Japan Biomass Power Market Secure Sustainable Biomass Fuels

CMT's 1st Japan Biomass Power Market held in Tokyo mid-May was a success. Over 200 participants and 15 exhibitors discussed the current development and outlook of Japan's emerging biomass power market.

JAPAN HAS WITNESSED A SURGE in biomass power plants after a feed-in tariff (FIT) system was introduced in July 2012. Data from Biomass Industrial Society Network showed that there were 84 approved projects by November 2014, including 44 unused wood biomass projects, 36 wood biomass projects, and 4 recycled wood projects. Approved capacity reached 1 200 MW and should consume 24 million m³ of wood biomass.

Biomass power outlook

It is already 4 years since the FIT Act began, and over 100 wood biomass electric power generation plants are under consideration and another 84 projects have been approved. Interest and expectations are very high amongst stakeholders within the forest industries because the purchasing prices for wood biomass generation are fixed at higher levels.

The Japanese biomass business is driven by government policy (FIT) intended to encourage domestic forestry industry. Small-scale biomass plants are mostly sourcing domestic resources, while large-scale biomass plants will mostly source overseas resources.

Due to the significantly higher cost of sub-2 MW power generation from unused wood biomass, the FIT purchase price was increased from JPY 32 to JPY 40 per kWh (around EUR 0.23 to EUR 0.29 per kWh) as of April 1, 2015.

High transport costs

According to Kiyoshi Kamikawa, Japan Paper Association, Japanese paper companies are also trying to take advantage of this opportunity to enter into the energy business and are pushing for 8 projects right now.

– The problem is that it is very difficult to secure a stable supply of domestic wood biomass because of fragmented small forest ownership and the high cost of timber transportation. There are few projects considering the import of wood biomass from overseas, but it could be a potential source in the future, depending on the prices, he said.

Domestic sources cannot meet demand

Of Japan's total 364 560 km² landmass area, about 66 percent is under forest cover, of which 40 percent is planted forest. The rate of annual growth of planted forest is 100 million m³ per annum, however the quantity of wood used is only 25 million m³. Thinned and abandoned wood represents 20 million m³, because of high transport costs. The Government aims for the national rate of wood self-sufficiency to increase from 28 to 50 percent by 2020, and for the use of wood thinnings for energy to increase to 6 million m³.

Thai pellet King? According to Champ Srichokechai, CEO, Euro Pellet Co., Ltd, the company currently runs the largest wood only pellet plant in the country.

– The fuel demands for authorised wood biomass generation in FIT is vast with around 24 million m³, so the potential of Japanese wood resources is enormous. But it seems only a few million m³ are being provided. Most plants cannot get the wood that they need, said Ms Miyuki Tomari, Biomass Industrial Society Network.

Look outside Japan

Most woody biomass currently being consumed for fuel is being sourced from within Japan: locally sourced and imported wood pellets and woodchips; wood processing residues; construction and demolition waste; forest pruning and thinning residues; harvesting residues; bark. Imported biomass is expected to represent around 10-15 percent of the total biomass fuel in

– It is very difficult to secure a stable supply of domestic wood biomass because of fragmented small forest ownership and the high cost of transportation, highlighted Kiyoshi Kamikawa, Japan Paper Association.

Biomass Generation Authorised Situation in FIT (New, operational at the end of 2014; obtained authorization as of January 2015)

	Methane	Unused timber	General timber *	Recycled timber	Waste	Total
Operational	38	9	5	1	24	77
Authorisation	82	44	36	4	55	221
Operational (kW)	7,829	30,011	30,075	317	67,784	136,016
Authorisation (kW)	22,482	327,597	866,240	11,377	274,703	1,76,163

* General timber: Sawmill residues, imported wood, PKS and so on

Source: Ms Miyuki Tomari, Biomass Industrial Society Network

Categories		FY2014	FY2015
Wood (unused)	2 000 kW or more	JPY 32=> (EUR 0.23)	JPY 32 (EUR 0.23)
	Less than 2 000 kW		JPY 40 (EUR 0.29)
Wood (general) *		JPY 24 (EUR 0.17)	JPY 24 (EUR 0.17)
Wood (waste materials of buildings)		JPY 13 (EUR 0.09)	JPY 13 (EUR 0.09)
Waste materials		JPY 17 (EUR 0.12)	JPY 17 (EUR 0.12)
Methane fermentation		JPY 39 (EUR 0.28)	JPY 39 (EUR 0.28)
Purchase period		20 years	20 years

* General timber: Sawmill residues, import wood, PKS and so on

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– Japanese utilities are well-positioned, explained Matt Boveland, Indufor Asia Pacific.

2015, including at least 180 000 tonnes of pellets and 130 000 tonnes of palm kernel shells (PKS) a residue from the palm oil industry.

– Most of the projects under construction or in planning expect to get their biomass from domestic sources. Many projects may not be able to realise this objective. They should either switch fuel, close down, or not start, or they have to look outside Japan, commented Matt Bovelander, Analyst with consultancy company Indufor Asia Pacific Ltd.

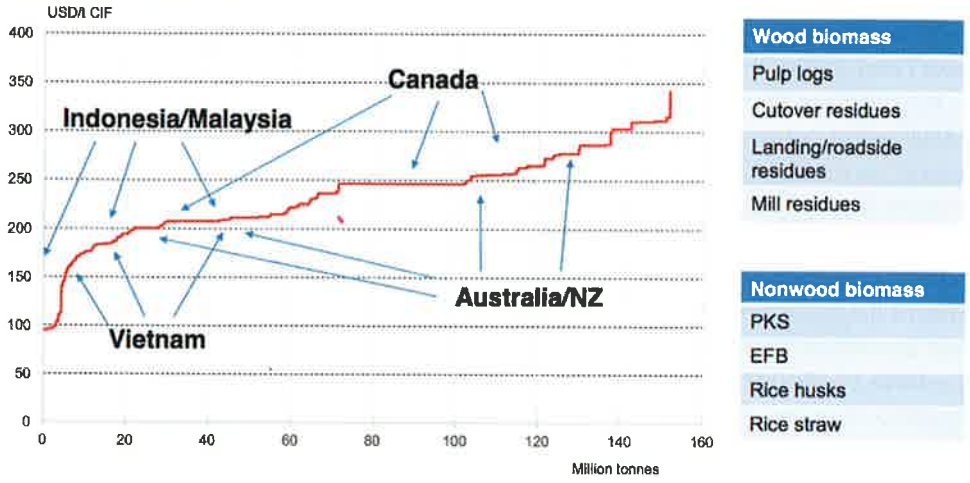
According to Bovelander the market for imported biomass still relatively small with supply currently dominated by pellets from Canada along with palm kernel shells (PKS) from Indonesia and Malaysia. Buyer prices are still high and influenced by the cost of supply/quality, longevity, and quantity trade-off.

– Japanese utilities are well positioned and well disposed to seek substantial volumes of quality biomass, secured over long term supply contracts. The FIT supports the Japanese price paying capability. Generally they can afford to pay prices at USD 200-220 per tonne of pellet equivalent CIF, suggested Bovelander.

Taking the trading house perspective Tomoyuki Itabashi from Itochu Corporation spoke on

The Biomass Supply Curve

Different types of biomass, in different forms, volumes and costs are available from different countries



- The supply curve is in tonnes pellet equivalent.
- Sawlog and peeler log estimates are included. Supply from un aggregated biomass baskets smaller than 25 000 tonnes/a are included. Captive pulp log and wood chip for pulp are included.
- Values are not adjusted for energy content

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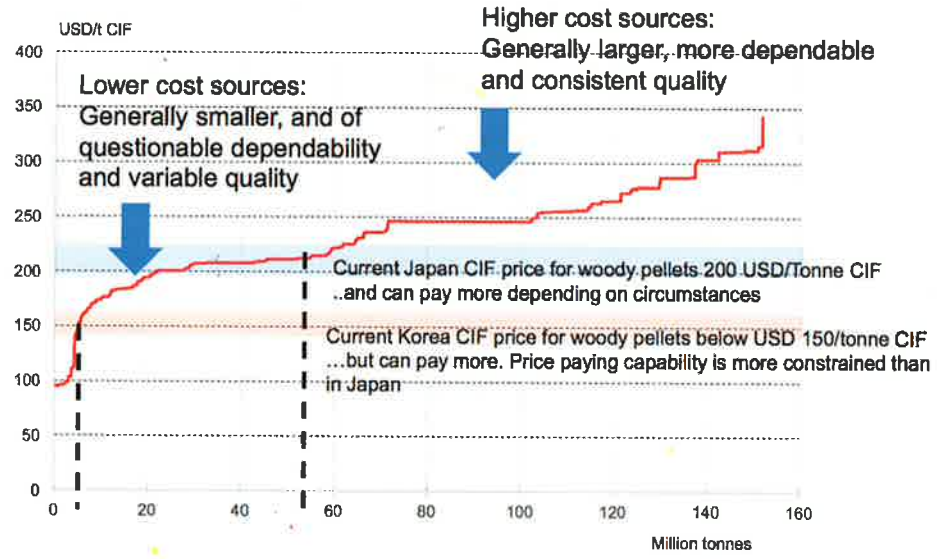
Differentiating Biomass Supply



- The supply curve is in tonnes pellet equivalent.
- Values are not adjusted for energy content

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filling the gap between biomass producer and utility enduser.

– User demands and suppler demands often does not meet each other. We, as an investor in biomass power plants and supplier of biomass fuel, are fully aware of the demand on both sides. Relying on a single supply source is too risky, relying on a single country is too risky. We organize multiple supply chain to end-user, said Itabashi adding that Itochu assumes responsibility for the biomass fuel supply chain throughout the entire 20-year FIT period even a supplier goes out of business.

Tightning Korean standards

Malaysian biomass pellet producers have been ramping up production targeting the Korean utilities.

– The Korean RPS gave us big potentials in the past years. Many Malaysian SMEs have invested into biomass business. However, 30 percent of pellets producers are struggling right now because their products cannot meet the Korean standard and they don't know how to find buyers. The FOB price drops to 100 USD/t. Korean power companies emphasis on short-term supply contracts and focus on price. Thus, we look into Japan biomass power market and wish to influence Japan's policy. Japan biomass power demand can consume the total pellets production from SEA countries, said Dato' Joseph Lim Heng Ee, CEO, Global Green Synergy Sdn. Bhd.

Text & photos: Xinyi Shen
Illustrations courtesy Indufor/CMT