

Highlights of Research and Development for Environment Technologies

Research and Development of Biomass-Energy Utilization

Our R&D activities coordinate design and development divisions and the group companies, with our Energy and Environment Technology Division at the hub. We also remain in close contact with external research organizations and universities through joint studies, covering a wide range of disciplines. The said division comprises the Technology Planning & Administration dept., Energy & Environmental Development dept., Combustion and Core Technology Development dept., and Research Center. With a combined effort, we aim to strengthen our core technologies and accelerate the development of new products.

We are pleased to present our gasification power generation technology using sewage sludge as one of the R&D efforts in the utilization of biomass energy.



Cherry trees lining the inner moat of Shinoyana castle

○ Demonstration Test for the utilization of unused energy such as biomass

As the Kyoto Protocol took effect, the “Outline of the Campaign for Preventing Global Warming” was revised into the “Action Plan for the Kyoto Protocol” defining Japan’s course for alleviating global warming. As for the utilization of biomass energy, a cabinet resolution called “Biomass-Nippon Overall Strategy,” issued in December 2002, describes its direction and policy, but is now being revised in order to meet the requirement of the “Plan.”

Sewage sludge is one of the carbon-neutral biomass

resources, and its utilization is awaited as it ensures a stable supply, both in quantity and quality, and poses few problems in its collection and transportation.

We are currently conducting a joint research project “Demonstration test of gasification-power generation using sewage sludge” with the New Energy and Industrial Technology Development Organization of Japan (NEDO) and Tokyo Gas Co., Ltd.

● Demonstration Plant of Sewage Sludge Gasification and Power Generation

This plant was completed in March 2005, having a throughput of 15ton/day of sludge (78% moisture). The excess energy is used to dry the sludge, utilizing its internal energy efficiently.



Sewage Sludge Gasification and Power Generation Demonstration Plant

For gasifying, a circulating fluidized-bed furnace was adopted because it maintains an even temperature inside the furnace, and facilitates temperature control. The dried sludge is partially burned (850°C). and gasified by air. The product gas is cleaned by a high-temperature gas filter, a tar-reforming unit and a wet scrubber before being used to run a gas engine for power generation. The generation capacity is 200~260 kW.

The efficiency of the gas engine is approximately 40%. The product gas from the gasification of sewage sludge can be mix-burned with city gas for high efficiency power generation, proving electricity to satisfy the need of the sewage treatment plant.

The fluidized-bed furnace is the mainstay of sewage sludge combustion. In our system, gas needed for combustion is less than 1/3 of disposal by combustion, minimizing the furnace size. We will run demonstration tests with this plant until the end of 2006, acquiring the necessary data for designing commercial-scale plants, while confirming the reliability of all components for continuous operation.