

Biomass Energy and Technology Development in China

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Biomass energy has an essential strategic and practical significance for China, as the exploitation of biomass resources involves rural development, energy development, environmental protection, resource conservation, state security and ecological conservation. During the last more than 10 years the Chinese Government has regarded research and demonstration activities in the field of biomass and bioenergy as priority topics for sustainable development.

It is well known that China is a large agricultural country with 70% of the population living in rural areas. Biomass is one of the major energy resources in rural areas, thereby significantly influencing the national energy structure. China is rich in biomass resources such as straw (720 million t/yr), firewood (127 million t/yr), livestock wastes (130 million t/yr) and urban wastes (120 million t/yr). The total amount of biomass resources in China is about 700 million t/yr. However, the resources are not properly utilised. It is estimated that the utilisation ratio is only 30% and the utilisation methods are very primitive. At present, biomass is mainly used through direct burning with an efficiency of less than 10%. The Chinese Government has always focussed much attention to the development of biomass energy. The Ministry of Science and Technology has chosen research on and application of biomass resources as key research projects for three consecutive Five-Year-Plan periods (1990-2004).

Today, there are about 7 million household biogas digesters and more than 30,000 large- and medium-scale biogas digesters in China with total volume of more than 1.37 million m³. There are also 630 large biogas plants with a volume of more than 100m³, mainly used for treating livestock wastes and organic waste water. Besides, more than 300 gasification stations, over 100 systems for rice husk gasification and electricity generation as well as 20 MW-level biomass gasification and electricity generation systems were constructed. The application of these technologies has brought considerable social, environmental and economic benefit.

In future, further efforts will be made in China to provide rural people clean energy resources and to improve rural living environment and rural people's living standard. In order to improve the value of biomass energy, technologies on conversion from biomass to high-quality energy resources will be developed. Mountainous areas, wasteland, and desert will be used to develop new resources of biomass and establish energy farms and forests. At the same time, industrial utilisation of biomass will be enhanced, thus increasing the proportion of biomass energy in the total energy consumption.

During the 10th Five-Year-Plan period (2000-2004), the Ministry of Science and Technology will continue to regard the development of biomass utilisation technologies as key and preferable research target. The focus of the 10th Five-Year-Plan Program will be on technological demonstration of applicable technologies, such as:

- Optimised 4MW biomass gasification and electricity generation systems
- Ethanol production from cellulose waste including the demonstration of an annual production of 600 tons of ethanol
- Ethanol production from sweet sorghum juice including the demonstration of an annual production of 5,000 tons of ethanol
- Biomass fast pyrolysis including the demonstration of an annual production of 400 tons of pyrolysis oil.

Additionally, research projects have been granted on biogas utilisation, waste water treatment, pyrolysis oil and energy crops.

In order to reach the ambitious target to significantly increase the implementation of biomass technologies the Chinese Government seeks support from international organizations, foreign governments and scientists. Utilising various forms of cooperation and exchange to promote technological progress will therefore contribute to an accelerated development of biomass energy in China.

