

# JFE Group and JR East Group Form Partnership for Food Recycling and Power Generating Business

## 1. Introduction

J Bio Food Recycle Corporation (hereinafter, J Bio) is a project realized by leveraging the strengths of the JFE Engineering Group, which has a track record of operating biogas power generation facilities and waste treatment technologies, and the East Japan Railway Company (JR East), which is involved in the reuse of food waste. The project was launched in August 2018 with investment from four companies: JFE Engineering, J&T Recycling, East Japan Railway Company, and JR East Environmental Access Co., Ltd. The project is responsible for recycling food waste in the Tokyo metropolitan area by receiving food waste and effectively utilizing it to generate biogas power, thereby contributing to improving the food recycling rate of waste-discharging businesses and reducing carbon dioxide (CO<sub>2</sub>) emissions by creating waste-derived renewable energy.

## 2. Outline

### 2.1 Treatment Process Flow

Figure 1 shows treatment process flow of the J Bio plant. After the received food waste is sorted by machine to remove containers and packages that are unsuitable for fermentation, it is slurried by addition of water and agitation. The slurried food waste is sent to a fermenter, where it is converted into biogas through the methane fermentation action of microorganisms. This biogas is then converted into electricity by a gas engine generator and sold to a retail electric utility. The dewatered sludge is thermally recycled at an incineration facility, the dewatered filtrate is reused in the facility after biological treatment, and the surplus is discharged into the sewage system.

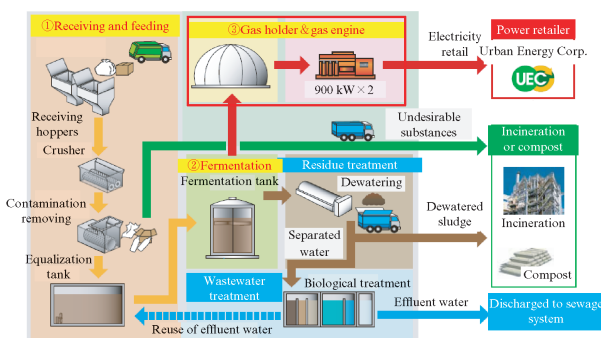


Fig. 1 Treatment process flow

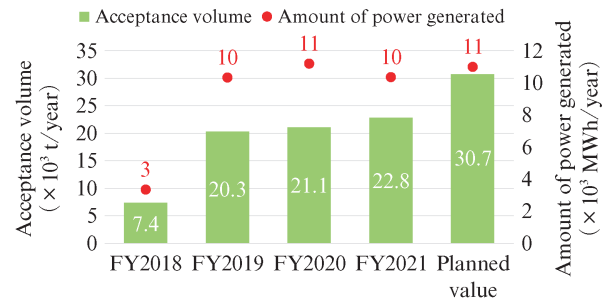


Fig. 2 Waste disposal and generated power

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### 2.2 Result of Operation

The company's food waste processing volume and power generation are shown in Fig. 2. Since opening in 2018, the amount of food waste processed was increased gradually, but the amount collected in FY 2020 was flat with that of FY 2019 due to a decrease in food waste from commercial facilities, etc., following the recent spread of COVID-19. In FY 2021, the plant was still affected by the novel coronavirus pandemic, but it is expected to reach the planned throughput of 80 t/d in FY 2022. In FY 2020, the amount of electricity generated reached the planned level of 11 000 MWh before the amount of food waste treated reached its planned level, as the amount of biogas produced per unit of accepted food waste was higher than planned.

## 3. Initiatives Related to SDGs

J Bio is implementing various initiatives to realize the SDGs, with Goal 7 and Goal 12 being the most relevant.

### 3.1 Contribution to Goal 7 - J Bio Virtual Forest

Figure 3 shows the CO<sub>2</sub> reductions achieved. Because biogas power generated from food waste is a carbon-neutral form of electricity that does not emit greenhouse gases, CO<sub>2</sub> emissions can be reduced by

- Contributes to the creation of renewable energy up to 11 000 MWh per year
- CO<sub>2</sub> reduction effect: About 5 000 t-CO<sub>2</sub>/year (FY2020) (Compared to fossil fuel-derived power generation)

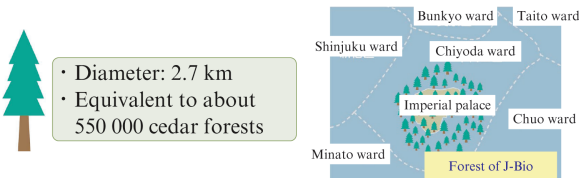


Fig. 3 Reduction in carbon dioxide emissions

using it as an alternative to fossil fuel-derived electricity. Use of electricity generated by J Bio as a substitute for the electricity supplied by TEPCO Energy Partners will reduce CO<sub>2</sub> emissions by approximately 5 000 tons per year. This reduction in CO<sub>2</sub> emissions is equivalent to a cedar forest with a diameter of 2.7 km, or an area of forest 1.5 times the size of Japan’s Imperial Palace. Thus, as a global warming countermeasure, use of biogas power generation, a renewable energy source, is as effective as extensive afforestation.

### 3.2 Contribution to Goal 12

#### 3.2.1 Improvement of recycling rate

J Bio is also contributing to SDG Target 12.5, reducing food waste generation. As an example, at a commercial facility in Tokyo Station (JR East Cross Station Co., Ltd.), food waste in containers and packaging was simply incinerated in the past, but the food recycling rate was improved by 30 points, from 36 % to 66 %, by recycling by bio gasification at J Bio.

#### 3.2.2 Electricity recycling loop

An overview of the electricity recycling loop is shown in Fig. 4. Urban Energy, a new electric power company, provides a service whereby businesses that discharge food wastes sign a power purchase agreement with Urban Energy to receive electricity generated from food waste by J Bio at a discounted rate based on the amount of food waste they generate. In addition, electric vehicles are used to collect and transport the food waste, creating a loop in which food waste is transported using electricity generated from the food waste.

#### 3.2.3 Fertilizer recycling loop

Currently, the residue that remains after methane fermentation is incinerated, but J Bio plans to convert this residue into fertilizer in FY2022, as it is rich in nitrogen and thus has value as a fertilizer. Specifically, after registering the fertilizer, demonstrations will be conducted in cooperation with farmers and food-re-

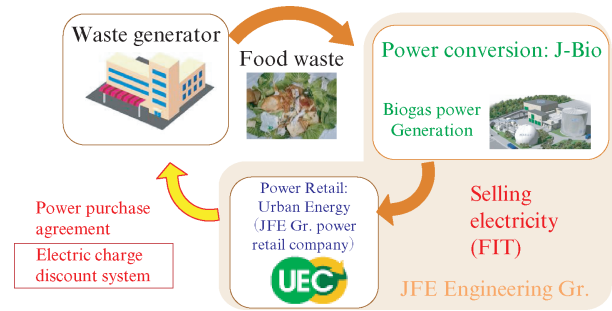


Fig. 4 Electricity recycling loop

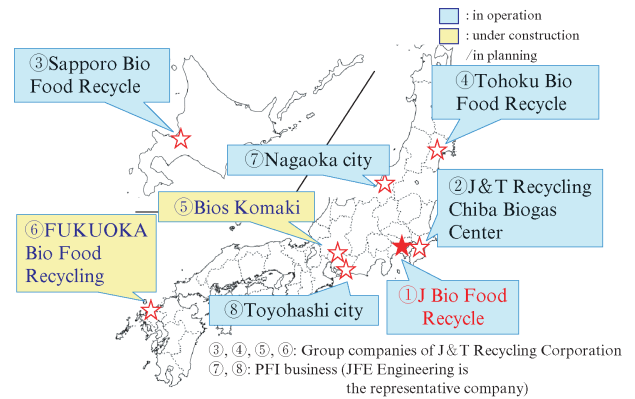


Fig. 5 Food recycling facilities in JFE Engineering group

lated businesses with the aim of constructing a recycling loop in which agricultural products produced from fertilizers derived from food waste are supplied to the market as part of an agricultural recycling loop.

## 4. Development of Food Recycling Business

Figure 5 shows the food recycling facilities of the JFE Engineering Group. Six facilities were in operation or under construction as of April 2022. In February 2022, Tohoku Bio Food Recycle started operation in Sendai City, Miyagi Prefecture; in the winter of 2022, Bios Komaki will start operation in Komaki City, Aichi Prefecture; and in the spring of 2024, FUKUOKA Bio Food Recycling will start operation in Fukuoka City, Fukuoka Prefecture. Other projects are in the planning stages, and the JFE Engineering Group aims to further expand its operations in this field in the future.

## 5. Conclusion

J-Bio is contributing to achievement of the SDGs by increasing the food recycling rate and creating renewable energy. The company is also actively providing opportunities for environmental education by accepting tours from educational institutions, and disseminating information by introducing its business at lectures and other events. We will continue to contrib-

ute to the creation of a sustainable society through stable food waste treatment and power generation.

**For Further Information, Please Contact:**

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