1.Environmental Plant Business

Strengthening our value chain and supplying facilities that create new value

Hidetoshi Tomita
Executive Officer
Executive Manager, Environmental Plant Division

We receive orders for a broad range of services, from construction to maintenance.

Since constructing Japan's first fully continuous mechanical Energy from Waste plant in 1963, Takuma has delivered Energy from Waste plants for more than half a century as a leading company in its industry. To date, we've delivered more than 360 plants in Japan, including Energy from Waste plants with some of the largest processing capacities in Japan (at 1,800 tons per day) and methane gasification facilities.

During FY2018, we received two orders for new municipal solid waste treatment plants, one for the Osaka City・Yao City・Matsubara City Environment Facilities Association (located in Osaka Prefecture), and one for the Ariake Living Environment Facilities Association (located in Fukuoka Prefecture). We also received a total of four orders for primary equipment improvement work and equipment renovation work for customers including the Oshima District Cooperative of Municipal Solid Waste Management (located in Hokkaido Prefecture) and the City of Hitachiota (located in Ibaraki Prefecture). We also received orders for overhaul work, regular adjustment, and maintenance inspections from local governments, and we're working hard to maintain plant performance and stable operation.

We're seeing steady growth in orders for filtration systems.

Takuma also has more than 50 years of experience in water treatment, another key aspect of the Environmental Plant Business. Our products excel particularly in advanced wastewater treatment technologies, and we've delivered numerous upflow moving-bed filtration systems (Uniflow Sand Filter).

During FY2018, we received orders for sand filtration systems and other products, and order volume is generally in line with our goals for the first year of the current Medium-Term Management Plan.

We're helping build a sustainable society.

Noteworthy accomplishments during FY2018 included receipt of the Grand Prix, the most prestigious award at the Association for Resilience Japan's Japan Resilience Award (Resilience Grand Prize) 2019, together with Imabari City (Ehime Prefecture), NPO Imabari Center, and Imabari High Trust Co., Ltd. The accolade recognized advanced and extensive disaster prevention initiatives carried out by the four partners at the Imabari City Waste Management Center, a facility that we delivered in FY2017.

In this way, we will continue to supply safe facilities that inspire peace of mind and comfort on the part of local residents, enhance operations and service, and strengthen our value chain in areas such as plant maintenance and operation.

The United Nations Sustainable Development Goals were adopted in 2015, and the Paris Agreement came into force in 2016. Going forward, Takuma will work to help build a sustainable society by striving to reduce its environmental impacts.

Business topics

Receiving the Japan Resilience Award (Resilience Grand Prize) 2019 Grand Prix

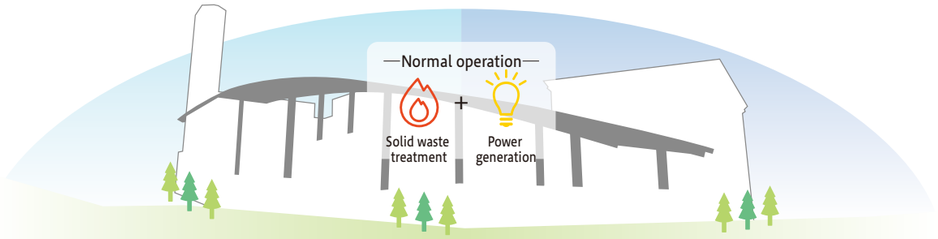
The Imabari City Waste Management Center, which received the Japan Resilience Award (Resilience Grand Prize) 2019, incinerates solid waste from about 160,000 residents of the city of Imabari and uses the resulting thermal energy to generate electricity. The plant is the first solid waste treatment facility in Japan to adopt the "Phase Free" concept, allowing it to function as a place where residents can gather and enjoy interaction with other members of the community during times of normal operation and as a designated evacuation center where residents can seek refuge in times of disaster. The facility has incorporated procedures such as disaster prevention training and evacuation center operation into its operation in order to ensure it can serve as a space where residents can evacuate with peace of mind in the immediate aftermath of a disaster.

The plant received the Grand Prix in recognition of these advanced and extensive disaster prevention initiatives.

* Japan Resilience Awards
The Japan Resilience Awards recognize advanced companies and organizations that have undertaken activities, technology or product development programs, or other initiatives to help make their country, region, people, or industry more resilient in an effort to build a next-generation society that is resistant to the effects of disasters.

At the award ceremony

Imabari City Waste Management Center
Phase Free initiative



Always (normal operation)
- Waste treatment
- Environment awareness-raising activities
- Events
- Supply of power to the community
- Resident activities
- Communication of facility information

In times of emergency (natural disasters)
- Continuation of waste treatment
- Disaster waste treatment
- Evacuation center
- Supply of power to evacuees centers
- Provision of space for evacuees
- Communication of disaster information

The facility's gym is used for resident activities.

The facility supports events by local NPOs.

The gym can be used as an evacuation center.

The facility supports evacuation center operation by local NPOs.

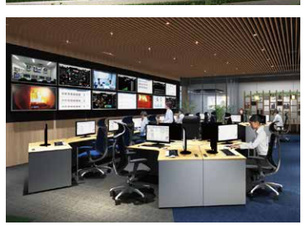
Equipment-focused initiatives (Resilient facilities and equipment)　Organizational initiatives (Personnel support and community development)

Opening Solution Lab, a next-generation facility that utilizes ICT

Since opening in 2004, Takuma's Comprehensive Operation Support Center has provided remote monitoring and operational support for municipal solid waste treatment facilities. In 2019, we opened the Solution Lab with the goal of further enhancing the Center's functionality by augmenting the expertise it's accumulated to date with use of operational and maintenance management data obtained by means of the latest information and communications technologies (IoT, "Big Data," and AI). As a result, it is able to offer optimal, high-quality operational support services in partnership with group company Takuma Technos.

The Solution Lab will move to the sixth floor of the tentatively named Takuma Building New Wing (Training Center)*, which is being built at our Head Office campus.

* The Takuma Building New Wing, which is scheduled to be completed in October 2020, is a six-story, next-generation wood structure built using cross-laminated timber (CLT) and fireproof laminated wood. The structure was selected as part of the Ministry of Land, Infrastructure, Transport and Tourism's FY2018 Sustainable Building Leading Program (Leading Wood Structures).



Three roles of the Solution Lab

Operation and maintenance support	Customer issue resolution and research	Human resources development and technology training

(Related SDGs)

Municipal Solid Waste Treatment Plant Business

Municipal solid waste treatment plants built recently are required to offer far-reaching performance and functionality, including increased generating efficiency and recycling rates, reduced greenhouse gas emissions, enhanced facility resilience, and longer service lives.

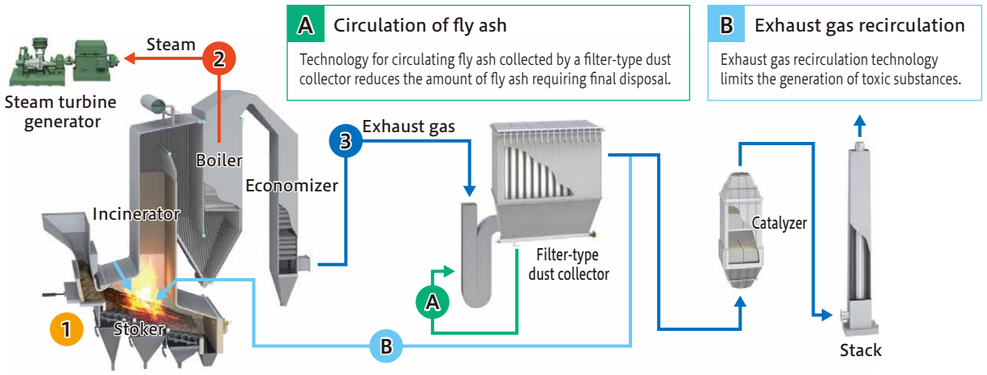
To meet precisely these demands from society and customers, Takuma delivers safe facilities that inspire peace of mind by taking maximum advantage of the advanced technologies and expertise that have been fostered by its extensive track record of projects.

Plant construction

Stoker-type incinerators

Energy from Waste plants must process waste in a safe and stable manner. Takuma stoker-type incinerators, which are one of our flagship products, excel at safe, stable combustion and generate lower CO_2 emissions than other designs that require auxiliary fuel.

By combining a stoker-type incinerator with other technologies such as high-efficiency power generation and advanced exhaust gas treatment, we're helping municipalities around Japan solve their solid waste treatment issues.



A Circulation of fly ash

Technology for circulating fly ash collected by a filter-type dust collector reduces the amount of fly ash requiring final disposal.

B Exhaust gas recirculation

Exhaust gas recirculation technology limits the generation of toxic substances.

1 Incineration of solid waste

- Solid waste introduced into the incinerator burns at a temperature of 850°C or higher as it moves on the stoker (a step grate stoker system).

2 Use of steam

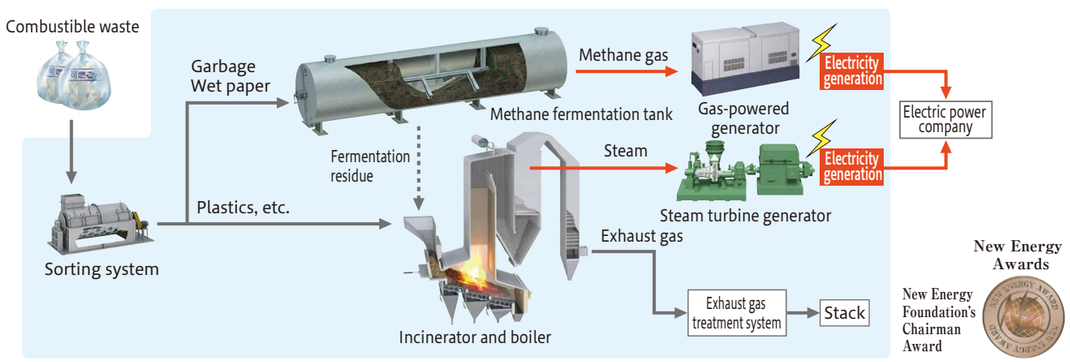
- Heat produced during the incineration process is recovered by the boiler and economizer and used to produce steam, which flows through a steam turbine generator to generate electricity.
- Steam also serves as a heat source for hot water, heating, cooling, and other uses in the plant and nearby facilities.

3 Processing of exhaust gas

- Toxic substances in exhaust gas flowing out of the boiler and economizer are removed by a filter-type dust collector and catalyzer so that they do not remain in smoke generated by the plant.

Methane recovery plants

Recently the Ministry of the Environment has been encouraging the introduction of methane recovery plants for use with municipal solid waste. This is an area where Takuma is helping further lower CO_2 emissions with a combined system of methane fermentation and incineration for municipal solid waste to recover the maximum amount of energy from the waste treatment and utilize it in high-efficiency power generation. (The system received the New Energy Foundation's Chairman Award at the FY2014 New Energy Awards.)



Primary equipment improvements

Municipal solid waste treatment plants must operate for extended periods of time, but their equipment must be updated once 20 or more years have passed since the start of operation. In addition, changes to applicable laws and social conditions may necessitate large-scale modifications.

Takuma draws on the sophisticated heat utilization technologies and energy-saving technologies it has accumulated as a boiler and environmental plant manufacturer to carry out high-value-added and large-scale renovation projects. In this way, we are able to help extend facilities' service life while lowering CO_2 emissions.

Example of a primary equipment improvement project

Measures to recover energy

Improvement of heat recovery

- Installing boilers on water-injection furnaces
- Expanding boilers' heating surface

Improvement of steam turbine capacity

Improving generating capacity by increasing steam intake capacity and optimizing design features

Enhancement of combustion equipment efficiency

Improving stable combustion by changing furnace shape and stabilizing the volume of steam generation and power generation

Measures to save energy

Control changes

Introducing inverters for speed and airflow control

Raising efficiency

Raising the efficiency of electric machinery and other components

Maintenance

Annual maintenance is essential in order to ensure stable operation of municipal solid waste treatment plants. Maintenance demands both sophisticated technological capabilities and experience, both because waste treatment plants draw on a range of expertise and because the manner in which their equipment deteriorates over time varies with the properties of the waste they process. Takuma takes maximum advantage of its accumulated expertise to contribute to stable waste treatment and long-term facility operation by developing long-term repair plans, carrying out elaborate site investigations, and then performing maintenance that has been optimized in terms of both timing and content.

Repairing an incinerator's refractory

Maintaining a conveyor

Long-term turnkey operation business

The long-term turnkey operation business, in which customers enter into contracts covering both operation and maintenance management for a term of 10 to 20 years, has become the most common approach in the industry in recent years, for example in the form of DBO projects. The Takuma Group operates many facilities using this approach.

We've been introducing **POCSYS**®, a comprehensive operation, maintenance, and management support system that we developed in FY2016, to these facilities in an effort to improve our operation and maintenance management services. Furthermore, we're offering additional support for operation while helping customers resolve issues by using data collected from facilities we operate by the Solution Lab (see page 26).

We will continue to meet the needs of customers and society by making maximum use of the Takuma Group's technologies and expertise, including maintenance management expertise accumulated by Takuma and operational management expertise accumulated by Group company Takuma Technos.

Operated facility

- Operating data
- Inspection data
- Maintenance data

Increasing the quality of our operation, maintenance, and management services

- Implementation of safe and sophisticated operation
- Streamlining of maintenance and management
- Optimization of utility use and power income/expenditures

Aggregation of data

Utilization of system functionality and provision of technical support

Takuma, Takuma Technos

POCSYS® **integrated server**

Central management and accumulation of a range of data types

- Statistical analysis of data and machine learning
- Evaluation of equipment performance and failure prediction
- Visualization of service level and study of reductions etc.

Solution Lab

(Related SDGs)

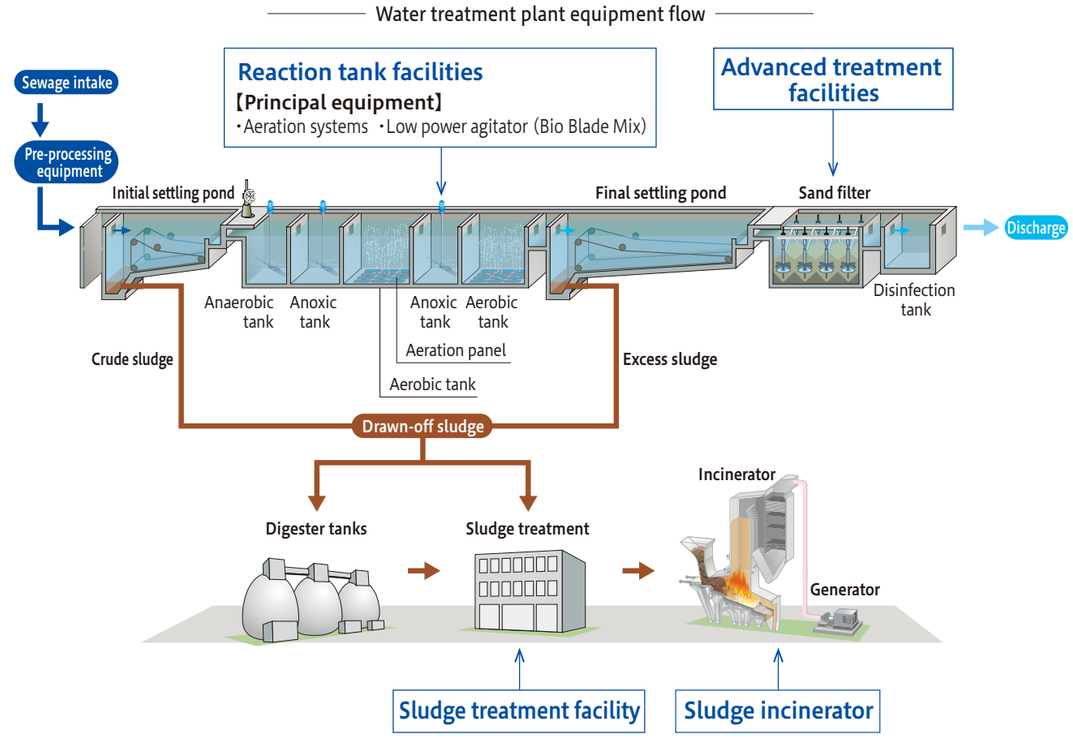
Water Treatment Plant Business

Takuma has delivered numerous systems utilizing advanced technologies, particularly for treating wastewater, in an effort to help conserve the aquatic environment.

The recent trend is for plants to be called upon not only to purify water, but also to reduce power use by treatment equipment and create energy from sewage sludge. In an effort to meet these requirements, Takuma has been focused on developing a step grate stoker furnace sewage sludge power generation system and commercializing technologies that use waste heat from the incineration process to generate electricity.

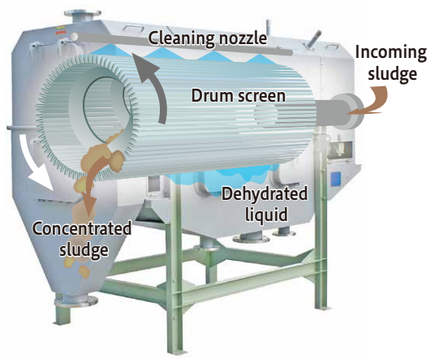
Going forward, we will continue to help conserve the aquatic environment by supplying products that meet the needs of our times.

Water Treatment Plants



● Sludge treatment facility 【Principal equipment】・Rotating drum-type concentrator

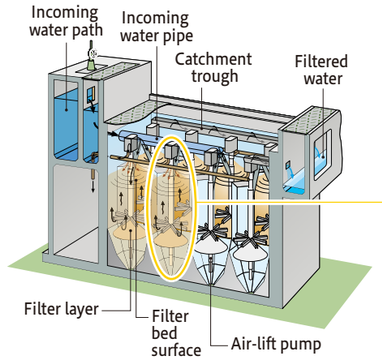
A rotating drum-type concentrator consists of a drum-shaped screen consisting of metal wedge wire that separates and concentrates solid and liquid components from coagulated sludge as the drum rotates. Following solid-liquid separation, sludge is transported to the exit side of the system as it is concentrated and pushed by spiral-shaped vanes on the inside of the rotating drum. Thanks to a simple design whose operation hinges on a slowly rotating drum screen, the system uses less power than its conventional counterparts, yielding high energy savings.

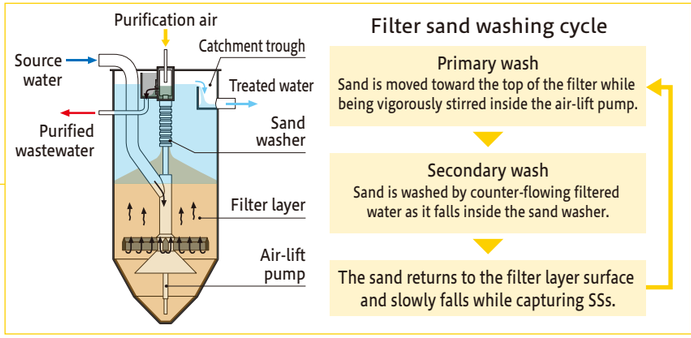


● Advanced treatment facility 【Principal equipment】・Upflow moving-bed filtration (Uniflow Sand Filter)

Measures undertaken to improve the quality of public water sources and the need to reuse treated sewage are spurring demand for more advanced water treatment. Upflow moving-bed filtration systems (Uniflow Sand Filter), which eliminate suspended solids (SSs) from water, are used in a variety of fields, including in final processing at sewage treatment plants and in pre-processing to remove solids at water plants. This particular model is a long-selling product featuring proven water purification technology of which we have delivered more than 2,700 units in Japan. A design that combines filtration treatment with continuous backwashing of the filtration sand ensures stable operation and exceptional maintainability.

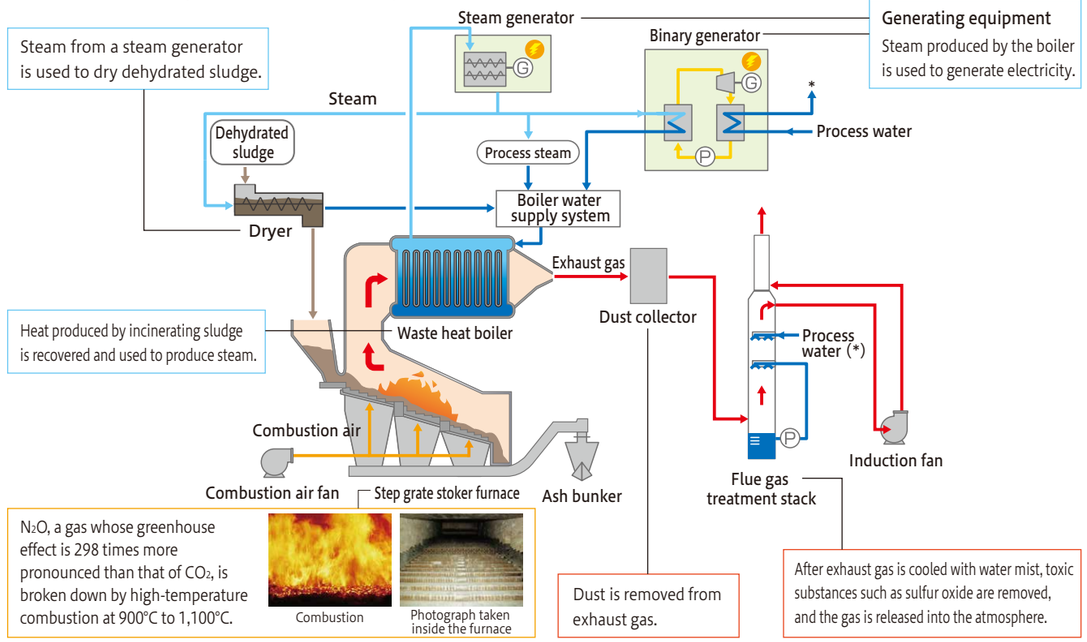
The product line includes high-speed models with double or triple the filtration speed of the standard model as well as denitrifying and dephosphorizing variants that add functionality for eliminating nitrogen and phosphorus to standard SS elimination functionality.





● Sludge incinerator 【Principal equipment】・Step grate stoker furnace sewage sludge power generation system (step grate stoker furnace and innovative step grate stoker furnace)

Because it contains a large amount of energy, sludge generated during the sewage treatment process has been attracting attention in recent years as a biomass resource. We are taking advantage of our core incineration and boiler technologies to make effective use of the energy contained in sludge by using it as a fuel to generate electricity. Following the system's selection for inclusion in the Ministry of Land, Infrastructure, Transport and Tourism's Breakthrough by Dynamic Approach in Sewage High Technology Project (B-DASH) in FY2013, we have received orders for the system from the cities of Tokyo and Sapporo.



1.Environmental Plant Business

Main Recent Projects

The following are the main plants supplied by Takuma during FY2018.

Municipal Solid Waste Treatment Plant Business

New construction

Environmental Forest Center, Kizugawa

Project name
Clean Center Facility Maintenance Project

Capacity
Incineration facility:
94 tons per day (47 tons per 24 hours × 2 units)
Power output: 1,220 kW

Location
Kyoto Prefecture

Primary equipment improvements

Kumagaya Sanitation Center No. 1 Plant

Project name
Kumagaya Sanitation Center No. 1 Plant
Primary Equipment Improvement Project

Capacity
Incineration facility:
140 tons per day (70 tons per 24 hours × 2 units)

Location
Saitama Prefecture

The Inariyama Environmental Center

Project name
Primary Equipment Improvement Project,
The Inariyama Environmental Center, Sayama City

Capacity
Incineration facility:
165 tons per day (55 tons per 24 hours × 3 units)
Power output: 264 kW

Location
Saitama Prefecture

Water Treatment Plant Business

Takasu Sewage Treatment Plant

Project name
Urado Bay Eastern Basin Takasu Sewage Treatment Plant
Sludge Treatment System Construction Part 12

Capacity
Type: Pressurized screw press dehydrator
Treatment capacity: 225 kg-DS per hour

Location
Kochi Prefecture

Matsubara Preprocessing Plant

Project name
FY2017 Matsubara Preprocessing Plant Automatic Coarse Dust Eliminator Renovation Project

Capacity
Type: Intermittent front-surface mixing-type screen
Specifications: 3,500 (W) × 1,100 (D) mm

Project name
FY2018 Matsubara Preprocessing Plant No. 2 Concentration Tank Sludge Scraper Update Project

Capacity
Type: Sludge scraper (center-drive vertical type)
Specifications: ⌀17.9 m × 1 unit

Location
Hyogo Prefecture

Kasai Water Reclamation Center

Project name
Kasai Water Reclamation Center Sludge Concentration Tank No. 1 Machinery and Equipment Improvement Project

Capacity
Type: Sludge scraper (center-drive post type)
Specifications: ⌀28 m × 1 unit

Location
Tokyo Prefecture

Iizaka Clean Site

Project name
Iizaka Clean Site Phase 2 Final Treatment Plant Seepage Water Treatment Plant Construction Project (No. 2 Area)

Capacity
Type: Contact oxidation-type nitrification denitrification system
Specifications: 110 m^3 per day
Type: Centrifugal dehydrator
Specifications: 515 kg-DS per hour

Location
Fukushima Prefecture

2.Energy Plant Business

Contributing to local communities and the renewable energy industry with plants of the highest possible level of quality

Mitsuaki Adachi
Managing Executive Officer
Executive Manager, Energy Plant Division

Meeting growing demand with a sure track record

Our Energy Plant Business traces its roots back to the founding of Takuma in 1938 by Tsunekichi Takuma, who developed Japan's first high-performance boiler. Since that time, we've enhanced technologies for using a variety of fuels including biomass and solid waste and delivered numerous boilers to customers (more than 600 in Japan and overseas; a total of more than 3,220 boilers including units that burn oil, gas, and wood).

Demand for wood-fueled biomass power plants has been growing since Japan's introduction of a feed-in tariff (FIT) program for renewable energy in 2012, and we have delivered such facilities to many customers that have praised our long-running track record. I am grateful for this achievement and recognize that it is the result of our stakeholders' support. We take pride in marshalling all of our capabilities to fill orders by supplying plants of the highest possible level of quality.

Biomass power as a solution for social problems

We recently received our first O&M order for a biomass power plant that will be delivered to a private-sector company. Going forward, we will strive to ensure we can contribute to customers' businesses in a comprehensive way by offering a range of proposals, including for O&M projects.

Under the FIT program, biomass power is treated as a source of power that strives to facilitate medium- and long-term autonomy while coexisting with local communities, and it is a business that can contribute directly to the resolution of social issues in the form of unused lumber left on mountains and local employment. Consequently, we look forward to helping facilitate the sustainable development of local communities and of the renewable energy industry by making a broad contribution to customer businesses based on technologies and comprehensive capabilities developed over many years, even as we keep tabs on factors such as discussions of an expected future review of the FIT program.

(Related SDGs)

Contributing to society through business activities

We're helping realize a sustainable society while working to resolve customers' issues as well as social problems through our business activities.

Promoting renewable energy

We're helping promote renewable energy by supplying biomass power plants.

Preserving the environment in the form of water, air, and mountain forests

We're helping preserve the global environment by supplying plants that utilize appropriate technologies and systems to protect the environment.

Making effective use of unutilized resources

We're helping realize a recycling-based society by supplying plants that can efficiently burn fuels and waste products that have gone underutilized in the past.

Reducing CO_2 emissions

We're helping realize a low-carbon society by supplying high-efficiency power plants.

Value provided by Takuma's Energy Plant Business

1. Plant engineering

We supply plants that can burn a variety of fuels and waste products in a stable manner over extended periods of time based on our extensive track record of deliveries.

Biomass power plants

We supply power plants that can utilize a variety of biomass fuels to operate in a stable manner over extended periods of time, including unused lumber, lumber waste, construction waste, PKS, pellets, livestock waste, bagasse, and papermaking sludge.

Facilities that incinerate industrial waste to generate power

We supply facilities that can recover heat in a highly efficient manner, including by using it to generate electricity, after burning even difficult-to-treat waste products in an appropriate manner.

2. After-sales service

We offer service designed to ensure that plants can operate in a stable manner over the long term based on our advanced technologies and extensive experience.

Maintenance

We offer proposals for, and carry out, plans for periodic inspections and maintenance, functional improvements, and preventive maintenance in order to maintain high plant performance and prevent unplanned stoppages.

O&M

We accept orders for operation, maintenance, and management over 20-year terms to reduce workload and life cycle costs so that customers can maximize the profitability of their businesses.

Main Recent Projects

The following are the main plants supplied by Takuma during FY2018.

Energy plants

KOBE BUSSAN CO., LTD.

Project name
Biomass Power Plant Construction Project

Capacity
Fuel: Wood fuel
Steam conditions (normal operation):
28 tons per hour × 5.98 MPaG × 425°C
Power output: 6,250 kW

Location
Hokkaido Prefecture

Ariake Co., Ltd., No. 2 Power Plant

Project name
Arao No. 2 Biomass Power Plant
New Construction Project

Capacity
Fuel: Wood fuel
Steam conditions (normal operation):
29.2 tons per hour × 6.0 MPaG × 425°C
Power output: 6,250 kW

Location
Kumamoto Prefecture

Mogami Biomass Power Co., Ltd.

Project name
Mogami Wood Biomass Power Plant
Generating System Construction Project

Capacity
Fuel: Wood fuel
Steam conditions (normal operation):
28 tons per hour × 5.98 MPaG × 465°C
Power output: 6,800 kW

Location
Yamagata Prefecture

Daisen Biomass Power Generation Co., Ltd.

Project name
Biomass Power Plant Construction Project

Capacity
Fuel: Wood fuel
Steam conditions (normal operation):
28 tons per hour × 5.98 MPaG × 480°C
Power output: 7,050 kW

Location
Akita Prefecture

Chugoku Mokuzai Co., Ltd., Hyuga factory

Project name
Chugoku Mokuzai Wood-fueled Boiler (No. 2)
Construction Project

Capacity
Fuel: Wood fuel
Steam conditions (normal operation):
24 tons per hour × 1.3 MPaG × 195°C

Location
Miyazaki Prefecture

SARA Inc.

Project name
SARA Power Plant Construction Project

Capacity
Fuel: Wood fuel, PKS
Steam conditions (normal operation):
50 tons per hour × 6.0 MPa × 425°C
Power output: 10,000 kW

Location
Okayama Prefecture

3.Overseas Business

Assessing changes in global trends in the overseas market to ensure we can continue to contribute to the development of industry in countries worldwide

Takashi Manabe
Managing Executive Officer
Executive Manager, International Division

Resolving issues by accommodating a diversifying array of needs

The International Division is responsible for sales of boiler plants and waste treatment plants in overseas markets. We take pride in the fact that promoting those businesses, which reduce greenhouse gases by making effective use of non-fossil fuels while contributing to the resolution of environmental issues through the appropriate treatment of waste, will help achieve the Sustainable Development Goals (SDGs) that Takuma is pursuing.

We've already delivered close to 400 biomass boilers to overseas customers. Nowhere is the viability of this business more apparent than in Thailand, where Takuma has a local subsidiary and where we have been supporting the sugar industry as well as other sectors of the economy for over 60 years. In the past, biomass boilers were used to provide heat and power for equipment at industrial plants, but today their role is diversifying as a recent global trend toward converting to renewable energy drives expectations that they will function as true power plants by taking on some responsibility for ensuring society's supply of electricity.

We've also delivered dozens of waste treatment plants overseas. In recent years, the appropriate treatment of waste has become a particularly urgent issue in developing nations. While environmental awareness, governmental programs, budgets, and other considerations vary from country to country, we're making preparations to ensure success in a careful and steady manner based on these and related developments, for example by formulating optimal schemes by which to pursue potential orders and develop projects.

Bringing necessary, valuable products to the international community

There is no doubt that plants that generate electricity using Takuma's core technologies to burn biomass and waste are earning recognition as both necessary and valuable in a society that's working to achieve the SDGs in a concerted manner. Although the business environment will remain intensely competitive, we will continue to contribute to the international community by developing latent customer demand in a fine-grained manner and supplying solutions that meet those needs.

(Related SDGs)

Overseas boiler plant business

The sugar business has been booming in Thailand, where Takuma has a local subsidiary. We have supported the industry for many years and have an extensive track record of supplying boilers that burn bagasse (fiber remaining after sugarcane is crushed) since our first delivery in 1959.

Going forward, we will continue to tap sure technology and fine-grained service based on our experience to date to help realize the biomass-derived, Earth-friendly supply of power in not only Thailand, but also in Indonesia, Vietnam, and other Southeast Asian countries.

*For more information on facilities delivered during FY2018, please see Feature 02, "Biomass Power Plant Construction Project in Thailand," on page 21.

Overseas waste treatment plant business

As emerging nations develop, they experience population growth and urbanization, causing waste-related issues to manifest themselves. Their environmental regulations and legal systems are also in a state of development, and inadequacies in information about waste and technologies for treating it mean these countries have high expectations for Energy from Waste technologies. We pursue sales activities, for example by studying information such as local systems and waste composition, so that we can meet those expectations by delivering waste treatment plants that satisfy customers.

As one example, during FY2018 we conducted a viability study of a project in the Indian state of Telangana by taking advantage of a Ministry of the Environment program. The results of the study, which we carried out along with local governments in Japan as part of a government-industry partnership and with the cooperation of local stakeholders in India, were reported jointly to the local government. By making effective use of a cooperative framework that brought together the Japanese and Indian governments, we were able to build a good relationship with the local government while discovering important information about local needs.

Takuma will continue to work to realize solutions to environmental problems by delivering waste treatment plants.

Waste composition study in Telangana

Main Recent Project (Waste treatment plant)

This section introduces one of the main projects that Takuma has delivered to date.

Lutsao Refuse Incineration Plant

Capacity
Incineration facility:
900 tons per day (450 tons per day × 2 units)
Power output: 28,000 kW

Location
Chiayi, Taiwan

Message

Naoya Akasaki

**Sales Section 2, International Department
International Division**

Waste issue offers challenges to all countries, but specific needs and conditions vary from country to country. In Asia, there has been a trend away from waste disposal, which has centered on landfill until now, and we believe that this constitutes a field in which Takuma's Energy from Waste technologies and experience can make a contribution. Continuous, stable operation is key to facilities that treat waste such as Energy from Waste plants, for example, as one type of local and environmental infrastructure. To that end, we will continue to work to ensure we can help resolve challenges in this field while deepening our understanding and pursuing cooperation with an array of local entities, companies, and other stakeholders from the "glocal" (think globally, act locally) perspective.