Creating the Foundation for Life

Food Waste Recycle and Biogas Power Generation

August 29, 2019

J Bio Food Recycle Corporation
I. Outline of J Bio Food Recycle Co., Ltd.
Establishment of J Bio Food Recycle

Completed in August 2018

Investors in our Company

JFE Engineering Corporation
J&T Recycling Corporation
East Japan Railway Company
JR East Environment Access Co., Ltd. (JR East Group company)
Location: Yokohama, Japan

Date of Establishment: August 2016

Start of Acceptance: August 15, 2018

Treatment Capacity: 80 tons per day

Power Production: Approx. 11,000 MWh per year
    (Two systems producing 900 kW each)

* Power generation. 3,000 households

* CO₂ reduction effect of approx. 5,500 tons per year

Equivalent to 2,800 kL of fossil fuel
### Characteristics of J Bio Food Recycle

<table>
<thead>
<tr>
<th>1. Friendly for global environment</th>
<th>- Food waste utilized for power generation</th>
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</thead>
<tbody>
<tr>
<td>2. Reliable one-stop operation providing safety and reassurance</td>
<td>- The investing group plays a core role in one-stop operation including collection, transport and recycling of food waste</td>
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</tbody>
</table>
| 3. Assured recycling backed by triple security | ① Located in high security area  
② High sensitivity monitoring cameras installed  
③ Remote monitoring for 24 hrs security |
| 4. Convenient location from the Tokyo region | - Conveniently located in Yokohama, to extensively serve the Tokyo region, from which a large amount of food waste is emitted |
• Plant Location: Yokohama
• Collection Area: Approx. 50km from the plant
Operation Scheme of J Bio Food Recycle

Emitting operators: Food factories and other facilities, Railway station buildings, restaurants, cafes and more

Sales Representative Collection and Transport: J&T Recycling, JR East Environment Access

Biogas power generation: J Bio Food Recycle

Helping customers with CSR actions

Higher food recycling ratio
Effective use of renewable energy
Contribution to prevent global warming
• Raw food materials loaded on pallets
Accepted waste (2/4)

- Packed expired food
• Residue from food preparation
  (mixed with toothpicks, chopsticks and others)
• Disposed food in containers (plastic, paper, containers)
Treatment System and Process Flow

Area  6,852 m² located next to JFE Engineering’s head office

① Receiving pit
② Fermentation tank
③ Gas holder
④ Power generator
Treatment Process Flow (overall)

1. **Receiving and feeding**
   - Receiving Hoppers
   - Crusher
   - Contamination removing
   - Equalization Tank

2. **Fermentation**
   - Fermentation tank

3. **Gas holder & Gas engine**
   - Electricity retail
   - Urban Energy Corp.
   - 900kW×2

**Residue treatment**
- Dewatering
- Dewatered Sludge
- Incineration
- Incineration or compost
- Compost

**Wastewater Treatment**
- Effluent water
- Biological treatment
- Effluent water

**Reuse of effluent water**

**Discharged to sewage system**

**Undesirable substances**
Treatment Process Flow (overall)

1. Receiving and feeding
   - Receiving Hoppers
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   - Contamination removing
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2. Fermentation
   - Fermentation tank
   - Wastewater Treatment
   - Reuse of effluent water

3. Gas holder & Gas engine
   - 900kW × 2
   - Electricity retail
     - Urban Energy Corp.

   - Undesirable substances
     - Incineration or compost
     - Incineration
     - Compost
     - Discharged to sewage system

   - Residue treatment
     - Dewatering
     - Dewatered Sludge
     - Biological treatment
     - Effluent water

   - Power retailer
     - Urban Energy Corp.
Fermentation tank capacity: 4,000 m³

Food waste slurry from the equalization tank (before fermentation process) is fed through the piping to the fermentation tank. In the tank, slurry is heated to 37°C and fermented for 20 days to produce methane gas.

★ Maximum gas generation: 600 m³ per hour
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   - Electricity retail
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  - Compost

- Incineration or compost
- Discharged to sewage system
- Reuse of effluent water
Gas holder stores methane gas and supplies it to gas engine.  
Gas holder: 1,500 m³

Gas engine capacity: 900 kW each  
(Total capacity with two engines: 1,800 kW)  
Gas consumption: 385 m³ per hour per engine
Treatment Process Flow (overall)

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- Receiving Hoppers
- Crusher
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Power retailer
- Urban Energy Corp.
II. State of Operation of Facility
Annual Acceptance Volume

- From FY2021, Daily Acceptance Volume will be Max, 80t/d

<table>
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<tr>
<th>Year</th>
<th>Acceptance Volume (x10^3t/year)</th>
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<tr>
<td>FY2018</td>
<td>7,000t/y (48t/d)</td>
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<tr>
<td>FY2019</td>
<td>19,000t/y (53t/d)</td>
</tr>
<tr>
<td>FY2021</td>
<td>29,000t/y (80t/d)</td>
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Annual Accepted Waste (FY2018)

From Restaurant, Convenience store and Supermarket: 3,525t (48%)

From Food factory and Food storage warehouse: 3,836t (52%)

Waste: 7,361t

- Pet food: 11%
- Beverage: 9%
- Garbage: 9%
- Vegetables: 5%
- Others: 13%
- Ice cream: 5%
- Others: 5%
SDG’s Target of J Bio Food Recycle

【SDG’s Goal and Target】
・Goal 7 : Increase the share of renewable energy(7.2) ⇔ Biomass Power Generation
・Goal12 : Reduce waste generation through recycling(12.5) ⇔ Methane Fermentation
Thank you for your attention.