



# Environmental Solution

JFE Engineering Corporation

[www.jfe-eng.co.jp/en](http://www.jfe-eng.co.jp/en)

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The JFE Group – Contributing to society with the world’s most innovative technology.



JFE Engineering Corporation is developing “cutting-edge engineering” as a world leader in its business field.



as of Mar. 2021



# Environmental Solution



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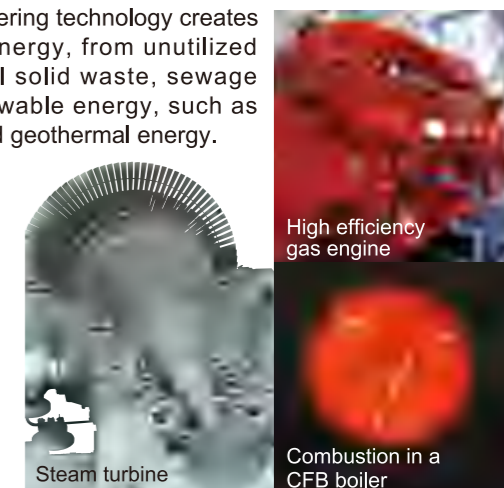
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## Waste & Renewable Energy

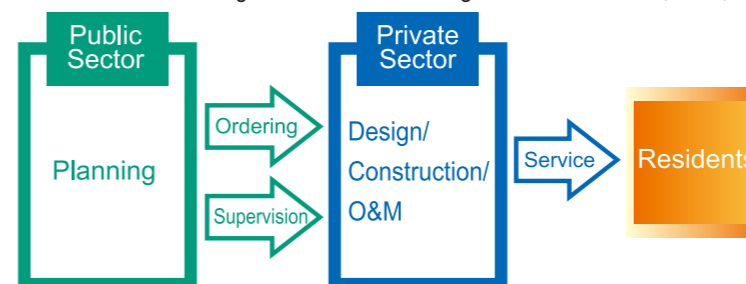


JFE's advanced plant engineering technology creates environmentally-friendly energy, from unutilized material such as municipal solid waste, sewage sludge, and also from renewable energy, such as wood waste, solar energy and geothermal energy.



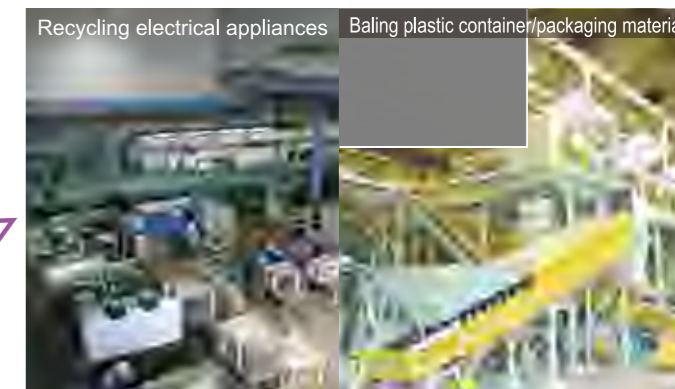
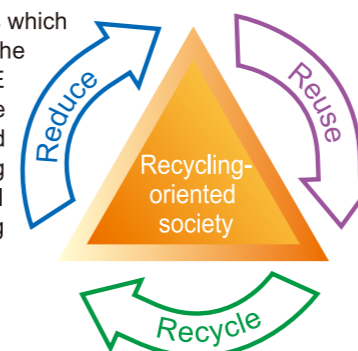
## From Public to Private

"From public to private." Privatization of public services is accelerating. JFE Engineering has been involved in a large number of projects for waste to energy plants and waterworks and sewage facilities under arrangements such as PFI, DBO, etc.



## 3R Reduce, Reuse, and Recycle

Advanced recycling systems which make the maximum use of the total capabilities of the JFE Group are contributing to the creation of recycling-oriented society, while also reducing consumption of natural resources and decreasing environmental loads.





# Waste to Energy





# Waste to Energy

Effective utilization of energy, harmony with local communities, economy. Our mission is to create plants that respond to future social needs.

JFE Engineering proposes waste treatment plants that satisfy both high incineration performance and easy operation and maintenance, while also realizing "reduction of life cycle cost." We can respond flexibly to social needs for effective utilization of energy and plant design in harmony with the surrounding environment.



## Stoker Furnace

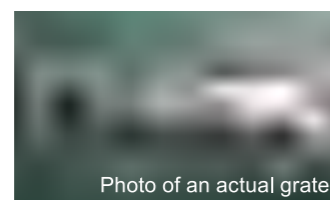
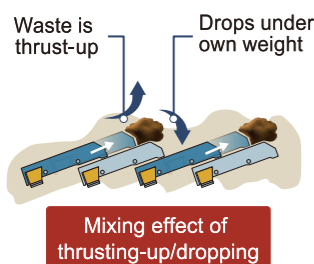
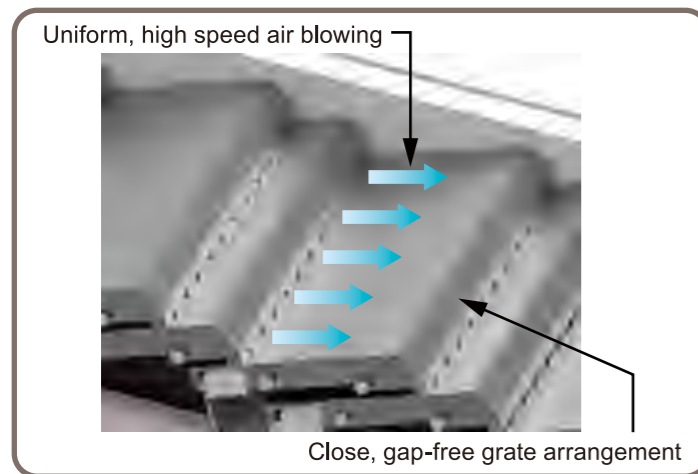
Creating energy by maximizing waste use.

This high efficiency combustion system developed by JFE Engineering greatly reduces environmental loads and realizes high waste heat recovery. JFE proposes original energy recovery technologies based on a wealth of experience and a proven track record gained in the construction of more than 180 plants throughout Japan.



### 1 Water-cooled Hyper grate

Hyper grate is an original technology developed by JFE Engineering, and has excellent resistance to heat and wear. High mixing performance accelerates drying and burning of waste and ensures a uniform supply of combustion air independent of waste properties.



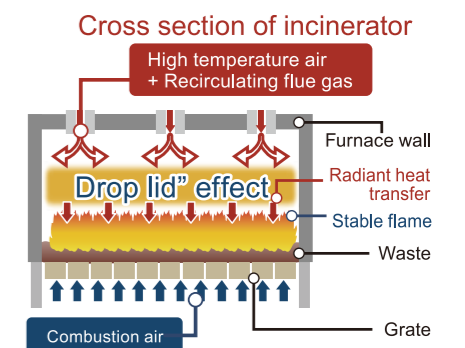
### 3 Pressure wave and water jet cleaning system

Energy recovery efficiency is improved by using a steam-free pressure wave cleaning device and a water jet cleaning system that enables on-line boiler cleaning even during operation.

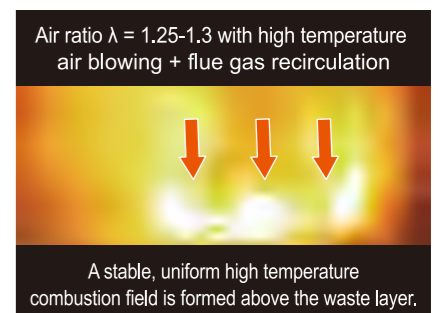
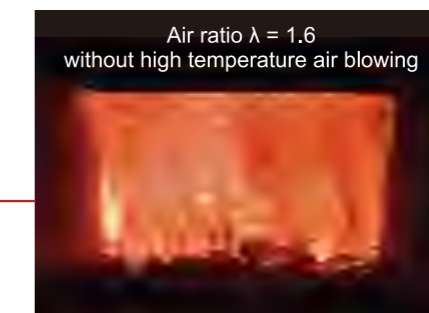


### 2 High temperature air combustion technology

A uniform combustion field is formed above the waste layer by blowing high temperature mixed gas from the top of the incinerator. A stable flame can be maintained, achieving ideal low NOx, low CO combustion.



### Combustion in actual incinerator





# Gasifying and Melting Furnace

(High Temperature Gasifying and Direct Melting Furnace)

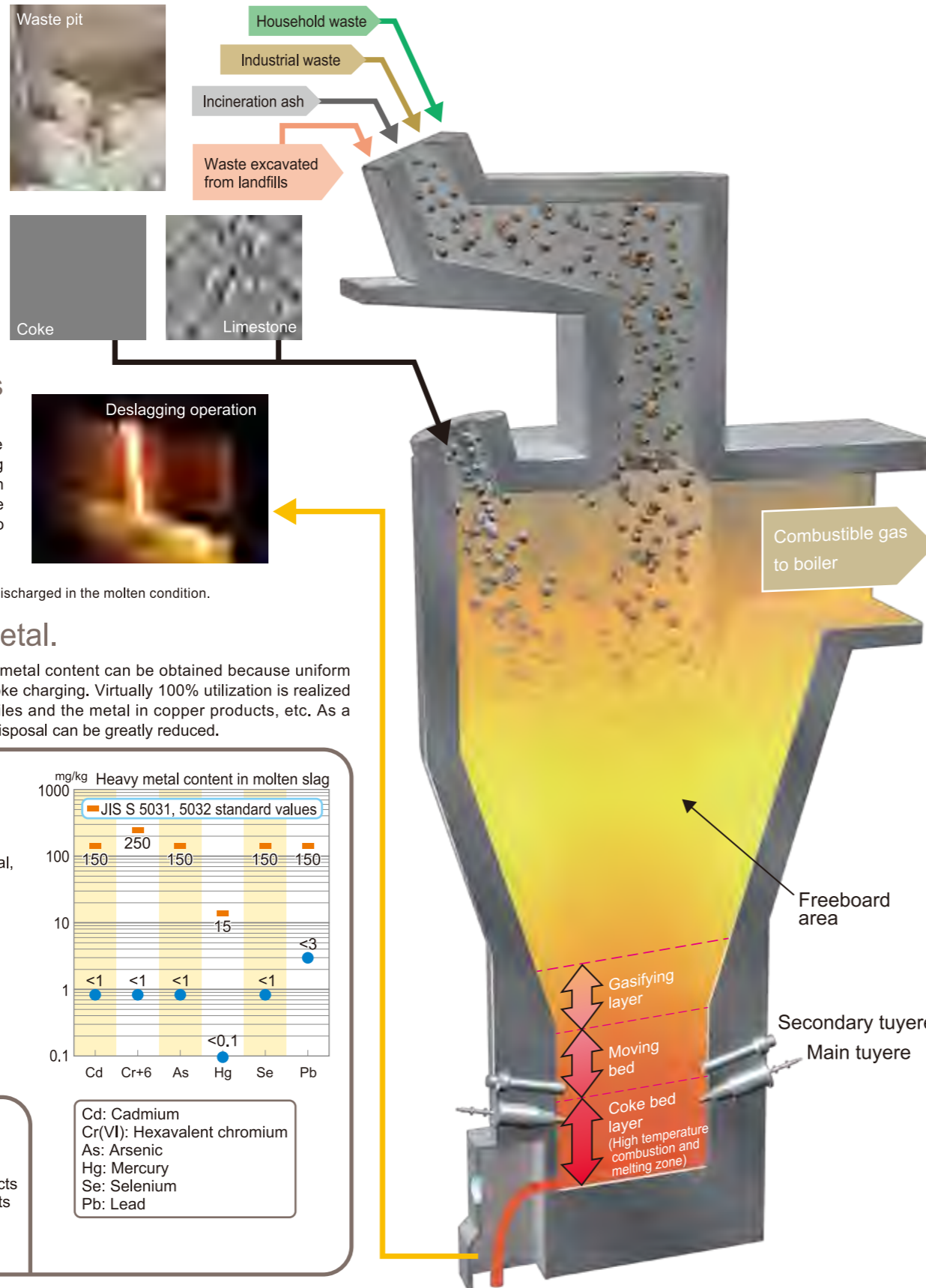
## Gasifying and Melting furnace

Let's convert waste into energy and valuable material at one stroke!

In conventional incinerators, the incombustible material in waste is treated as incineration ash. The gasifying and melting furnace is a system which transforms waste into resources that can be utilized effectively, namely, slag and metal, by gasifying/melting waste at high temperature using coke and limestone together with the waste.

### 1 Suitable for wide range of wastes

A wide range of wastes, from household waste, oversized waste, industrial waste and incineration ash to wastes excavated from landfills, can be treated by adjusting coke charging amount. Medical waste and other hazardous wastes can also be treated safely when passed through the high temperature zone ( $\geq 1,600$  C). Waste is gasified and melted instantly, and amount of heat of the coke also contributes to power generation. And use of biomass-derived coke also contributes to decarbonized society.



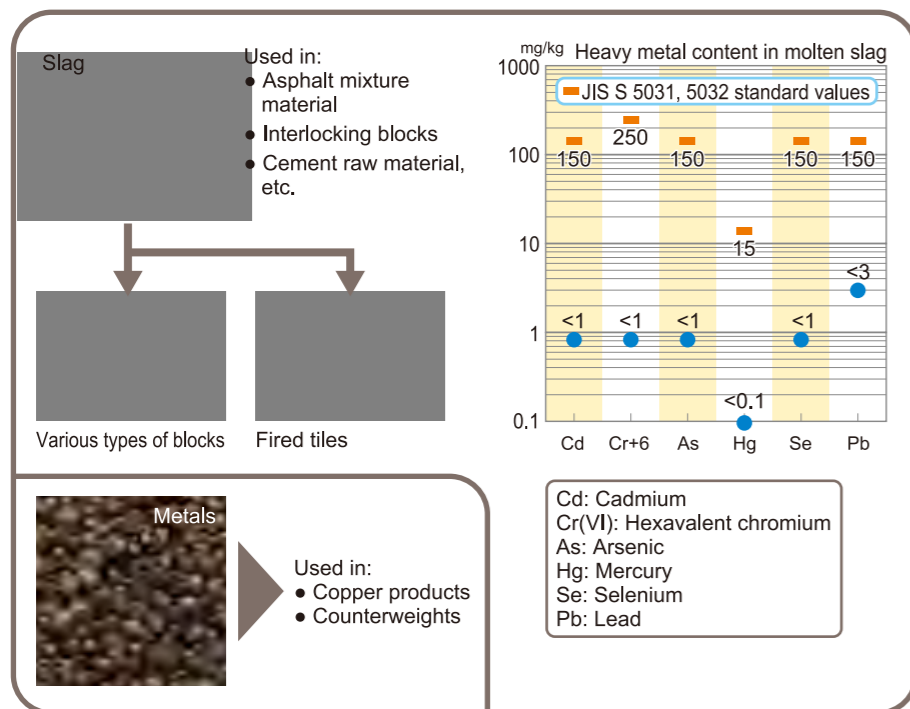
### 2 Revolutionary continuous deslagging\* method

Deslagging work at the furnace can be minimized by continuous deslagging using steel making technology. In comparison with conventional batch deslagging, working time is greatly reduced, operation is easier, and no special operator skills are required.

\*Deslagging: Process in which slag and metal are discharged in the molten condition.

### 3 Utilization of slag and metal.

Safe and high quality slag with a low heavy metal content can be obtained because uniform melting of the waste is achieved thanks to coke charging. Virtually 100% utilization is realized by using the slag in concrete blocks, fired tiles and the metal in copper products, etc. As a result, the amount of waste requiring landfill disposal can be greatly reduced.



# Boiler Steam Turbine

## Waste Heat Recovery Boiler / Steam turbine

Effectively utilizes the heat of exhaust gas. Enables high efficiency power generation.

By taking advantage of the strength of in-house design/manufacture of the boiler, steam turbine and incinerator, JFE can realize a design that maximizes total power generation.



The boiler cools the high temperature combustion gas and simultaneously converts that heat to steam for power generation. High efficiency power generation is achieved by superheated steam with a high temperature of 400 degree C. JFE Engineering supplies self-standing boiler with a high degree of freedom of shape enabling maximum heat recovery under various site conditions.



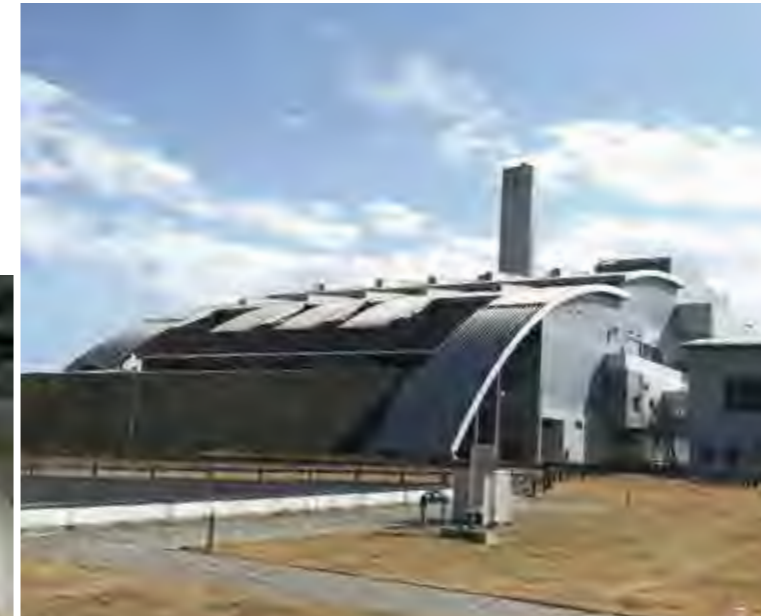
JFE Engineering has an extensive track record of the steam turbine in the field of industrial power generation facilities for such as steel, textile and paper productions. The reliability due to the robust structure, and highly efficient and economical operation are evaluated at many facilities.



# JFE's Track Record

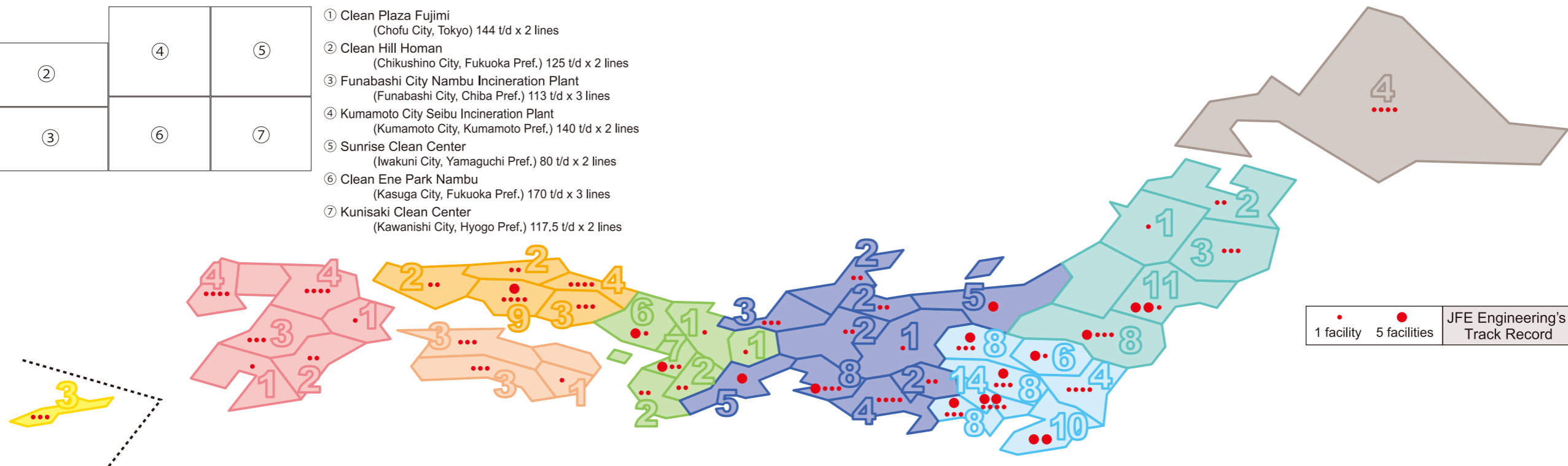
185 Plants (as of Sept. 2021)

Responding to the needs of clients, JFE Engineering's incineration plants are continuing to operate stably in all over Japan.



		④	⑤
①	②		
	③	⑥	⑦

- ① Clean Plaza Fujimi (Chofu City, Tokyo) 144 t/d x 2 lines
- ② Clean Hill Homan (Chikushino City, Fukuoka Pref.) 125 t/d x 2 lines
- ③ Funabashi City Nambu Incineration Plant (Funabashi City, Chiba Pref.) 113 t/d x 3 lines
- ④ Kumamoto City Seibu Incineration Plant (Kumamoto City, Kumamoto Pref.) 140 t/d x 2 lines
- ⑤ Sunrise Clean Center (Iwakuni City, Yamaguchi Pref.) 80 t/d x 2 lines
- ⑥ Clean Ene Park Nambu (Kasuga City, Fukuoka Pref.) 170 t/d x 3 lines
- ⑦ Kunisaki Clean Center (Kawanishi City, Hyogo Pref.) 117.5 t/d x 2 lines







# Aqua

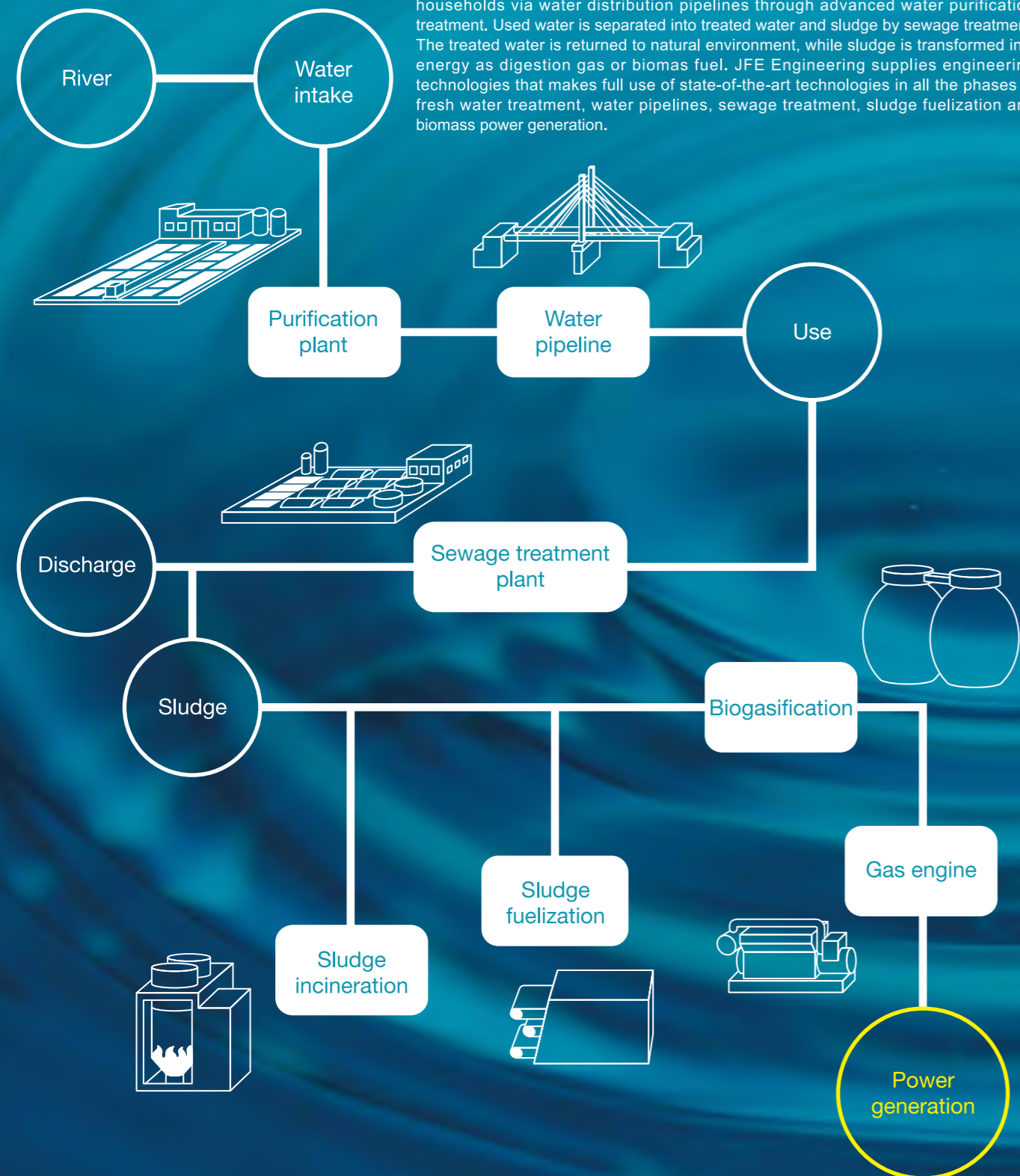
~Water and Sewage~



# Aqua Business

Producing delicious water, recycling wastewater. Generating electricity from sewage sludge. JFE's technologies are leading the way to a recycling-oriented society and low carbon society.

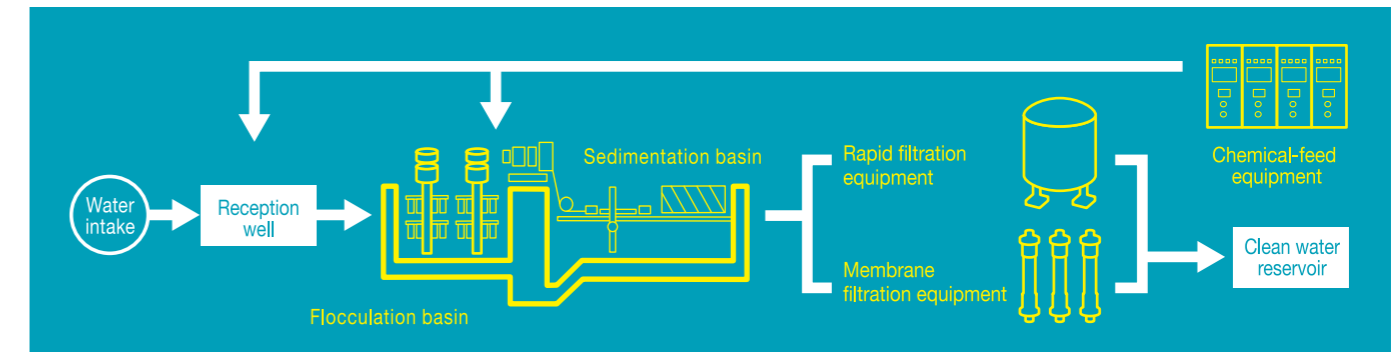
Water which is taken from rivers and other water sources is delivered to individual households via water distribution pipelines through advanced water purification treatment. Used water is separated into treated water and sludge by sewage treatment. The treated water is returned to natural environment, while sludge is transformed into energy as digestion gas or biomass fuel. JFE Engineering supplies engineering technologies that makes full use of state-of-the-art technologies in all the phases of fresh water treatment, water pipelines, sewage treatment, sludge fuelization and biomass power generation.



## Water Purification Plants

A lineup of solutions and products that can respond to all conditions.

In response to rapid deterioration of water sources and increasingly diverse needs, including additional energy saving, space saving and cost reduction, JFE Engineering will continue to supply the optimum water treatment plants based on technical capabilities cultivated over many years and wide-ranging product line from water intake facilities to pretreatment, filtration and chemical injection equipment, as well as advanced water purification systems and wastewater treatment systems.



**Membrane treatment system**

JFE Engineering has a lineup of various types of membrane modules suited to specific water quality and regional characteristics, and can respond to a wide range of water sources by combining these membrane filtration units with other processes.



**Single wire-type clarifier**

Sludge removal capacity is improved because clarifier can be designed to match the basin width. Based on duplex, single-drive concept, this unique device can be installed in settling facilities such as the inclined tube at the top of the facility.



**Inclined tube settler**

A production method by "deposition" using ultrasound is adopted instead of the conventional adhesive method. Increasing the precipitation area improved the floc removal rate.



**MF-type chemical injection system**

Features wide range, high accuracy feed control of various chemicals such as sodium hypochlorite and PAC (polyaluminum chloride) by using combination of control valves and electromagnetic flowmeters.



**New Hardinge 600 filtration system**

This system is motorized with natural balance type filter basin with a domestic track record that includes installation at more than 120 locations in Japan. The filtration basin is divided into small sections, enabling continuous filtration during backwashing, and foolproof cryptosporidium countermeasures include surface washing device and water discharge mechanism.



# Water Pipeline

Aiming at the water supply service that are “stronger and can withstand earthquakes and water shortages.”

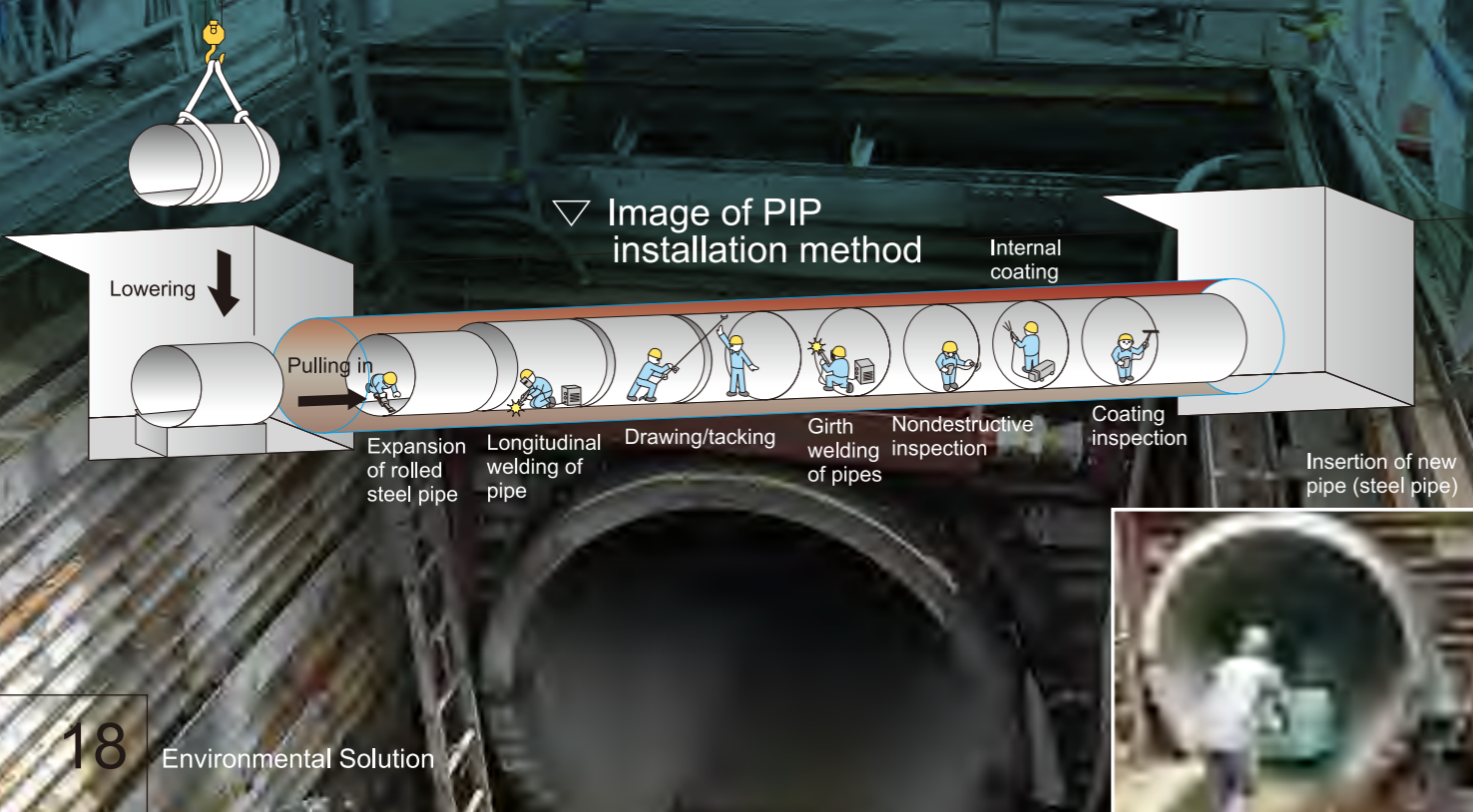
Since the 1950s, JFE Engineering has accumulated a track record of many projects as a pioneer in the field of steel pipes for water supply. JFE has an integrated production line and a complete staff of technical experts. In the future, we will continue to supply even more outstanding technologies and products for renovation/seismic retrofitting of water supply facilities.

Lowering newly-installed pipe



## Renewal of pipeline by PIP (Pipe-in-Pipe) Method

An installation method for renewing existing pipelines to a new condition by inserting/joining carbon steel pipes or rolled steel pipes in the existing pipe. In addition to enabling the installation in urban areas and under heavily-travelled roads, the PIP method is also excellent in terms of economic efficiency and shortening of the installation period.

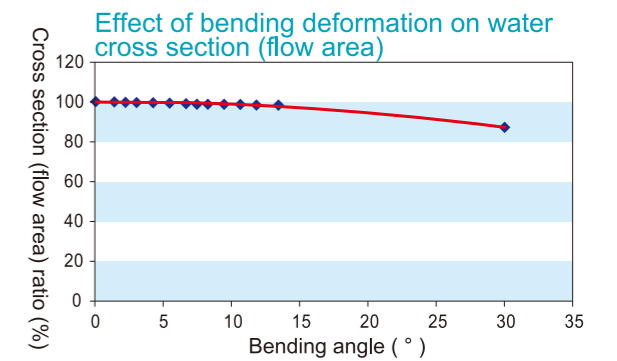


## JFE “Only One” Product



## SPF: Steel Pipe for crossing Fault

Earthquake-resistant steel pipe for water supply which can secure the water lifeline function with no cracks or water leaks in the pipe, even in case of forced displacement of several meters, by forming an easily-deformed wave-shaped pipe section in a straight pipe in advance. Although the design allowable bending angle in 1 SPF (1-ridge type) is 12°, experiments confirmed that cracking does not occur even under 30° bending. SPF was adopted for the first time in 2012 in a major project in Kobe City.



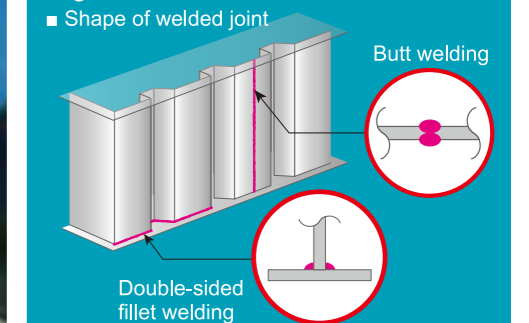
## Stainless steel square-shaped reservoir



### Earthquake-resistance revolution

- Excellent earthquake resistance
- High performance of watertightness
- Outstanding durability

### High-reliable welded structure

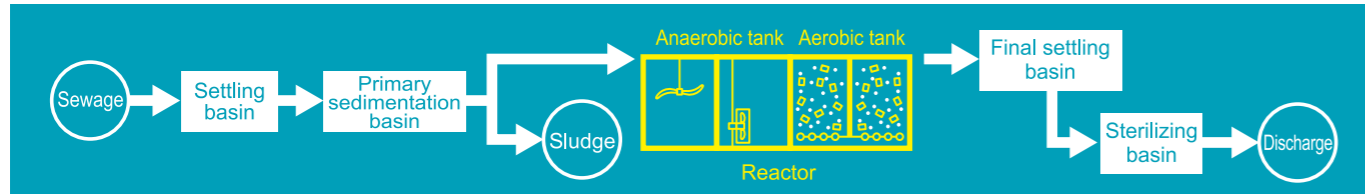




# Sewage Treatment Plant

A product lineup that realizes water purification and energy saving.

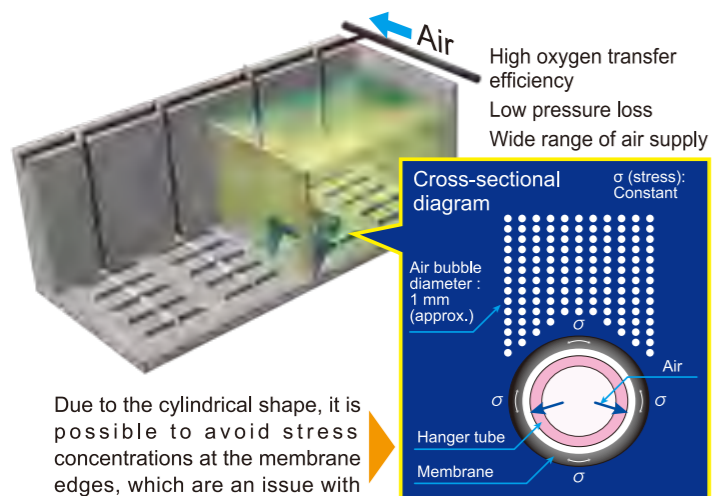
Purification of water in sewage treatment plants requires a large amount of energy. JFE Engineering has a full line of products that pursue to reduce power consumption and CO<sub>2</sub> emissions and enable lower life cycle cost.



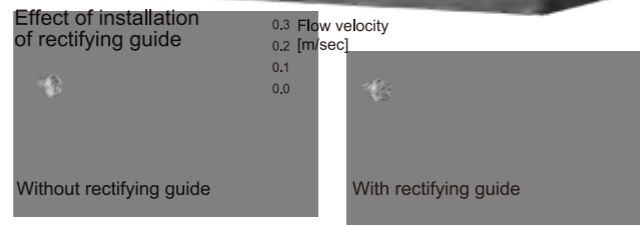
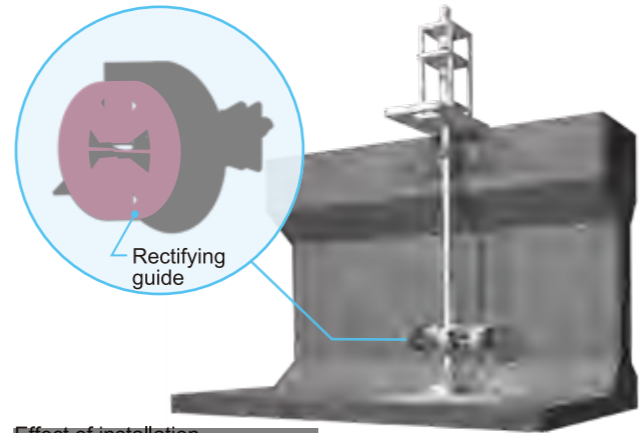
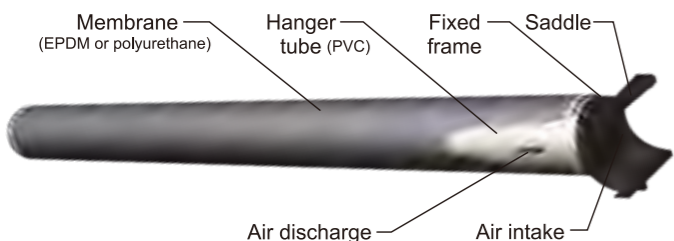
**BB Mixer (Low power reactor stirring device)**  
Has a simple structure, realizing energy saving with simple and easy maintenance

## Flex Air

(Activates microorganisms by high efficiency air supply)



Due to the cylindrical shape, it is possible to avoid stress concentrations at the membrane edges, which are an issue with panel-shaped devices.



## Swing Mixer Neo

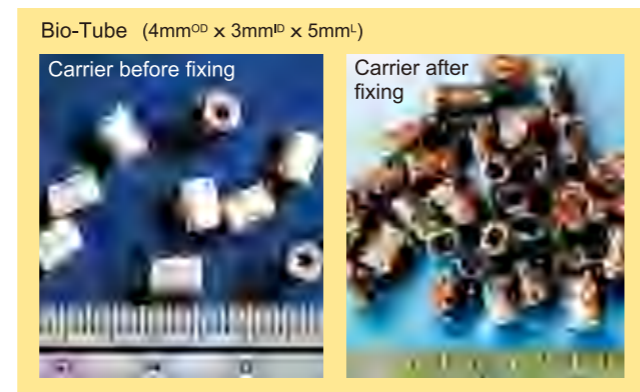
(Low power reactor stirring device)

Addition of an original rotating structure enables stirring of a wider range and reduces the number of installations to approximately half that in a conventional plant. The effect of the rectifying guide further increases the straightness of the water flow, achieving a significantly longer flow distance with the same power.

## BiO-Tube

(Holds a high concentration of microorganisms necessary for advanced treatment)

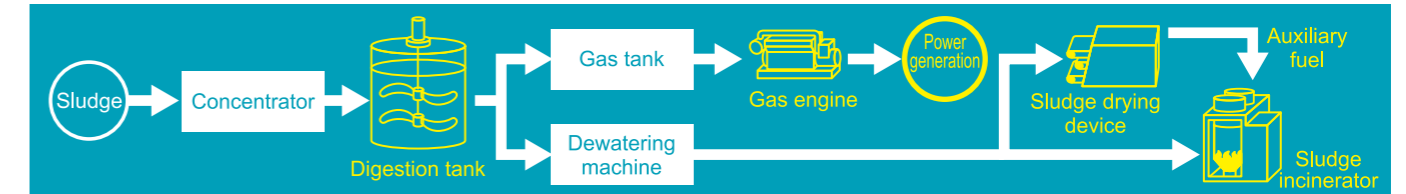
Fixing microorganisms at a high concentration supports high efficiency, low cost, space saving type advanced treatment systems.



# Sludge Treatment Plant

A product lineup which effectively utilizes sludge biomass.

Sludge which is generated by sewage purification is a type of biomass that can be stably obtained. JFE Engineering has the know-how to obtain biogas and solid fuel from sludge, and technologies for utilizing them.



## JFE steel digestion tank and stirrer DMBB

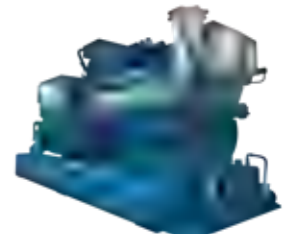


This system combines JFE's proven record in the field of steel tanks and know-how related to the digestion reaction, resulting in a large decrease in construction cost and construction time. This system conforms to Japanese earthquake-resistance standards, the Gas Utility Industry Law and related regulations.

## JFE Engineering Gas Engines

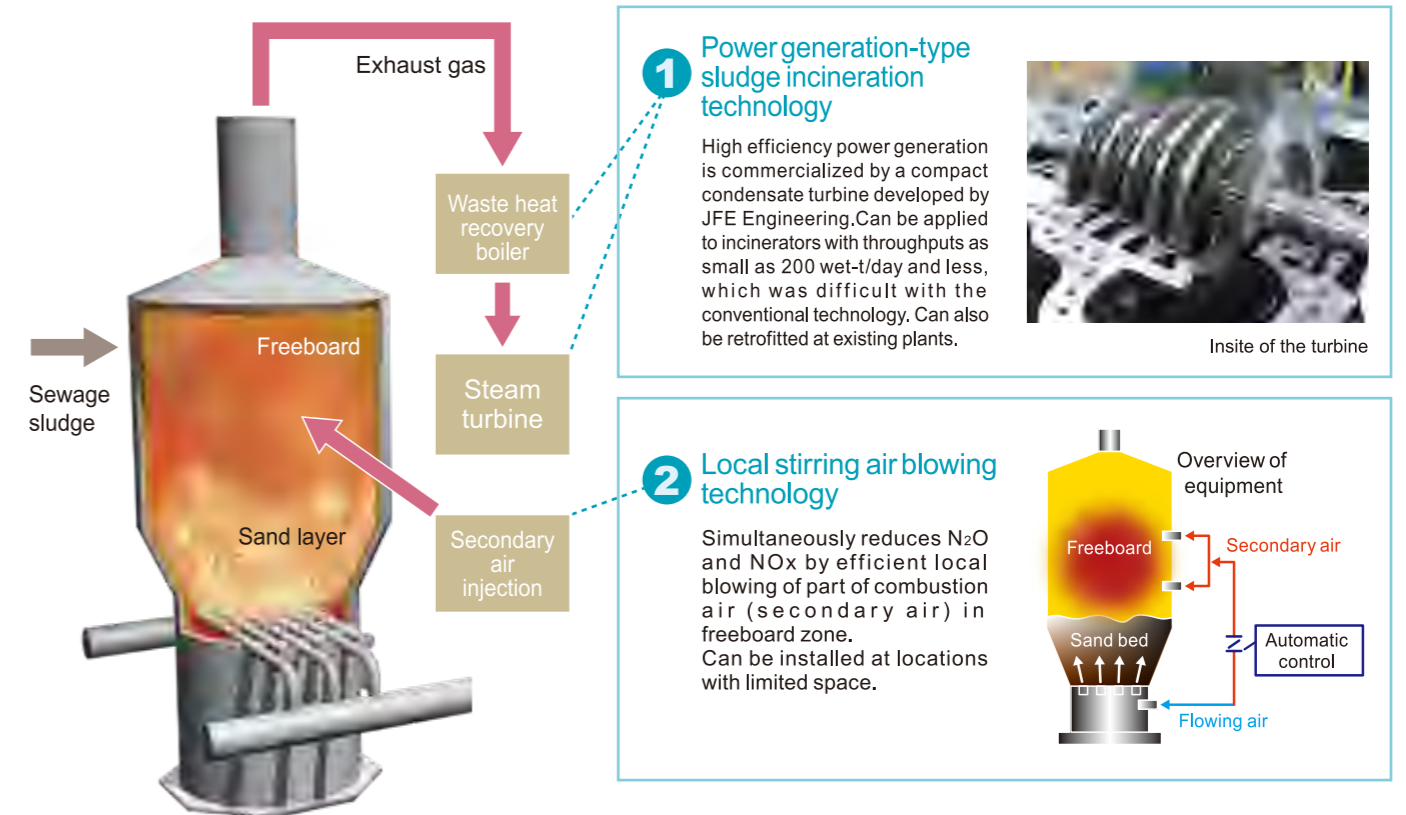
- 1 Japan's No. 1 track record in biomass power generation
  - 2 High efficiency & stable operation
  - 3 Lineup of wide range of outputs
- Rated outputs from 25 kW to 780 kW

- Succeeded in generating efficiency of **41.8%** with biogas.
- Stable operation thanks to siloxane removal device.
- Applicable to diverse types of biogas (raw garbage, sewage sludge, etc.)



High efficiency gas engine

## OdySSEA: JFE Engineering's power generation-type sludge incineration technology





# Biogas Power Generation PFI Project

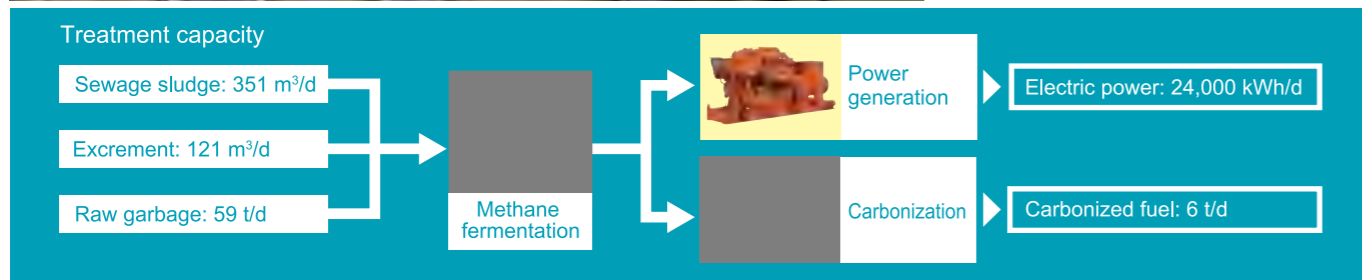
## Japan's largest biogas facility.

This PFI (Private Finance Initiative) project is a pure (100%) biomass energy conversion facility based on biogas power generation and biomass fuelization, using sewage sludge, raw garbage and other biomass as resources. JFE Engineering is actively involved in PFI projects utilizing its abundance of experiences in operation know-how.

### Toyohashi City Biomass Utilization Center (in operation since Oct. 2017)



- Mixed treatment of 3 types of biomass**  
Mixed treatment of sewage sludge, raw garbage and excrement
- Pure (100%) biomass energy conversion facility**  
Produces electricity (equivalent to approx. 2,000 households) and carbonized fuel from digested sludge.
- Largest scale in Japan**  
Serves 380,000 persons in Toyohashi City.

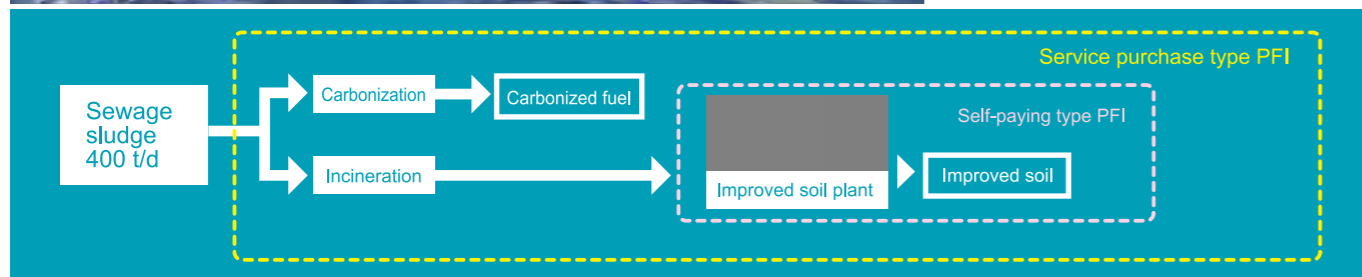


### Hokubu Sludge Treatment Plant, City of Yokohama Project for Sewage Sludge Treatment and Effective Use

(Operation started in April 2017)



- 100% effective utilization**  
Converts approximately 400 t/d of sludge to carbonized fuel, improved soil and raw material for cement
- Contributes to realizing a decarbonized society**  
Reduces CO<sub>2</sub> emissions by optimum operation of incinerator and fuel conversion furnace
- Japan's largest scale and composite-type sewage PFI**  
PFI (Private Finance Initiative) combining the "service purchase" model and "self-paying" model

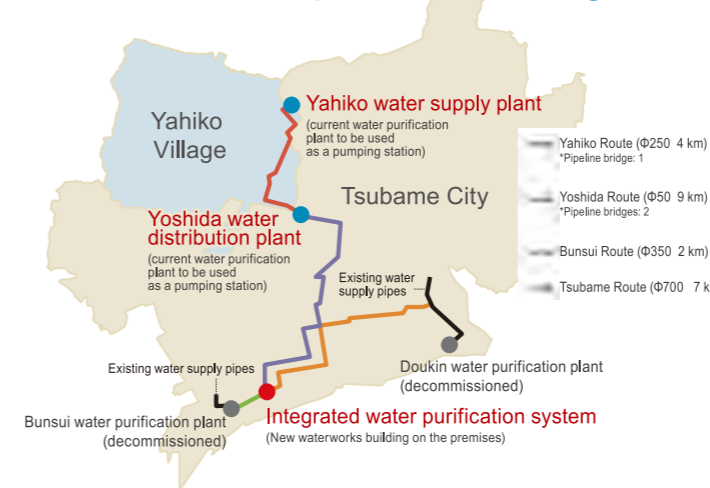


# DBO Project Concessions

## Public-private partnership projects

JFE Engineering not only carries out conventional EPC projects, but is also actively taking on the challenge of DB/DBO/PFI concession projects. JFE Engineering is contributing to sustainable development of waterworks and wastewater projects by making full use of its wealth of knowledge in all phases of design, construction and operation, together with a wide range of engineering capabilities from water pipelines to water and sewage treatment plants.

### Tsubame City-Yahiko Village Water Transmission and Distribution Pipeline DB/Integrated Water Purification System DBO

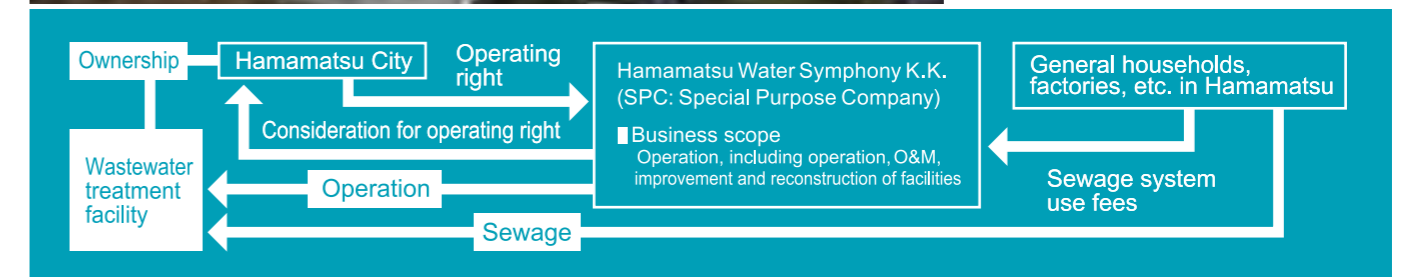


- Water transmission/distribution pipeline DB**
  - Design and construction of new connecting pipelines, total length of approximately 22 km (Project period: April 2019 to September 2024)
  - Use of technologies owned by JFE Engineering (underground object survey radar, IT construction management system, etc.)
- Integrated Water Purification System DBO**
  - Planned maximum water supply capacity: 42,500 m<sup>3</sup>/d
  - Adoption of membrane filtration to respond flexibly to turbidity fluctuations
  - Business operation for 20 years after completion (April 2025 to March 2045)

### Hamamatsu City Sewerage (Seien Area) Concession Project (operation for 20 years from April 2018)



- First sewerage concession project in Japan**  
Self-paying operation by sewage system use fees
- Voluntary business in addition to legally-required business**  
In addition to management, operation & maintenance and reconstruction, also includes operation of an eel farm pilot project





# Operation & Maintenance



Tottori Chubu Furusato Inter-City Alliance Hoki Recycling Center  
Renovation of air preheater





# Operation & Maintenance

As a “home doctor for environmental plants,” JFE Engineering realizes secure, safe, and stable facility operation.



JFE Engineering performs plant maintenance for waste treatment, water treatment and other plants at 623\* facilities nationwide. A large number of specialist engineers are assigned to various regions throughout Japan to perform quick, detailed after-delivery service so that clients can use facilities with full confidence for many years to come. The JFE Engineering Group company, JFE Environmental Service Corporation is in charge of operation of plants.

- \* Waste treatment: 123 facilities
- Waterworks: 250 facilities
- Sewage/excrement: 250 facilities

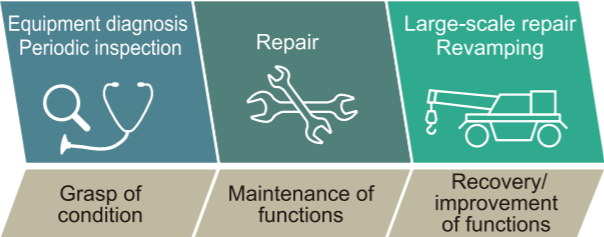
◀ Air preheater installation work (brought in from an opening in the building roof)

## Waste Treatment Plants

JFE’s rich track record in O&M realizes long life of facilities.

### 1 Maintenance

JFE Engineering has a long history in the field of plant maintenance since the company first began construction of waste treatment plants in the 1960s. By utilizing our wealth of know-how, understanding the special features and condition of deterioration of each equipment, and performing appropriate diagnosis and trend management that anticipates future changes, we provide maintenance service with an excellent balance of high quality and cost performance. We also perform large-scale renovation work to extend the life and reduce the life cycle cost of facilities.

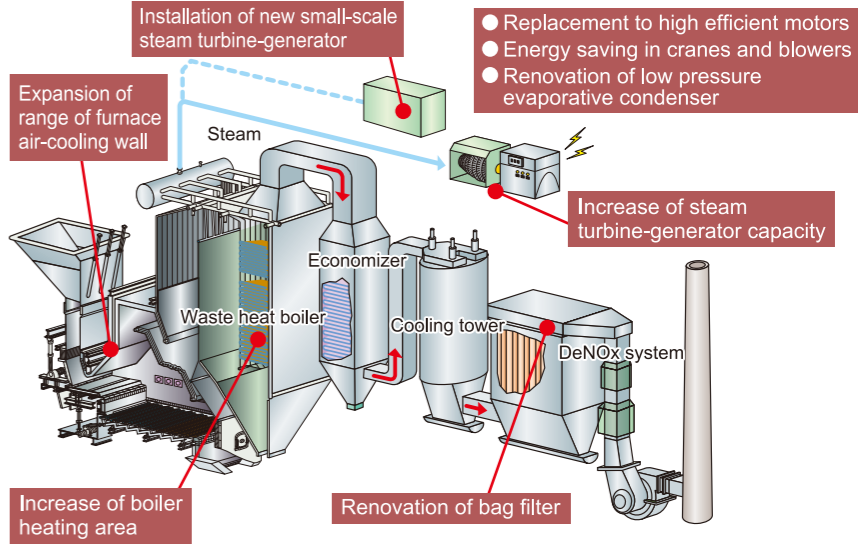


### 2 Revamping

JFE performs restoration work to improve functions when facility performance has decreased due to age. In addition to extending the life of facilities by renovating various types of equipment, we can also realize a higher level of environmental performance, for example, by improving energy saving or increasing power generation capacity.

- ▶ Improvement of environmental performance (CO<sub>2</sub> emission reduction, energy saving, increase of power generation capacity)
- ▶ Reduction of financial burden (Reduction of life cycle cost)
- ▶ Effective utilization of existing facilities (Extension of service life)

#### Example of Basic Improvement Work Menu



### 3 Operation

JFE Environmental Service Corporation (ESC, JFE Engineering Group company) is responsible for the operation of waste treatment plants. ESC has a record of plant operation at more than 100 facilities in Japan, including facilities of incineration, gasifying and melting, RDF production, recycling, water treatment and others. Operation and maintenance information is shared in the group companies.

## Water Treatment Plants

Supporting a stable supply of water, from maintenance and inspection to operation of facilities.

JFE Engineering also has a long history of O&M of waterworks and sewage facilities, and the soundness of our facility asset management system has been highly evaluated. We have received certification under ISO55001, the international standard for Asset Management Systems (AMS).





# PPP

## Public Private Partnership

- Providing optimum service through cooperation between public and private sectors -



Integrated plant operation system linking the various systems developed by JFE Engineering to improve convenience through data sharing and provide optimum solutions for operational work as a whole by analyzing linked data.



World's first system that realizes total automation in the operation of waste incinerators, which are the most important equipment in waste treatment plant.



Plant management system that realizes information sharing and optimized operation by digitization and storage/integrated management of information related to facility operation.



AI (artificial intelligence) engine built around modelling technology for the causal relationships hidden in observed data to support simulation-based engineering.



JFE Engineering's worldwide remote monitoring center, which provides total monitoring, operational support and maintenance support for plants both in Japan and overseas, including WtE power plants, biomass power plants, solar power plants, water treatment plants and others.



Data analysis tool that enables easy use of AI and big data, even by employees without specialized knowledge of IT.





# PPP (Waste Treatment)

JFE Engineering proposes optimum solutions for the diverse requirements of the PPP consortium based on its rich track record in construction, O&M and business management of incineration facilities, recycling facilities and final disposal sites.

## Long-term full consignment operation of waste treatment plants

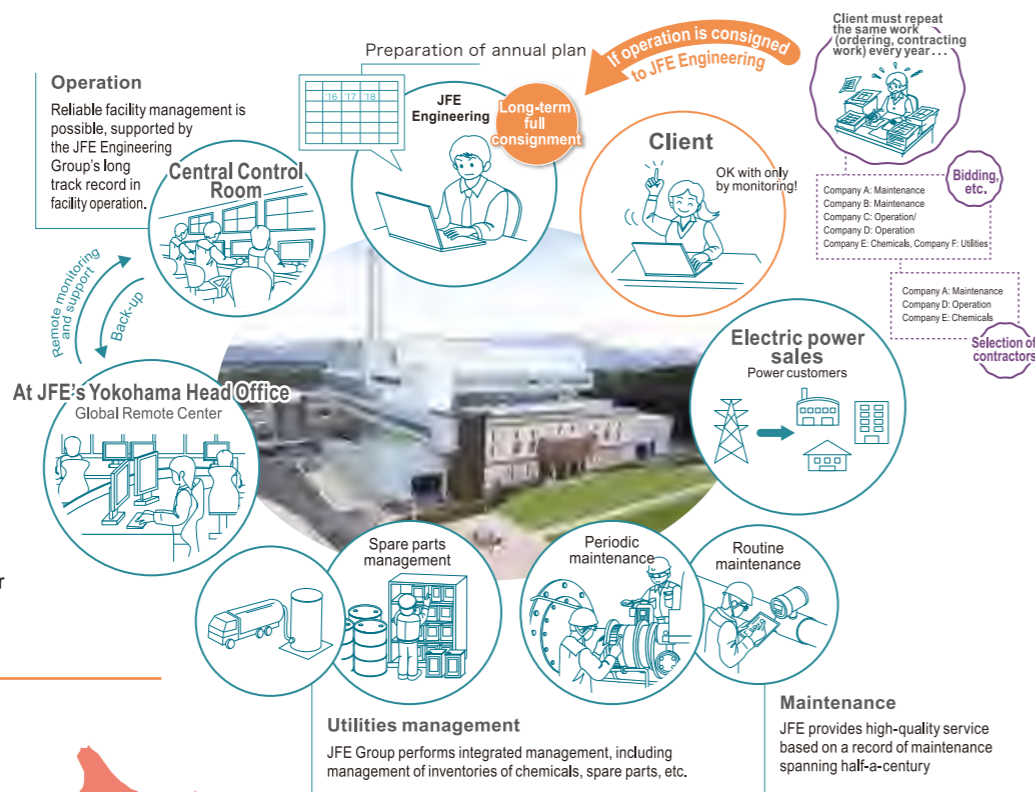
Long-term full consignment operation of waste treatment plants  
Long-term full consignment operation agreements for periods of 5 to 20 year are increasingly common in the operation and maintenance of environmental plants. The number of environmental plants operated by JFE Engineering under full consignment arrangements in all parts of Japan is also increasing year by year. "From public to private": JFE Engineering is actively involved in operation businesses throughout Japan under arrangements such as PFI (Private Finance Initiative) and DBO (Design, Build and Operate), in which facility operation is performed through cooperation between administrative authorities and a private-sector company.

### What is long-term full consignment?

Scheme in which a local government, etc. concludes a multi-year agreement with a private-sector company with the necessary technical capabilities to ensure planned and efficient management of facilities.

### Benefit

- 1 Levels government expenditures from year to year, and reduces LCC (life cycle cost)
- 2 Reduces the burden of preparing new contracts every year
- 3 Enables safe, secure and stable facility operation based on the wealth of know-how of the private sector



## Record of WtE Facility Operation for Local Power Producers and Suppliers (PPS) (as of April 2021)



### Record of Local PPS Operation

Company (location of head office)
1 Tokorozawa Mirai Electric Power Co., Ltd. (Tokorozawa City, Saitama Pref.)
2 Niigata Swan Energy Corp. (Niigata City, Niigata Pref.)
3 Honokuni Toyohashi Energy (Corp.) (Toyohashi City, Aichi Pref.)
4 Fukuyama Mirai Energy Co., Ltd. (Fukuyama City, Hiroshima Pref.)
5 Smart Energy Kumamoto Co., Ltd. (Kumamoto City, Kumamoto Pref.)

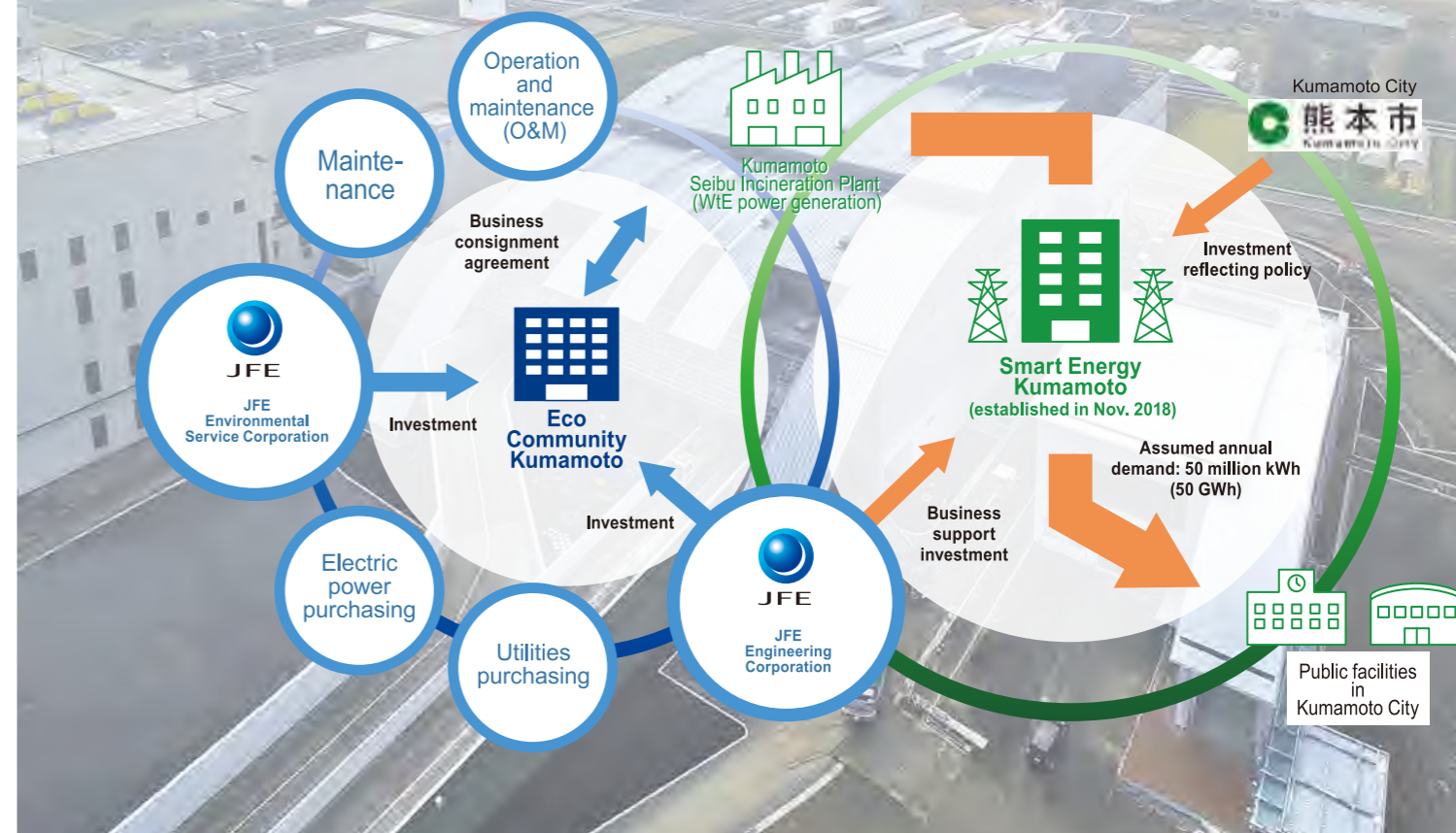
### Record of Waste Treatment Plant Operation (Blue: Under construction/pre-operational)

Client	Incinerator capacity	Facilities operated
1 Ministry of Environment (Fukushima Pref.)	200 t/d x 1	Incineration facilities, ash melting facilities
Nasushiobara City (Tochigi Pref.)	70 t/d x 2	Incineration facilities, ash melting facilities, recycling facilities
Tatebayashi Hygiene Facilities Union (Gunma Pref.)	50 t/d x 2	Incineration facilities, recycling facilities, final disposal site
ORIX Environmental Resources Management Corporation (Saitama Pref.)	200 t/d x 2	Incineration facilities
2 Higashi-Saitama Resources and Environment Association (Saitama Pref.)	148.5 t/d x 2	Incineration facilities
Tokorozawa City (Saitama Pref.)	115 t/d x 2	Incineration facilities, recycling facilities
Fujimi Eisei Kumiai (Tokyo Metropolis)	144 t/d x 2	Incineration facilities
Funabashi City (Chiba Pref.)	113 t/d x 3	Incineration facilities

Client	Incinerator capacity	Facilities operated
Niigata City (Niigata Pref.)	110 t/d x 3	Incineration facilities, ash melting facilities
Hotaka Area Business Union (Nagano Pref.)	60 t/d x 2	Incineration facilities
3 Takaoka Wide Area Administrative Association (Toyama Pref.)	85 t/d x 3	Incineration facilities
Fukui-Sakai Municipalities Broad Regional Administrative Association (Fukui Pref.)	74 t/d x 3	Incineration and recycling facilities, final disposal site
Wakasa Wide Area Administrative Association (Fukui Pref.)	35 t/d x 2	Incineration facilities
4 Suzuka City (Mie Pref.)	90 t/d x 3	Incineration facilities
Kadoma City (Osaka Pref.)	40 t/d x 1	Recycling facilities
5 Greater Upper Inagawa Garbage-disposal Facility's Association (Hyogo Pref.)	117.5 t/d x 2	Incineration facilities, ash melting facilities, recycling facilities
Nishinomiya City (Hyogo Pref.)	140 t/d x 2	Incineration facilities
Ashiya City (Hyogo Pref.)	115 t/d x 2	Incineration facilities
Mizushima Eco-Works Co., Ltd. (Okayama Pref.)	185 t/d x 3	Incineration facilities
Kurashiki City (Okayama Pref.)	150 t/d x 2	Incineration facilities, recycling facilities
Fukuyama Recycle Power Co., Ltd. (Hiroshima Pref.)	314 t/d x 1	Incineration facilities
Fukuyama City (Hiroshima Pref.)	200 t/d x 3	Incineration facilities, recycling facilities
East Tottori Prefecture Wide Area Administrative Management Association (Tottori Pref.)	120 t/d x 2	Incineration facilities
6 Tottori Chubu Furusato Inter-City Alliance (Tottori Pref.)	100 t/d x 2	Incineration and recycling facilities, final disposal site
Yonago City (Tottori Pref.)	90 t/d x 3	Incineration facilities
Izumo City (Shimane Pref.)	100 t/d x 2	Incineration facilities
Hamada District Regional Administrative Union (Shimane Pref.)	49 t/d x 2	Incineration facilities
Iwakuni City (Yamaguchi Pref.)	80 t/d x 2	Incineration facilities
Fukuoka-Nambu Kankyo Jigyo Kumiai (Fukuoka Pref.)	170 t/d x 3	Incineration facilities
Chikushino-Ogori-Kiyama Cleaning Facilities Association (Fukuoka Pref.)	125 t/d x 2	Incineration facilities
Amagi-Asakura-Mitsui Environmental Facilities Association (Fukuoka Pref.)	60 t/d x 2	Incineration facilities, recycling facilities
7 Sasebo City (Nagasaki Pref.)	55 t/d x 2	Incineration facilities, recycling facilities
Kenou Kennan Clean Authority (Nagasaki Pref.)	100 t/d x 3	Incineration facilities
Kumamoto City (Kumamoto Pref.)	140 t/d x 2	Incineration facilities

## Long-term full consignment operation of waste treatment plants Locally-produced, locally-consumed electric power

JFE Engineering is involved in many public-private partnership (PPP) projects in partnership with local governments, including long-term full consignment operation of the Kumamoto City Seibu Incineration Plant, and "locally-produced, locally-consumed" electric power.  
As an electric power supply business, Smart Energy Kumamoto, new company established with investment by Kumamoto City and JFE Engineering, supplies surplus electric power generated by the waste incineration plant, which is one type of renewable energy, to more than 200 public facilities.



## Integrated operation of incineration facility, recycling facility and final waste disposal site

JFE Engineering received an order for long-term full consignment operation of the "Tatebayashi Clean Center," a waste incineration facility owned by the Tatebayashi Hygiene Facilities Union, including not only construction and operation of the facility itself, but also the operation of existing recycling facility and final waste disposal site located in the neighboring region. This was JFE Engineering's first project involving integrated operation of multiple facilities owned by the municipalities that make up a regional association.



1 Tatebayashi Clean Center (incineration facility)



2 Itakura Recycling Center (recycling facility)

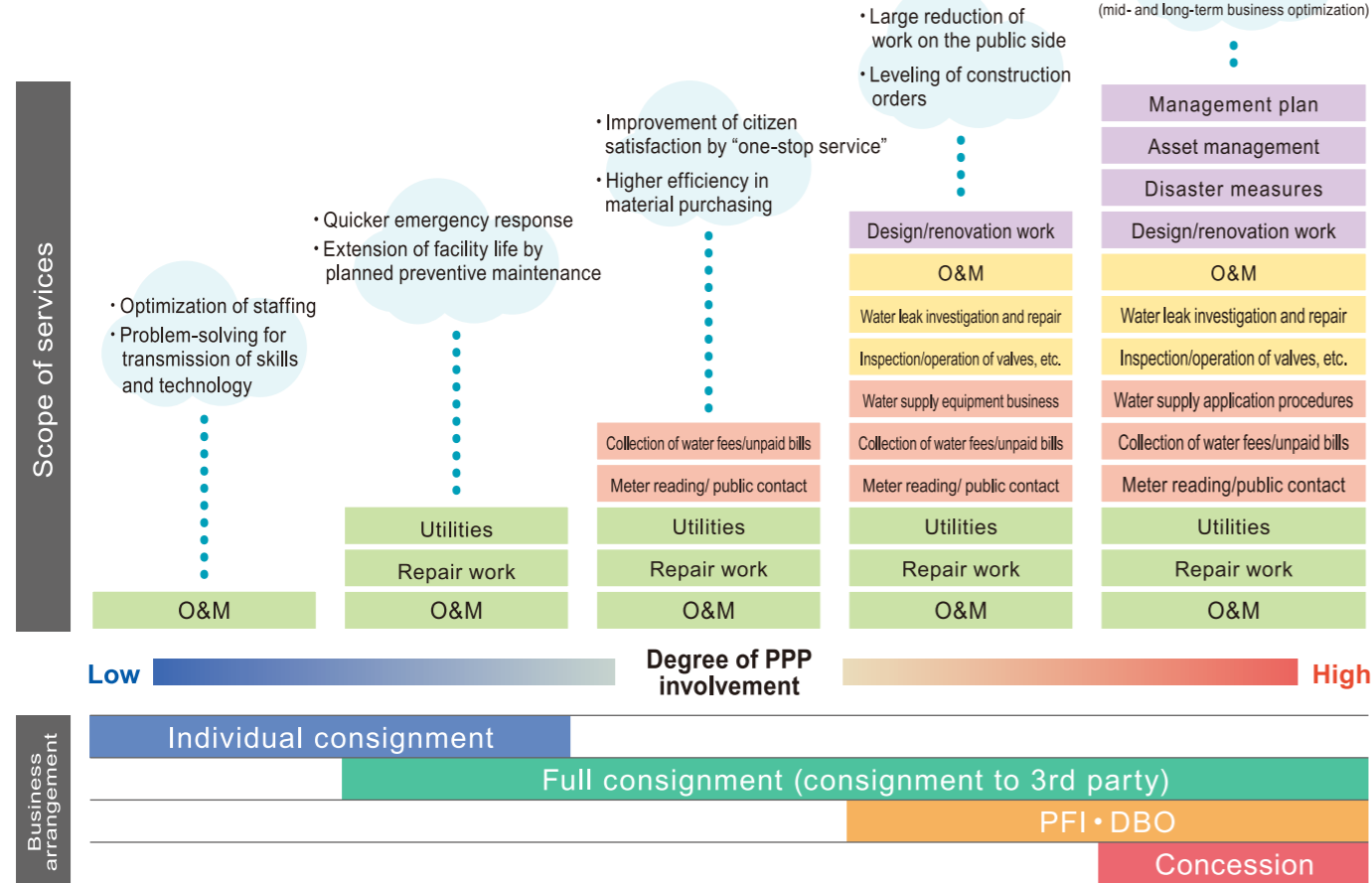
3 Meiwa Ecopark (final waste disposal site)



# PPP (Water/Sewage)

JFE Engineering proposes optimum solutions for the various issues facing PPP consortiums based on rich track record that ranges from construction and O&M of water purification plants, sewage treatment plants and water pipelines to actual business operation.

## Expansion of Public-Private Partnerships (PPP) and Assumed Merits

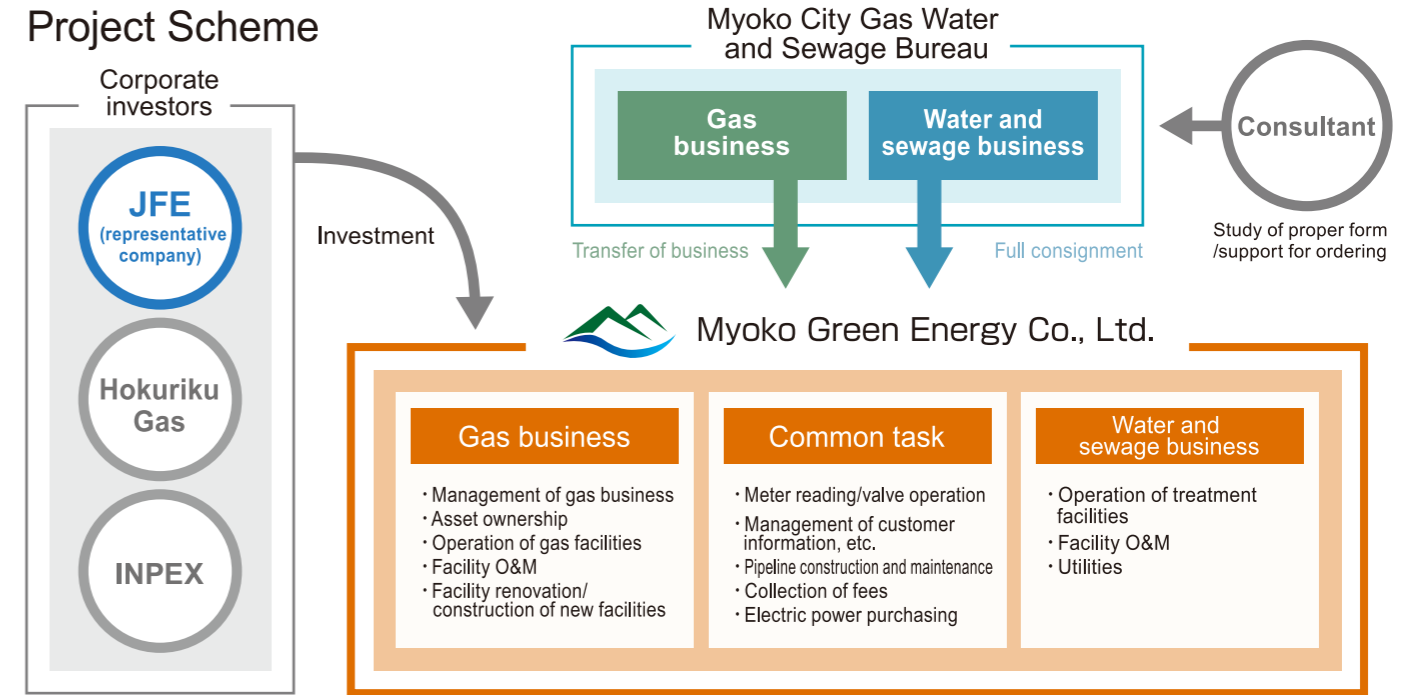


## Transfer of gas business and private-sector consignment of public water and sewage business

Based on a rich track record in gas, water and sewage projects, consortium led by JFE Engineering submitted a proposal suited to the local characteristics of Myoko City which incorporated the creativity, know-how and experience unique to the private-sector. As a result, Myoko Green Energy was established in Myoko City in August 2021 and began operation as Japan's first multi-utility business in April 2022.

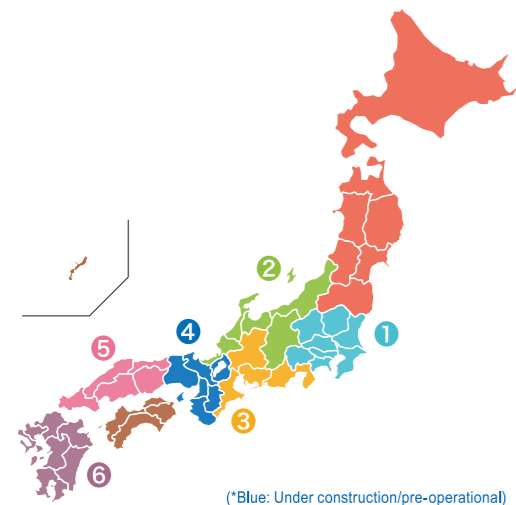
As a locally-based entity, Myoko Green Energy will provide its customers with a safe and secure lifeline. In the future, the company also plans to expand its public utility services beyond gas, water and sewage into new business areas such as retail power and renewable energy in order to contribute to the supply of better utility services and revitalization of the regional economy.

## Project Scheme



## Record of Operation of Waterworks and Sewage Related Facilities

(As of April 2021)

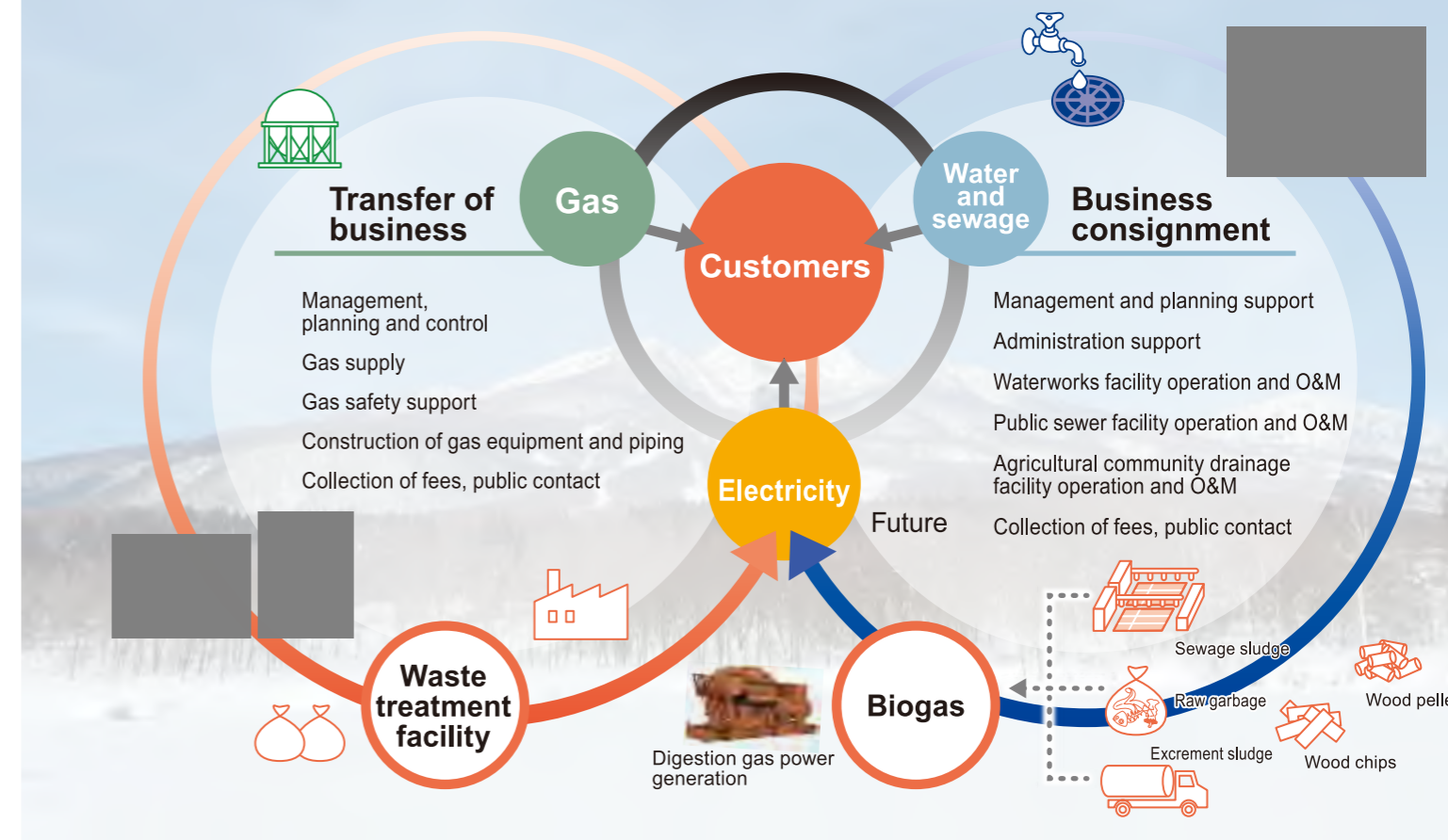


	Client / Business content	Treatment facility capacity	Facilities operated
	Yokohama City / Sludge recycling	200 t/d	Sewage
	Yokohama City / Gas power generation	900 kW x 5	Sewage
	Yokohama City / Hokubu full consignment	12,500 t/d	Sewage
①	Yokohama City / Improved soil	70 m³/h	Sewage, etc.
	Kanagawa Pref. / Hakone waterworks full consignment	20,000 m³/d	Waterworks
	Saitama Pref. / Sludge recycling	200 t/d	Waterworks
	Goka Town / Waterworks full consignment	4,050 m³/d	Waterworks
	Funabashi City / Digestion gas power generation	340.7 m³/d + 390 kW x 3	Sewage, etc.
	Nagaoka City / Biogas	65 t/d + 560 kW	Sewage, etc.
②	Tsubame City-Yahiko-mura / Waterworks full consignment	42,500 m³/d	Waterworks
	Myoko City / Waterworks & wastewater full consignment	17,930 m³/d 18,453 m³/d	Waterworks Sewage
③	Toyohashi City / Biogas	472 m³/d + 59 t/d	Sewage, etc.
④	Otsu City / Waterworks O&M	140,500 m³/d	Waterworks
	Toyonaka City / Biogas	1,000 kW x 1	Sewage, etc.
⑤	Fukuyama City / Waterworks O&M	478,200 m³/d	Waterworks
⑥	Aira City / Excrement O&M	195kt/d	Excrement

(\*Blue: Under construction/pre-operational)

## Myoko Model

First business model in Japan for integrated supply of multiple utilities





# Global Business

**132**  
projects

Incinerators  
and Gasifying  
& Melting  
Furnaces

**40**  
projects

Water & Wastewater  
Treatment Plant

**63**  
projects

Biomass  
Power  
Generation  
Plants

**154**  
projects

Heat Recovery  
Steam  
Generation  
Plants

**72**  
projects

Repair &  
Maintenance Service  
Contract Amount:  
>1 Million EUR



# Global Engineering Center

Based on each localized Engineering Centers, JFE Engineering furnishes best engineering performance expected by respective regions.

● Major engineering bases

## Standardkessel Baumgarte Group

Across-the-board engineering for power plants and incineration plants



J&M Steel Solutions



## J&M Steel Solutions

(Design and production of steel structures)

## Dongjie EnvironmentalTechnology

(Across-the-board engineering for environmental plants)

## JFE Engineering India Private Ltd.

Planning and design of waste heat recovery power plants and incineration plants



## JFE Techno Manila

(Design for all product areas)



JFE Techno Manila



Dongjie EnvironmentalTechnology

## PT. JFE Engineering Indonesia

Design and construction for energy and environmental sector



PT. JFE Engineering Indonesia



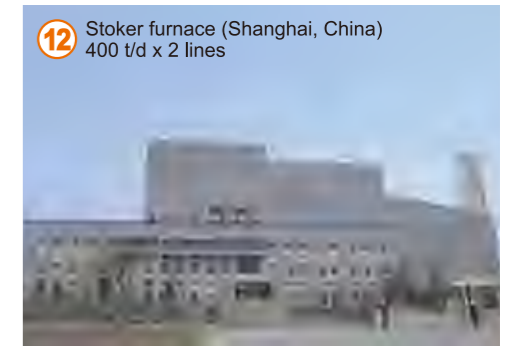
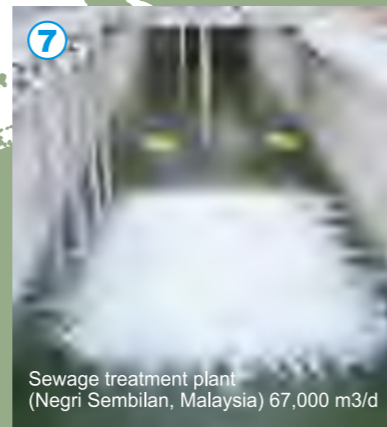
# Worldwide Track Records

## Waste to Energy, Biomass Power and HRSG Business in Europe

JFE Engineering Cooperation is developing EPC, revamping and maintenance business together with Standardkessel Baumgarte Group, in the fields of Biomass Power, Waste to Energy and Heat Recovery Steam Generation (HRSG) plants.

## Environmental Solution Business in Asia

JFE Engineering is exhaustively pursuing local needs, centering on the emerging nations of Asia, and is supplying a wide range of solutions in the fields of energy and environmental protection.



- 132 projects ● Incinerators and Gasifying & Melting furnaces
- 40 projects ● Water & Wastewater Treatment Plants
- 63 projects ● Biomass Power Generation Plants
- 154 projects ● Heat Recovery Steam Generation Plants
- 72 projects ● Repair & Maintenance Service Contract Amount: >1 Million EUR





# Standardkessel Baumgarte Group

The core competence of Standardkessel Baumgarte lies originally in the boiler technology. In recent years the group evolved from supplier of boiler plants to an Full-EPC supplier of complete power plants within and outside Europe.

## Power Plants

- Primary Fuel fired Boilers 286
- Biomass fired Boilers/ Power Plants 63
- Heat Recovery Steam Generators/ Combined Cycle Power Plants 109
- Liquid + Gaseous Residues fired Boilers 30

## Service

More than 1000 references on service incl. overhauls repairs and spare parts

## Energy from Waste

Waste to Energy Boilers/ Power Plants 120

### Standardkessel Baumgarte GmbH

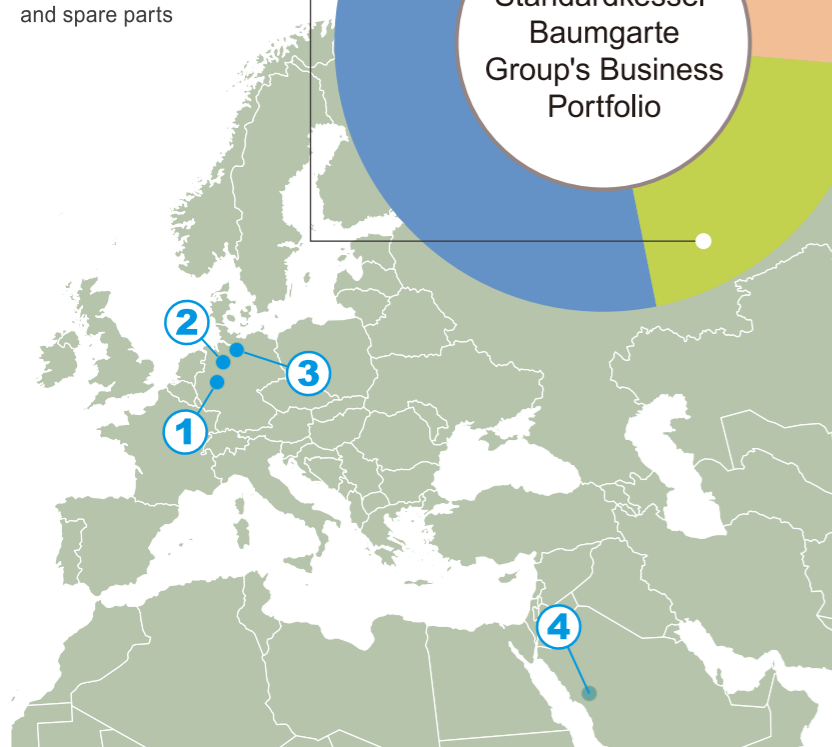
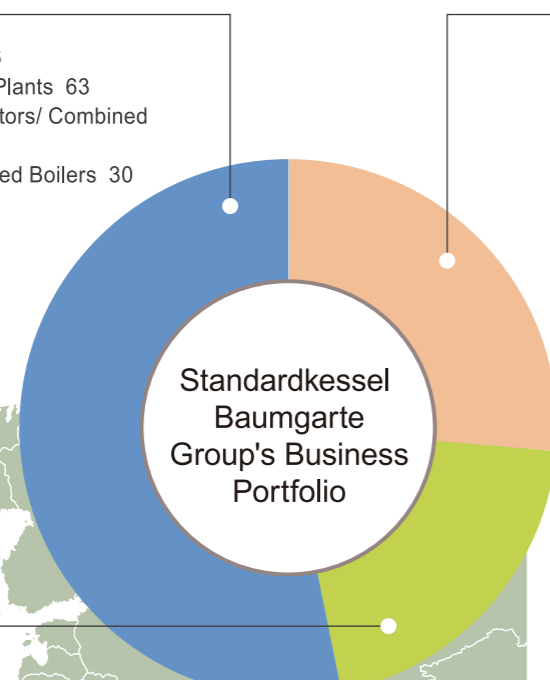
- Power Plants
  - Wissollstr. 19, 45478 Mülheim an der Ruhr, Germany
  - Senner Str. 115 • 33647 Bielefeld • Germany
- Catalytics Dept.
  - Uwestraße 12 • 22525 Hamburg • Germany

### Standardkessel Baumgarte Service GmbH

- Service
  - Wissollstr. 19, 45478 Mülheim an der Ruhr, Germany
  - Senner Str. 115 • 33647 Bielefeld • Germany

### Environment & Power Co. Ltd, SA (EPCo)

- Service
  - Jeddah, Saudi Arabia



Bielefeld



Duisburg



## Energy from Waste



Scope: Boiler Island  
Business Line: Energy from Waste

Annual incineration capacity of 270,000 tonnes for the thermal utilization of municipal waste  
80 MWth for the generation of heat to the city of Kaunas and for the public grid.

### Energy from Waste Plant at Kaunas, Lithuania

Steam Parameter: 107 t/h / 76 bar / 450 °C  
Fuel: Domestic / Industrial refuse  
Commissioning: 2020  
Scope: Boiler Island

## Power Plants



Scope: Turnkey Plants and Components  
Business Line: Liquid and gaseous residues, HRSG/CCPP, direct fired boiler (coal, gas, oil), Biomass

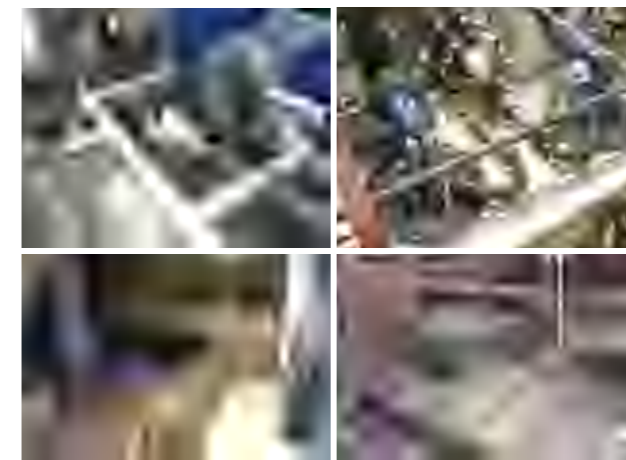
Green Energy for the Scottish Highlands

2 km burried steam line connection as heat supply to one of the most famous Single Malt Whisky Distilleries

### Speyside Biomass-Fired Power Plant, United Kingdom

Steam Parameter: 52 t/h - 510 °C - 95 bar  
Fuel: Green Wood  
Commissioning: 2016  
Scope: TurnKey Plant

## Service



Scope: All kind of service for industrial power plants

Increase of the efficiency factor by 3 % due to reduction of the waste gas temperature by means of changed eco surfaces.

### Board Mill Buchmann, Annweiler / GE, Increase in Efficiency and Refurbishment of a Steam Boiler behind Gas Turbine

Performance and operating data:  
Operating Pressure: 110 bar  
SH Steam Pressure: 525 °C  
Fresh air before Modernisation: ca. 26.0 t/h  
Fresh air after Modernisation: 45.0 t/h  
Comb. Operation before Modernisation: ca 35.0 t/h  
Comb. Operation after Modernisation: 65.0 t/h



# Renewable Energy





# Biomass

## Biomass Power Plants

JFE Engineering supplies total plants, from fuel storage/charging to flue gas/ash treatment equipment.

JFE Engineering's wood biomass plant comprises a CFB (circulating fluidized bed) boiler, steam turbine-generator, storage and material handling equipment, etc. This system can use a wide range of solid fuels with different properties, and can combust those fuels efficiently. It is also an environment-friendly system which can achieve self-reduction of emissions such as NOx, SOx, etc.

### 1 Fluidized bed furnace

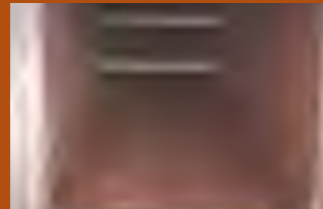
Has a rectangular, vertical shape with a narrowed lower part. Fuel and bed material are supplied to the bottom, and are fluidized by primary air from the bottom and secondary air from the intermediate part. Scattered unburned fuel and bed material are recovered by a cyclone and recirculated to the furnace again. Relatively long residence combustion period enable desulfurizing effectively in the furnace by limestone injection. Thermal NOx can also be suppressed by low temperature combustion.



Furnace Bottom

### 2 In-furnace wall-type heating tubes (wing panel)

The combustion temperature and steam temperature are optimized by arranging wall-type heating tubes (wing panels) in the intermediate stage of the furnace as necessary. The wing panels have high durability against abrasive condition in the CFB furnace.



Interior of furnace

### 3 Membrane Water wall

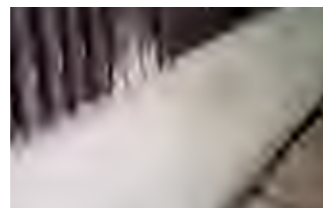
The CFB furnace and also second pass are surrounded by membrane water wall. This design secures high air-tightness and heat conduction, and also reduces heat loss due to radiation.



Membrane wall

### 4 Superheater

The selection of material and optimal arrangement of the superheaters are adopted based on the properties of the biomass fuel, the composition of the combustion gas and actual results with various types of waste heat boilers.

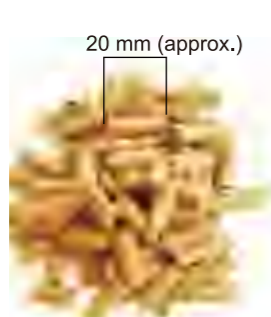


Wing panels(superheaters)

### High adaptability with diverse type of biomass fuel



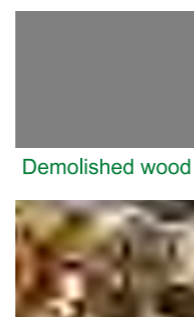
Wood waste  
50 mm (approx.)



Wood pellet  
20 mm (approx.)



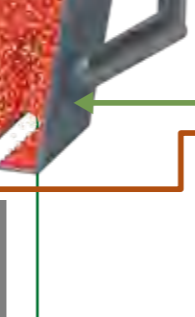
PKS (palm kernel shell)  
20 mm (approx.)



Demolished wood

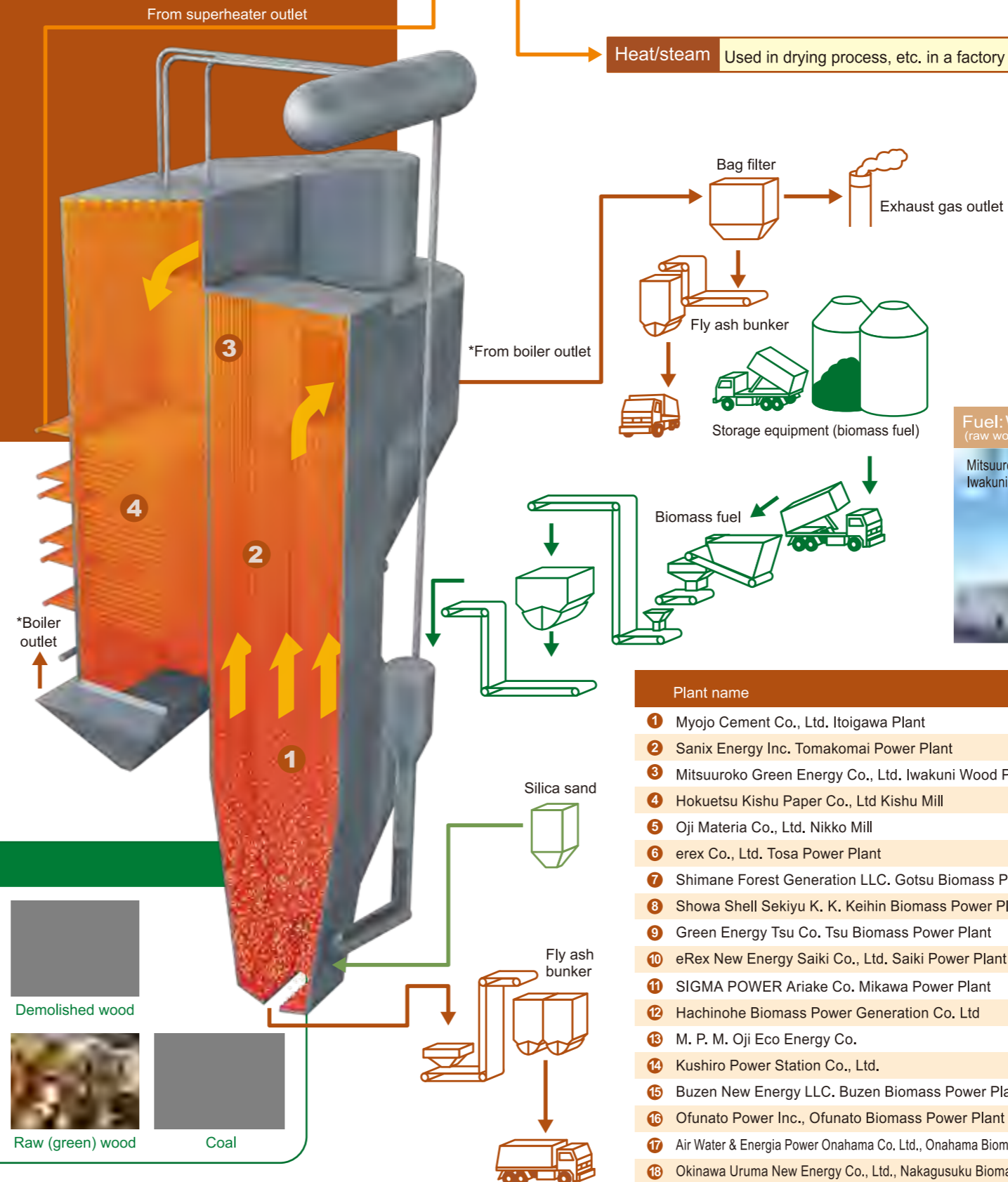


Raw (green) wood



Coal

## Circulating Fluidized Bed Boiler



Fuel: Wood waste, PKS

Shimane Forest Generation LLC  
Gotsu Biomass Power Plant



Fuel: Wood waste, waste plastics, coal

Hokuetsu Kishu Paper Co., Ltd  
Kishu Mill



Fuel: Wood biomass  
(raw wood, construction waste) 100%

Mitsuuroko Green Energy Co., Ltd.  
Iwakuni Wood Power Plant



Fuel: PKS 100%

erex Co., Ltd. Tosa Power Plant



Plant name	Steam generation rate/Scale of power generation	Start of operation
1 Myojo Cement Co., Ltd. Itoigawa Plant	95 t/h·19 MW	1997
2 Sanix Energy Inc. Tomakomai Power Plant	180 t/h×2 boilers	2002
3 Mitsuuroko Green Energy Co., Ltd. Iwakuni Wood Power Plant	45 t/h·10 MW	2005
4 Hokuetsu Kishu Paper Co., Ltd Kishu Mill	130 t/h	2008
5 Oji Materia Co., Ltd. Nikko Mill	75 t/h	2008
6 erex Co., Ltd. Tosa Power Plant	75 t/h·20 MW	2013
7 Shimane Forest Generation LLC. Gotsu Biomass Power Plant	52.7 t/h·12.7 MW	2015
8 Showa Shell Sekiyu K. K. Keihin Biomass Power Plant	179 t/h·49 MW	2015
9 Green Energy Tsu Co. Tsu Biomass Power Plant	85 t/h·20 MW	2016
10 eRex New Energy Saiki Co., Ltd. Saiki Power Plant	200 t/h·50 MW	2016
11 SIGMA POWER Ariake Co. Mikawa Power Plant	185t/h	2017
12 Hachinohe Biomass Power Generation Co. Ltd	56t/h/12.4MW	2018
13 M. P. M. Oji Eco Energy Co.	235t/h/74.95MW	2019
14 Kushiro Power Station Co., Ltd.	370t/h/112MW	2020
15 Buzen New Energy LLC. Buzen Biomass Power Plant	230t/h/74.95MW	2020
16 Ofunato Power Inc., Ofunato Biomass Power Plant	235t/h/75MW	2020
17 Air Water & Energia Power Onahama Co. Ltd., Onahama Biomass Power Plant	229 t/h / 75 MW	2021
18 Okinawa Uruma New Energy Co., Ltd., Nakagusuku Biomass Power Plant	187 t/h / 49 MW	2021



# Solar

## Photovoltaic power generation

### Photovoltaic Power Generation Plants

JFE is proud of the abundant Solar Power Plant construction results.

Solar power, a representative type of clean energy which has increased rapidly nationwide since July 2012, when Japan introduced a feed-in tariff (FIT) system for electric power. The JFE Engineering Group has carried out a cumulative total of more than 130 mega-solar construction projects with a total capacity exceeding 600 MW.\*

\*Capacity share in mega-solar plants with an equipment capacity of 1 MW or more in operation by March 31, 2017. Estimate based on data of the Japan Photovoltaic Energy Association (JPEA).



Haga Solar Power



Tsurunoura Solar Power



Miho Solar Power

#### EPC orders received

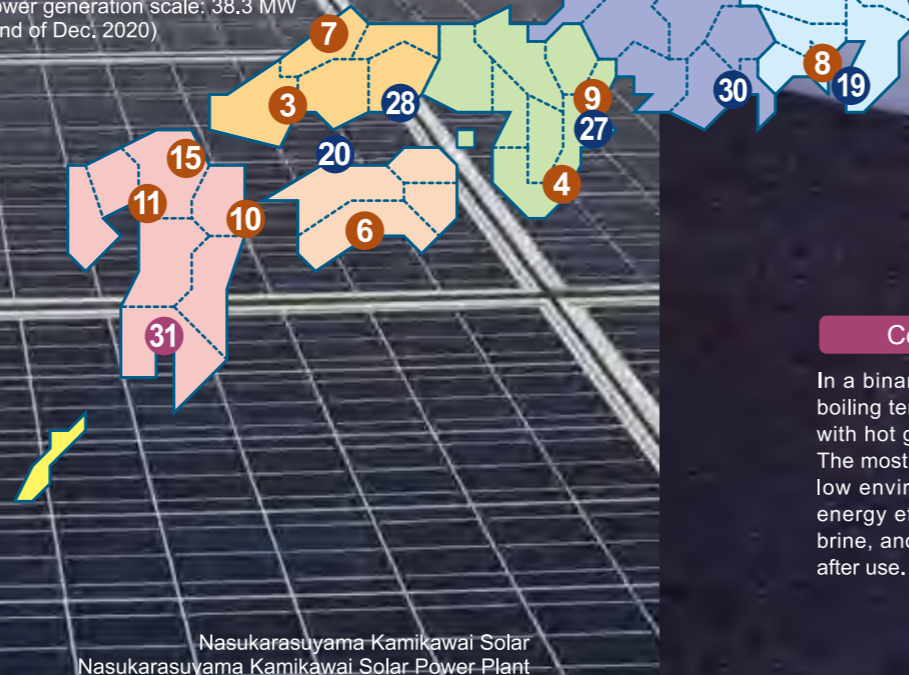
Plant name	Plant Capacity	Start of operation
17 JXTG Nippon Oil & Energy Corporation Akita Mega Solar Power Plant	4.0 MW	2014
18 Rakuten Trust Co.,Ltd. Scimes Noboribetsu Solar Power Plant	2.8 MW	2014
19 Chiba Shine Energy Co.,Ltd. Futtsushi Minato Mega Solar Power Plant	2.8 MW	2015
20 Saijo Komatsu Solar Power Plant Joint Management Business Association Saijo Komatsu Solar Power Plant	33.9 MW	2015
21 Sunny Health Co.,Ltd. Sunny Solar Fukushima Central Solar Power Plant	26.2 MW	2015
22 SGET Kushiro Mega Solar LLC SGET Kushiro Tsuruno Mega Solar Power Plant	21.7 MW	2015
23 T&J Power Plant Co., Ltd. Oirase Solar Power Plant	2.4 MW	2015
24 Nippon Renewable Energy K.K. NRE Mito Yatsu Solar Power Plant	36.0 MW	2016
25 SGET Kurihara Mega Solar LLC SGET Kurihara Takashimizu Mega Solar Power Plant	15.1 MW	2017
26 SGET Tochigi Mega Solar LLC SGET Tochigi Mega Solar Power Plant	22.0 MW	2017

Total of 137 including the above.  
Total power generation scale: 600 MW  
(As of end of Dec. 2020)

#### Construction for JFE solar power business

Plant name	Plant Capacity	Start of operation
27 JFE Solar Power Tsu Co.,Ltd. Kumozu Solar Power	3.8 MW	2013
28 JFE Solar Power Kurashiki Co.,Ltd. Tsurunoura Solar Power	6.8 MW	2013
29 JFE Solar Power Haga Co.,Ltd. Haga Solar Power	12.5 MW	2014
30 JFE Solar Power Shimizu Co.,Ltd. Miho Solar Power	9.3 MW	2014

Total of 8 plants including the above.  
Total power generation scale: 38.3 MW  
(As of end of Dec. 2020)



Nasukarasuyama Kamikawai Solar  
Nasukarasuyama Kamikawai Solar Power Plant

## Geothermal power generation



Medipolis Energy, Ltd.  
Medipolis Ibusuki Power Plant

Plant name	Scale of power generation	Start of operation
31 Medipolis Energy, Ltd. Medipolis Ibusuki Power Plant	1500 kW	2015
32 Tsuchiyu Onsen Energy Co. Tsuchiyu Hot Spring No. 16 Wellhead Binary Power Plant	400 kW	2015
33 Iwate Geothermal Power Co., Ltd. Matsuo-Hachimantai Geothermal Power Plant	7,499 kW	2019

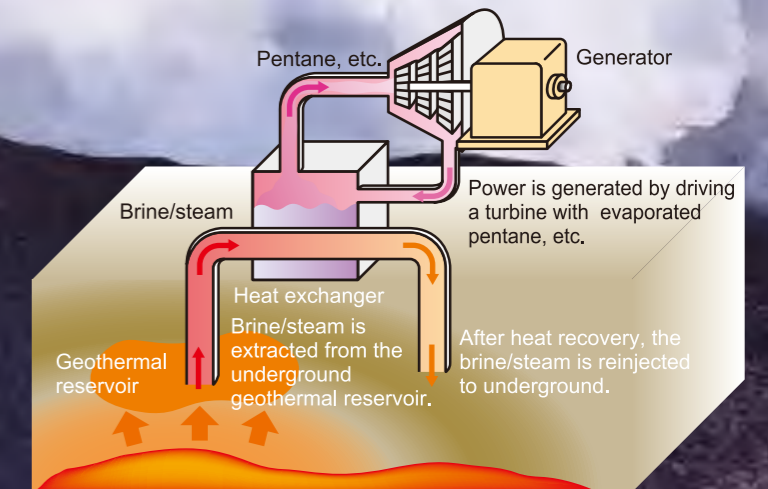
# Geothermal

Contributing to the acceleration of geothermal power generation development with binary power generation.

Geothermal power is drawing public attention as a stable clean electric power source. Japan ranks in the world's top 3 countries in geothermal resources, and more than 97% of its resources are still unused. Thus, geothermal energy has extremely high potential for future. Since the startup of Japan's first commercial geothermal power plant (Matsukawa Geothermal Power Plant) in 1966, JFE Engineering has delivered the steam production equipment for more than half of the main geothermal power plants in Japan. In 2010, JFE added binary power generation equipment to its product lineup under a business cooperation agreement with the American company Omat International, Inc.

#### Concept of binary power generation

In a binary power generation system, motive fluid, which boiling temperature is lower than that of water, evaporates with hot geothermal fluids and drives a turbine generator. The most important feature of binary power generation is its low environmental burden, as this is a system with high energy efficiency and can utilize not only steam but also brine, and all the brine/steam is reinjected to underground after use.



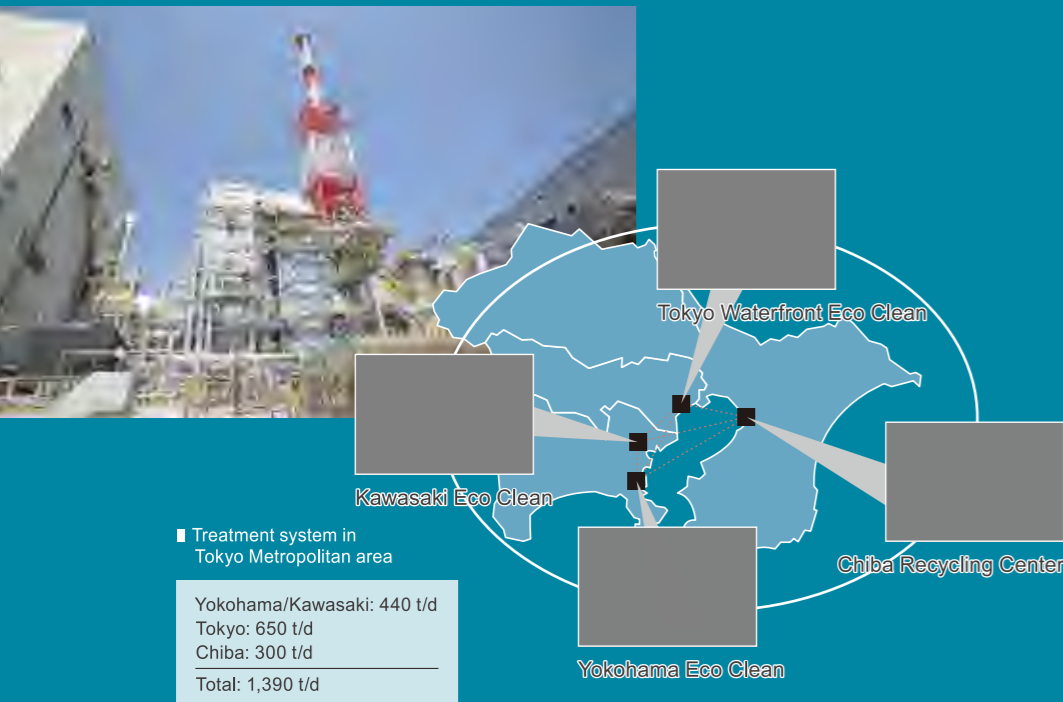


# Group Companies

## J&T Recycling Corporation

The J&T Recycling Group is contributing to the creation of a better global environment by promoting environmental and recycling businesses with state-of-the-art technologies.

In addition to the Tokyo Metropolitan area, J&T Recycling also has facilities in Sapporo, Sendai, Tsu and Fukuyama. J&T Recycling responds to the needs of customers with a wide recycling menu and a foolproof network system.



### J&T Recycling Corporation

**Kawasaki Head Office**  
 Solid Square Bldg. East 9 F, 580 Horikawa-cho, Saiwai-ku, Kawasaki City, Kanagawa Pref. 212-0013  
 TEL: +81-44-330-9480  
 FAX: +81-44-511-1500  
 URL : <https://www.jt-kankyo.co.jp/>

- Total recycling business**
- ◆ Incinerators, melting furnaces and power generation
  - ◆ Treatment of waste liquids and sludge
  - ◆ Fluorescent lamp recycling
  - ◆ Solid waste treatment
  - ◆ Disposal of confidential information media
  - ◆ PET bottle recycling
  - ◆ Container and packaging plastics recycling
  - ◆ Recycled plastic pallets
  - ◆ Waste plastic recycling as raw materials & fuel
  - ◆ Household electrical appliance recycling
  - ◆ Food waste recycling
  - ◆ Waste collection / Transportation

## J&T Recycling Group

Providing total solutions utilizing the J&T Group network.

### JFE Urban Recycle Corporation

6-1 Mizue-cho, Kawasaki-ku, Kawasaki City, Kanagawa Pref.  
 Household electrical appliance and OA recycling  
 ■ Capacity: Crushing capacity 79 t/d  
 ■ Target: Used household electrical appliances, personal computers and OA equipment



Household Electrical Appliance Recycling Plant

### J Bio Food Recycle Co., Ltd.

Head office: 3-1 Benten-cho, Tsurumi-ku, Yokohama City, Kanagawa Pref.  
 Plant: 2-1-5 Suehiro-cho, Tsurumi-ku, Yokohama City, Kanagawa Pref.  
 Food waste recycling  
 ■ Generating capacity: Approx. 11,000 MWh/y, waste receiving capacity: 80 t/d  
 ■ Target: Raw garbage (general waste), animal and plant residue (industrial), sludge (industrial)



Yokohama Plant

### Sapporo Bio Food Recycle Corporation

45-53 Nakanuma-cho, Higashi-ku, Sapporo City, Hokkaido Pref. (in Sapporo Recycling Complex)  
 Food waste recycling  
 ■ Generating capacity: Approx. 1,000 MWh/y, waste receiving capacity: 68 t/d  
 ■ Target: Raw garbage (commercial general waste)



Sapporo Plant

### Kyoei J&T Recycling Corporation

1 Kumozu Kokan-cho, Tsu City, Mie Pref. (on grounds of JFE Engineering Tsu Works)  
 PET bottle recycling  
 ■ Capacity: 180 t/d (planned)  
 ■ Target: Used PET bottles



West Japan PET Bottle MR Center

### Tohoku Bio Food Recycle Co., Ltd.

Plot 26-1 in Land Readjustment Project Area, Northern Gamo Area Disaster Reconstruction Zone, Miyagino-ku, Sendai City, Miyagi Pref.  
 Food waste recycling  
 ■ Capacity: 40 t/d (planned)  
 ■ Target: Food waste

Planned start of operation, Spring 2022



Sendai Plant

### Dia Ecotech Hiroshima

5-1 Ebaoki-machi, Naka-ku, Hiroshima City, Hiroshima Pref.  
 Container and packaging plastics recycling  
 ■ Capacity: 80 t/d  
 ■ Target: Plastics subject to Japan's Container and Packaging Recycling Law



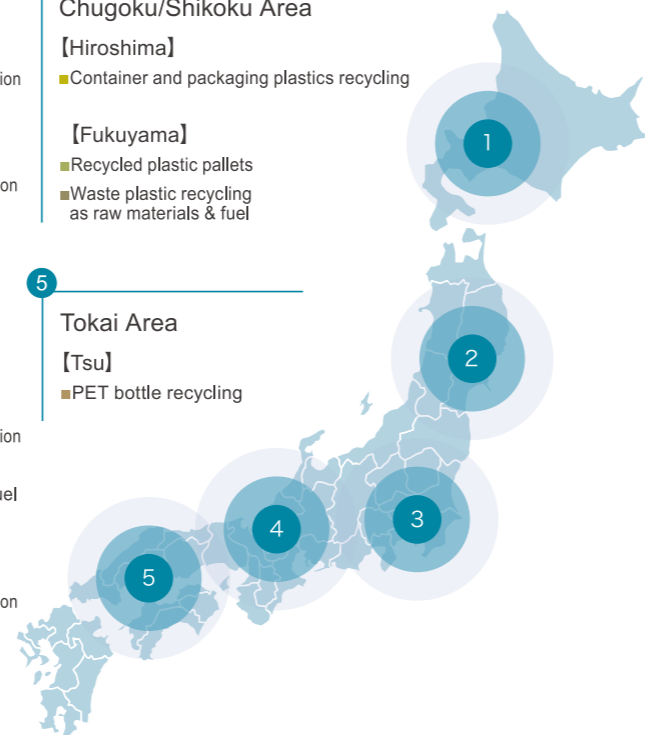
Dia Ecotech Hiroshima

### ■ Main Facilities

- 1 Hokkaido**  
 [Sapporo]  
 ■ Food waste recycling
- 2 Tohoku Area**  
 [Sendai]  
 ■ Fluorescent lamp recycling  
 ■ Disposal of confidential information media  
 ■ Container and packaging plastics recycling  
 ■ Recycled plastic pallets  
 ■ Waste plastic recycling as raw materials & fuel  
 ■ Food waste recycling

- 3 Kanto Area**  
 [Tokyo]  
 ■ Incinerators, melting furnaces and power generation  
 ■ Disposal of confidential information media  
 [Yokohama]  
 ■ Incinerators, melting furnaces and power generation  
 ■ Treatment of waste liquids and sludge  
 ■ Fluorescent lamp recycling  
 ■ Dry cell and storage battery recycling  
 ■ Solid waste treatment  
 ■ Container and packaging plastics recycling  
 ■ Food waste recycling  
 [Kawasaki]  
 ■ Incinerators, melting furnaces and power generation  
 ■ PET bottle recycling  
 ■ Waste plastic recycling as raw materials & fuel  
 ■ Household electrical appliance recycling  
 [Chiba]  
 ■ Incinerators, melting furnaces and power generation  
 ■ Food waste recycling

- 4 Chugoku/Shikoku Area**  
 [Hiroshima]  
 ■ Container and packaging plastics recycling  
 [Fukuyama]  
 ■ Recycled plastic pallets  
 ■ Waste plastic recycling as raw materials & fuel
- 5 Tokai Area**  
 [Tsu]  
 ■ PET bottle recycling





# Group Companies

## JFE Environment Technology Co., Ltd.

### Creating a better living environment

The JFE Environment Technology Group is contributing to the sustainable development of local communities through the conservation of the global environment and recycling of local resources.

We provide integrated environmental technologies from design, procurement and construction of environmental facilities to operational management and maintenance.

#### ■Main Environmental Facilities

##### Municipal solid waste treatment

- ◆ Gasification & melting furnaces
- ◆ Fluidized bed/stoker type incinerators
- ◆ Recycling plazas
- ◆ PCB treatment facilities
- ◆ Chemicals supply

##### Waste water treatment

- ◆ Waterworks and sewerage, rural sewage, leachate treatment facilities
- ◆ Sludge recycling facilities, night soil and septic tank sludge treatment facilities
- ◆ Membrane filter and Chemicals supply

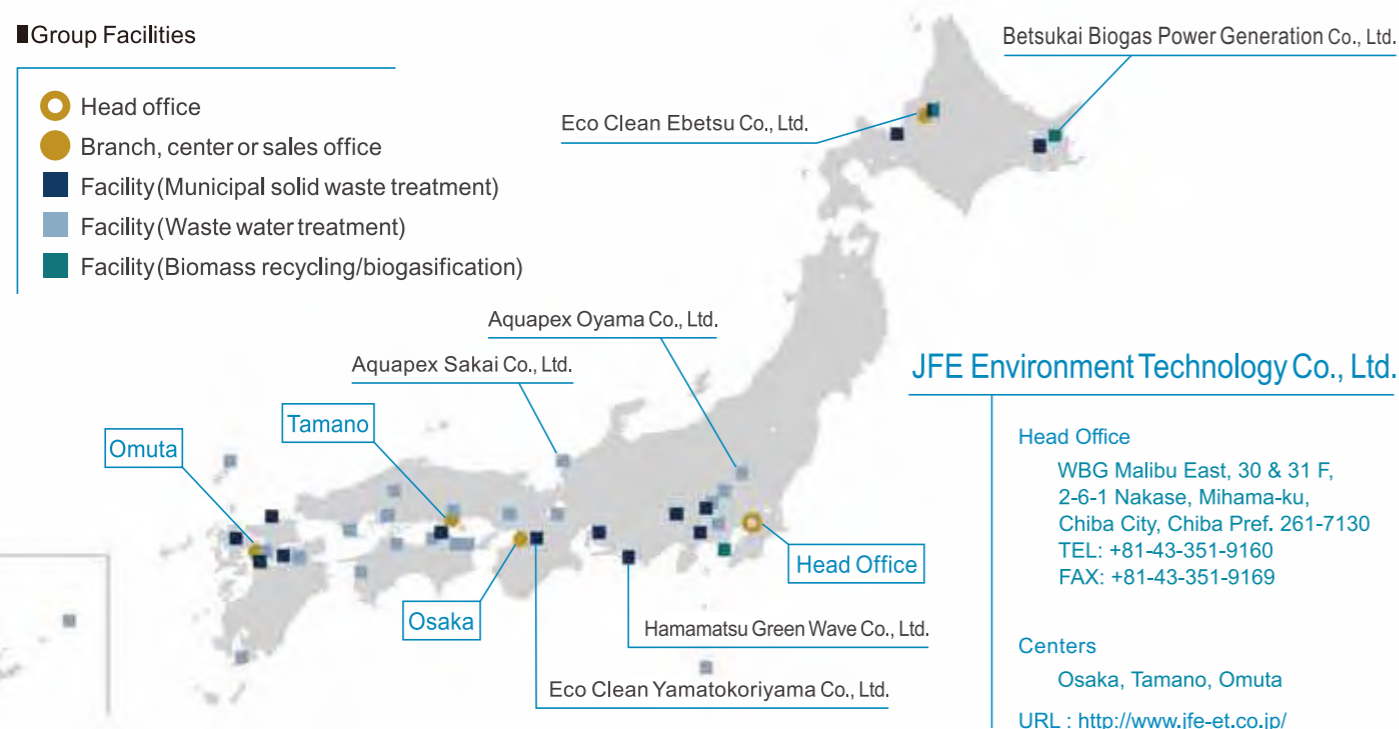
##### Biomass recycling/biogasification

- ◆ Methane fermentation facilities
- ◆ Biomass recycling facilities
- ◆ Feed conversion facilities



#### ■Group Facilities

- Head office
- Branch, center or sales office
- Facility (Municipal solid waste treatment)
- Facility (Waste water treatment)
- Facility (Biomass recycling/biogasification)



**Head Office**  
 WBG Malibu East, 30 & 31 F,  
 2-6-1 Nakase, Mihama-ku,  
 Chiba City, Chiba Pref. 261-7130  
 TEL: +81-43-351-9160  
 FAX: +81-43-351-9169

**Centers**  
 Osaka, Tamano, Omuta  
 URL : <http://www.jfe-et.co.jp/>

## Other Group Companies



### JFE Environmental Service Corporation

3 Benten-cho, Tsurumi-ku, Yokohama 230-0044, Japan  
 TEL. 045(502)2226 FAX. 045(506)2709  
 URL: <http://www.jfe-esc.co.jp>

- ◆ Operation and maintenance of waste treatment facilities, water treatment facilities, mechanical plants and their auxiliary equipment.
- ◆ Recycling business of solidified molten material made from waste etc.
- ◆ Business related to treatment and recycling of waste and sales of its recycled products.
- ◆ Planning, design, manufacturing, sales, repair and construction service for waste treatment facilities, water treatment facilities, machinery plants and their auxiliary equipment.



### JFE Aqua Machine and Service Corporation

1450 Ryoke, Kakegawa, Shizuoka 436-0038, Japan  
 TEL. 0537(24)5531 FAX. 0537(24)5518  
 URL: <http://jfe-jms.co.jp>

- ◆ Maintenance related to drinking water purification facilities.
- ◆ Manufacture of water treatment-related equipment
  - Chemical injection equipment
  - Membrane treatment systems
  - Residual chlorine analyzers
  - Telescopes, etc.

### <http://www.ecobeing.net/> Environmental website "ecobeing"

The JFE Group supports the environmental website "ecobeing."  
 "ecobeing" features diverse contents, and aims to be a website which is useful in enlightenment activities for a wide range of people.

