

Taikichiro Mori Memorial Research Grant Report 2013

Name of the Research Project	<i>Analysis on Japan Biomass: Current Status of Woody Biomass in Hita, Shimokawa and Kawasaki City</i>
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Research Abstract:

Japan has used biomass as one of renewable sources for more than 10 years. Biomass can be utilized as products such as compost, feed, charcoal deodorizer, plastic, biofuel, *etc.* and as energy such as generating electricity, utilization of heat *etc.* Wood biomass is referred to material obtained from trees and trees product. The utilization of woody biomass is still hardly implemented, due to dispersed small-scale pellet plants, uncompetitive pellet pricing, problematic forest management, unformed wood pellet markets, duplicated work among energy related agency and inadequate dissemination on accurate bio-energy information. There are notably three cities in Japan, which are Hita, Shimokawa and Kawasaki, have operated woody biomass. This research is aimed to observe the current situation of the three woody biomass plants in Hita, Shimokawa and Kawasaki. The three locations differ in term of resource and usage of woody biomass. Data are collected through field inventory include type of woody biomass resources, population, energy production, area and forest area.

Research Result Report:

1. Introduction

Forest is Japan's abundant resource. It is covered 60% of Japan area. Instead of being maximally utilized, Japan forestry sector has been sluggish for many years and domestic wood demand is very dependent on imports. In 2012, Japan government revised forest law to revitalized forest and forestry sector. With the implementation of feed-in tariff policy for renewable energy, forestry sector can be benefited from utilizing leftover wood from forest industry, forest management and construction business for energy, as well as energy related

business and develop forest society. Previous studies of woody biomass utilization have been conducted in Shimokawa, Hokkaido and Hita, Oita. From Shimokawa's case, woody biomass utilization, which is managed by the local government, has benefits in reducing heating expenses in public buildings, creating jobs in forest management, establishing total timber industry and dealing with aging society. While in Hita, woody biomass is utilized for power plant. The power plant is private sector investment and thus, it creates job opportunity and contribute to local economic. In Kawasaki, biomass fired power plant is fully private investment. It will supply clean energy by burning wood chips collected from Kanto area.

2. Research Approach

This study is based on a review of existing Biomass Plan in Hita, Shimokawa and Kawasaki, fieldwork and literature review.

3. Findings

Shimokawa

Shimokawa area covers 644.20 km², with 569.8 km² forest area (88% of town area). The forest is coniferous forest composed of Japanese Larch trees and Fir trees in dominant and Birch trees in small number. Population by the end of January 2012 is 3,644 with aging rate: 37.2%. The GDP is reached ¥20 billion.

Heating consumes most of the energy expenses. Every year, 1.2 billion ¥ of GDP is spent for energy, in which 0.7 billion ¥ for heating and 0.5 billion ¥ for electricity. Electricity is supplied by Hokkaido Electric Company, which use nuclear power and coal to generate electricity. Since September 1st, 2013, the Hokkaido Electric Company raises the electricity rate due to the extended shutdown of Tomari Nuclear Power Station. Heating depends on oil. Current woody biomass is used for heating purposes, but in the future more woody biomasses will be established to generate electricity. Potential biomass feed stocks are estimated as followed:

- Wood industry: 10,309 ton/year
- Wood collected from river: 1,279 ton/year
- Wood collected from the road: 30 ton/year
- Left over forest material: 8,805 ton/year
- Construction: 32 ton/year

Hita

Hita is a city in Oita Prefecture. The city covers 666.19 km². Hita has forest covered 522.99 km² (83% of its area). Population is more than 70,000 people in 2013, with aging rate is 29%. Hita has abundant resources of forest and the number of population can maintain the availability of work forces. Private investment, Green Power Oita, operates the woody biomass power plant since November 2013. The power plant area is 27,000 m³, with energy supply is approximately 5,000 kW. The use of feed is 60,000t/year using 40% moisture woodchips and the boiler capacity is 25 t/h. This power plant sell the electricity generated to Kyushu Electric Power Company.

Kawasaki

Kawasaki is known as industrial city. It is located in Kanagawa Prefecture. The area covers 142.70 km² with population 1,437,266 people. Kawasaki is the 9th most populated city in Japan. Although this city is not a forest area, the biggest woody biomass fired has been constructed here, utilizing woodchips collected from Kanto area. The generation capacity is 33MW, with input volume of wood biomass 180,000t/year. The operating companies are:

- Kawasaki Biomass Electric Power: to control the biomass power generation activities
- Japan Bio Energy Co. Ltd.: to supply wood chips for fuel
- Japan Bio Energy Holding Co. Ltd.: holding company of Japan Bio Energy