

October 19, 2009

Input and receiving of biogas derived from food residue into city gas pipelines

Bio Energy Corporation
Ichikawa Kankyo Engineering Co., Ltd.
Tokyo Gas Co., Ltd.

Bio Energy Corporation (hereinafter referred to as "Bio Energy"; Mr. Etsuya Kishimoto, President), a subsidiary of Ichikawa Kankyo Engineering Co., Ltd. (hereinafter referred to as "IKE"; Mr. Kunio Ishii, President) and Tokyo Gas Co., Ltd. (hereinafter referred to as "Tokyo Gas"; Mr. Mitsunori Torihara, President) concluded a basic agreement for input and receiving of biogas derived from food residue into city gas pipelines for the ten-year period from fiscal 2010 to 2019.

The basic agreement was concluded today along with acceptance of the application filed by Bio Energy for a project* for proving input of biogas into city gas pipelines proposed by the Toshi-gas Shinko Center.

This will be Japan's first input and receiving of biogas derived from food residue into city gas pipelines.

* In this project, biogas originating from sewage digestion, food waste, and other biomass will undergo a process of blending to have the same constituents and calorific value as city gas, odorization, and supply to the ordinary pipeline network of a gas enterprise using compressors, in order to prove its utility.

<Developments leading up to conclusion of the basic agreement>

1. Manufacture of biogas

Bio Energy was established in July 2003 for the purpose of developing business in reutilization of food cyclical resources, in accordance with the Food Recycling Law. Its operations are based in a methane fermentation plant within the Bio Energy Jonanjima food recycling facility constructed in Super Eco-Town, which was built by the Tokyo Metropolitan Government in Ota-ku, Tokyo. At this plant, it receives and ferments supplies of food residue in bags from hotels, supermarkets, convenience stores, restaurants, and other such facilities in central Tokyo as well as waste food and beverage products from food processing plants, 24 hours a day, 365 days a year. Each day, it has an intake of about 110 tons of food residue and waste food products, and about 20 tons of waste beverages. It is Japan's biggest food residue methane fermenter.

The biogas produced at this plant is currently being put to use as fuel for gas engines (840kW) and fuel cells (250kW). Besides generating power, Bio Energy recovers the waste heat derived in the generation process and makes effective use of it within the plant. However, the amount of biogas output is increasing more rapidly than was foreseen due to the increase in food residue from which it is produced and improvement in fermentation efficiency. This situation has prompted studies of additional modes of utilization.

2. Use of biogas as city gas

Ordinarily, biogas is put to use at the site of its derivation as fuel for equipment such as

gas-engine power generators and boilers. The waste heat from this equipment is also recovered and put to effective use. Utilization of biogas as city gas is a prospective approach for effective use in locations that do not have a high demand for thermal energy.

Biogas, however, is a blend of methane (CH₄), carbon dioxide (CO₂), and certain other gases. Furthermore, it contains many constituents that are not contained in liquefied natural gas (LNG), which is the main base resource for production of the city gas supplied by Tokyo Gas. Under these circumstances, in fiscal 2008, the three companies Bio Energy, IKE, and Tokyo Gas began conducting a joint program to prove technology for utilization of biogas as city gas. In February 2009, they installed a test unit in the aforementioned Bio Energy Jonanjima food recycling facility and used it for a one-month test of refining to remove CO₂ and other impurities from biogas.

Based on the results of this test, the three companies designed a biogas refining plant and examined the prerequisites for input and receiving into city gas pipelines. In response to today's acceptance of Bio Energy's application for participation in the proving project (to run for the ten-year period from fiscal 2010 to 2019) for input of biogas into city gas pipelines, Bio Energy and Tokyo Gas concluded the aforementioned basic agreement regarding recovery of methane gas from biogas derived from food residue, adjustment to the same constitution and calorific value as city gas, odorization, and input and receiving into city gas pipelines.

<The proving project for input of biogas into city gas pipelines determined under this agreement>

1. Outline of the project

Facilities will be constructed in fiscal 2009 for refining, calorific value adjustment, odorization, and other processes required for input of biogas into city gas pipelines. Operating data for the two years fiscal 2010 and 2011 will be collected and compiled into a report for submission to the Toshi-gas Shinko Center.

These facilities are expected to continue operating in fiscal 2012 and succeeding years.

2. Place of implementation

The project will be implemented at the Bio Energy Jonanjima food recycling facility (Jonanjima 3-4-4, Ota-ku, Tokyo, Japan; within the TMG Super Eco-Town).

3. Role of each company

*** Bio Energy**

Bio Energy applied for the proving project, and currently manufactures biogas from food residue at a plant already built for methane fermentation. It will carry out the refining, calorific value adjustment, and odorization required for input of biogas into city gas pipelines at facilities to be newly installed for these processes.

*** IKE**

IKE will procure the food residue as material for production of biogas. It will also prepare plans for the proving project to be implemented by Bio Energy, raise funds, and otherwise manage the project.

*** Tokyo Gas**

Tokyo Gas will prepare standards for receiving of the biogas into city gas pipelines after the processes of refinement, calorific value adjustment, and odorization. It will also perform control and supervision of the gas taken into the city gas pipelines.

4. Amount of gas into city gas pipelines

- In terms of city gas equivalent: about 800,000 m³N/year (requisite amount of biogas: about 1.65 million m³N/year)

5. Anticipated CO₂ emission reduction

- About 1,830 tons/year

<Outline of the companies>

1. Bio Energy Corporation

- 1) Head office: 2-6-15 Yaesu, Chuo-ku, Tokyo, Japan
- 2) Tel.: 03-3242-0007 (PR official: Akashi)
- 3) Capitalization: JPY490,000,000
- 4) Representative: Mr. Etsuya Kishimoto
- 5) Business: reconstitution and reuse of food cyclical resources; planning and operation of methane fermentation facilities, and related consultation services

2. Ichikawa Kankyo Engineering Co., Ltd.

- 1) Head office: 2-11-25 Tajiri, Ichikawa, Chiba Prefecture, Japan
- 2) Tel.: 047-376-1715 (Business Planning Office)
- 3) Capitalization: JPY250,000,000
- 4) Representative: Mr. Kunio Ishii
- 5) Business: business in all areas from consultation to actual operations in the field of waste treatment and intermediate treatment through crushing, sorting and granulation

3. Tokyo Gas Co., Ltd.

- 1) Head office: 1-5-20 Kaigan, Minato-ku, Tokyo, Japan
- 2) Tel.: 0570-002211(Tokyo Gas Customer Center)
- 3) Capitalization: JPY141,844,000,000
- 4) Representative: Mr. Mitsunori Torihara
- 5) Business: production, supply, and sales of gas; fabrication and sales of gas appliances; and related construction work, thermal energy supply, and electrical power supply