given a 6.13% share of the global CO_2 emission target in 2025, with the shares of the United States and China being 16.35% and 12.71% respectively.

This allocation by the UN should be made free of charge. Of course the balance between the allocated allowance and an actually emitted amount of a country can be traded. Therefore a country that was not allocated enough allowance can emit more CO_2 than the allowance originally allocated by the UN if it purchases allowance from another country. In this regard, a quantity each country gets through the initial UN allocation does not matter much as long as market mechanism works smoothly for trading CO_2 allowances. In other words, admitting trading in CO_2 allowances enables countries, including developing ones, to expand their economies more than expected. Unless trading is allowed, the quantified target for a country will put a ceiling on its economic growth.

The review of UN allocation of CO_2 allowances should start around 2020 rather automatically, reflecting changes in the population and GDP of each country for the purpose of establishing another midterm goal of 2038. The year 2018 will be the base year in which each country's CO_2 allowance is calculated, based on a ratio of its GDP and population to those of the world. Since Japan's population started declining from 2005 and its GDP is predicted to grow only by 1 % on average for the next 11 years in the Goldman Sachs report, for example, a CO_2 allowance allocated to Japan will decline to 4.6% or so in 2018.

5. Domestic Distribution

The government of each country that has obtained CO_2 allowances from the UN will distribute them to domestic applicants, based generally on the past emission records of each user or through bidding. Each user cannot emit more CO_2 than the given emission allowance unless the user gets an additional allowance from other users who do not use it for their own emission control.

There are several problems to solve, including the following.

Firstly, allocating emission allowances based on the past emissions of a user is criticized in that inefficient energy users tend to be given more allowances than efficient ones. In addition, bureaucratic, arbitrary and complicated procedures of allocation by the government are of concern. Therefore introducing a bidding system should be studied seriously. However, in this case, each government should be careful for a bidding market not to be overwhelmed by speculators. If speculators can rampage through the market, the entire bidding system will not work due to an unreasonably high price of a unit CO_2 allowance. As long as it remains in a reasonable range, energy users should accept it as an inevitable cost to avoid bureaucratic, arbitrary and complicated procedures of allocation by the government.

Secondly, tracking CO_2 emission allowances at an early stage may be better than doing it at a later stage. In order for the entire system to work, a user of oil, for example, has to be checked directly or indirectly as to whether it has enough allowance to enable it to use the oil. In the case of the EU that has already been implementing a "EU Trading System," checking CO_2 emission allowances has been conducted at each stage of energy consumption.

Let's assume that oil is imported by a refinery and refined oil is sold to a factory. According to the EU system, both the refinery and factory have to prove that each has an allowance for CO_2 emissions. Big factories can be checked. But small and medium-sized enterprises (SMEs) cannot be checked as to whether they have CO_2 emission allowances just because there are too many such businesses. Therefore it is said that the EU has been checking only 15,000 enterprises. Checking will be conducted more efficiently and comprehensively if it is done at an upstream stage, or, in this case, at an importing or refining stage. Then not only big businesses but also SMEs and private individuals can be checked indirectly.

6. Countermeasures against Non-Participants

What should we do against countries that do not accept quantified obligations to reduce CO_2 emissions? There can be three measures.

The first one is for participating countries not to purchase CO_2 emission allowances. Under the Kyoto Protocol, a participating country that has committed itself to a quantified target can purchase an emission allowance from a developing country. Since developing countries are not required to be committed to quantified targets, this means that there are leakages taking place through these big loopholes of the entire CO_2 reduction program. Therefore under the post-Kyoto Protocol system, a decision should be made that participating countries do not purchase CO_2 emission allowances from non-participating countries.

The second countermeasure is for participating countries to prohibit their manufacturers to invest in those countries not accepting the obligations. If we don't take this measure, manufacturers of countries with such obligations will invest in countries without obligations to enjoy more competitive manufacturing conditions there. This gives not only unfair competitiveness to non-participating countries, but also increases CO_2 emissions without limitation. International rules on investment have not been taken up in the Doha Round of WTO negotiations. Therefore it is free to restrict manufacturing investment rather ironically as of now although restrictions on investment in the service sector are regulated by the General Agreement on Trade in Services (GATS).

The third measure is to use import restrictions or countervailing duties that can be justified by GATT Article 20 that authorizes GATT member countries to adopt measures necessary to protect human, animal or plant life or health. Experts on climate change and international trade should judge whether this article can be enforced.

7. Conclusion

The dream of preventing global warming will come true if, in parallel with the measures mentioned above, every country can try hard to develop CO_2 emission-saving technologies, including cost-competitive non-fossil fuel, to change our industrial structure and lifestyle toward more energy-saving patterns and to increase the CO_2-absorption capacity of the globe. I will be extremely happy if this essay could contribute to your food for thought on this matter. JS

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