Japan: Biofuels Policy & Market

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Japan’s move toward biofuels is in line with the country’s commitment to reduce its greenhouse gas emissions by 6% from the 1990 levels between 2008 and 2012 under the Kyoto Protocol. To reach that goal, the Petroleum Association of Japan (PAJ), which is composed of 18 refiners and primary distributors, set a target in April 2005 to replace fossil fuels with 500,000 kiloliters of biofuels for the transportation sector by 2010.

The new government, led by the Democratic Party, further announced the following new medium- and long-term emission targets under the Global Warming Countermeasures Basic Bill:

- Reduce Japan’s greenhouse gas emissions by more than 25% below 1990 levels by 2020;
- Aim to reduce over 60% below 1990 levels by the earliest possible date, before 2050; and
- Increase the share of renewable energies to 10% of the total primary energy supply by 2020.

In December 2002, the Ministry of Agriculture, Forestry and Fisheries (MAFF) established the Biomass Nippon Strategy, which is a national project aimed at promoting biomass use. The strategy analyzes biomass resources and sets targets for the future introduction of biomass with the goal of increasing utilization of domestic food waste, wood and other materials. After reviewing the key issues and policies for enhanced implementation of related projects, a revision was made to the strategy in March 2006 that included the promotion of biomass energy as transportation fuel. The revision also emphasized the acceleration of the Biomass Town Program aimed at enhancing the use of unutilized biomass resources. This included seeking a low-priced procurement method for feedstock, along with the development of low-cost/high-yield technology for producing ethanol from biomass or wood.

Ranked as the world’s third largest petroleum consumer behind the U.S and China, Japan is also aiming to reduce its oil dependence in the transportation sector. As a result, the Ministry of Economy, Trade and Industry (METI) released a New National Energy Strategy focusing on energy security in May 2006. Currently, the transportation sector is 98% dependent on petroleum-based products, and Japan set a target to reduce that figure to around 80% by 2030. In 2010, METI amended the strategy which aims to achieve the following targets related to renewable energy:

- Increase renewable energy ratio in primary energy to 10% by 2020;
- Increase biofuels consumption to comprise 3% of gasoline by 2020;
- Introduce sustainable standards for biofuels, i.e., GHG reduction must be over 50%;
- Establish next-generation biofuel technology and extend by 2030; and
- Promote domestic biofuel production and import biofuels in Asian countries.

Furthermore, MAFF implemented an act on the “Effective Utilization of Resources from Agricultural, Forest and Marine Organism as Raw Materials for Biofuel” in October 2008. The act aims at sustainable development of the agriculture, forestry and fishery sectors, and at diversifying energy sources by using biomass derived from these sectors. No further details are available at this stage. In June 2009, the “Promotion of Non-Fossil Fuel Energy Usage and Effective Utilization of Fossil Fuel Act” was enacted. This law requires energy suppliers, particularly oil distributors and gas suppliers, to use biofuels or biogas.
In addition, METI has jointly established the Biofuel Sustainability Study Group with the Cabinet Office, MAFF and the Ministry of the Environment (MOE). The group aims to conduct studies and discussions to address biofuel-related issues, such as the effect in reducing greenhouse gas emissions, changes in land use due to biomass cultivation, competition with food, disruption of the ecosystem, cost efficiency, supply stability, and summarize challenges that should be resolved before establishing the Japanese version of biofuel sustainability standards. Results were released in March 2010 with highlights of the study shown as follows:

• Contribution to CO₂ emission reductions identified by an LCA: The CO₂ emissions reduction standards on an LCA basis are 50% in the EU (from 2017 onward) and 50% in the U.K. (from 2010 onward). Considering these levels, it would be appropriate for Japan to set the CO₂ emissions reduction standards on an LCA basis at 50%;

• Supply stability as a source of energy: From the viewpoint of energy security, Japan should strive to achieve a high degree of self-sufficiency in biofuel. The self-sufficiency rate is 3% in Japan, 99% in the U.S. and 60% in the EU. One future direction for Japan is to meet at least 50% of biofuel requirements through domestic production, as well as development and import from Asia; and

• Coping with competition with food: To address competition with food, related ministries should cooperate in monitoring the effect of biofuel introduction and analyzing the causes of competition in order to identify solutions. The government should also emphasize the development and dissemination of technologies for biofuel produced from grass and wood cellulose.

In 2010, the government launched the National Plan for the Promotion of Biomass Utilization, which set the biomass target up to 2020. There are three main targets for 2020:

• Expand the use of biomass: (a) Expand to use of biomass resources equal to 26 million tons of CO2/year; (b) Set the targets for usage rates of different types of biomass.

• Formulate the 600 Municipal Biomass Utilization Promotion Plans: (a) Draw up “Municipal Biomass Utilization Promotion Plans” in 600 municipalities (about 1/3 of all municipalities in Japan); (b) Draw up the “Prefectural Biomass Utilization Promotion Plans” in all 47 prefectures in the country.

• Create a biomass industry worth around JPY500 billion (US$4.2 billion).

After the great earthquake in 2011, to strengthen an independent energy supply and distribution system in Japan, the government established the Biomass Industrialization Strategy in 2012. The policy aims to fully utilize biomass potential by 2020 in areas such as electricity generation, fuel for the transportation sector and greenhouse gas reduction. According to the strategy, about 18.5 billion liters of fuel and 22 billion kWh of electricity can be produced if Japan used all unutilized biomass.

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