

Research Trends and Results

Research on the application of the local production for local consumption type renewable energy in urban areas

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1. Introduction

One of the policies to create the low-carbon city is the application of cut branches and mowed grass generated from park green spaces, roadside trees etc. (hereafter referred to as "plant waste material derived from urban area") as an energy resource. Furthermore, after the Great East Japan Earthquake disaster, application of the plant waste material derived from urban area is expected to prevail from the view point of securing self-sufficient energy at the time of disaster. Under such a background, we would like to release a report of contents of the "Research on the application of local production for local consumption type renewable energy in urban areas" that the Landscape and Ecology Division is working on.

Shown in the figure is a series of processes to apply the plant waste material derived from urban area as an energy resource.

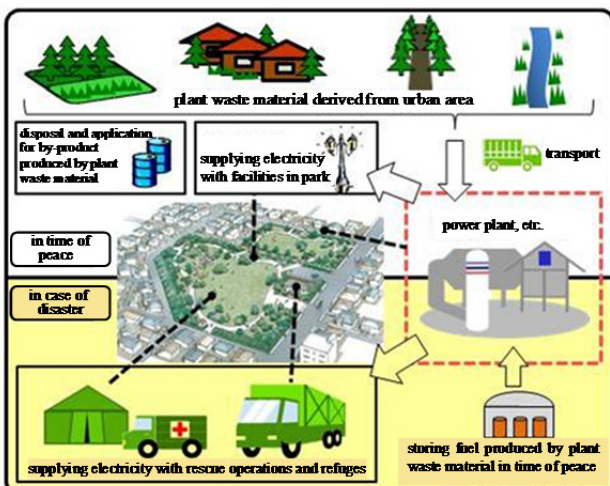


Fig. Process of the application of the plant waste material derived from urban area

2. Study on the method to apply the plant waste material derived from urban area as energy

In this research, surveys were carried out on the nationwide generated volume of the plant waste material derived from urban area as well as on the energy consumption of electricity, urban gas, kerosene, etc. in general parks and so on. Furthermore, we studied how to make solid fuel such as chips and pellets from the plant waste material derived from urban area as well as energy application methods such as heat utilization by stove and boiler, electricity utilization through gasification and the

like so as to carry out a case study of the energy application using the plant waste material derived from urban area and conducted it.

3. Experimental study on the renewable energy application technology in National Government Parks

As the energy application method considered as appropriate for the plant waste material derived from urban area, we have the gasification power generation technology capable of achieving comparably high efficiency even by small scale system that can be located in a park or similar areas. Now that this power generation technology is going through the demonstration stage, gasification is a process to pyrolyze the biomass such as wood under low oxygen or anoxic condition so as to generate combustible gas such as hydrogen, carbon monoxide, methane, etc. and convert such generated gas to electricity through a motorized electricity generator.

In this research, we verified the feasibility of a small scale gasification power generation system by adopting Michinoku Lakeside National Government Park and Showa Kinen National Government Park as the field.

4. Conclusion

As the plant waste materials derived from urban areas are generated broadly and thinly dispersed in the urban area, it is important to study the process of plant waste material application in the whole urban area such as facility location, collection and transport adding to develop the technology appropriate for their generation volume and material characteristics. To meet such a task, Parks, Green, Spaces and Landscape Division of City Bureau in the MLIT performed the demonstration experiment in collaboration with the model local governments (Kita-kyushu and Matsumoto city) in 2012.

As a final goal, we are to reflect the scientific and technological findings of the energy application method of the plant waste material as the result of this research on the study on an examination to draw up a guideline on the introduction of the local production for local consumption type renewable energy in urban areas in the ministry and a proper guideline will be issued.

【Reference】

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