Creating the Foundation for Life

Food Waste Recycle and Biogas Power Generation

July 30, 2019

J Bio Food Recycle Corporation

I. Current State of Food Recycling

Order of Recycling Precedence (the Food Recycling Act)

≪Reduce production≫

⇩ at every phase in the cycle including manufacturing, distribution, restaurant, etc

≪Recycle≫ ※the priority of nominated method

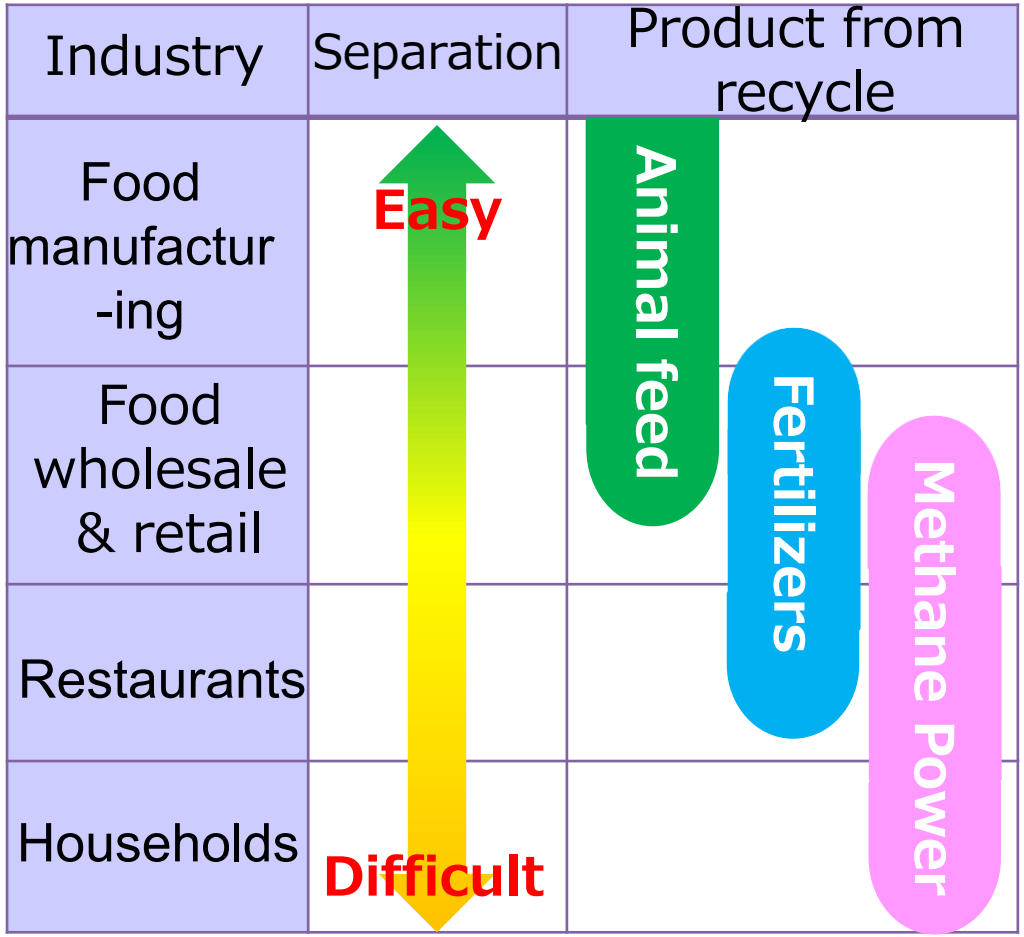
①Animal Feed, ②Fertilizer,

③Methane Fermentation

★**Upstream industries:** Without contamination, food residue is suitable for animal feed and fertilizers.

★**Downstream industries:** Contamination are difficult to remove. Food residue is not suitable for animal feed and fertilizers.

★Methane fermentation is an good solution for the the contaminated food waste which is not good for animal feed and fertilizers.
It can contribute to increase the recycling ratio.



II. 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)

Corporate Profile of J Bio Food Recycle

- 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

  * CO_2 reduction effect of approx. 5,500 tons per year

  Equivalent to 2,800 kL of fossil fuel

Plant Location and Collection area

- 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

Service contact/ collection and transport

JFE

J&T Recycling

JR East Environment Access

Packer vehicles, wing body trucks, flat body trucks and more

Waste treatment and biomass power generation

J Bio Food Recycle

Electric power sales

UEC

Supplying electric power after power generation

Helping customers with CSR actions

① Higher food recycling ratio

②Effective use of renewable energy

③Contribution to prevent global warming

Accepted waste（1/4）

- Raw food materials loaded on pallets

Accepted waste（2/4）

- Packed expired food

Accepted waste（3/4）

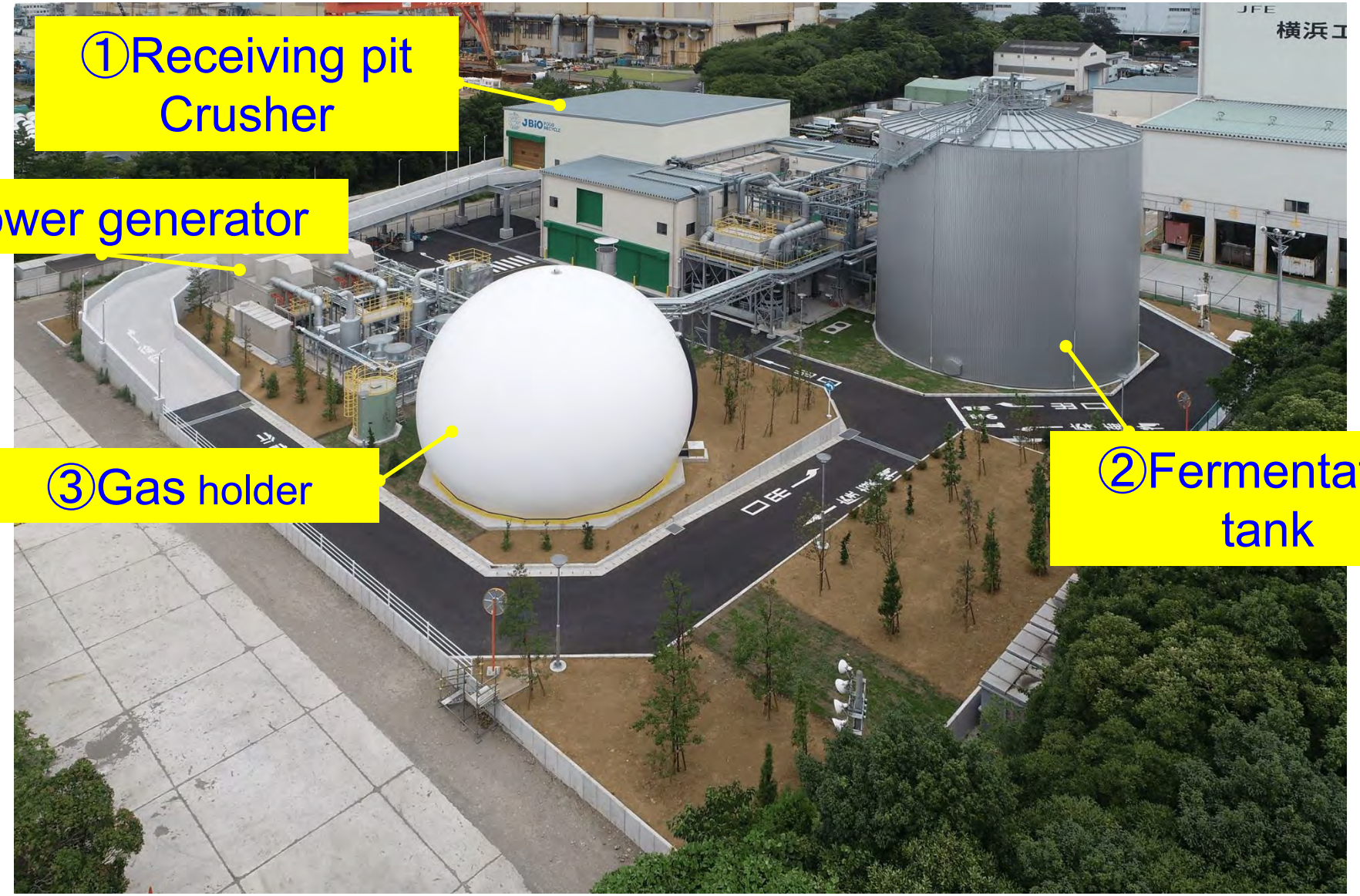
- Residue from food preparation
  (mixed with toothpicks, chopsticks and others)

Accepted waste（4/4）

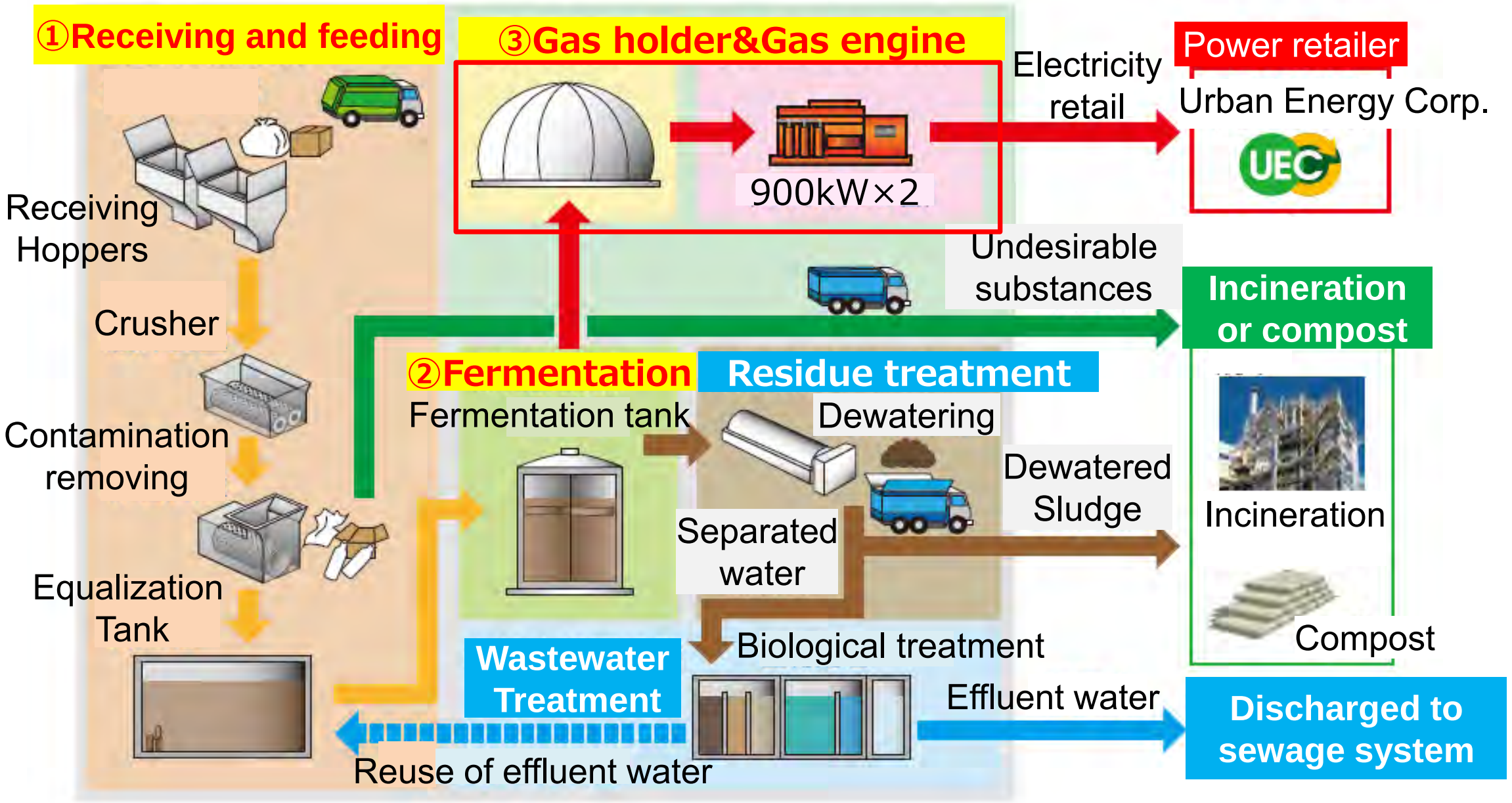
- Disposed food in containers (plastic , paper,containers)

Treatment System and Process Flow

Area 6,852 m^2 located next to JFE Engineering's head office



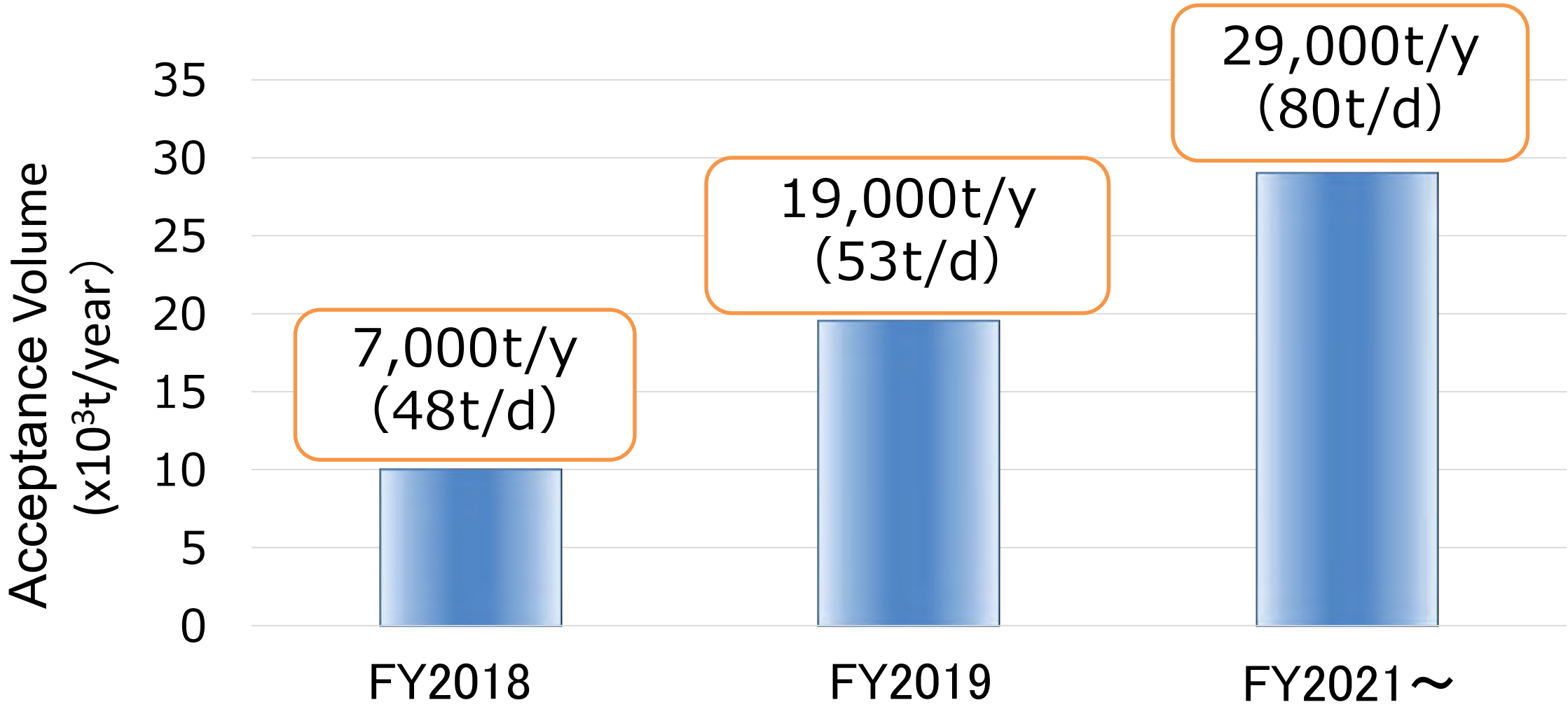
Treatment Process Flow（overall）



III. State of Operation of Facility

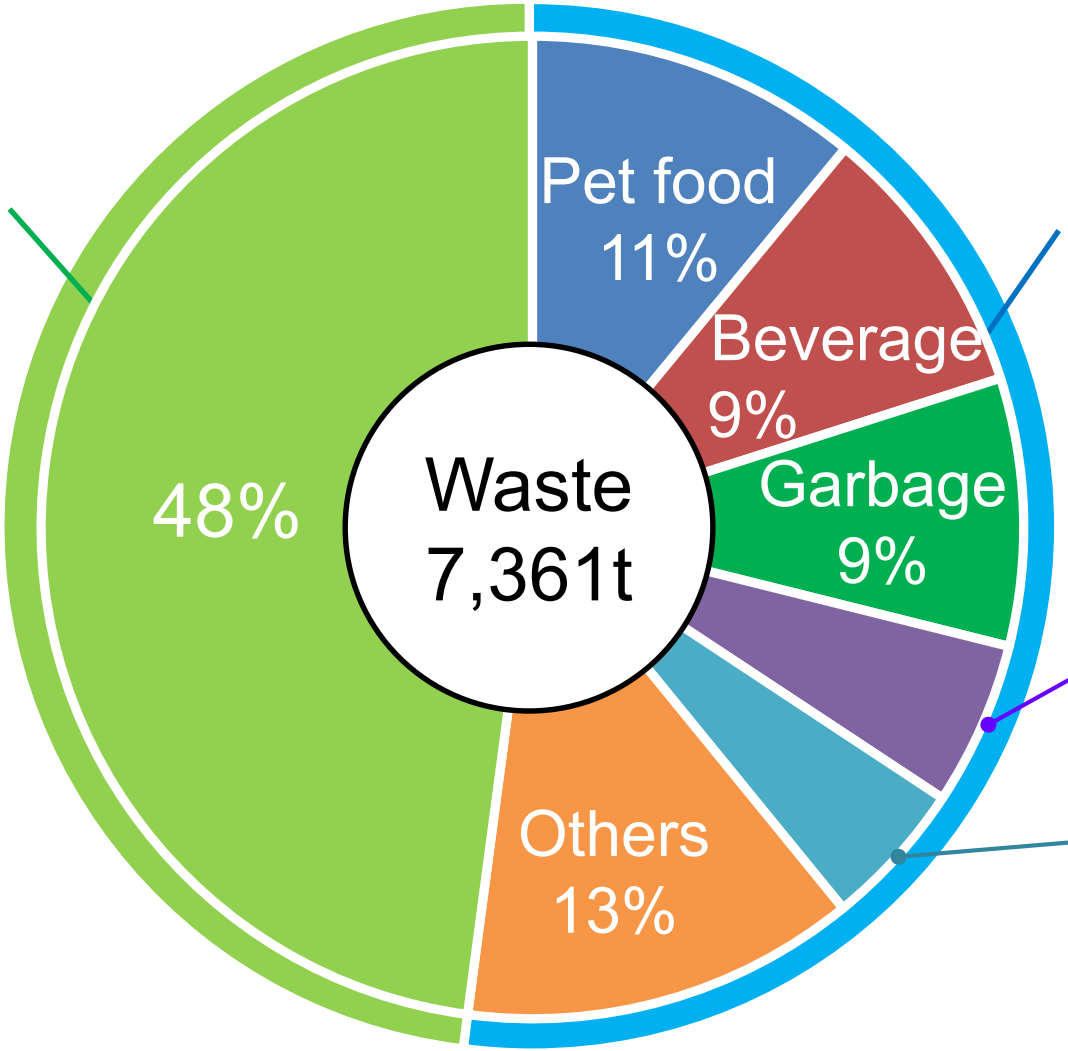
Annual Acceptance Volume

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



Annual Accepted Waste (FY2018)

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



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

SDG's Target of J Bio Food Recycle

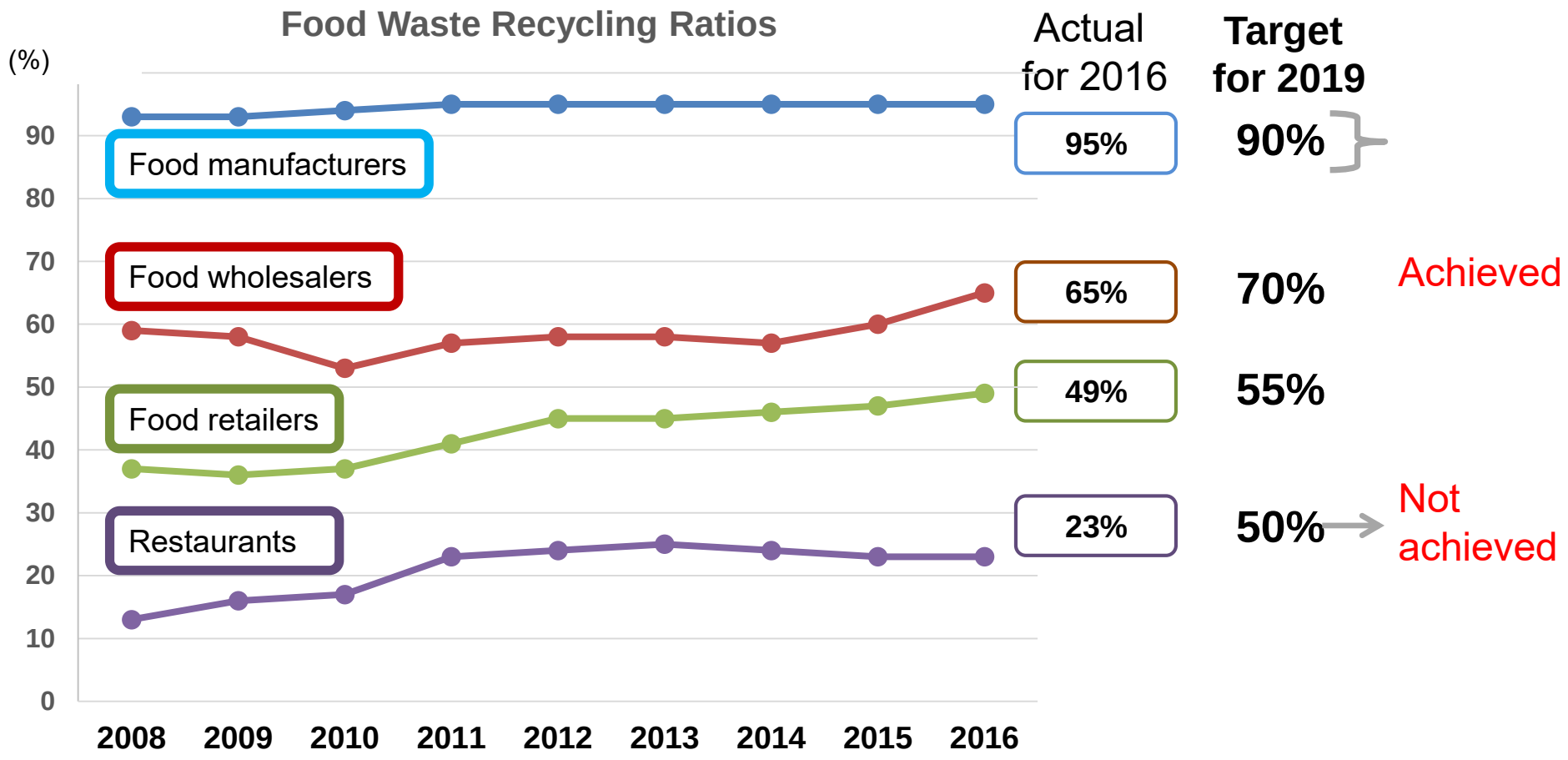
【SDG's Goal and Target】

- 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.

Current State of Food Recycling (1/2)

Food recycling ratio target under the Food Recycling Act:



* Reuse ratio targets for individual industries under the Food Recycling Act

Current State of Food Recycling (2/2)

- **Upstream industries:** Without contamination, food residue does not require separation and is suitable for use as animal feed and fertilizers.
- **Downstream industries:** Contamination, such as packaging and toothpicks, are difficult to remove and food residue is not suitable for use as animal feed and fertilizers.
  ⇒ Conventionally, food residue was incinerated though currently methane fermentation is an effective way to increase the recycling ratio.

Industry	Food residue	Separation	Product from recycle
Food manufacturing	●Soy bean cake and rice bran ●Bread waste and confectionery residue ●Soy pulp ●Food residue from factories ●Returned products and excess portion of production	Easy ↓ Difficult	Animal feed Fertilizers Methane Power
Food wholesale & retail	●Food preparation residue from stores ●Unsold processed food ●Unsold box meals		
Restaurants	●Food preparation residue from stores ●Leftovers in restaurants		
Households	●Food preparation residue ●Leftovers		

Characteristics of J Bio Food Recycle

1. Friendly for global environment

- Food waste utilized for power generation
- 80% waste reduction

2. Reliable one-stop operation providing safety and reassurance

- The investing group plays a core role in one-stop operation including collection, transport and recycling of food waste and supports customers' CSR activities

3. Assured recycling backed by triple security

① Located in high security
② High sensitivity monitoring cameras installed
③ Remote operation covering 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

Accepted waste（5/5）

- Other items such as flexible container bags and drums

Treatment Process Flow （Fermentation）

◎Fermentation tank capacity: 4,000 m^3

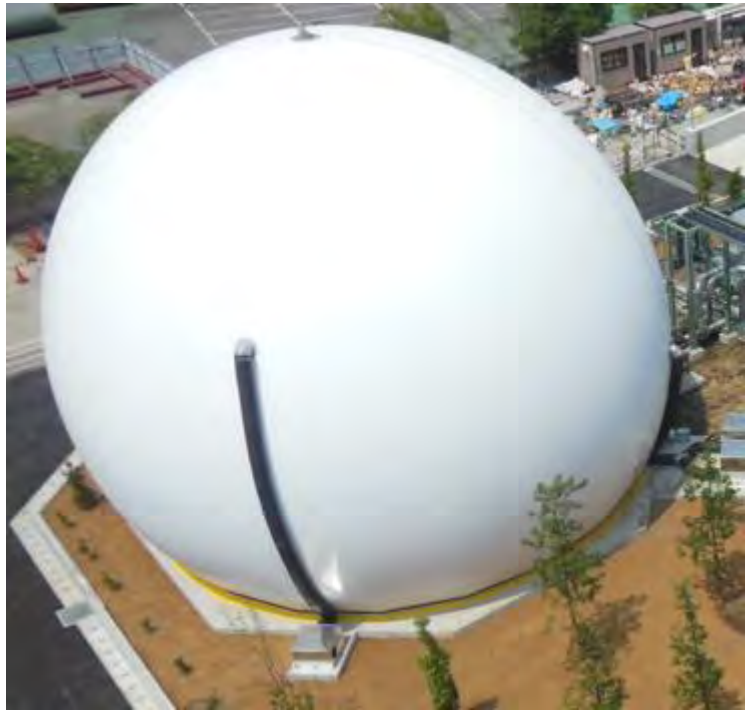
- Food waste slurry from the equalization tank (before fermentation process) is fed through the piping to the fermentation tank.
  In the tank, slurry is heated to 37°C and fermented for 20 days to produce methane gas.

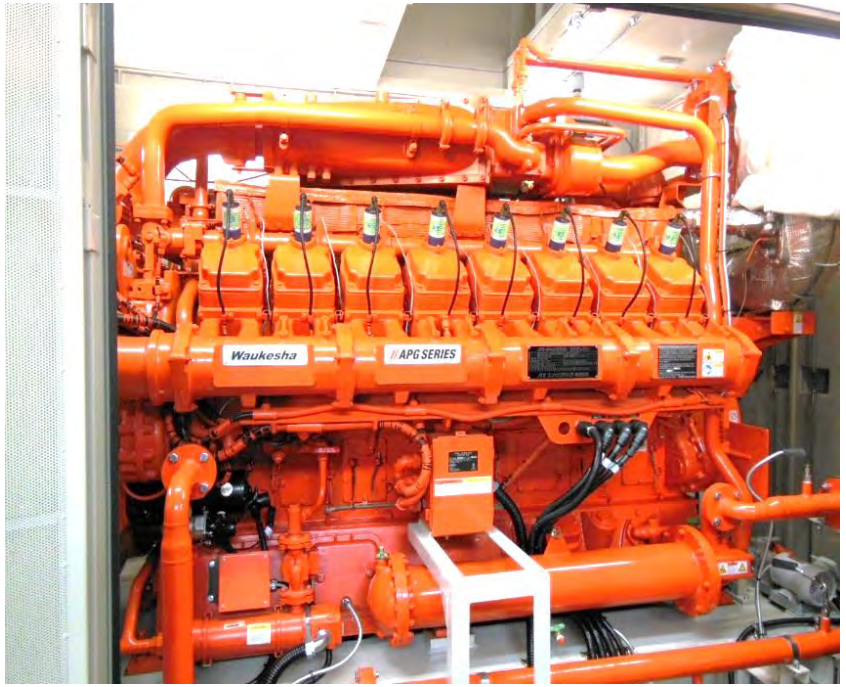
★ Maximum gas generation:
600 m^3 per hour

Treatment Process Flow （Power generation）

➢ Gas holder stores methane gas and supplies it to gas engine.

Gas holder: 1,500 m^3





➢ Gas engine capacity: 900 kW each

(Total capacity with two engines: 1,800 kW)

Gas consumption: 385 m^3 per hour per engine