

# Japan's Targets Depend On Others' Ambitions

What should constitute Japan's mid-term goals for greenhouse gas emissions reductions bearing in mind the potential impact on GDP and households' disposable income? Yamaguchi Mitsutsune reviews the debate to date.

The proposed Global Warming Countermeasures Basic Bill passed through the Environmental Committee of the House of Representatives on May 14 and has a good chance to become law. The principal aims of the bill are to cut greenhouse gases by 25% versus 1990 levels by 2020 as a mid-term target and to cut them by 80% versus 1990 levels by 2050 as a long-term target. As measures to achieve these ends, the bill provides for the creation of a domestic emissions trading scheme, an environment tax and a feed-in tariff for renewable energy.

In implementing the measures, consideration is to be given to the economy, jobs and the stable supply of energy, with efforts made to promote nuclear power as well. However, the commit-

ment of Japan to mid-term goals is on the premise that a fair and effective international framework will be established and under which all major economies participate and agree to ambitious targets. Under the current circumstances or commitments by major economies, however, the Japanese government deems that these conditions will not be met. Moreover, it may take one year to design a domestic emissions trading scheme after the bill passes in the Diet.

In general, other countries including those of the EU and Australia propose unilateral targets that can be raised if international agreement is made on a sufficiently ambitious target. In contrast, Japan's position is unique in pursuing no unilateral target when the preconditions are not satisfied.

## In Search of a Fair and Attainable Mid-Term Target

In this context, debate on Japan's mid-term goals continues at the Diet. In working out such goals, successive administrations have acted three times to assess the impact on the economy, employment and so on, first with the Committee on Mid-Term Targets in April of 2009 under the government of the LDP, then with the Global Warming Task Force in November of the same year following the change of administration, and finally with the Mid-Term Road Map Study Group in March 2010. In the last two cases, the studies have been focused on the 25% reduction target.

The first two rounds were based on the outcomes of the three Computable General Equilibrium (CGE) Models

Comparison of Four CGE Models (25% Domestic Reduction)

	Real GDP	Real disposable income (per household)	Unemployment	Electricity price increase	Marginal abatement cost
<b>Keio University</b>					
Mid-term Committee	-5.6%	-15.9% (¥770,000)	1.9%	97.3%	¥87,667
Task Force					
<b>NIES</b>					
Mid-term Committee	-6.0%	-9.1% (¥440,000)	-	100.6%	¥61,029
Task Force	-3.2%	-3.4% (¥170,000)	-	113.6%	¥54,438
<b>JCER</b>					
Mid-term Committee	-3.2%	-4.5% (¥220,000)	-	124.7%	¥81,555
Task Force	-3.1%	-4.5% (¥220,000)	-	117.0%	¥63,180
<b>Osaka University</b>					
Business-as-usual innovation	-0.43%	-0.4% (¥19,000)	0.13%	10.2%	¥55,635
Accelerated innovation	0.40%	-0.05% (¥2,000)	-0.41%	10.7%	¥52,459

**Notes:**  
 1) Keio Univ. model assumed that tax revenues are used for repayment of Government bonds to avoid interest rate increase whereas the NIES (National Institute for Environmental Studies) and JCER (Japan Center for Economic Research) models assumed the revenue to be recycled to households. Osaka Univ. assumed economy-wide cap and trade hence no tax revenue.  
 2) Disposable income losses by Osaka Univ. model were calculated by the author using the same formula applied for the other models.

(economic models)—one by Keio University Associate Professor Nomura Koji and two by other research institutes—as well as technology models of three organizations including the Research Institute of Innovative Technology for the Earth (RITE). The Roadmap Study Group considered a CGE model of Professor Ban Kanemi of Osaka University, a number of technical models and an input-output model.

The committees covered a wide variety of topics. The accompanying table compares the results of computations for just the CGE models with respect to the 25% domestic reduction case (no overseas credits). Given the differences in the assumptions of the various models, a simple comparison of the findings is impossible (see notes to the table). Strictly speaking, moreover, the Osaka University model does not contemplate a CO<sub>2</sub> reduction of 25% in real terms.

That said, there are substantial differences between the three models considered in the first two rounds and the Osaka University model considered by the last study group. According to the Osaka University model, the impact on GDP and disposable income is very slight even on the assumption of normal advances in technology. For example, the Keio University model puts the

reduction in disposable income per household in 2020 at 770,000 yen while the Osaka University model puts it at between 2,000 to 19,000 yen, a huge difference in comparison to that of the Keio estimate.

One reason for this gap lies in the inherent differences between the models: while the Keio model used a recursive dynamic model using equilibriums each year, the Osaka model used a forward-looking approach maximizing the discounted present value of consumption. Another major reason for the differing results is thought to be the assumptions of the Osaka model such as a 2.5% annual improvement in energy efficiency, an annual de-carbonization rate of 2% to 4%, and a 20% annual increase in the area of installed solar power generation (33% with the promotion of technology innovation case). These differences should therefore be borne in mind.

One person who has been encouraged by the Osaka University findings is Environment Minister Ozawa Sakihito, who has announced a tentative plan comprising a roadmap for achieving a 25% domestic reduction on the assumption that substantial reductions would be possible while the economy continues growing. However, it seems very risky to set national goals relying on the most

optimistic of estimates despite these disparities between the models. More to the point, even the Osaka University model puts the marginal abatement cost at about 600 dollars per ton of CO<sub>2</sub>, which is more than ten times that for the United States and the EU. In addition, there is no sign that other nations will meet the preconditions set by Japan.

While it is well and good for Japan to lead the international community in setting ambitious targets, the Japanese target set in such a way stands out sharply from those of other nations and involves the risk of flighting industries overseas, resulting in higher emissions globally (carbon leakage). The real contribution which Japan could make toward slashing CO<sub>2</sub> globally over the long term would be sharing its technology with the world. RITE estimates indicate that potential global reductions in CO<sub>2</sub> resulting from the distribution and dissemination of cutting-edge Japanese technology in just three sectors of power generation, steel and cement would be double the volume of emissions of Japan as a whole. This kind of strategy deserves greater consideration. □

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### Overview of the Bill of the Basic Act on Global Warming Countermeasures

#### Purpose

The mitigation of and adaptation to climate change are issues faced in common by all humankind and it is critical to address climate change under a fair and effective international framework in which all major economies participate. In light of these points, in order to contribute to the global greenhouse gas emissions reduction and bring about a society that emits as little greenhouse gas as possible, Japan will promote global warming countermeasures while ensuring economic growth, stable employment and stable supply of energy. It will also contribute to conserving the global environment and to ensuring the present and future healthy and culturally-rich lives of the Japanese people.

#### Basic Principles

The Bill establishes the following principles for global warming countermeasures:  
 Create a society that can reduce greenhouse gas emissions while realizing sustained economic

growth that ensures prosperous lives of the people and competitiveness of industry through the establishment of new lifestyles and other means Engage in active promotion through international cooperation, bringing out our knowledge, technology, and experience Develop industries contributing to mitigation of and adaptation to climate change; expand opportunities for job creation; ensure stable employment Ensure a stable energy supply, coordinating with energy-related measures Gain understanding of the effects and impacts of global warming countermeasures on economic activities and people's daily lives.

#### Mid- and Long-term Goals

##### Greenhouse gas emissions reduction targets:

- A reduction of 25% below 1990 level by 2020, premised on the establishment of a fair and effective international framework by all major economies and agreement on their ambitious targets
- A reduction of 80% below 1990 level by 2050, striving to share with all economies the vision of the goal of achieving at least 50% reduction of

global emissions by 2050

##### Renewable energy target:

- Raising the share of renewable energy out of total primary energy supply to 10% by 2020

##### Basic Plan

Formulate a plan to chart out the comprehensive and systematic promotion of global warming countermeasures

##### Basic Measures [Numerous outlined in the following fields]

- Emission Trading System
- Tax for Measures against Global Warming
- Feed-in Tariff
- Changing Lifestyle
- Local Development
- Industry
- Nuclear energy
- Adaptation to Climate Change
- International Cooperation

Source: Ministry of the Environment website