

## **Reconstructing the Regions Devastated by the Great East Japan Earthquake**

01 April 2011

### **JST Center for Low Carbon Society Strategy**

As we pray for the souls of those who lost their lives in the disaster of March 11, 2011, and express our deepest condolences to their surviving families, we also pray that the affected regions will be able to rebuild and reconstruct as quickly as possible.

At the Center for Low Carbon Society Strategy, we are studying ways to construct a dynamic and sustainable low carbon society, based on detailed designs and evaluations of economic/social and technological scenarios. Japan has the world's most rapidly aging population, and we take this into consideration as we study how to proceed and whether it is possible to construct a comfortable society using a low carbon approach.

The March earthquake and subsequent tsunami left over 17,000 dead or missing, and more than 180,000 homeless (Headquarters for Emergency Disaster Control data as of 18:00, 28 March, 2011). In addition, earthquake damage to power generation facilities and equipment and the ongoing nuclear plant accident have caused large-scale power shortages. Despite urgent efforts to restore power supplies, blackouts (both scheduled and unscheduled) across a wide area of the Tohoku and Kanto regions are inevitably having a major impact on economic and social activities.

The people of Japan are united in wishing for the speediest possible reconstruction of the affected regions to help the victims of this unprecedented disaster. We present these scenarios in the hope that reconstruction can be carried out in ways that will ensure a brighter future for them and for the country in general.

With the aim of meeting the 2020 targets for GHG emission reduction, LCS has been studying changes in daily life such as moving to more energy-efficient and ecological housing and cars, and the widespread use of solar and other forms of renewable energy. Our scenarios also anticipated stable power supply from the nuclear sector, based on the introduction of new nuclear plants, improved utilization ratios, etc. We suggested possible scenarios where, for example, advances in solar technology would boost performance and lower costs thus increasing their economic advantage.

However, the current emergency shutdown of nuclear power plants in the Tohoku and Kanto regions due to the earthquake, together with the accident at Fukushima Dai-ichi Power Plant, mean that we can no longer base our forecasts on stable supply from the nuclear sector as originally

envisaged.

LCS realizes that it is necessary to consider the situation caused by the recent disaster and to incorporate reconstruction of the affected regions into our scenarios for the ongoing shift to a low carbon society. We therefore now propose scenarios for realizing a livable low carbon society that include redevelopment in the Tohoku and Kanto regions, energy systems with a greater proportion of renewable sources, and revitalization of industries including agriculture and fisheries. We have prepared a short-term scenario in response to the pressing issues of power shortages in the Tohoku and Kanto regions, and a medium-term scenario (to be released later) that combines reconstruction and redevelopment.

The scenario is currently based on rough preliminary calculations but as reconstruction progresses detailed studies will improve our accuracy and enable us to make any revisions required. We are also making our best efforts to reflect conditions in the affected areas and the feelings of the victims of the disaster.

### **Short-term Scenario: Reconstruction of Disaster-struck Areas and Redevelopment to Resolve Urgent Power Shortage Issues**

For our short-term scenario proposing energy saving measures and ways to maximize energy production in response to the power shortage crisis in the Tohoku and Kanto regions, we have compiled an approach to redevelopment that covers both post-disaster reconstruction and measures to relieve power shortages. This scenario is based on using electricity saving measures and distributed power systems to allow society in the Tohoku and Kanto regions to continue functioning normally from summer through winter of 2011, and applying these results to the reconstruction scenario.

The following are the major points in this scenario regarding the use of energy conservation and distributed power generation to avoid power shortages over the 2011 summer season.

- The estimated power supply capacity for July 2011 in the Tohoku and Kanto regions is approximately 61 million kW, while forecast peak demand is about 75 million kW. This means a possible shortage of 14 million kW at peak hours.
- Japan's domestic ability to produce and install other forms of generating equipment (solar, wind, generators, etc.) by summer 2011 is 1 million kW at maximum. By maintaining the current rate of increase in production facilities, we can expect a maximum of 9 million kW of new capacity by summer 2012.

- Electricity conservation measures by the household sector could save as much as 10 million kW. These could include replacement of older air-conditioners, refrigerators, etc. by more energy efficient models, not using a/c, washers, dryers, vacuum cleaners, dishwashers, etc. during the summer peak demand hours of 2-3pm, and lifestyle changes such as shifting hours of appliance use to non-peak times.
- With the addition of energy conservation by offices and factories, and the ongoing introduction of solar and wind power generation, we can hope to minimize the effects on economic and social activities.
- Successful energy conservation in homes and offices depends largely on the understanding and cooperation of consumers in the Tohoku and Kanto regions.
- Details of this scenario are available at the following link.

Short-term Scenario: [Redevelopment and Reconstruction of Disaster-struck Areas and Resolving Urgent Power Shortage Issues](#)

30 March, 2011 LCS (Center for Low Carbon Society Strategy of the Japan Science and Technology Agency)

### **Reconstruction Scenario: A Scenario for Reconstruction Based in Renewable Energy**

This scenario envisages reconstruction of the disaster-struck areas with new towns able to produce their own renewable energy, in which the installation of solar and wind power generation facilities and equipment more than compensates for the power capacity lost due to the nuclear plant accident. Installation of solar panels on temporary and new housing built in the affected areas, wind and solar power generating facilities along the region's coastline, and promotion of solar power for existing and new housing in unaffected parts of the region would form the basis for a reconstruction that will also be economically durable. It is important to build scenarios that combine various systems, based on quantitative analysis of improvements to social systems, economic revitalization and technological advances.

The reconstruction scenario has the following special features. The detailed scenario will be released as soon as preparations are complete.

- Increasing the proportion of our reliance on renewable energy will increase national energy self-sufficiency and contribute to the realization of a low carbon society.
- Regional reconstruction with towns able to produce their own renewable energy will allow a system whereby surplus power generated by home solar panels etc. can be sold at a profit.

- Surplus power can be supplied at no charge to stimulate new industries in the region, help create new kinds of industries related to the low carbon society project, and provide job opportunities.
- By adding 5.2 million kW to the power production capability of the entire East Japan region, this scenario more than makes up for the 4.7 million kW loss in capacity due to the tsunami destruction of the Fukushima Dai-ichi Nuclear Plant. Surplus capacity can be supplied to Kanto and other regions that face power shortages.