

## Important aspects for biomass utilization in Japan

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Biomass is a renewable, and carbon neutral energy resource, and expected to be one of the main energy employed for achievement of the sustainable society. However, its utilization is not always easy. There are several aspects to be considered when biomass utilization is to be promoted especially in Japan. In this paper, these aspects are introduced, and contribution needed from the academic society for this purpose is discussed.

Utilization of biomass in Japan is more difficult than other countries due to the limited land area and high labor cost. The availability of Japanese biomass is estimated to be about 5% of total primary energy consumption, and average scale of biomass collectable at a site is around 10 t/d. Based on this fact, two directions are mainly sought for biomass utilization in Japan.

One direction is to use biomass for activation of rural region. Biomass such as logging residue and livestock waste is produced in the rural area of Japan. By the use of the biomass produced in the rural area as an alternative energy in the region, the waste treatment cost can be lowered, energy cost can be saved, and job is created in the region. This leads to the possibility that rural area suffering from the decreasing population of younger generation gets re-activated.

Another direction is to use biomass resources imported from foreign countries in direct and indirect manner. The direct use is the use of imported biomass in Japan. For example, ethanol can be produced and imported from Brazil, and blended to gasoline in Japan. The indirect use is made by the use of Kyoto Mechanism. Foreign biomass is used in the foreign country with the financial support from Japan, while the carbon credit associated with the biomass use is obtained by Japan.

In either case, development of conversion technology which is cheap, of small scale, and with high efficiency is wanted. I proposed to call this kind of biomass conversion plant "compact plant." Utilization of compact plant is effective for the biomass use in rural area since the amount of available biomass is 10 t/d. It is also effective to increase the availability of biomass resource in foreign countries since it enables to use the biomass of small scale which otherwise could not be used.

It is also wanted that a system is developed with which biomass utilization is economical, and is beneficial for the people in the region. The cost of biomass utilization is usually higher than fossil fuels. However, by treating several kinds of biomass together to increase the treatment scale, or by getting tipping fee in the use of waste biomass, the cost of biomass utilization can be reduced. In the foreign countries, needs of the countries are also to be considered.

### Keywords

Biomass: Organic compounds which is produced by the activity of living creatures. Examples are wood, grass, livestock manure, sewage sludge, and food processing waste.