

Innovate, Disseminate

Jun Arima, deputy director-general for environmental affairs at the Ministry of Economy, Trade and Industry, elucidates the two approaches—dissemination of clean and efficient energy technology, and development of innovative energy technologies—which Japan is taking to create a low-carbon society both domestically and around the world.

Thanks to the country's world-leading energy-saving and environmental energy technology, Japan has been achieving remarkable performance in terms of low carbon intensity and high energy efficiency. A 2005 OECD survey put Japan's CO₂ emissions on a GDP basis at 0.24 (kilograms of CO₂ emitted per dollar of GDP), compared to 0.43 for the EU (twenty-seven countries) and 0.53 for the United States. Emerging countries India and China meanwhile scored 1.78 and 2.68 respectively. Similarly, compared to Japan's rate of primary energy supply on a GDP basis (its energy efficiency), Japan's energy efficiency is roughly twice as high as that in the European Union and the United States and between eight and nine times as high as that in China and India. If the entire world could benefit from Japan's superior energy-saving and other forms of low-carbon technology, it would help considerably reduce emissions on a global scale.

In international negotiations on the post-2012 framework, Japan is advocating sectoral approaches aiming at reducing CO₂ emissions by efficiency improvement and wider use of non-carbon energy in key sectors such as iron and steel, cement, aluminum, power generation and road transport. By defining key technologies and assessing mitigation potential in each sector through penetration of such technologies, sectoral approaches could contribute to fair and equitable target-setting by developed countries and to effective measurable and verifiable mitigation actions by developing countries through technology dissemination. Sectoral approaches are a particularly useful tool for engaging

major developing countries in the global efforts for reducing GHG emissions. While it would still be difficult for such countries to set absolute emissions reduction targets like the ones for developed countries, setting intensity targets for key sectors (for example, CO₂ emissions per unit ton of steel production or thermal efficiency of coal-fired power plants) could be envisaged because it does not impose constraint on economic activities and could be compatible with economic growth and energy security. It goes without saying that the efforts of such countries for achieving their intensity targets need to be supported by technology transfer and financial assistance where necessary. Since intensity targets in key sectors are measurable, reportable and verifiable, clear linkage could be ensured between the efforts by developing countries and the support from developed countries.

Japan believes that, to incorporate sectoral approaches in the post-2012 framework, it would be useful to set up an Advisory Group for Sectoral Technology Cooperation (AGSTC) engaging both public and private sector experts as a part of the post-2012 framework. The main reason for this proposal is that, in practice, only private sectors have expertise in specifying key technologies in each sector, assessing their current penetration in developing countries and identifying bottlenecks. This proposal comes from positive experience from the Asia-Pacific Partnership on Clean Development and Climate (APP), an international initiative made up of Japan, the United States, China, South Korea, India, Australia and Canada. Having set up working groups in sectors such as iron and steel, cement,

aluminum and power generation and identified technology that needs to be transferred based on public-private involvement, the APP has made a positive contribution to essential technical cooperation in key sectors. The proposed AGSTC aims at incorporating APP-type public-private partnership in the post-2012 framework.

International Cooperation

As stressed by Japan at last year's G8 summit, it is clear that the world will not be able to achieve a 50% reduction in greenhouse gas emissions by 2050 using existing technologies alone. It will therefore be crucial to develop genuinely innovative technologies. However, such technologies could not be developed by private sectors alone due to their long-lead time and high risk. It is therefore vital for governments to step in and play a leading role.

Despite the crucial role of government-funded research and development, government spending on energy-related research and development amongst International Energy Agency (IEA) member countries peaked in the mid 1980s and has unfortunately more or less halved since then, due in part to falling oil prices in the wake of the oil crises. Increasing R&D spending for key innovative technologies in each country is an essential condition if the world is to meet its target of halving greenhouse gas emissions. It will also be essential to promote international cooperation, utilizing such international organizations as the IEA, which could periodically review member countries' R&D spending plans, help member countries to share roadmaps for key technologies and assess the progress of various international cooperation initiatives for key technologies including carbon capture and storage (CCS) and hydrogen technologies. While current negotiations tend to focus on technology transfer rather than technology R&D, given the long-term nature of climate change issues, the aspect of R&D must also be addressed under the post-2012 framework with due regard to the crucial importance of the protection of intellectual property

rights (IPR).

Domestic Policies

Action Plan for Achieving a Low-carbon Society

Ideas such as these regarding the promotion of existing technology and development of innovative technology were incorporated into the Action Plan for Achieving a Low-carbon Society announced in July 2008. The Action Plan set out targets such as raising the share of “zero-emission power source” from 40% in 2006 to at least 50% by 2020, expanding photovoltaics (PV) by ten times by 2020 and forty times by 2030 while halving its cost in three to five years and expanding the share of Next Generation Vehicles in new car sales from 1/50 to 1/2 by 2020.

Non-Fossil Fuel Promotion Law

As a legislative action to achieve the targets stipulated in the Action Plan, the Cabinet approved a Bill for Promoting Non-Fossil Fuel Utilization and Efficient Use of Fossil Fuel by Energy Suppliers in March 2009. This legislation will oblige power supply companies to increase the share of non-fossil fuels in their total power supply in line with the target set out in the above Action Plan. In addition, with a view to expanding PV, the legislation will also oblige power-supply companies to purchase surplus power generated from PV installed by households at a fixed preferential price for ten years, roughly doubling the current purchase price under a voluntary program. Obligation will also be imposed on oil and gas suppliers to use biofuel and biogas as well as utilizing crude oil and natural gas in an efficient manner.

Emissions Trading

With a view to enhancing Japanese industry’s contribution to creating a low-carbon society, Japan has launched the experimental introduction of an integrated domestic market for emissions trading. In this scheme, participating companies will set their own targets (for example, absolute emissions target or intensity target) consistent with the Voluntary Action Plan on the Environment of Nippon

Keidanren (Japan Business Federation). With a view to ensuring environmental integrity, their targets are reviewed and verified by relevant Government Advisory Councils. They can trade emissions quota, Kyoto credits and “domestic credits” for achieving their targets if necessary. “Domestic credits” are issued for certified emissions reductions through joint projects between large companies participating in the Voluntary Action Plan and non-participating entities such as small and medium-sized companies, farms and schools. As an analogy with CDM between developed countries with binding caps and developing countries without, this could be called “domestic CDM.” This is a unique initiative in Japan for exploring mitigation potential in the whole society, which cannot be found in the EU emissions trading system.

Model Projects

The Ministry of Economy, Trade and Industry has secured a budget of 4 billion yen (41.2 million dollars) for the promotion of advanced community development projects aimed at creating a low-carbon society based on the concept of involvement from technology, communities and local residents. The Ministry opened up submissions for ideas, with an envisioned budget of around 200 million yen (2 million dollars) per project, and received over 200 responses. The thirty-seven projects selected as a result include a number of experimental initiatives, such as a project to install rapid charging stations for electric vehicles and a project to use water to dissolve and fix CO₂ emitted from thermal power stations.

The aim of projects such as these is to conduct experimental trials in an effort to incorporate ideas into broader social systems based on cooperation between industrial, academic and government bodies, local participation and technology. Projects will therefore need to harness both innovative and existing technology and be nurtured as model initiatives. Although the importance of transferring existing technology and developing innovative technology may have already been stressed within the context of international negotiations, it goes without



Deputy Director-General for Environmental Affairs Jun Arima

saying that it is of the utmost importance on the domestic front as well.

Carbon Footprint

Visualization of CO₂ emissions is also crucial for moving towards low carbon society. Calculating the “carbon footprint” of products is an initiative to this end. It entails working out the volume of CO₂ emissions throughout a given product’s life cycle, from the procurement of raw materials right through to disposal. A trial project covering seventy-five products made by twenty companies, including Tesco (supermarket chain) and Coca-Cola, is already underway in the United Kingdom, with similar projects being carried out in countries such as Germany and France. In Japan, an even larger project is underway as evidenced by the trial carbon footprint products, ranging from retail to consumer goods, exhibited by the thirty-plus manufacturers taking part in the Eco-Products Exhibition in December last year. The government is working on the international standardization of a carbon footprint scheme under the International Standardization Organization (ISO). Visualizing CO₂ emissions so as to influence choices made by consumers, in markets both at home and overseas, will be another vital element in the quest to create a low-carbon society. 

Jun Arima is deputy director-general for environmental affairs at the Industrial Science and Technology Policy and Environment Bureau, Ministry of Economy, Trade and Industry.