

The Low-carbon Society Must Be *Sustainable*

Responses to global warming should not be treated as a mere policy issue, writes **Kazuhiro Ueta**, professor of environmental economics and public finance at the Graduate School of Economics at Kyoto University, but as an opportunity to build a new socioeconomic order which makes sustainable development possible on both the global and local levels.

Defining the best policy response to global warming.

Any mention of this issue is certain to spark a debate over the choice of environmental policy instruments and the decision, for example, of whether such measures as emissions trading schemes and eco-taxes should be adopted. The selection among environmental policy instruments naturally involves decisions that will greatly influence the environmental impact and effectiveness of those policies. The pros and cons of many different policy options should be carefully considered. However, whatever instruments are ultimately to be adopted, clearly defining the criteria for choosing among environmental policy alternatives will be impossible without showing why and for what purpose such measures have been adopted, which is to say, without defining the goals and targets of environmental policy. We need to go even further and ask what kind of society will result if these policy instruments are effective.

This approach treats global warming not as a mere policy issue but as

an opportunity to build a new socioeconomic order which makes sustainable development possible on both the global and local levels. It is also in this context that we should debate the matter of setting medium-term targets for reducing greenhouse gas emissions to the extent possible by 2020, which is our present focus.

Targets and Cool Earth 50

We need to transition to a sustainable, low-carbon society.

Japan's first venture toward considering this effort was the Cool Earth 50 proposal. The Cool Earth 50 proposal was made by then Prime Minister Abe at the end of May 2007, just prior to the Heiligendamm Summit. Based on the principle that all major greenhouse-gas emitting nations should participate, the proposal set a long-term target of cutting worldwide greenhouse gas emissions in half from present levels by the year 2050.

However, while the Cool Earth 50 initiative proposed a target of reducing global emissions by half, there was no mention of how much Japan intended

to cut its own greenhouse gas emissions by 2050. Nor did the proposal clearly specify a base year for measuring the progress of reductions. Although the initiative was basically welcomed, in part because Japan's reduction targets were not specified, it is unlikely that either the Japanese public or Japanese companies had any concrete sense of how much they had to do in order to cut greenhouse gas emissions. To put it bluntly, there were, perhaps, only a few people who correctly understood the great significance of the Cool Earth 50 proposal.

Present greenhouse gas emissions are balanced roughly evenly between developed countries and developing countries. Let us assume, based on the most optimistic scenarios, that greenhouse gas emissions overall can be maintained at present levels even though the economies of developing countries will undergo substantial development by the year 2050. The European Union has been attempting "decoupling" measures aimed at breaking the link between economic development and the associated environmental burden (in this case, the volume of greenhouse gas emissions). From their present position, however, it would take a miracle for developing countries to be able to achieve a scenario. That much is clear from the fact that virtually all international organizations project that emissions by developing nations are set to increase substantially.

But it's here that the problems begin. Even if this miracle could be achieved, the question remains how far the developed countries would have to cut their own emissions before global emissions could be reduced by half. It immediately becomes apparent that worldwide greenhouse gas emissions could not be halved unless the emissions of developed countries were cut to zero. This means that achieving the targets of the Cool Earth 50 proposal would require that developed countries build societies having virtually no greenhouse gas emissions through the year 2050. It was to be expected that the United Kingdom and Germany both announced targets aimed at slashing emissions and that Japan, in the Fukuda Vision 2050, announced plans

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to cut emissions by sixty to eighty percent by the year 2050. Early on, moreover, the Intergovernmental Panel on Climate Change pointed out the need to dramatically cut the volume of greenhouse gas emissions, and I would only add that many scientists support this view.

Innovation and Revolution

Transitioning to a low-carbon society cannot be accomplished without breaking from our energy system centered on fossil fuels and fundamentally transforming our production and a consumption system, which is dependent on fossil fuels. Such an effort would represent a transition in the history of civilization rivaling the industrial revolution. In short, preventing global warming is not the kind of challenge which can be achieved merely by maximizing conservation efforts while maintaining the present socioeconomic system. Rather, the task must be understood as one of innovation, one of creating the technology and social institutions making it possible to prevent global warming and of building a new socioeconomic system which supports that effort. One might also say this is an obligation which the present generation has to future generations.

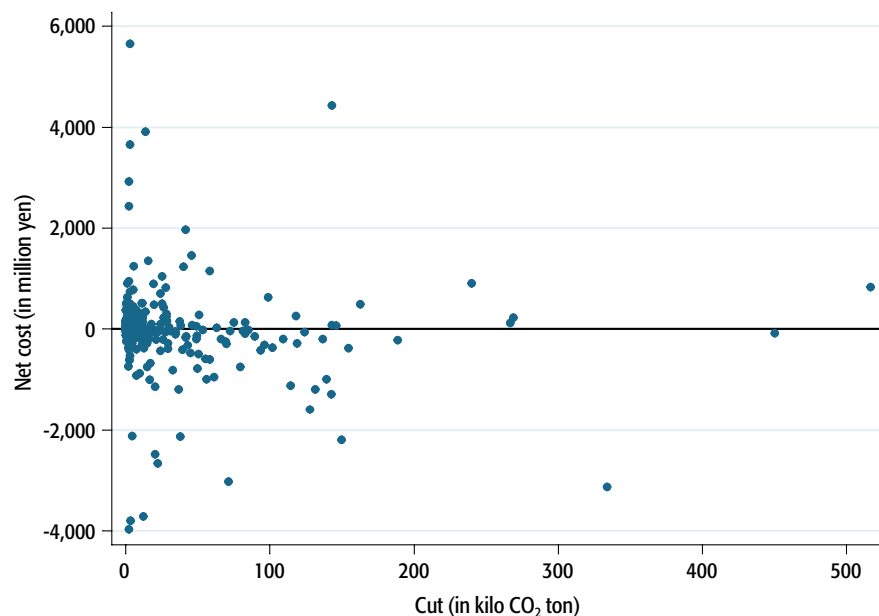
With regard to the 2020 medium-term targets, the EU already proposed that it would cut emissions by twenty percent from 1990 levels on its own and proposed a thirty percent reduction target if other developed countries cooperated. The Japanese government also began considering medium-term targets but in the ensuing debate it was argued that attempting to achieve cuts along the lines of those of the EU would involve massive costs and substantially damage the economy.

Let us therefore consider the relationship between policy targets and cost burdens. From the standpoint of efficiency, the global warming policy target is defined as the point where the curve representing the marginal damage costs associated with global warming intersects with the curve representing the marginal abatement costs of greenhouse gas emissions. (The marginal damage cost refers to the in-

crease in environmental damage costs accompanying each incremental increase in greenhouse gas emissions. The marginal abatement cost refers to the additional expense required to bring about each incremental decrease in greenhouse gas emissions.) In reality, however, it is by no means easy to accurately measure the marginal damage costs associated with global warming. Moreover, partly because the entities incurring environmental damage are different from the entities causing the environmental damage, some observers argue that target levels should not be set merely on the basis of efficiency. In particular, it should be born in mind that, in addition to achieving a

tific perspectives. Reduction targets based on the scientific perspective no doubt represent the targets required from a purely scientific perspective without reference to the expenses necessary to achieve the them. The Framework Convention on Climate Change originally adopted the perspective of precautionary principle. This principle states, with respect to problems involving a high degree of uncertainty but also the potential for catastrophic damage, that preventative measures should be taken so long as taking them does not involve unbearable expense for the society in question. In short, one could say that the problem of setting intermediate-term targets for

Cost to Cut Greenhouse Gases by Japanese companies



Note: Dots under the zero line (for no net cost) indicate those companies that made profits by cutting CO₂ emissions. Dots (companies) above the zero line made a loss.

Source: Seiji Ikkatai et al.

balance in the global warming issue between North and South, another problem is that of the balance between generations, since future generations will suffer the damage.

A "Towel Wrung Dry"?

Accordingly, the grounds for determining how to establish the present medium-term targets should not be economics but the approach set forth in the IPCC Fourth Assessment Report which represents a collection of scien-

preventing global warming amounts to a question of whether or not the costs required to achieve the targets set are prohibitively high for the society in question. Determining which strategy to adopt in addressing global warming therefore involves a choice among values.

If the slope of the rising marginal abatement cost curve for greenhouse gas emissions is mild, then the additional abatement costs could be less. In short, the cost required to cut greenhouse gases is largely dependent on

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the shape of the marginal abatement cost curve.

Two points should be kept in mind here. The first concerns the problem of accurately estimating marginal abatement costs. From time to time the analogy of a “wrung out towel” has been used, and it has been said that the greenhouse gas emission marginal abatement costs for Japanese companies are already very high. However, according to the research of Kyoto University Professor Seiji Ikkatai et al, if anything, the reverse is true. Based on field interviews and data gathered from environmental reports and financial statements made public by about 200 companies in fifteen major industries, researchers analyzed some 1,000 panel data sets from 1999 through 2006 and found that greenhouse gas emission marginal abatement costs were minus 6,800 yen (see **figure**). These findings indicate that the energy saving efforts made by Japanese companies remain within a scope which is profitable, which is to say, they are only implementing greenhouse gas reduction measures which are profitable. A recently released report by McKinsey & Company also points out that the greenhouse gas emission reduction potential remains large. It seems that greenhouse gas marginal abatement costs should be studied not only by using model analysis but also by examining actual conditions in detail.

Secondly, the effect of reducing marginal abatement costs through advances in technology must be considered in conjunction with the fact that the prevention of global warming will become a long-term issue. Although the immediate goal was not prevention

of global warming per se, a research report by Kyushu University Associate Professor Nobuhiro Horii showed that domestic Chinese production of desulfurization equipment has moved ahead very rapidly, with the price per kilowatt falling dramatically, or from the 800–1,300 RMB/kW range in 2000 to under 100 RMB/kW by the end of 2006. The price reduction may be seen as having resulted from market competition in the sphere of technological development, the competition resulting in turn from the presentation of clear policy targets and instruments and the building of the necessary institutional framework. Well-known examples of the effect which environmental policies have in inducing technological innovation include those associated with auto-gas regulations in Japan, an effect that has been described through the Porter hypothesis. In environmental policy, what are needed are institutions and policies which enhance dynamic efficiency rather than static efficiency in a point in time.

Japan's Responsibility


As is clear from the foregoing, it is questionable whether intermediate-term targets themselves can ensure the prevention of global warming. At the same time, the impact of those targets as a signal for how business firms and the public should respond with respect to global warming is also of great importance. Clear signals will increase confidence in investments, and if combined with “Green New Deal” public policies, will have considerable impact.

In addition to reducing the green-

house gases of advanced industrialized countries, such clearly defined targets and the greenhouse gas prevention measures based on them will provide a future model for developing nations. This is a critical point. The model which the advanced nations propose must be one in which, while reducing greenhouse gases, can enhance societal and economic wealth. If there is anything that can enhance the achievability of this model it will be ensuring that developing countries can achieve sustainable development in the future.

Meanwhile, Japanese global warming prevention measures should be approached with a view to resolving the socioeconomic problems facing Japan. What Japan needs to achieve is a sustainable, low-carbon society. Building a low-carbon society is a necessary but not sufficient condition for the sustainable society we must achieve. If measures to cut greenhouse gas emissions and prevent global warming are implemented in such a way that local economies suffer, the will to pursue them will not build and the measures themselves will not succeed.

The goal of preventing global warming must be incorporated into *monozukuri* (manufacturing), town planning and lifestyle planning, and all of these must then be pursued in a coordinated fashion. These respective efforts will encourage each other, and a Japanese model will be born from the innovative creation of a new lifestyle and technology, as well as the social institutions which support them.

While it is Japan's responsibility as an advanced industrialized country to take the lead in contributing to the resolution of the difficult worldwide problem of global warming, this same effort will yield new know-how and technological assets for preventing global warming and will further Japan's national interests. Such a model will stimulate corporate activities based on sustainability and lead to a sustainable, low-carbon society, helping to strengthen the Japanese economy qualitatively. 

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