

## Woody Biomass in Austria and the Prospects of Woody Biomass in Japan オーストリアにおける木質バイオマスと日本の木質バイオマスの展望

January 2014 / 2014 年 1 月

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### 1. Introduction

The Japanese forest resource is in surplus condition: the speed of the growth of the forests exceeds the demand for timbers. Therefore, there is an urgent necessity in Japan for developing practical usages of the resource other than using them as lumbers. Furthermore, as a resulting destruction of the nuclear power plants in Fukushima caused by East Japan great earthquake and the tsunami has raised calls for a paradigm shift in Japan's energy policies. After the so-called *Saiseikanou-Enerugi Kaitori Act*, or "Renewable Energy Purchase Act," which was enforced in July, 2012, biomass draws some attention as an alternative resource for developing a society with sound material cycles. Taking these backgrounds in to an account, utilizing the rich woody biomass resource as a source of energy and heat generation can certainly be an issue that is widely discussed in Japan.

On the other hand, woody biomass occupies an important part of the energy production of Austria. Hence, in this paper, seeing Austria as country with a relatively sophisticated use of woody biomass, I compare and contrast the usage of woody biomass in Japan and in Austria mainly by reviewing literatures and with a few key field works. By doing so, I am hoping to illustrate awaiting solutions for woody biomass to take more important role in Japan as a source of energy production.

### 2. Literature Review

Kuboyama(2006a) pointed out that, using international price competitiveness as a keyword, reduction of the cost of tilling and exporting lumbers in the upper parts of rivers in Japan and improvement of the production efficiency in the sawing factory in the lower parts of rivers in order to regain the international price competitiveness that domestic forestry has lost since Japan's high economic growth period. Shirai(2007) argued that main problems of Japanese forestry resulting in the problems of efficiency lie in the upper parts of river side. The introduction of the overhead wire system and large-sized forestry machines on steep slopes of mountains are in urgent necessity to reduce the price of logs in the market, because the reduction of costs for tilling and transporting logs is a prerequisite in order to promote the utilization of woody biomass in Japan.

Pregernig(1998) pointed out the following: after having restored its complete independence after World War II, the Republic of Austria had a stable political system described as corporatism. He explained that such a political stability enabled quick decision-making to contribute to relatively smooth forest preservation measurements. GLÜCK(2001) made an even more detailed analysis about the main constituent which had an interest in politics and forests in Austria. His study highlighted the influence of the stakeholders and the interest groups to political decision making process related to forestry. Yamagata(2008) tried to analyze the actions taken by Austrian government in terms of forest management from the viewpoint of energy security. In the situation where the rise in oil prices and unstable supply of oil from Middle East and of natural gas from Russia potentially threaten its national security, Austria was early to realize the importance of forestalling, or "to beat to the punch."

### 3. Research

It is impossible for the upper sides of river to promote the utilization of the forests and woody biomass by themselves. In order to achieve that, the lower sides of rivers, government policies and consumers need to make a virtuous circle: a positive cycle of backing

up the lower sides of rivers. Therefore, I analyze these four sectors to figure out the required measurements for utilizing woody biomass in Japan.

The woody biomass plant in Simmering is launched as a joint venture of Wien Energie GmbH, Wiener Netze GmbH and Austrian Federal Forests. Simmering Power Plant needs 190,000t of woody biomass annually and most of them are the chips from scrap woods and timber offcuts. It supplies around 48,000 households in Vienna with electricity and 12,000 households heating: contributing to the reduction of 144,000t of CO<sub>2</sub>; that is equivalent to 47,000t of oil. This plant is considerably unique in a sense that it is an urban biomass plant which is closely located to the center of Vienna. Conventional theories argued that a woody biomass plant should be near a place where huge quantities of biomass exist, because woody biomass are pretty much scattered around. The case of Simmering shows that a sufficient quantity of woody biomass from scrap woods can be secured in and near cities.

In a cement factory run by Sumitomo Cement Co., Ltd. in Sano City in Tochigi Prefecture, a woody biomass plant generates electricity by burning chip from scrap wood and forest thinning which is collected within the range of neighborhood 50km and cover the electricity consuming in the factory and sell the surplus of the generated electricity. Its output is 250,00kW and it consumes 1400 cubic meters of woody chip a day and 540,000t of woody chip a year. Hence, the factory succeeded in securing fuels. However, a huge storehouse is necessary for the storage of fuels because of the large mass of woody chip. There is a silo aiming to temporarily store the fuel in this factory. It can store, however, only up to about 2,800 cubic meters. The factory can run only for two days with this amount of fuel. In addition, the chip slit of the boiler used to get jammed once in a while causing the plant to stop its operation for several times. To minimize the risk of such troubles, the plant management had to prepare cogenerate facilities as an alternative source of electricity and heat.

In short, in order for the upper sides of rivers to increase the supply capacity of woody biomass, the innovations and increase in the demand in the lower sides of rivers are prerequisite: resulting in making the upper sides of rivers motivated in increasing supply.

#### 4. Conclusions

To utilize domestic forest resource and to increase the utilization of woody biomass, following measurements have to be taken:

- (1) Raising public awareness for Japan's rich forest resources,
- (2) To develop infrastructures to improve efficiency: intensification of the forestry, the development of forest roads, and the introduction and application of cutting-edge technologies such as overhead wire systems commonly used in Austria.
- (3) Create demands from the lower part of rivers to stimulate the upper part: forming a point that takes a central role in the distributing lumber and in investing in cutting-edge technologies.
- (4) Inter-disciplinary cooperation: to make woody biomass energy generation easily visible, affordable, and attainable by consumers.
- (5) Effective measurements and implementation of policies by the government: to support connection the upper and lower parts of rivers and consumers to maintain positive circle and matrix of these three actors.

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