



Corporate Profile & CSR Report 2016

Value Technology, Value People, Value the Earth

Takuma Provides New Value for Society in the Environmental and Energy Fields.

Municipal solid waste treatment plants

We support the realization of a recycling-oriented society using advanced waste treatment technologies that meet the needs of local communities.



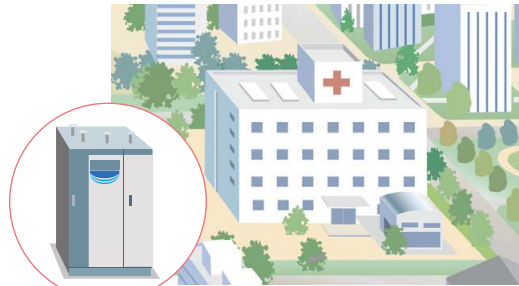
Energy plants

Takuma's core technologies are utilized in various types of boilers such as biomass fuel boilers as well as total systems.



General-purpose boilers

As the convergence of Takuma combustion technologies, our boilers are a reliable brand that has earned the support of a wide range of industries.



Industrial waste treatment plants

Using advanced incineration technologies, we can even treat toxic substances suitably and we are supporting the environmental protection efforts of industry.



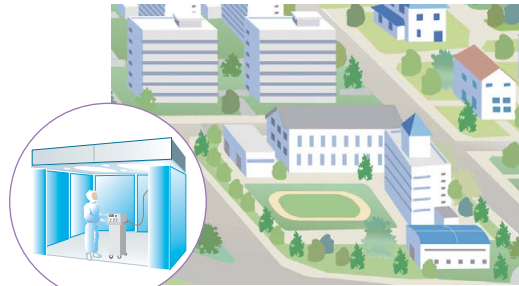
Water treatment plants

We are working to purify wastewater with a holistic perspective through a "dialogue with water."



Air-conditioning equipment and clean systems

We provide comfortable, clean environments to customers in the semiconductor industry as well as locations such as universities, research institutions, and hospitals.



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Message from Top Management

Pursuing CSR management to achieve sustained growth along with society



Business policies

Takuma's Management Principles state that the company will strive for "social contribution, corporate value enhancement, long-term corporate development, and the satisfaction of all stakeholders by providing goods and services that are needed and recognized as valuable in society."

In keeping with this philosophy, we have identified two goals: first, continuing to play an essential role for society as a leading company in the utilization of renewable energy and in the field of environmental protection; and second, of achieving ordinary profit of JPY 10.0 billion in FY2020 as our target level of ordinary profit. Similarly, we have embraced a corporate vision of building structures capable of earning JPY 10.0 billion in profit or more in a stable and consistent manner even as the business environment continues to undergo dramatic change, and we are pursuing a series of business activities in pursuit of that vision. We will achieve this vision not through the standalone

efforts of the company, but as the result of the combined capabilities of the entire Takuma Group. To that end, we have adopted a basic management policy of maximizing profits in our consolidated financial accounting and of increasing corporate value.

The Group will work diligently to implement the 11th Medium-Term Management Plan (FY2015 to FY2017) in an effort to build on past results to enhance its business so that it can achieve sustained growth, both in terms of quality and quantity.

Business environment

In the Group's key businesses, operators of waste treatment facilities are planning to renovate and improve aging plants as a result of stepped-up efforts to prevent global warming and conserve resources and energy due to increased environmental awareness. In addition, demand for biomass power facilities is expected to continue to rise

in the future thanks to energy policies such as feed-in tariff programs that facilitate fixed-cost purchases of power generated using renewable energy.

At the same time, 2015 saw international society embrace two new initiatives. First, new emissions reduction targets for greenhouse gases were adopted at the 2015 United Nations Climate Change Conference (the 21st yearly session of the Conference of the Parties to the 1992 United Nations Framework Convention on Climate Change)*¹, and second, the 2030 Agenda for Sustainable Development*² was adopted at the UN Sustainable Development Summit. We believe that Takuma's technologies for processing waste and reducing carbon dioxide emissions through high-efficiency power generation using biomass will make a significant contribution to resolving these social issues, and that doing so will lead to the further development of the Group's businesses.

Achieving sustained growth

Currently, our society is grappling with a diverse range of challenges, including environmental issues; increased demand for energy, water, and other resources in the face of global population growth; global warming; aging social

capital; and diversity in people's values. The Takuma Group must adapt to changes in the business environment and strengthen initiatives to treat these changes as business opportunities. The Group has embraced the Company Motto, Management Principles, Takuma Group Ethics Charter, and Takuma Group Code of Conduct as the foundation of CSR management. We believe that sincerity is central to management, and, in keeping with the idea that proper conduct is the natural course of action for the company, that the goal of CSR management is to cultivate a corporate culture in which all executives and employees can speak naturally. This approach embodies a path that will allow us to achieve sustained growth.

Takuma has been a signatory to the United Nations Global Compact since 2006, and we support its 10 fundamental principles in the 4 areas of human rights, labour, environment, and anti-corruption. We will work to develop our business while understanding and supporting these globally shared principles.

In closing, in compiling this CSR Report we have sought not only to provide a resource by means of which a broad range of stakeholders could learn more about the Takuma Group's activities, but also to help each and every Group employee think carefully about CSR and bring that perspective to bear in his or her work. We at the Takuma Group encourage readers to offer their candid views and advice, which we will carefully review in order that we might better resolve social issues and contribute to the sustained development of society.

July 2016

Takaaki Kato
President and CEO
Takuma Co., Ltd.

Takaaki Kato



*1 Japan's greenhouse gas emissions reduction target is to slash emissions by 26.0% compared to FY2013 by FY2030 (a reduction of 25.4% compared to FY2005).

*2 The Agenda consists of 17 Sustainable Development Goals (SDGs) and 169 targets for eradicating poverty and achieving a sustainable world.



The Takuma Group has joined the United Nations Global Compact (UNGC), which is a voluntary effort to create a global framework for implementing sustainable growth by having companies and groups exercise responsible and creative leadership while acting as good members of society.
Reference: UN Global Compact <http://www.unglobalcompact.org/>

Company Motto

Value Technology, Value People, Value the Earth

Management Principles

Takuma will strive for social contribution, corporate value enhancement, long-term corporate development and the satisfaction of all stakeholders by providing goods and services that are needed and recognized as valuable in society.

The founding spirit of Takuma was "Service to the nation through boiler manufacturing,"* which in present-day language means "contribution to society by supplying goods and services that we yield." This spirit can also be applied to the concept of Corporate Social Responsibility (CSR) that in recent years has become a vital issue for corporate management. The management principles of the Takuma group companies are all based on the said founding spirit.

* Service to the nation through boiler manufacturing
It was the Company Motto of Takuma, then Takuma Boiler Manufacturing Co., Ltd., founded by Mr. Tsunekichi Takuma, one of the ten great inventors of Japan during the Meiji and Taisho periods (1868–1926).

Takuma Group Ethics Charter

Takuma and the Takuma Group companies believe that it is essential for the sound development of the group that all of the directors and employees remain aware of our social responsibilities and the circumstances surrounding us as well as act in response to social ethics complying with applicable related laws and ordinances. Bearing the above in mind, we have established and will promote this ethics charter as our code of conduct, aiming to realize our management principles.

1. We shall strive for proactive social contribution while establishing a harmonious coexistence with the global environment as good corporate citizens.
2. We shall act in good faith in accordance with sound business custom, while complying with applicable laws and regulations and committing ourselves to fair, transparent and free competition, as well as conducting lawful business activities.
3. We shall never have any relationship with antisocial forces or organizations, which may pose a threat to the social order and security of civil society.
4. We shall respect fundamental human rights and never practice discrimination.
5. We shall strive to provide high quality products and services, based on our advanced technologies, to attain high acclaim and confidence from our customers.
6. We shall strive to disclose corporate information to shareholders and investors through investor relations (IR) and other activities on a timely and equitable basis.
7. We shall strive to protect corporate properties as well as information, while never using either for improprieties or any unjustifiable purpose other than normal business operations.

Takuma Group Code of Conduct

Harmony with society

1. Coexistence with the global environment
2. Coexistence with international society
3. Practice of social contribution activities

Practice of compliance with laws and ordinances as well as sound economic activities

4. Free competition and fair trade
5. Relationship with politics and public administration
6. Policies concerning business entertainment and gift-giving
7. Prohibition of involvement in anti-social activities
8. Appropriate export and import transactions

Respect for basic human rights

9. Prohibition of discriminatory actions
10. Respect for individuality, personal quality, and privacy
11. Safe work environment

Practice of customer satisfaction

12. Safety of products and services as well as ensuring reliability
13. Policies concerning advertising

Making appropriate disclosure of information

14. Transmission of corporate information
15. Ensuring reliability of financial reporting
16. Prohibition of insider trading

Protection of corporate properties and information

17. Management and proper use of corporate properties
18. Handling of confidential information
19. Intellectual property protection

Takuma Group 11th Medium-Term Management Plan — An Overview

1 Business Directions

① Positioning of the 11th Medium-Term Management Plan

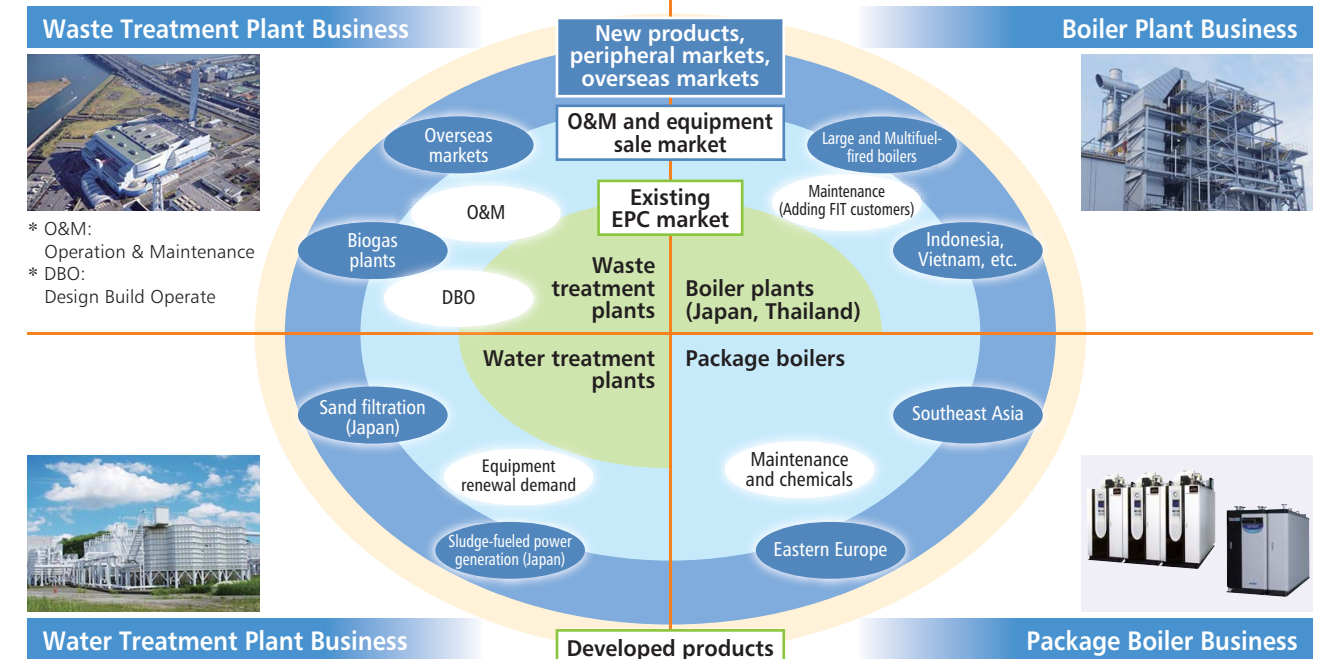
Achieve sustained growth by targeting growth markets while maintaining and expanding our market position in the EPC business and using businesses that generate base profits as a foundation for growth.

* EPC: Plant engineering, procurement, and construction



② Principal business domains

Enhance our businesses in terms of both quantity and quality by expanding on-site maintenance and management service, competitive product development, and regional reach around the existing EPC business.



2 Policies and Perspectives of the 11th Medium-Term Management Plan

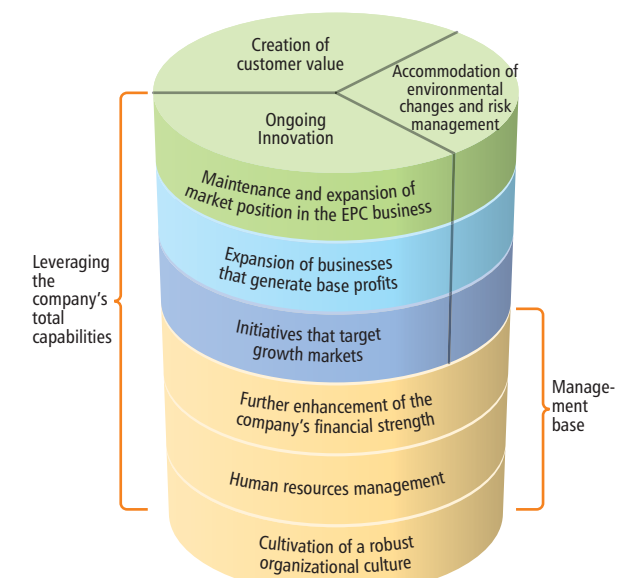
Policies

- ① Maintenance and expansion of market position in the EPC business
- ② Expansion of businesses that generate base profits
- ③ Initiatives that target growth markets
- ④ Further enhancement of the company's financial strength
- ⑤ Human resources management
- ⑥ Cultivation of a robust organizational culture

Perspectives

- ① Creation of customer value
- ② Ongoing innovation
- ③ Accommodation of environmental changes and risk management

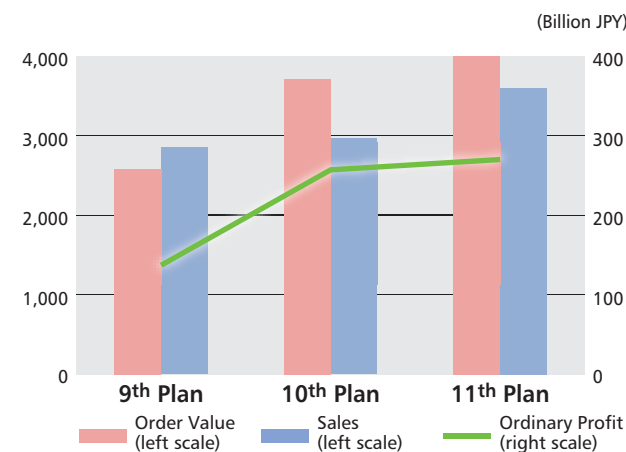
Achieving sustained growth



3 Financial Targets (Consolidated)

We are currently striving to build structures capable of consistently earning an ordinary profit of JPY 10 billion even as the business environment undergoes a process of significant change in keeping with our corporate vision of "aiming to maintain our role of being an indispensable presence in society as a leading company in the field of renewable energy utilization and environmental protection" and our target of achieving ordinary profit of JPY 10 billion in FY2020.

To facilitate the achievement of the goals outlined in this plan, we will undertake initiatives to realize sustained growth in accordance with the policies while seeking to steadily improve our business in terms of both quantity and quality. To that end, we have established the financial targets described below.



	9th Medium-Term Management Plan results				10th Medium-Term Management Plan results				11th Medium-Term Management Plan targets
	2009	2010	2011	Total	2012	2013	2014	Total	FY2015 – FY2017
Order Value	705	970	904	2,579	1,092	1,480	1,137	3,710	400 Billion JPY (3-year cumulative total)
Sales	951	891	1,010	2,853	963	963	1,038	2,965	360 Billion JPY (3-year cumulative total)
Ordinary Profit	20	44	73	137	71	94	91	257	27 Billion JPY (3-year cumulative total)

4 Core Business Units and Emphasis of Future Activities

Municipal Solid Waste Treatment Plant Business

Business Environment

- As facilities age, there is ongoing robust demand for renewal and service life elongation.
- DBO project volume is growing, and there is also growth in O&M services for existing facilities.

Emphasis of Future Activities

- Develop the foundation of the business and enhance our operational capabilities.
- Further strengthen initiatives to prolong the service life of facilities.

Boiler Plant Business (Japan)

Business Environment

- Demand for biomass power plants remains steady.
- The number of plants targeted for maintenance is increasing as facilities are completed and transferred to customers.

Emphasis of Future Activities

- Secure more orders for biomass power plants (secure market position).
- Enhance maintenance service and capabilities.

Waste Treatment Plant Business (Overseas)

Business Environment

- Plans to build Energy from Waste plants are underway in various regions worldwide against the backdrop of ongoing urbanization and increasing environmental awareness.

Emphasis of Future Activities

- Develop schemes for entering the market that are suited to each country and region.
- Develop structures to facilitate market entry.

Water Treatment Plant Business

Business Environment

- There is a growing need to recover energy from sewage sludge.
- Renewal demand and service life elongation demand are increasing as facilities age.

Emphasis of Future Activities

- Secure our position in the market for tapping the energy potential of sewage sludge.
- Expand our share in the advanced-treatment sand filtration market.

Boiler Plant Business (Overseas)

Business Environment

- Demand for biomass power plants in Thailand and surrounding countries remains robust.

Emphasis of Future Activities

- Maintain and enhance functionality for carrying out overseas projects, including enhancement of the functions of our local subsidiary (SIAM TAKUMA).
- Enhance price competitiveness and differentiated products.

Package Boiler Business

Business Environment

- The domestic market has matured, and it is not reasonable to expect a significant recovery of demand.
- The need for boilers is increasing overseas, particularly in developing nations.

Emphasis of Future Activities

- Expand our overseas business.
- Enhance our technologies and production capacity.

Corporate Profile

Corporate Information

Business Summary

The Takuma Group Network

Corporate Information

Company outline

Name: TAKUMA CO., LTD.
 Head office location: 2-2-33 Kinrakuji-cho, Amagasaki, Hyogo 660-0806, Japan
 TEL +81-6-6483-2609 FAX +81-6-6483-2751 (operator)
 Representative Director: Takaaki Kato, President and CEO
 Established: June 10, 1938
 Capital: JPY 13,367,457,968 (as of March 31, 2016)
 Main business areas: The design, construction and superintendence of a wide variety of boilers, plant machinery, pollution prevention plants, environmental equipment plants, and heating and cooling equipment and feed-water / drainage sanitation equipment and facilities
 The design, construction and superintendence of civil, architecture and other works
 Number of employees (non-consolidated): 815 (as of March 31, 2016)
 Number of employees (consolidated): 3,366 (as of March 31, 2016)

Permits and registrations

Head Office, branch offices and other business offices

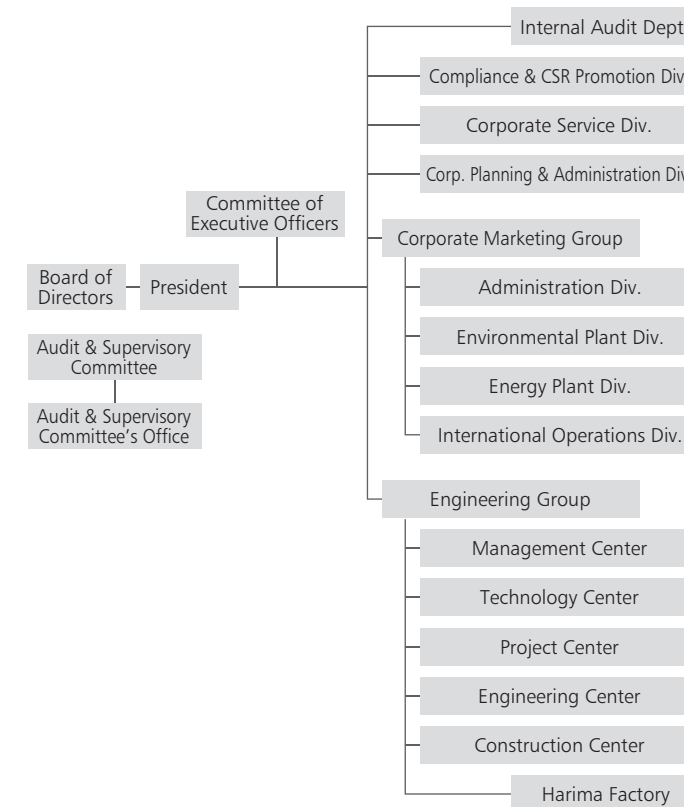
Construction license (Minister of Land, Infrastructure, Transport and Tourism license, Special 27-6129)
 Construction consultant registration (Minister of Land, Infrastructure, Transport and Tourism registration, Construction 26-10202)
 First-class architect office registration (01A02903)
 ISO 9001 quality management system certification

Harima Factory

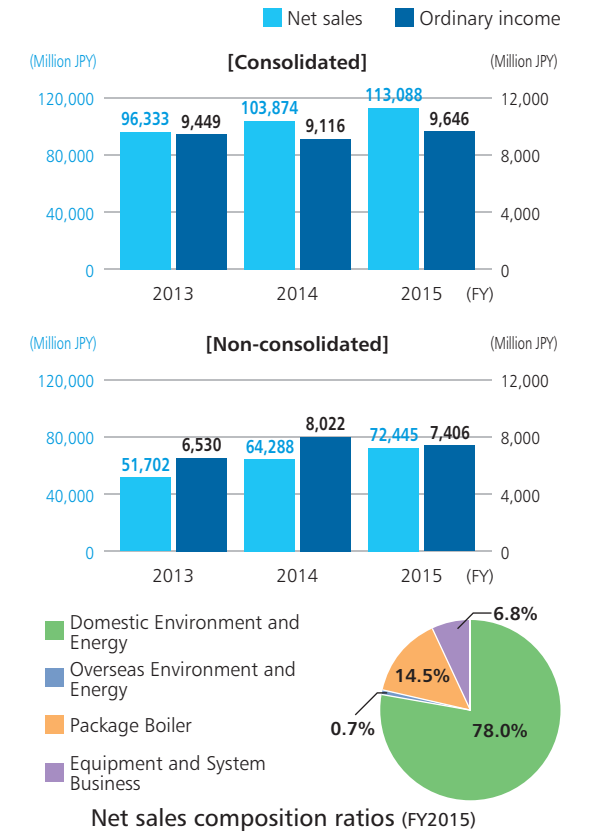
ISO 9001 quality management system certification
 ISO 14001 environmental management systems certification
 Manufacture of thermal equipment for power generation (Ministry of Economy, Trade and Industry)
 Permission to manufacture boilers and pressure vessels, permission to manufacture cranes (Ministry of Health, Labour and Welfare)
 Manufacture of specific high-pressure gas facilities (Ministry of Economy, Trade and Industry)
 Manufacture of refrigerators (Governor of Hyogo Prefecture)



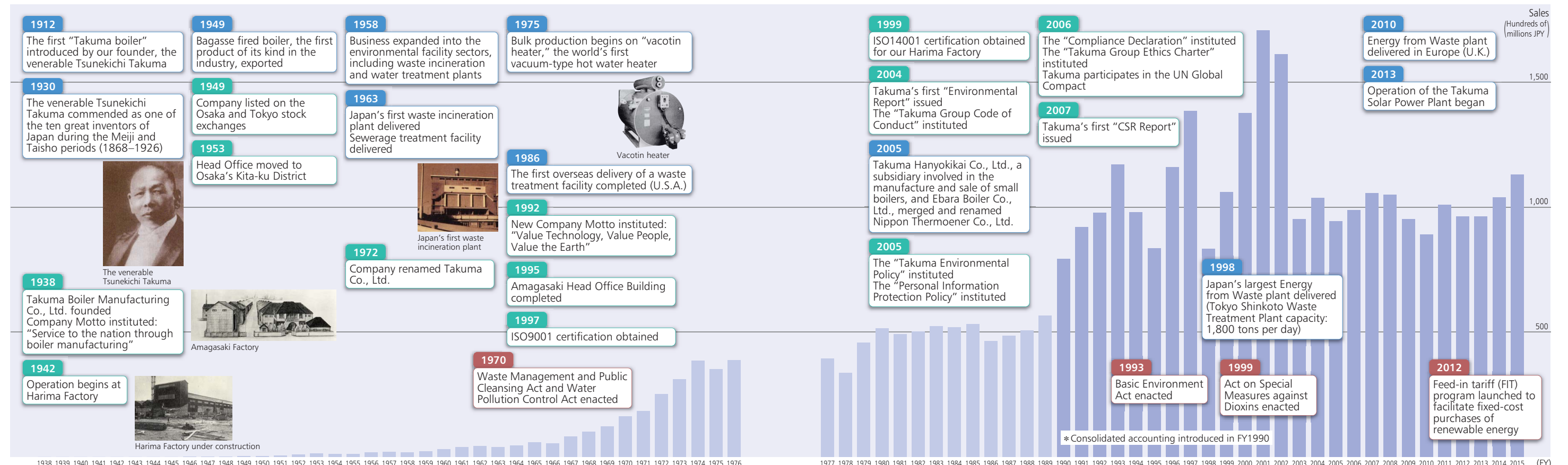
Corporate structure (as of June 28, 2016)



Balance sheet overview and net sales composition ratios



The History of Takuma



Business Summary

Environmental and energy business

Municipal solid waste treatment plants

We support the realization of a recycling-oriented society using advanced waste treatment technologies that meet the needs of local communities.

- Energy from Waste plant
- Pyrolysis gasification and melting plant
- Resource recycling and collection plant
- Bulky garbage crushing plant
- Incineration ash and fly ash melting plant
- Waste to solid fuel conversion plant
- Transition and intermediate processing plant
- Raw fuel (biogas) recovery plant
- Various types of pollution prevention equipment



Energy from Waste plant



Bulky garbage crushing plant

Energy plants

Takuma's core technologies are utilized in various types of boilers, starting with biomass boilers, as well as total systems.

- Biomass boiler
- Fossil fuel boiler
- Waste heat boiler
- Power generation plant



Biomass power generation boiler



Waste heat boiler

Package boiler

General-purpose boilers

As the convergence of Takuma's combustion technologies, our boilers are a reliable brand that has earned the support of a wide range of industries.

- Once-through boiler (Eqos, Super Eqos)
- Vacuum-type water heater (Vacotin heater)
- Package water-tube boiler
- Smoke tube boiler (RE boiler)
- Heat-transfer oil boiler (thermoheater)
- Radiation heating equipment (strip heater)
- Various equipment for ships

Note: These products are handled by Nippon Thermoener Co., Ltd., which is one of our group companies.



Vacotin heater



Thermoheater



Super Eqos



RE boiler

Industrial waste treatment plants

Using advanced incineration technologies, we can even treat toxic substances suitably and we are supporting the environmental protection efforts of industry.

- Industrial waste treatment plant



Industrial waste treatment plant



Plant that generates power from industrial waste and provides heat to a plantation

Water treatment plants

We are working to purify wastewater with a holistic perspective through a "dialogue with water."

- Sewage and wastewater processing plant
- Various types of advanced sewage processing plant
- Sludge processing plant
- Sewage sludge-fueled power plant
- Plant to process water that infiltrates final disposal sites



Upflow moving-bed filtration system



Sewage sludge-fueled power plant

Equipment and systems business

Air-conditioning equipment and clean systems

We provide comfortable, clean environments to customers in the semiconductor industry as well as many locations such as universities, research institutions, and hospitals.

- Building equipment
- Air-conditioning equipment
- Cleaning and drying devices
- Clean room
- Clean devices
- Chemical filters



Chemical filters



Clean oven



Clean booths

Plant construction process

This page introduces how our plant business, which is one of our core areas of operations, functions.

1 Sales activities

The mission of sales is to facilitate communication with customers, promote Takuma's products and services, and acquire information about potential customers' new plant construction plans as quickly as possible. Then sales personnel work with internal planning and design departments as well as cost estimation departments to create proposals that will satisfy those customers.



2 Planning and design

We develop a basic plan for each plant that will satisfy the customer's needs. For local governments, we propose a basic plan for the plant that conforms to the purchase specifications that the ordering agency has provided. The purchase specifications indicate the conditions and level of performance required by the local government, for example in terms of the amount and type of waste it wishes to process, site conditions, and waste-fueled power generation capacity. Engineering coordinators spec out incinerators and waste heat boilers along with other systems in order to satisfy those conditions and performance requirements and determine how the equipment will be laid out at the facility.



3 Cost estimation

We calculate the costs associated with all equipment and systems that will be installed at the plant up until the facility's completion based on the basic plan and finalize a quotation to submit to the customer.

Order receipt

We propose the plan developed through the collaboration of sales, planning and design, and cost estimation coordinators to the customer. For local governments, this proposal is submitted during the bidding process. If our proposal outshines other companies' proposals and satisfies the customer, we will receive an order for the project.

4 Plan implementation and detailed design

Once we have received an order, we transition to detailed design work to facilitate the construction of the plant. We conduct a detailed study of equipment specifications and layout based on the plan and design and then proceed to finalize associated details. At this stage, specialists from a variety of fields, including combustion technology, exhaust gas treatment, and electrical control systems work together to create the detailed design.



5 Manufacture and procurement

We manufacture equipment and systems whose specifications have been finalized at our factories using a strict quality control system and place orders with a variety of specialized equipment manufacturers.

6 Construction work and commissioning

We commence the civil and foundation work, construct all plant buildings, install equipment and systems, and manage the project until the plant is fully operational. Key considerations include efficient site operations, thorough schedule and cost management, and management of safety and quality at the site.

Acceptance

During the performance test, it is confirmed the constructed plant is capable of safe operation. Once the performance test is completed successfully, the acceptance of the plant can be made.

7 After-sales service

Once the plant has been handed over to the customer, we provide periodical inspections and maintenance to prevent problems and keep the plant operating safely over the long term. In addition to inspecting and repairing systems for which inspections are legally mandated, we inspect and repair equipment deterioration and damage that accumulates over time. In addition, we complete large-scale renovation work in response to changes in applicable laws and customer needs.



The Takuma Group Network

(as of April 1, 2016)



Takuma's business offices

1 Head Office

2-2-33 Kinrakuji-cho, Amagasaki, Hyogo
660-0806, Japan
TEL +81-6-6483-2609 FAX +81-6-6483-2751
<http://www.takuma.co.jp>

2 Osaka Office

Daiken Bldg., 2-3-20 Tsukamoto, Yodogawa-ku,
Osaka 532-0026, Japan
TEL +81-6-6100-3301 FAX +81-6-6100-3302

3 Tokyo Branch

Nomura Higashi-nihonbashi Bldg., 1-1-7 Higashi-
nihonbashi, Chuo-ku, Tokyo 103-0004, Japan
TEL +81-3-5822-7800 FAX +81-3-5822-7888

4 Hokkaido Branch

Daigo Bldg., 5-11, Ohdori Nishi, Chuo-ku,
Sapporo, Hokkaido 060-0042, Japan
TEL +81-11-221-4106 FAX +81-11-241-0523

5 Tohoku Branch

NMF Sendai Aoba-dori Bldg., 2-1-2 Ichibancho,
Aoba-ku, Sendai, Miyagi 980-0811, Japan
TEL +81-22-222-3042 FAX +81-22-225-6759

6 Chubu Branch

Daitokai Bldg., 3-22-8, Meieki, Nakamura-ku,
Nagoya, Aichi 450-0002, Japan
TEL +81-52-571-5211 FAX +81-52-581-3005

7 Kyushu Branch

Yakuin Business Garden, 1-1-1 Yakuin, Chuo-ku,
Fukuoka 810-0022, Japan
TEL +81-92-717-2828 FAX +81-92-717-2830

8 Okinawa Branch

Commons Bldg., 1-11-12 Mashiki, Ginowan,
Okinawa 901-2224, Japan
TEL +81-98-898-6650 FAX +81-98-898-6657

9 Harima Factory

1-2-1 Shinhami, Arai-cho, Takasago, Hyogo
676-8540, Japan
TEL +81-79-443-6511 FAX +81-79-443-6599

10 Taipei Branch

7F., No.16, Lane 35, Jihu Rd., Neihu District,
Taipei 114-92, Taiwan
TEL +886-2-8752-3838 FAX +886-2-2656-0584

Overseas group companies

1 Taiden Environtech Co., Ltd. (Taiwan)

Design, installation and superintendence of waste
treatment facilities and a wide variety of industrial
machinery and equipment

7F., No. 16, Lane 35, Jihu Rd., Neihu District,
Taipei 114-92, Taiwan
TEL +886-2-2659-7137 FAX +886-2-2656-0584

2 SIAM TAKUMA Co., Ltd. (Thailand)

Sale of energy and environment-related plants,
sales of parts for the same plants and after-sales
service

77/53 Sinn Sathorn Tower, 15th Floor,
Krungthongburi Road, Klongtongsa, Klongsarn,
Bangkok 10600, Thailand
TEL +66-2-4385616 FAX +66-2-4400114

The Takuma Group Network



Group companies in Japan

1 Nippon Thermoener Co., Ltd.

Sales of a wide range of boilers and related equipment
Shirokanedai Bldg., 3-2-10 Shirokanedai,
Minato-ku, Tokyo 108-0071, Japan
TEL +81-3-6408-8251 FAX +81-3-6408-8278
<http://www.n-thermo.co.jp/>

2 Takuma Technos Co., Ltd.

Maintenance, management and operation of waste
treatment facilities, excreta processing facilities and
other facilities, as well as the design, installation and
management of various types of boilers, environmental
equipment and other equipment
10th Chuo Bldg., 1-5-6 Nihonbashi, Chuo-ku,
Tokyo 103-0023, Japan
TEL +81-3-3231-2911 FAX +81-3-3231-2917
<http://www.takumatechnos.co.jp/>

3 Hokkaido Sanitary Maintenance Co., Ltd.

Operation and maintenance of sewage treatment facilities
Daigo Bldg., 5-11, Ohdori Nishi, Chuo-ku,
Sapporo, Hokkaido 060-0042, Japan
TEL +81-11-221-8398 FAX +81-11-221-8542
4 Takuma Technos Hokkaido Co., Ltd.
Operation and maintenance of waste treatment facilities
Daigo Bldg., 5-11, Ohdori Nishi, Chuo-ku,
Sapporo, Hokkaido 060-0042, Japan
TEL +81-11-221-4128 FAX +81-11-221-1030

5 Sun Plant Co., Ltd.

Design, construction and superintendence of
air-conditioning equipment, feed-water/drainage
sanitation equipment, and electrical equipment
Nomura Higashi-nihonbashi Bldg., 1-1-7 Higashi-
nihonbashi, Chuo-ku, Tokyo 103-0004, Japan
TEL +81-3-5825-0921 FAX +81-3-5825-1631
<http://www.sunplant.co.jp/>

6 Takuma Engineering Co., Ltd.

Design of environmental equipment plants and energy
plants
Takuma Bldg., 2-2-33 Kinrakuji-cho, Amagasaki,
Hyogo 660-0806, Japan
TEL +81-6-6487-4820 FAX +81-6-6487-4829
<http://www.takuma-eng.co.jp/>

7 Takuma System Control Co., Ltd.

Design of electrical instrumentation equipment, including
environmental equipment plants and energy plants
Takuma Bldg., 2-2-33 Kinrakuji-cho, Amagasaki,
Hyogo 660-0806, Japan
TEL +81-6-6487-4830 FAX +81-6-6487-4839
<http://www.takuma-sc.co.jp/>

8 Dan-Takuma Technologies Inc.

Manufacture and sale of clean equipment, cleaning
equipment, chemical filters, clean rooms, drying
equipment and thermal chambers
3-12-16 Iwadokita, Komae, Tokyo 201-0004, Japan
TEL +81-3-3488-1111 FAX +81-3-3488-1118
<http://www.dan-net.com/>

9 Kyoritsu Setsubi Co., Ltd.

Design, construction and superintendence of Energy from
Waste Plant, mechanical equipment of sewage treatment
facilities, and boiler plants for general industries
5-1-38 Yurigahara, Kita-ku, Sapporo, Hokkaido
002-8081, Japan
TEL +81-11-770-2811 FAX +81-11-770-2822

10 Kankyo Sol-Tech Co., Ltd.

Analyzing and measurement for environment-related issues,
including water quality, exhaust gas and soil pollution
1-2-1 Shinhama, Arai-cho, Takasago, Hyogo
676-8540, Japan
TEL +81-79-443-6508 FAX +81-79-443-6510
<http://www.k-soltech.co.jp/>

11 Campo Recycle Plaza Co., Ltd.

Municipal solid waste and industrial waste treatment
services
1 Takayanishitani, Sonobe-cho, Nantan, Kyoto
622-0032, Japan
TEL +81-771-68-3636 FAX +81-771-68-3639
<http://www.c-rp.co.jp/>

12 Nagaizumi High Trust Co., Ltd.

Facility upgrading, operation and maintenance of
municipal solid waste final disposal sites
374-12 Higashino, Nagaizumi-cho, Suntou-gun,
Shizuoka 411-0931, Japan
TEL +81-55-989-2268 FAX +81-55-987-9935
<http://www.nagaizumi-ht.jp/>

13 Fujisawa High Trust Co., Ltd.

Operation and maintenance management of municipal
solid waste treatment facilities
2168 Ishikawa, Fujisawa, Kanagawa 252-0815,
Japan
TEL +81-466-45-5411 FAX +81-466-45-5454

14 Iwate-Kenpoku Clean Co., Ltd.

Industrial and municipal solid waste treatment services
48-34, Dai 20 Chiwari, Esashika, Kunohe-mura,
Kunohe-gun, Iwate 028-6505, Japan
TEL +81-195-42-4085 FAX +81-195-42-4550
<http://www.iwate2cln.co.jp/>

15 Hitachinaka-Tokai High Trust Co., Ltd.

Operation and maintenance management of municipal
solid waste treatment facilities
103-2 Shinkocho, Hitachinaka, Ibaraki 312-0005,
Japan
TEL +81-29-265-5371 FAX +81-29-265-5372
<http://hitachinaka-tokai-ht.com/>

16 Anan High Trust Co., Ltd.

Operation and maintenance management of municipal
solid waste treatment facilities
1-5 Kokatsu, Tachibana-cho, Anan, Tokushima
779-1631, Japan
TEL +81-884-49-5823 FAX +81-884-49-5824
<http://www.ecopark-anan.com/>

17 Takuma Energy Co., Ltd.

Power retail business
Takuma Bldg., 2-2-33 Kinrakuji-cho, Amagasaki,
Hyogo 660-0806, Japan
TEL +81-6-6487-4870 FAX +81-6-6483-2794

18 Energy Mate Co., Ltd.

Sale of cogeneration systems and systems for the
generation equipment of the same and total service
for onsite energy systems for consumer use
Midosuji Daiwa Bldg., 3-6-8 Kyutaromachi,
Chuo-ku, Osaka 541-0056, Japan
TEL +81-6-6241-6200 FAX +81-6-6241-6210
<http://www.energy-mate.co.jp/>

19 Takuma Plant Service Co., Ltd.

Maintenance of a wide variety of boilers and
environmental facilities
2-2-27 Kinrakuji-cho, Amagasaki, Hyogo
660-0806, Japan
TEL +81-6-6488-8434 FAX +81-6-6488-0300
<http://www.takuma-ps.com/index.html>

20 Biopower Katsuta Co., Ltd.

Sale of power generated using biomass energy from
wood fuel chips
1974-1 Koya, Hitachinaka, Ibaraki 312-0002, Japan
TEL +81-29-270-3341 FAX +81-29-270-3343

21 Kashiwara High Trust Co., Ltd.

Operation and maintenance management of municipal
solid waste treatment facilities
1038-2 Kawanishi-cho, Kashiwara, Nara
634-0826, Japan
TEL +81-744-26-6227 FAX +81-744-26-6228

22 Tochigi High Trust Co., Ltd.

Industrial waste treatment services
18-3 Kinugaoka, Moka, Tochigi 321-4367, Japan
TEL +81-285-83-3966 FAX +81-285-83-6500
<http://www.t-hitrust.co.jp/>

23 Katsuta Co., Ltd.

Industrial waste and municipal solid waste treatment
services
1968-2 Koya, Hitachinaka, Ibaraki 312-0002, Japan
TEL +81-29-270-3711 FAX +81-29-270-3712
<http://www.eco-katsuta.com/>

24 R.B.N. Co., Ltd.

Municipal solid waste, including waste home
appliances and office automation equipment, and
industrial waste treatment services
3059-20 Nakajima, Shikama-ku, Himeji, Hyogo
672-8035, Japan
TEL +81-79-243-1200 FAX +81-79-243-1202

25 Ichihara New Energy Co., Ltd.

Industrial and municipal solid waste treatment services
733 Mandano, Ichihara, Chiba 290-0549, Japan
TEL +81-436-50-8300 FAX +81-436-50-8400
<http://www.ichihara-new.com/>

26 Ecos Yonezawa Co., Ltd.

Final disposal of industrial waste
7028-1 Yanazawa, Yonezawa, Yamagata
992-0077, Japan
TEL +81-238-39-4050 FAX +81-238-39-4051
<http://www.ecos-y.co.jp/>



Business Development

1. Activities of Our Municipal Solid Waste Treatment Plant Business

2. Activities of Our Energy Plant Business

3. Activities of Our Water Treatment Plant Business

4. Activities of Our Overseas Business

5. Main Recent Projects

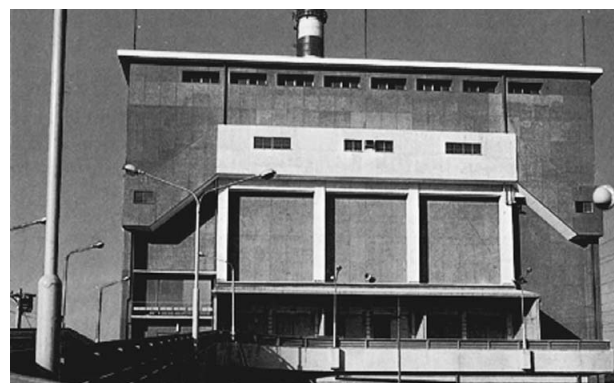
Activities of Our Municipal Solid Waste Treatment Plant Business

A leading company in the industry

Since completing Japan's first fully continuous mechanical waste incineration plant in Osaka City in 1963, Takuma has built more than 350 waste incineration plants in the country, more than any other company in the industry.

We have consistently led the municipal solid waste treatment industry, for example by starting operation of Japan's first combined facility comprised of biological gasification plant and municipal solid waste incineration plant and building more than 80 bulk garbage and resource waste recycling plants.

Takuma will continue to contribute to the realization of a recycling-based society as the industry's leading company.



Japan's first fully continuous mechanical waste incineration plant (Sumiyoshi Plant, Osaka City)



State-of-the-art Energy from Waste plant (Ota Incineration Plant, Clean Authority of Tokyo 23 cities)



Composite facility combining biogas and waste incineration plants (Nantan Bio, Thermal and Material Recycle Center, Nantan Integrated Administration of a Large Region Work Association)



Large-scale recycling plant (Numagami Resources Circulation Center, Shizuoka City)

From construction to after-sales service

Takuma's municipal solid waste treatment plant business consists of four components: plant construction, primary equipment improvement, maintenance, and long-term turnkey operation.

In each area of operations, we draw on technological capabilities and expertise based on our extensive experience to precisely meet the needs of local governments, regions, and society, allowing us to offer facilities that are welcomed by their communities.

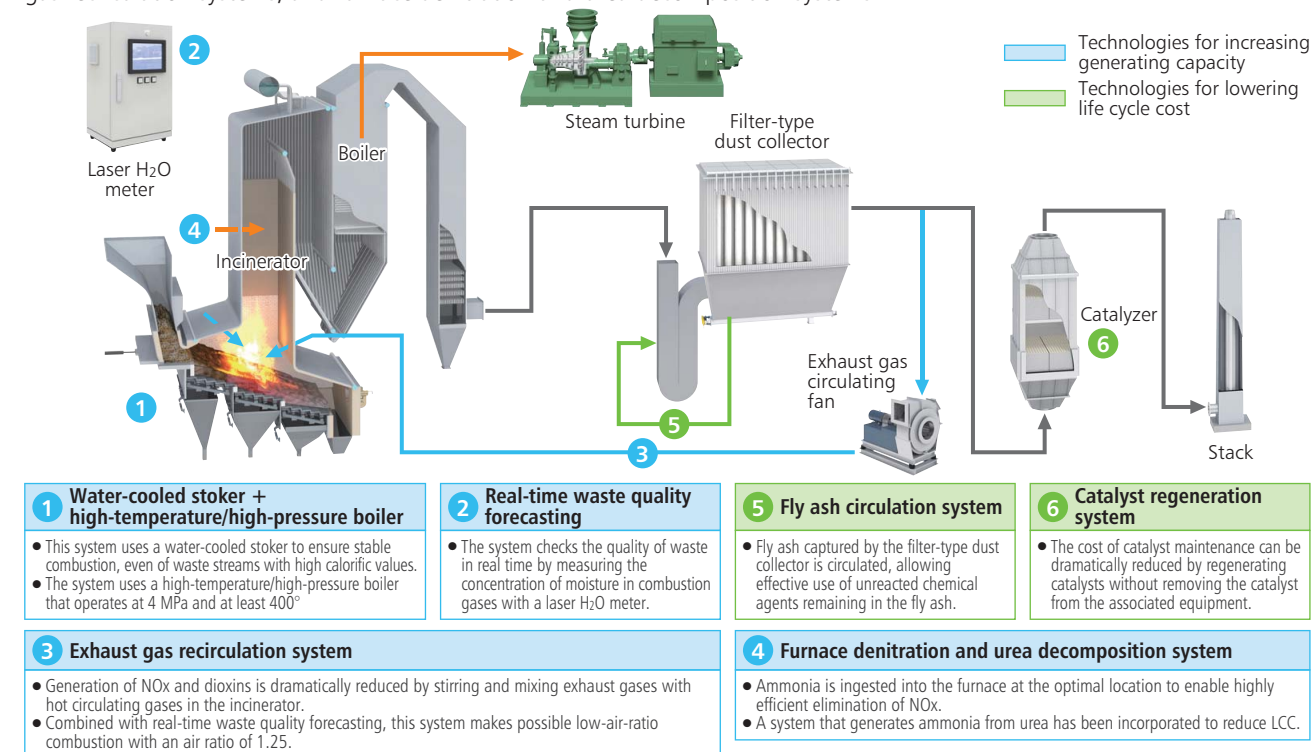


1 Plant construction

Stoker-type incinerators

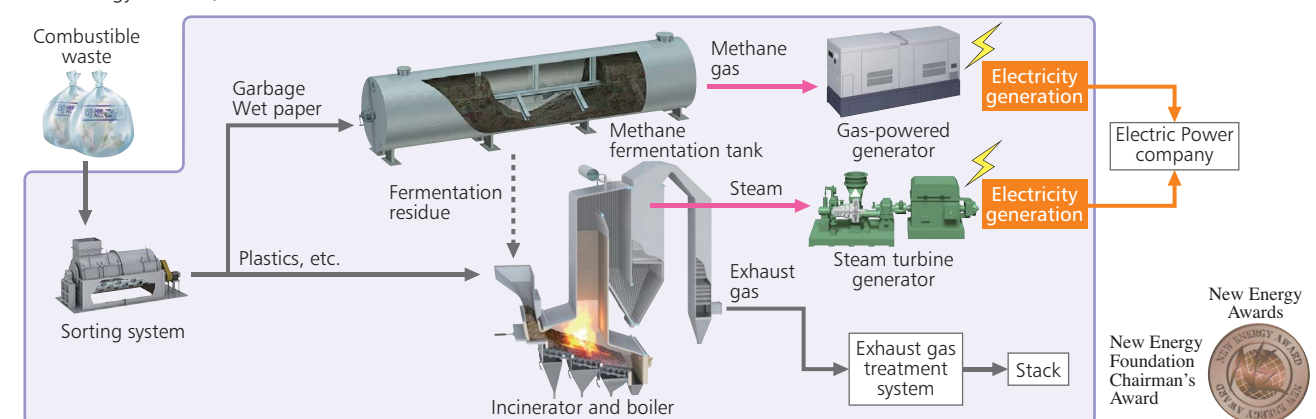
Most Energy from Waste plants use stoker-type incinerators. Takuma has been delivering stoker-type incinerators to customers for half a century, allowing us to accumulate a variety of expertise in areas such as stable combustion, exhaust gas treatment, and waste-fueled power generation.

Based on this well-established base of technological capability, we build and supply highly efficient waste treatment systems by integrating the latest technologies, for example water-cooled stokers, real-time waste quality forecasting, exhaust gas recirculation systems, and furnace denitration and urea decomposition systems.



Biogas facilities

Recently the Ministry of the Environment has been encouraging the introduction of biogas facilities for use with municipal solid waste. This is an area where Takuma is helping further lower CO₂ 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.)






Activities of Our Municipal Solid Waste Treatment Plant Business

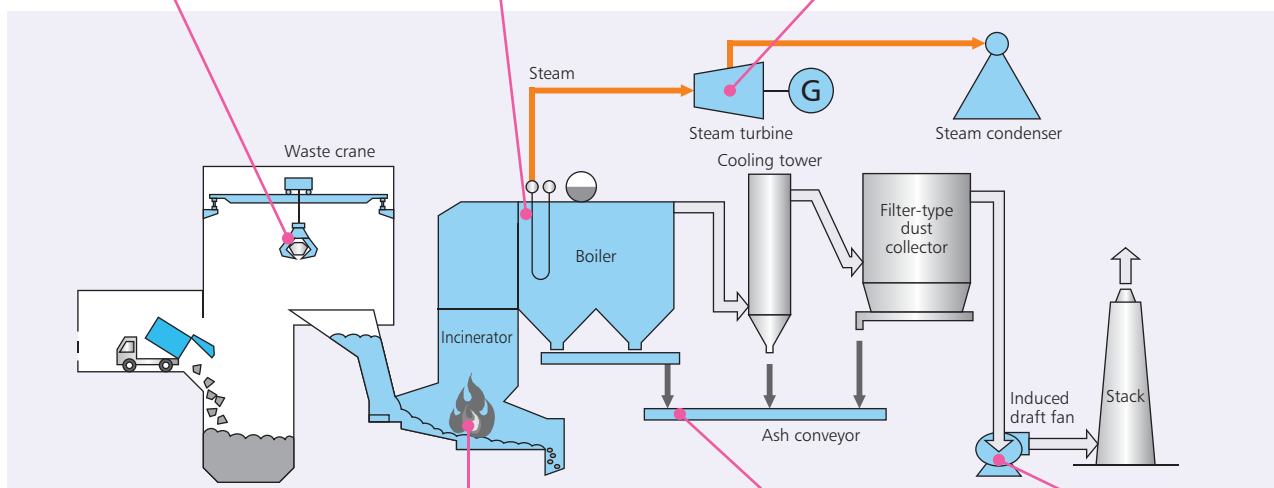
2 Primary equipment improvements

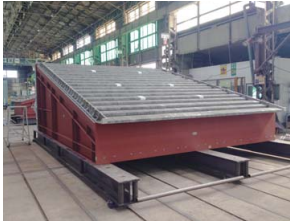


Implementing high-value-added renovations

Although waste treatment plants are required to operate over extended periods of time, equipment must be renovated once 20 or more years has passed since the plant began operating. In addition, changes in the regulatory environment and society sometimes make large-scale renovations necessary.

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 CO₂ emissions.

Installation of inverters on cranes	Improvement of heat recovery	Improvement of steam turbine capacity
<ul style="list-style-type: none"> Reducing power by installing speed control-type inverters 	<ul style="list-style-type: none"> Installing boilers on water-injection furnaces Expanding boilers' heating surface 	<ul style="list-style-type: none"> Improving generating capacity by increasing steam intake capacity and optimizing design features Improving the capacity of steam condensers 



Enhancement of combustion equipment efficiency	Adoption of high-efficiency motors	Installation of inverters on fans
<ul style="list-style-type: none"> Improving stable combustion by changing furnace shape and stabilizing the volume of steam generation and power generation Reducing the volume of exhaust gases and increasing the volume of heat recovery by adopting low-air-ratio combustion technology 	<ul style="list-style-type: none"> Reducing power use by adopting high-efficiency motors 	<ul style="list-style-type: none"> Reducing power use by installing speed control-type inverters 

Examples of primary equipment improvement works

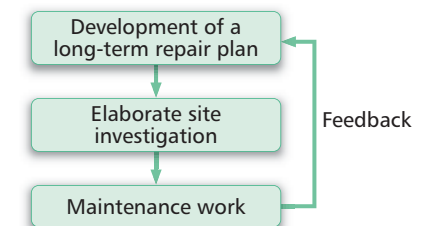
3 Maintenance

Ensuring stable waste treatment

Annual maintenance is essential in order to ensure stable operation of waste treatment plants.

However, 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



Measuring the thickness of boiler water tubes



Maintaining a conveyor

4 Long-term turnkey operation business

Safe, secure facility operation

In recent years, the number of long-term turnkey operation projects such as DBO* projects that involve long-term outsourcing of operation and maintenance management over 10 to 20 years has been increasing. The Takuma Group is pursuing this business actively, and as of June 30, 2016, we were operating 12 facilities and preparing for the start of operation of 4 more.

Against this backdrop, we are dedicated to pursuing safe, secure facility operation through initiatives that are designed to help establish a basis for future operations and to strengthen our capabilities in this area, for example by developing plant plans with a view toward operation, developing a turnkey operation and maintenance management support system, and strengthening self-monitoring.

* DBO projects: A business approach in which local governments secure funding and then place a single order encompassing facility design, construction, and operation.



Kurume Municipal Miyanojin Clean Center, which began operation in FY2016

Opening facilities to the community

While waste treatment plants play an essential role in daily life for nearby residents, the facilities are also prone to be perceived to be a nuisance.

Takuma strives to spread understanding of the facilities it operates and the need to practice the 3Rs by hosting various events in an effort to open facilities to the surrounding community.



At an event (Kashihara Eco Summit)

Activities of Our Energy Plant Business

—Transforming a variety of biomass resources into fuel

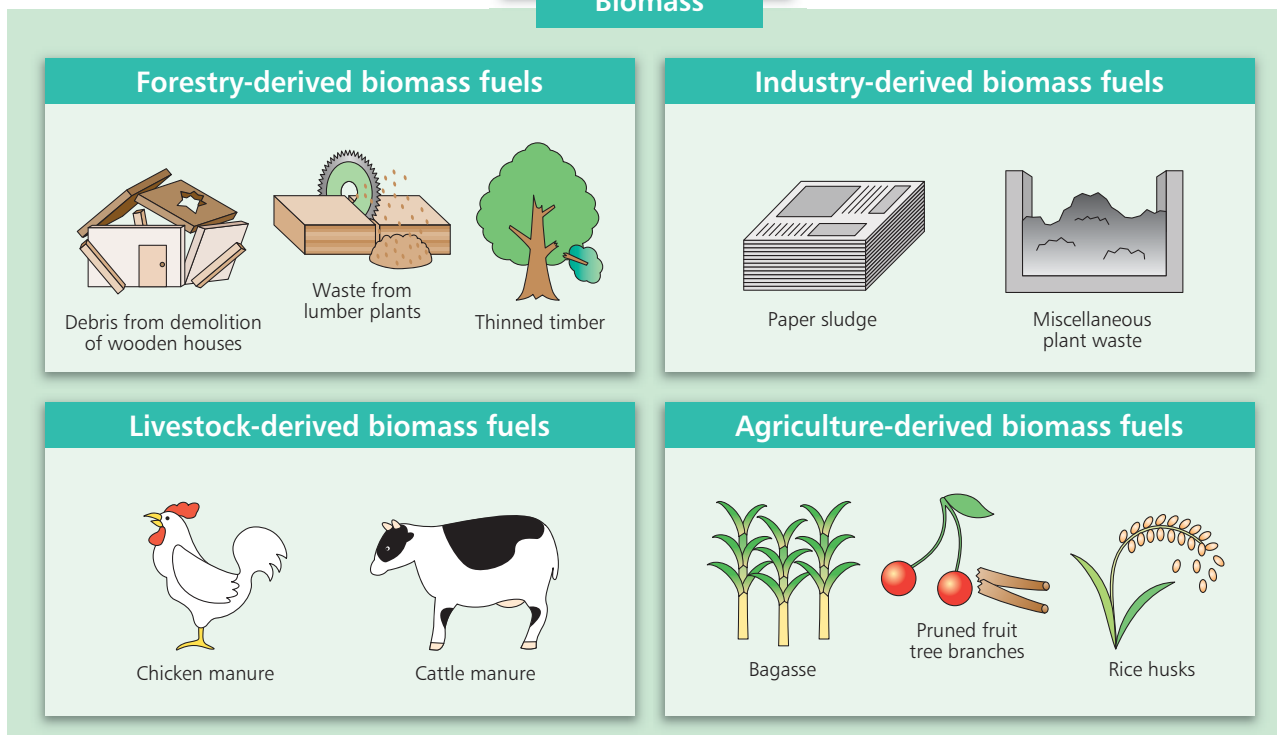
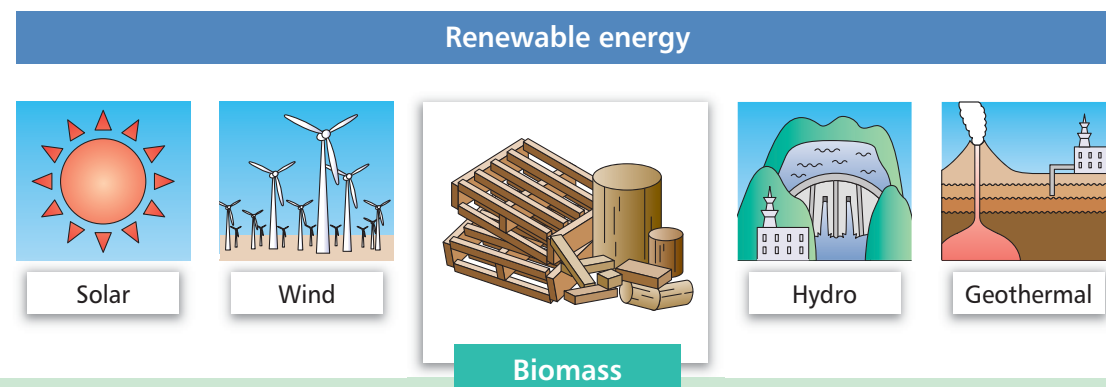
Technologies and experience in using a broad range of biomass fuels

Since its founding, Takuma has enhanced its technological capabilities as a pioneering boiler manufacturer to deliver a total of more than 600 boilers designed to accommodate a wide variety of biomass fuels in Japan and overseas.

Going forward, we will continue to actively pursue development and improvement of technologies for effectively using energy in a way that gives priority to both humankind and the planet while simultaneously meeting customer needs.

Social landscape

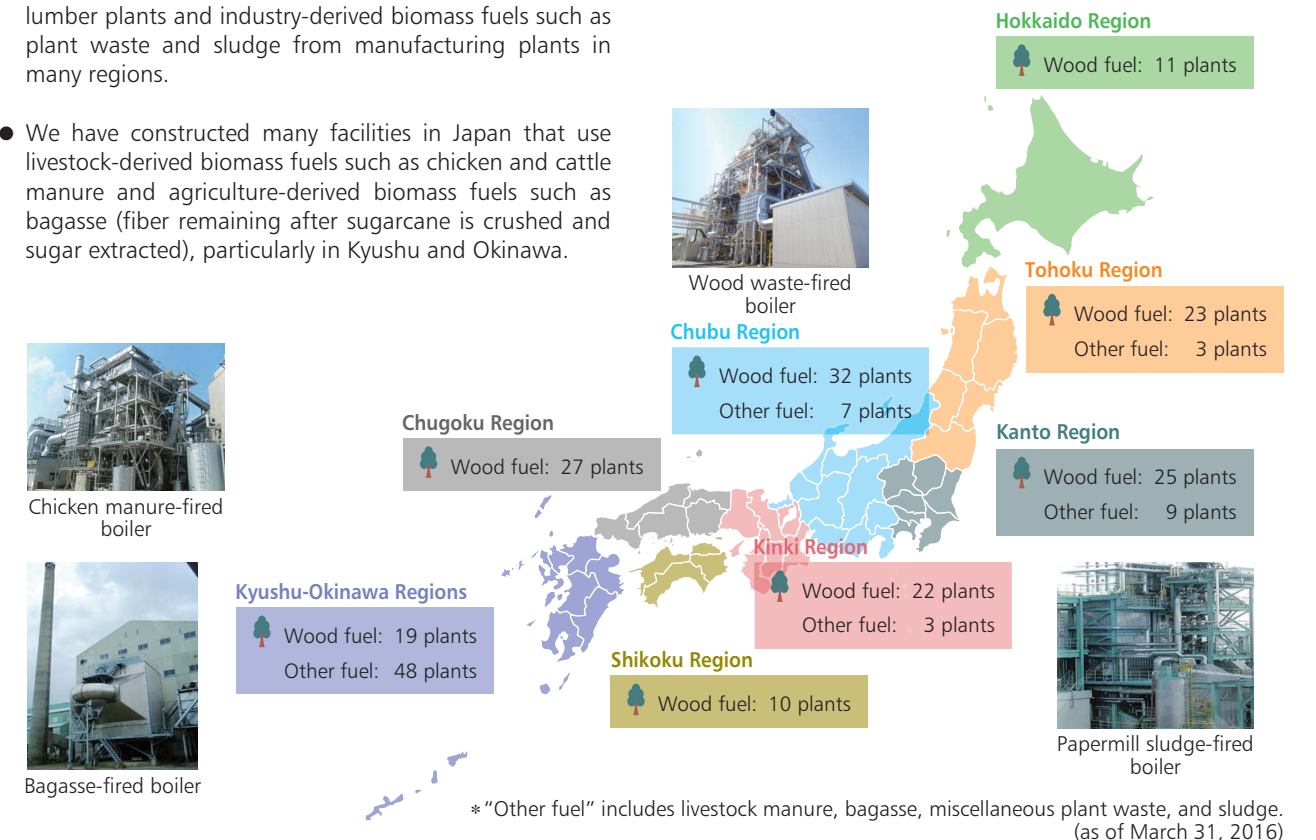
The Great East Japan Earthquake of 2011 threw the safety of nuclear power plants into question and led many to begin focusing on “renewable energy,” which is characterized by a low environmental impact, as an alternative source of energy. Biomass-fueled power generation in particular promises beneficial ripple effects such as redevelopment of the forestry industry and job creation as companies move to fill needs of fuel procurement, transport, and storage as well as chip processing and other operations. Compared to solar and wind power, biomass also has the advantage of being able to provide power in a relatively stable manner without being affected by weather. Currently, biomass-fueled power plants are being planned and built in locations across Japan.



Delivery record of biomass boilers by area of Japan

Takuma is working on facilities that use biomass fuel throughout Japan.

- We have constructed facilities that use forestry-derived biomass fuels such as thinned timber and waste from lumber plants and industry-derived biomass fuels such as plant waste and sludge from manufacturing plants in many regions.
- We have constructed many facilities in Japan that use livestock-derived biomass fuels such as chicken and cattle manure and agriculture-derived biomass fuels such as bagasse (fiber remaining after sugarcane is crushed and sugar extracted), particularly in Kyushu and Okinawa.



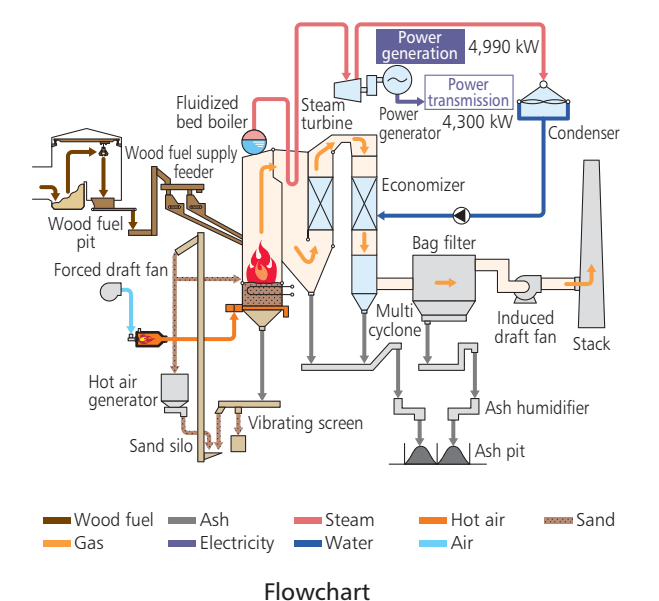
Wood chip-fired power plant

The introduction of Japan’s feed-in-tariff system for renewable energy is driving expectations for biomass power generation to new levels.

Anticipating these developments, Takuma has deployed numerous biomass power generation facilities and created a subsidiary with a wood biomass generation business to procure biomass fuels from various regions while operating, maintaining, and managing biomass power generation facilities.

Subsidiary profile

Subsidiary Biopower Katsuta Co., Ltd., operates a biomass-fired power generating plant located in Hitachinaka City in Ibaraki Prefecture. All the electricity the plant generates (with the exception of what is used to power the plant itself) is sold to the grid.

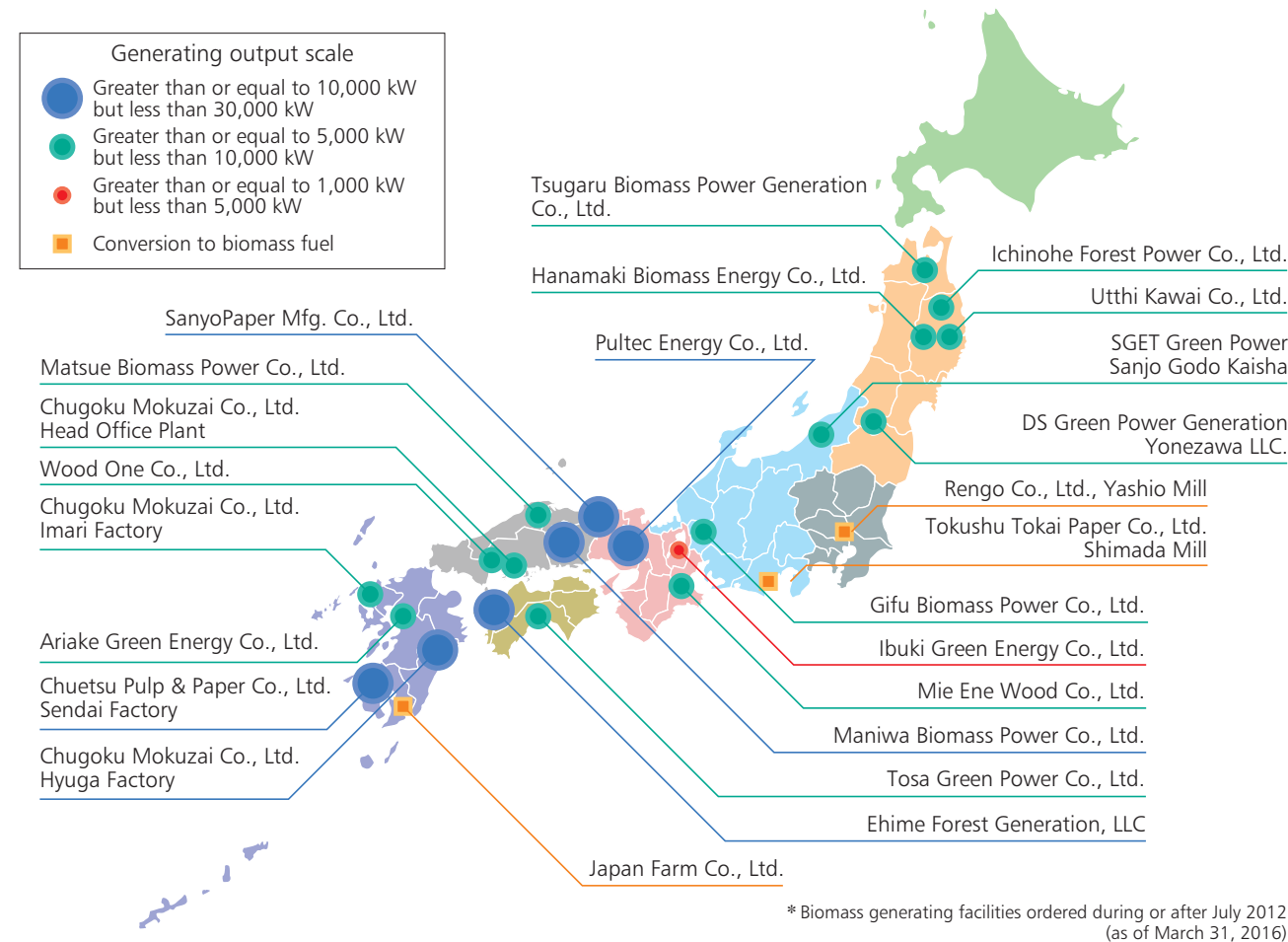


Activities of Our Energy Plant Business

—Pursuing biomass power generation

Biomass fired power plants comprise one of our most skilled product areas. Activity in the segment has been sparked by the prospect of stable profits made possible by the launch of Japan's feed-in tariff system for renewable energy in July 2012, and Takuma has received orders for numerous plants.

We have also received multiple orders for boiler fuel conversion projects to provide electricity and steam for internal plant use.



Biomass fuel under the feed-in tariff program [JPY per kWh]: Unit price for sale of electricity under the FIT program (FY2016)

Unused timber (Generating plant with output of 2,000 kW or greater) [JPY 32 per kWh]
(Generating plant with output of less than 2,000 kW) [JPY 40 per kWh]

In the forestry industry, leftover timber that cannot be used and trees that have been felled during thinning but whose value does not merit harvesting have gone unutilized. By setting a purchase price for this type of wood that is higher than that of other biomass materials, the feed-in tariff program is intentionally promoting use of these resources.

General timber [JPY 24 per kWh]

Timber other than unused timber and recycled timber is collectively known as general timber. This category includes mill ends, sawdust, bark, pruned branches from farms and other sources, as well as driftwood from dams and imported materials such as palm kernel shells (PKS).

Waste products [JPY 17 per kWh]

This category includes waste biomass such as municipal solid waste and sewage sludge, biomass from the livestock industry such as livestock excrement, and industrial biomass such as paper sludge and black liquor.

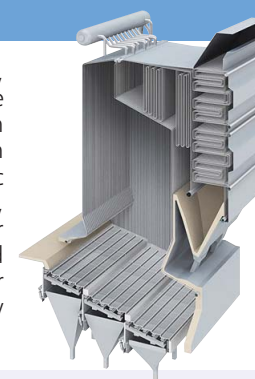
Recycled timber [JPY 13 per kWh]

This category includes construction waste, for example from the demolition of houses. Construction waste has been used as a primary fuel in wood biomass boilers for some time, and at present it constitutes the most commonly used wood fuel.

Proposing combustion furnaces that can accommodate the fuels customers use

Step grate stoker

This combustion method, which derives from waste incineration technology, can be used to uniformly burn fuels with different calorific values, moisture content, shapes, and sizes. Another characteristic of this method is that it requires less power to operate (known as facility power) than other types.



Installation example: Sendai Factory, Chuetsu Pulp & Paper Co., Ltd.

Chuetsu Pulp & Paper Co., Ltd., is a large general paper manufacturer that manufactures, processes, and sells pulp and paper products.

The facility we delivered at the company's Sendai Factory uses a step grate stoker that can accommodate biomass fuels with a variety of properties and shapes in anticipation of the future diversification of fuels.

[Equipment overview]

- Location: Satsumasendai City, Kagoshima Prefecture
- Generating output: 23,700 kW

Traveling stoker

With a traveling stoker, fuel is distributed in the furnace so that longer combustion times are secured for fuel with larger volumes. As with a step grate stoker, combustion is comparatively gradual, and the system can accommodate a wide range of fuels with different calorific values, moisture content, and shapes.



Installation example: Maniwa Biomass Power Co., Ltd.

Maniwa Biomass Power Co., Ltd., one of only a few wood biomass-fueled power generating companies in Japan, was established by 10 public- and private-sector investors, including Meiken Lamwood Corporation, Ltd., one of Japan's largest manufacturers of laminated lumber.

The company's generating plant, which utilizes unused lumber from the Maniwa region as its primary source of fuel, is expected to contribute to the growth of the area's forestry and lumber processing industries and to local job creation.

[Equipment overview]

- Location: Maniwa City, Okayama Prefecture
- Generating output: 10,000 kW

Bubbling fluidized bed

Since sand that has been fluidized by high-pressure air burns away the surface of the chips, little unburned fuel remains, making high boiler efficiency a characteristic of fluidized bed systems. They can accommodate a variety of different types of fuel, including fuels with high moisture content.



Installation example: Gifu Biomass Power Co., Ltd.

Gifu Biomass Power Co., Ltd., is a wood biomass-fueled power generating company established with Gisen Co., Ltd., as an investor.

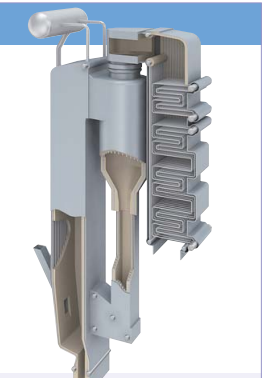
This system is designed specifically to burn unused lumber, which had been considered to have low utility value due to its high moisture content compared to traditional construction waste-type fuels, as well as general lumber, which is a manufacturing plant byproduct, as biomass fuel, allowing these resources to be effectively utilized.

[Equipment overview]

- Location: Mizuho City, Gifu Prefecture
- Generating output: 6,250 kW

Circulating fluidized bed

Heated, fluidized sand burns fuel as it circulates, keeping temperatures inside the furnace uniform to enable stable combustion. Since little waste remains unburned, boiler efficiency is high, and the system can accommodate a broad range of mixed fuels with different caloric values.



Installation example: Hyuga Factory, Chugoku Mokuzai Co., Ltd.

Chugoku Mokuzai Co., Ltd., is a large general lumber company that offers an extensive product line ranging from lumber to laminated lumber and pre-cut lumber.

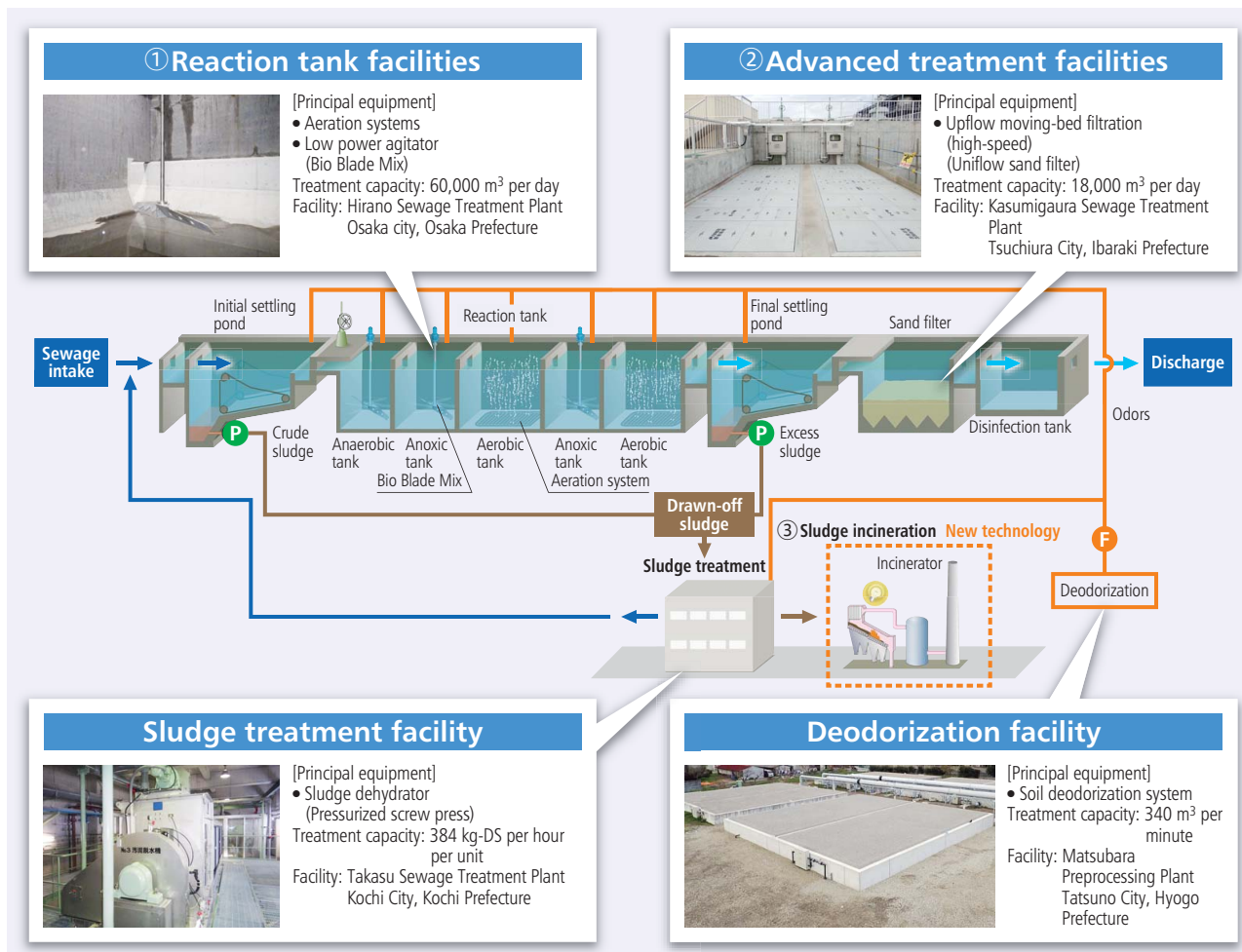
The facility delivered by Takuma to the company's Hyuga Factory uses a circulating fluidized bed boiler that can accommodate the customer's need to effectively utilize a wide range of biomass fuels.

[Equipment overview]

- Location: Hyuga City, Miyazaki Prefecture

Activities of Our Water Treatment Plant Business

Takuma contributes to the preservation of the water environment by providing a variety of water treatment facilities. In addition, we are working to develop new technologies to accommodate ongoing changes in society, for example by utilizing renewable energy and reducing emissions of greenhouse gases.



Installation examples of water treatment facilities delivered by Takuma

① Reaction tank facility

The reaction tank facility consists of an aerobic tank that supplies oxygen (aeration) and oxidizes and breaks down organic matter through the action of microorganisms known as activated sludge. Anaerobic and anoxic tanks are also provided for the purpose of biologically eliminating nitrogen and phosphorus.

Takuma has developed energy-saving stirring machines to stir the contents of the anaerobic and anoxic tanks. We have commercialized a low-power stirring machine in which two specially shaped stirring blades are powered by an above-water drive unit. We have delivered 68 of these machines, which provide stirring capacity of about 1.0 W per cubic meter at about 1/10 the power of a conventional machine, to sewage treatment plants and other sites in Japan.

② Advanced treatment facility

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. In order to reuse treated water, it is necessary to reduce the biochemical oxygen demand and suspended solid concentration in that water. Sand filtration is typically used as a technology for eliminating suspended solids, and both fixed-bed and moving-bed systems are available. Takuma has delivered a cumulative total of more than 2,500 upflow moving-bed sand filtration systems (uniflow sand filters).

Since the filtration differential pressure can be kept low in upflow moving-bed filtration ponds thanks to a purification mechanism that continuously purifies the sand, the amount of power used by lifting pumps can be reduced. In addition, Takuma has developed a high-speed sand filtration system that allows filter speeds of up to 1,000 meters per day, about three times that of conventional systems, while simultaneously using less space than those systems. There are already five of these facilities in operation.

③ Sludge incineration

Sewage sludge is a type of biomass, and it is expected to be used as a form of renewable energy. Past sludge incinerators have required auxiliary fuel and used large amounts of electricity, making them net consumers of energy. Takuma has developed a sludge incineration system based on a new concept that shifts operation to an energy-saving and energy-yielding footing, and we are working to develop a broad range of businesses using the system as a technology that can lower costs at sewage treatment plants while simultaneously reducing energy use and greenhouse gas emissions.

● Demonstration Study of Power Generation System with Sewage Sludge Incineration

This energy-yielding system consists of three technologies: sludge dehydration using an inside double coagulation type centrifugal dehydrator, energy recovery using an innovative step grate (with boiler), and energy conversion using steam generators (both centrifugal and binary-type).

The technology was adopted by the Ministry of Land, Infrastructure, Transport and Tourism's Breakthrough by Dynamic Approach in Sewage High Technology Project (B-DASH) in FY2013, and we constructed a full-scale demonstration plant capable of incinerating 35 tons (wet) per day at the Wakayama Municipal Central Sewage Treatment Plant. Based on data obtained from the plant's operation, we were able to conclude that it delivered the target level of performance that we had envisioned at the outset, that operation is stable even without auxiliary fuel, that it generates electricity using heat recovered by means of steam, and that it generates more power than the incineration facility uses. The results from the demonstration project were published in September 2015 by the Ministry of Land, Infrastructure, Transport and Tourism National Institute for Land and Infrastructure Management in the form of a series of "Guideline for Introducing a Technology (draft)."

● High-temperature energy-saving sludge incinerator

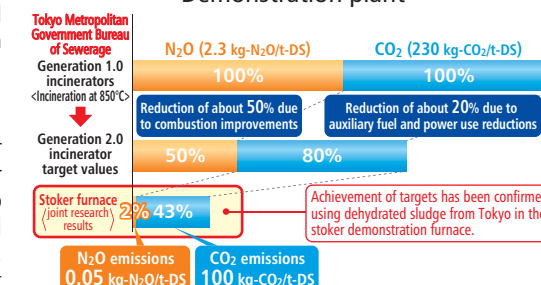
As a result of joint research, we were able to verify that stoker furnace-based sludge incineration technology satisfies the standards for high-temperature energy-saving incinerators as put forth by the Tokyo Metropolitan Government Bureau of Sewerage (for Generation 2.0 and 2.1 incinerators), which require incinerators to address global warming, improve energy savings, and reduce maintenance and management costs. Consequently, the incinerator was approved as a compliant facility.

● Energy self-reliant sludge incinerator

As a result of joint research, we were able to verify that our system combining stoker furnace-based sludge incineration technology with steam-driven power generation technology satisfies the standards for energy self-reliant sludge incinerators as put forth by the Tokyo Metropolitan Government Bureau of Sewerage (for Generation 3.0 incineration systems), which require that incinerators to generate more power than they use, that incinerators do not require auxiliary fuel (with the exception of special operations such as incinerator startup and shutdown^(*)), and that incinerators help reduce the CO₂ emissions associated with power use. Consequently, the incinerator was approved as a compliant facility.

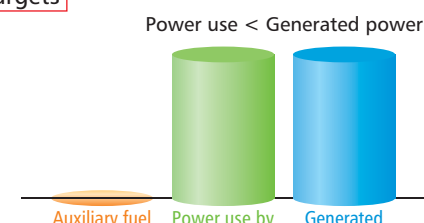


Demonstration plant



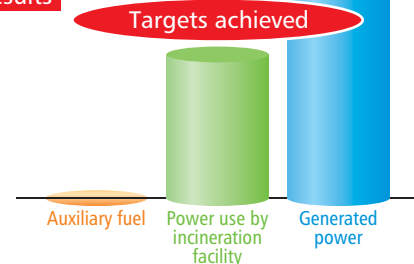
Joint research results of high-temperature energy-saving incinerator

Targets



Energy self-reliant sludge incinerator
N₂O emissions: 1.15 kg-N₂O/t-DS or less
Power use: 161 kWh/t-DS or less^(*)
Unit price of generated power: JPY 14/kWh or less

Results



Research results of stoker furnace
N₂O emissions: Target achieved
Power use: Target achieved
Unit price of generated power: Target achieved

^(*) Except during incinerator startup and shutdown, when dehydrated sludge moisture content exceeds 74%.
^(*) When incinerating dehydrated sludge with a moisture content of 74% and an incineration capacity of 300 tons per day. Some generated power may be used to operate the facility.

Joint research results for an energy self-reliant sludge incinerator

Activities of Our Overseas Business

—Sales of biomass-fired power plants, municipal solid waste incineration plants, and Energy from Waste plants overseas

For more than half a century, Takuma’s biomass boilers have contributed to industrial growth and economic development in Southeast Asia. In addition, our power plants help materialize coexistence of both environmental protection and energy supply.

Biomass-fired power plant sales in the Southeast Asian market

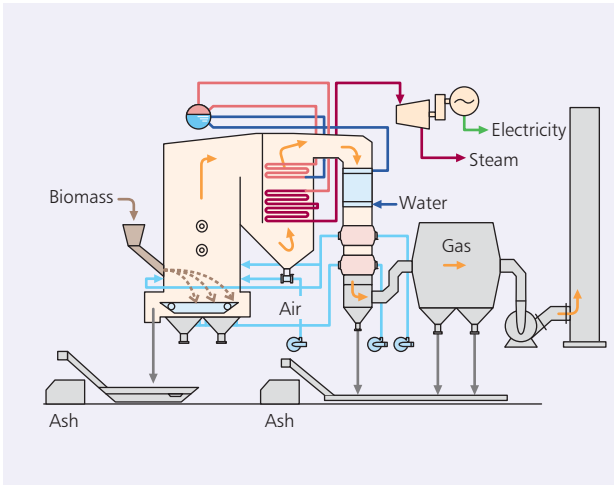
In the Southeast Asian market, the sugar industry in Thailand is undergoing a transition from a sector that focused on expanding sugar production volume to an energy-supplying industry in which sugar production is joined by electricity sales and bioethanol production as core business operations. Specifically, companies are combining bagasse (fiber remaining after sugarcane is crushed and sugar extracted) as a main fuel with eucalyptus wood chips, rubber wood chips, cane leaves, rice husks, and other materials as auxiliary fuels to effectively generate electricity, using comparatively high-temperature, high-pressure steam on the order of 10 MPa and 520°C, for sale to the grid.

Furthermore, impetus to this major change is being given by programs that give exemptions on import duties for building power plants using biomass and other renewables, that lower corporate taxes for operators during a specific period and that maintain advantageous purchase prices for power by means of feed-in-tariff (FIT) mechanisms. As a result, there continues to be a voracious appetite for investment in the Thai sugar industry despite the recent decline in sugar prices on international markets.

There is also a noteworthy trend on the part of other countries in Southeast Asia toward using the Thai programs as a model in the use of biomass and other renewables.

Takuma will continue to draw on its extensive experience and outstanding technology to meet market demand by supplying highly reliable power plants that deliver efficient and stable combustion of biomass.

In addition, we are confident that we will be able to make an even broader contribution by building on our record of success through delivery of biomass mixed-firing high-efficiency, high-temperature/high-pressure boiler power plants to the sugar industry in Thailand and thereby earning praise in the market so that we can supply highly reliable plants to the markets in nearby countries such as Indonesia, Myanmar, Vietnam, Cambodia and Laos.



High-temperature/high-pressure boiler



● Steam capacity:	165 tons per hour
● Design pressure:	12.5 MPaG
● Steam pressure:	10.5 MPaG
● Steam temperature:	520°C
● Design:	Single drum, Vertical type, Natural circulation, Membrane design
● Combustion method:	Traveling stoker
● Fuel:	Bagasse
● Principal emissions treatment:	Electrostatic precipitator

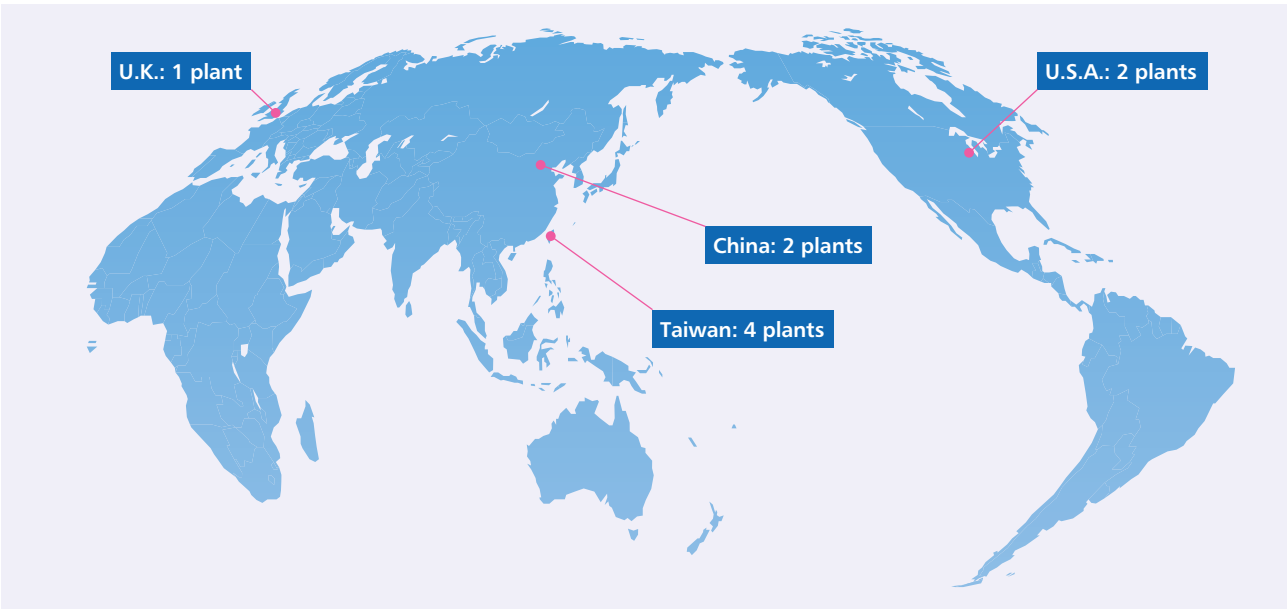
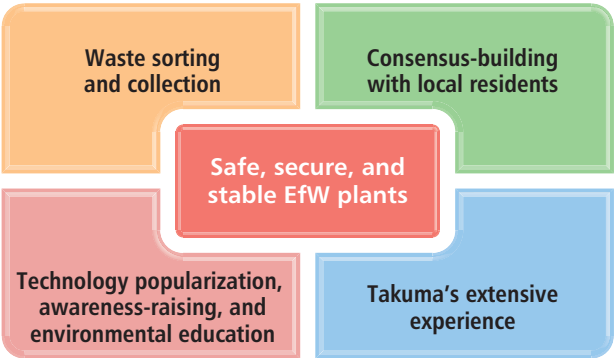
Overseas Energy from Waste plant business

Through its overseas market research, Takuma has become aware that demand for Energy from Waste (EfW) plants is growing rapidly worldwide against the backdrop of urbanization and growing environmental awareness. Particularly in developing countries where urbanization is occurring, there is pressure to take environmental factors into consideration along with infrastructure development (for example by preventing global warming through the use of renewable energy), and interest in building EfW plants is rising rapidly.

At the same time, most developing countries need appropriate diagnostic information, advice, and guidance concerning this type of facility, and due to the need to understand waste treatment in each of these markets, it will be essential for Takuma to strengthen partnerships with stakeholders in each country and obtain more accurate information in order to pursue its business.

Takuma has been able to take advantage of its extensive experience and track record, coming from the holding top market share in Japan and the high praise that the nine EfW plants delivered overseas have earned for stable operation and other performance, to provide optimal proposals in response to each country’s unique needs while exchanging detailed information with stakeholders. We are interested in working with Japanese local governments to help the public and private sectors in overseas countries come together to resolve waste-related issues, and we expect our expertise in areas such as waste sorting and collection, EfW technology popularization and awareness-raising, environmental education, and consensus-building with local residents to play an important role. We are confident that we can provide safe, secure, and stable plants to the people of these countries and regions by pursuing these initiatives.

Although the market and competitive environment worldwide are becoming more challenging as Asian and European companies join their domestic counterparts in competing for project orders, Takuma will conduct feasibility studies to gauge the viability of building optimal business models that will enable it to take advantage of its strengths as the first step after choosing target markets. In this way, we plan to contribute to environmental protection by building overseas EfW plant businesses that are optimally suited to each country and region.



EfW plants delivered by Takuma overseas

Main Recent Projects

The following are the main facilities supplied by Takuma during FY2015.

Municipal solid waste treatment plants

Shimonoseki City Okuyama Factory



Project name Shimonoseki City New Waste Treatment Facility Construction Project (Phase 1)
Capacity Incineration facility: 150 tons per day (150 tons per day × 1 unit)
Power output: 3,600 kW
Location Yamaguchi Prefecture

Yawatahama-minami Environmental Center



Project name Yawatahama-minami Environmental Center Primary Facility Improvement Project
Capacity Incineration facility: 84 tons per day (42 tons per day × 2 units)
Location Ehime Prefecture

Fujinomiya City Clean Center



Project name Fujinomiya City Clean Center Primary Facility Improvement Project
Capacity Incineration facility: 240 tons per day (120 tons per day × 2 units)
Location Shizuoka Prefecture

Aogishi Energy Center



Project name: Aogishi Energy Center Primary Facility Improvement Project
Capacity Incineration facility: 400 tons per day (200 tons per day × 2 units)
Power output: 4,300 kW
Location Wakayama Prefecture

Energy plants

Maniwa Biomass Power Co., Ltd.



Project name 10 MW Wood-fueled Boiler Power Generating Facility Installation Project
Capacity Fuel: Wood
Steam conditions (normal operation): 48.4 tons per hour × 6.0 MPaG × 425°C
Power output: 10,000 kW
Location Okayama Prefecture

Matsue Biomass Power Co., Ltd.



Project name Wood Biomass-fueled Power Generating Boiler Installation Project
Capacity Fuel: Wood
Steam conditions (normal operation): 28 tons per hour × 5.98 MPaG × 425°C
Power output: 6,250 kW
Location Shimane Prefecture

Japan Farm Co., Ltd.



Project name JF Biomass Power Generating Plant Installation Project
Capacity Fuel: Biomass (chicken manure)
Steam conditions (normal operation): 32 tons per hour × 1.67 MPaG × 206.3°C (saturation temperature)
Power output: 3,000 kW
Location Kagoshima Prefecture

Chugoku Mokuzai Co., Ltd., Hyuga Factory



Project name Wood-fueled Fluidized Bed Boiler Installation Project
Capacity Fuel: Wood
Steam conditions (normal operation): 13 tons per hour × 1.3 MPaG × 195°C (saturation temperature)
Location Miyazaki Prefecture

Tsugaru Biomass Power Generation Co., Ltd.



Project name Biomass Power Generating Plant Construction Project
Capacity Fuel: Wood
Steam conditions (normal operation): 28 tons per hour × 5.98 MPaG × 425°C
Power output: 6,250 kW
Location Aomori Prefecture

Chuetsu Pulp & Paper Co., Ltd., Sendai Factory



Project name Wood Biomass-fired Power Generating Facility Installation Project
Capacity Fuel: Wood
Steam conditions (normal operation): 85 tons per hour × 8.2 MPaG × 505°C
Power output: 23,700 kW
Location Kagoshima Prefecture

Rengo Co., Ltd., Yashio Mill



Project name Biomass Boiler Power Generating Facility Installation Project
Capacity Fuel: Wood
Steam conditions (normal operation): 70 tons per hour × 6.2 MPaG × 460°C
Power output: 9,000 kW
Location Saitama Prefecture

Chugoku Mokuzai Co., Ltd., Imari Factory



Project name Chugoku Mokuzai Biomass Power Generating Plant (Imari)
Capacity Fuel: Wood
Steam conditions (normal operation): 42 tons per hour × 6.0 MPaG × 460°C
Power output: 9,850 kW
Location Saga Prefecture

Nippon Zeon Co., Ltd., Mizushima Plant

Project name Boiler Upgrade Project (M141 Project)
Capacity Fuel: Byproduct oil and byproduct gas
Steam conditions (normal operation): 40 tons per hour × 1.2 MPaG × 191.6°C (saturation temperature)
Location Okayama Prefecture

Main Recent Projects

Industrial Waste Treatment Plants

■ Marusan Paper Mfg. Co., Ltd.



Project name Biomass Incineration Facility Installation Project
Capacity Fuel: Paper waste
Incineration capacity: 95 tons per day
Location Fukushima Prefecture

Water Treatment Plants

■ Urado Bay Eastern Basin Sewage Treatment Plant



Project name Urado Bay Eastern Basin Sewage Treatment Plant
Sludge Treatment Facility Project No. 10
Capacity Type: Pressurized screw press dehydrator
Capacity: 24.2 m³ per hour
Location Kochi Prefecture

■ Osaka City Hirano Sewage Treatment Plant



Project name Hirano Sewage Treatment Plant South Pond Reaction
Tank Facility Project (Tank Nos. 7 to 12)
Capacity Type: Diffusion plates in high-density configuration
and low-power vertical stirring machine
Capacity: 60,000 m³ per day
Location Osaka Prefecture

■ Tatsuno City Matsubara Preprocessing Plant



Project name Matsubara Preprocessing Plant No. 1 Soil
Deodorization Floor Installation Project
Capacity Type: Special soil, forced air
Capacity: 85 m³ per minute
Location Hyogo Prefecture

■ Yokkaichi City Hinaga Sewage Treatment Plant



Project name Yokkaichi City Hinaga Sewage Treatment Plant
Circuit 4 Water Treatment Facility Project No. 3
Project scope Disinfection facility, water supply facility,
diversion manhole facility
Principal systems Upflow fluidized bed filter M30UAG × 3 units
Capacity: 1,800 m³ per day
Location Mie Prefecture



Contributing to Society through Our Businesses and Products

1. Initiatives to Build a Comprehensive Operation, Maintenance, and Management Support System
2. Jointly Developing a Gas-fired, High-efficiency Simple Once-through Boiler
3. Launching a High-efficiency, Proportional-control Gas-fired Once-through Boiler
4. Awards Received from Outside Organizations

Initiatives to Build a Comprehensive Operation, Maintenance, and Management Support System

1 Developmental Background

The Takuma Group has offered waste incineration plant monitoring services for more than 10 years since launching the Total Operational Support System (TIPLOS) in 2004. With the increase in DBO and O&M^{(*)1} projects in recent years, there is growing demand for service characterized by greater stability and higher cost performance.

In an effort to deliver higher-quality operation, maintenance, and management services for such projects, we leveraged the latest ICT^{(*)2} technologies to build the **POCSYS**^{(*)3} comprehensive operation, maintenance, and management system, a new system designed to provide more extensive functionality and to utilize data more effectively.

*1 O&M: Operation and Maintenance

*2 ICT: Information and Communication Technology

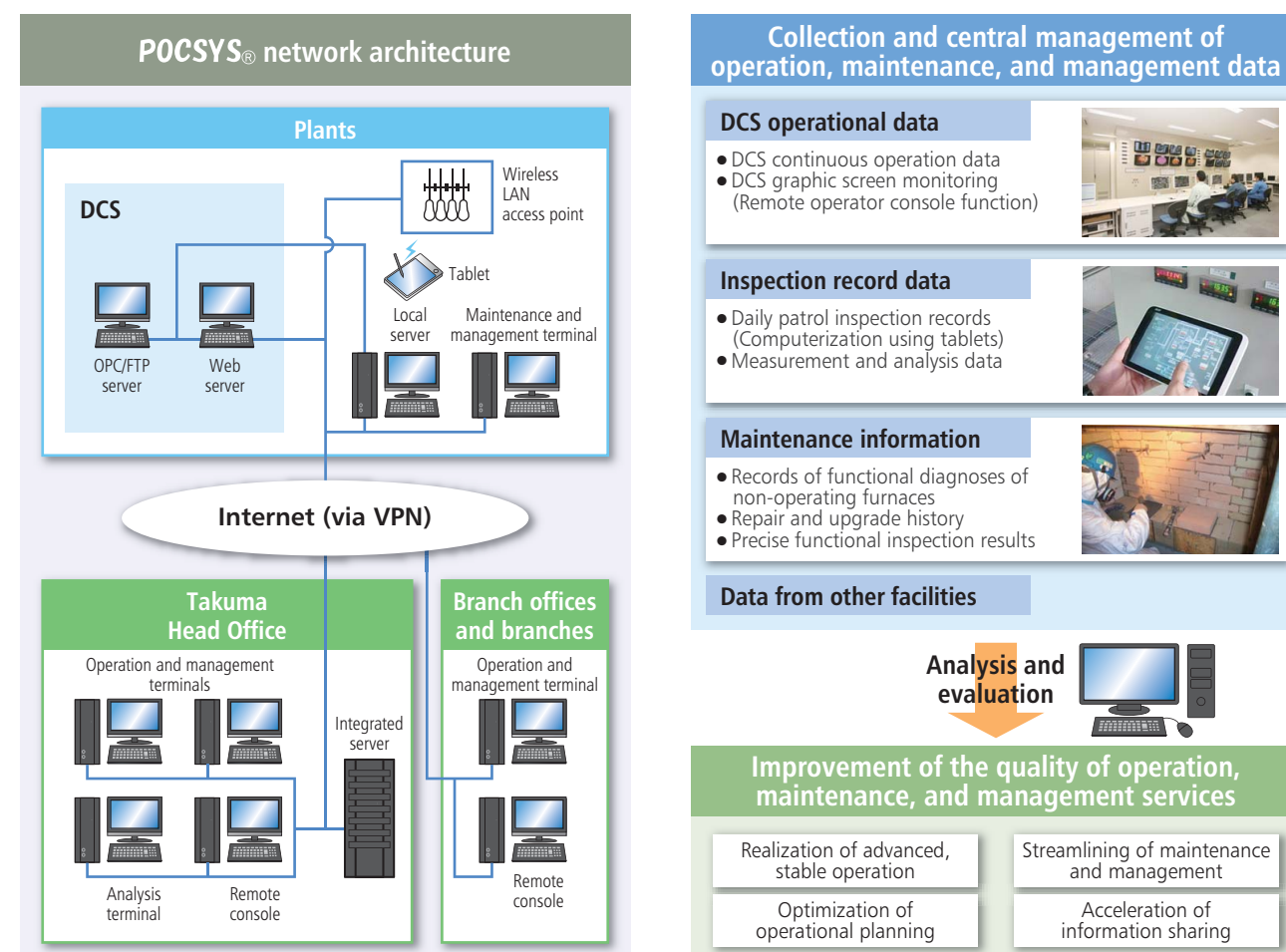
*3 **POCSYS**: Plant Optimization Comprehensive Support System

2 Overview of the **POCSYS**® comprehensive operation, maintenance, and management support system

POCSYS® augments the DCS^{(*)4} operational data captured by our previous TIPLOS system by capturing inspection record data and maintenance information, gathering and storing that data on a dedicated server, and facilitating central management of data from multiple plants. By comprehensively analyzing and evaluating the stored data, the system is able to provide higher-quality operation, maintenance, and management services.

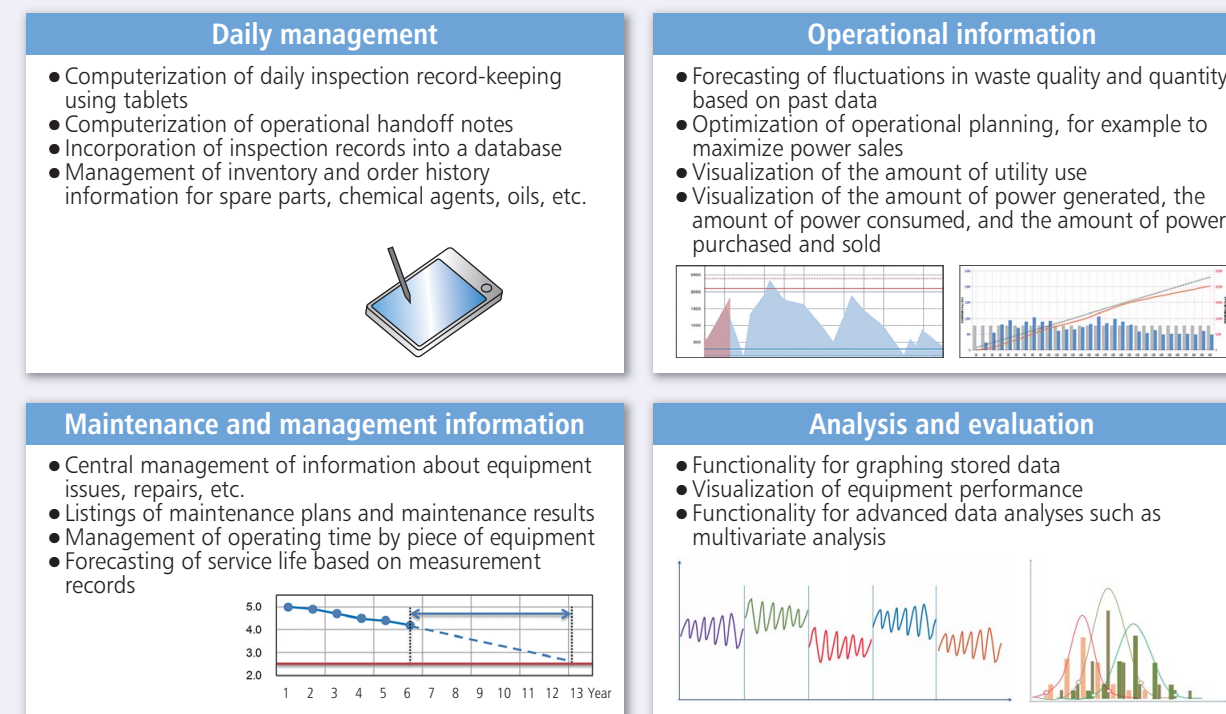
In addition, **POCSYS**® makes possible more stable operation through advanced, data-based operation, maintenance, and management, contributing to user-friendliness and the safety of everyone involved with managed facilities.

*4 DCS: Distributed control system



3 Functional enhancements

The enhanced functionality provided by **POCSYS**® falls into the four categories of Daily Management, Operational Information, Maintenance and Management Information, and Analysis and Evaluation. This functionality both makes possible efficient facility operation and provides an environment in which data can be effectively utilized.



4 Creation of new added value

During FY2016, the operator of a waste incineration plant in the Kyushu region began using **POCSYS**®, and we are planning on a progressive deployment at new and existing facilities for which the Group provides operational management services in DBO and O&M projects.

Furthermore, we will strive to create new added value through initiatives such as the following that utilize **POCSYS**®.

Establishing next-generation combustion technologies

We will analyze combustion characteristics that are influenced by multiple factors contained in stored data and operational characteristics, and in the future we will strive to establish next-generation combustion technologies to provide real-time feedback of analysis results to combustion control.

Expanding remote monitoring and operation support services

We will further expand the remote monitoring and operation support service offered as part of the TIPLOS system to date in an effort to establish operation support structures with a view to reducing manpower requirements through remote operation of plants.

Bringing innovation to private-sector plants

By deploying **POCSYS**® to private-sector boiler plants such as biomass power plants and expanding the maintenance and management services that use it, we will help ensure customer profits while reducing CO₂ emissions.

Jointly Developing a Gas-fired, High-efficiency Simple Once-through Boiler

—Improving operating efficiency by up to 6% through innovations such as reduced minimum output and use of a four-stage combustion control system

Working jointly with Tokyo Gas Co., Ltd.; Osaka Gas Co., Ltd.; and Toho Gas Co., Ltd., Takuma Group company Nippon Thermoener Co., Ltd., developed the EQRH-1001NM high-efficiency simple once-through*1 boiler (with equivalent evaporation*2 of 1,000 kg/h) featuring improvements in the operating efficiency thanks to innovations such as reduced minimum output and use of a four-stage combustion control system.

Simple once-through boilers, which are distinguished by the fact that no special license is required in order to operate them, are being used by facilities in a broad range of fields, from small businesses to manufacturing plants. The company's corporate partners proposed the product in August 2015, and it is being sold by Nippon Thermoener.

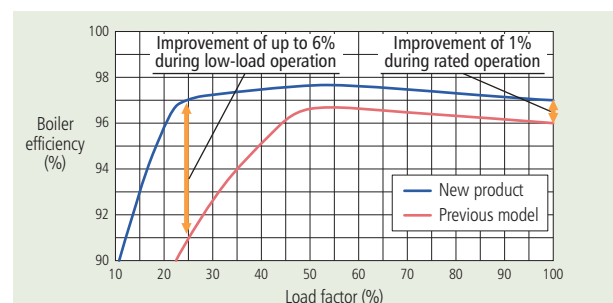
Features

By reducing the minimum output from the 50% rating used in previous models to 25% and adopting a four-stage combustion control system that controls output at four stages (100%, 50%, 25%, and 0%), we were able to reduce the number of combustion start-stop events (i.e., the on/off frequency)*3 and thereby to improve the boiler's operating efficiency*4 during periods of low-load operation. The design is the first simple once-through boiler in Japan to use a four-stage combustion control system. In addition, by developing a multi-path flow of combustion gas in the boiler body*5 and implementing low-air-ratio combustion, we were able to improve the boiler efficiency during rated

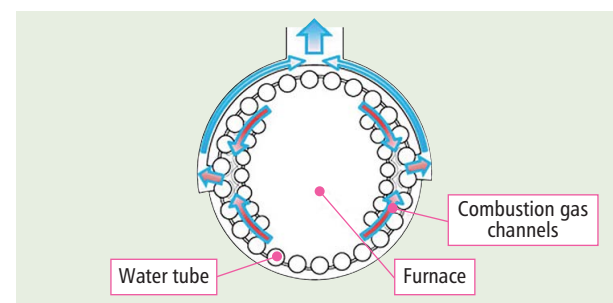
operation while simultaneously reducing the fan power consumption and improving its quietness. As a result of improvements in the boiler efficiency during low-load and rated operation, we were able to improve the operating efficiency*6 by about 3% to 6%.

Furthermore, by implementing fine-grained control over the water level in the boiler in response to output, we are able to supply high-dryness, high-quality steam over a broad range of operating pressures, from low to high loads.

Going forward, we will propose the product as a heat source for a broad range of customers, including dry cleaners, food plants and other business uses.



Load factor*7 and boiler efficiency



Multi-path flow in the boiler body (cross-section)

- *1 **Once-through boiler:** A boiler made up of tubes in which water enters on one end and leaves the other end as steam. Because the design is compact and lightweight, and because it holds a little boiler water, it can be started in a short period of time. Once-through systems are classified as boilers, small boilers, or simple boilers depending on specifications such as their maximum operating pressure and heating surface area. Simple boilers are the smallest type of once-through boiler, and no special license is required in order to operate them.
- *2 **Equivalent evaporation:** An index of boiler capacity. Equivalent evaporation indicates the amount of evaporation that occurs when water at 100°C is converted into steam at 100°C.
- *3 **Reduction in the number of combustion start-stop events (i.e., the on/off frequency):** Boilers control the evaporation by switching output levels such that the steam usage does not fall below the minimum output level. Where steam usage would fall below that level, the evaporation is regulated by cycling combustion on and off. After stopping combustion and when restarting the boiler, the furnace is purged with fresh air to ensure safety. During this purge process, heat inside the boiler escapes to the outside, causing thermal loss. Reducing the number of combustion on-off events serves to limit thermal loss, helping to increase the boiler operating efficiency.
- *4 **Boiler operating efficiency during low-load operation:** The ratio of the amount of heat absorbed by steam produced to the total amount of heat supplied to the boiler during low-output operation ranges from 50% of the rating to 25% of the rating.
- *5 **Boiler body:** The part of the boiler in which steam is generated. The new boiler's heat transfer efficiency has been improved thanks to innovations such as the optimization of the combustion gas channels (registered utility model No. 3196892, "Multi-pass Multi-tubular Once-through Boiler").
- *6 **Boiler operating efficiency:** The boiler's overall efficiency under actual operating conditions including operation during load fluctuations as well as stops.
- *7 **Load factor:** The ratio of steam generation to the boiler's rated output.

Basic specifications		New product (EQRH-1001NM)	Previous model (EQRH-1000NM)
Equivalent evaporation	kg/h	1,000	1,000
Boiler efficiency during rated operation	%	97	96
Combustion	Turndown ratio*8 (minimum output)	4 : 1 (25%)	2 : 1 (50%)
	Combustion control method	Four-stage control	Three-stage control
Air flow rate control method		Damper + inverter	Damper
Equipment ambient noise	dB	73 or less	76 or less
Boiler dimensions	Width	920	920
	Depth	2,210	2,340
	Height	2,300	2,400

*8 **Turn-down ratio:** A ratio indicating how much the combustion amount can be limited during operation relative to the boiler's rated combustion amount.



Launching a High-efficiency, Proportional-control Gas-fired Once-through Boiler

In January 2016, Takuma Group company Nippon Thermoener Co., Ltd., launched the SUPER EQOS EQi(H)-6001NM (with equivalent evaporation of 6,000 kg/h), a high-efficiency once-through boiler that achieves 99% rated load efficiency (and 101% partial load efficiency) while improving load tracking by means of high-turndown 8:1 proportional control.

Other product features include the ability to supply high-dryness, high-quality steam across a broad range of operating pressures; to recover heat from blow water at a higher level of efficiency than previous designs; and to take up less space when used in connected installations.

Going forward, Nippon Thermoener will propose the product as a heat source for a broad range of customers operating facilities such as manufacturing plants and large buildings.

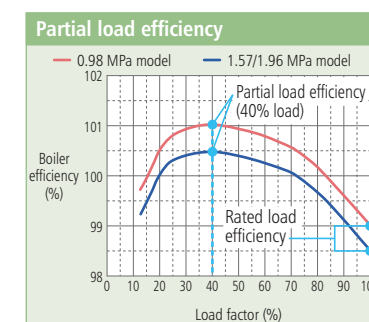


Features

1 Improved operating efficiency

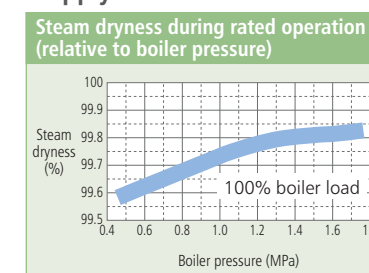
The new product achieves a rated load efficiency*1 of 99% (and a partial load efficiency*2 of 101%).

- *1 For the 0.98 MPa model (0.49 MPa, air supply temperature of 35°C, water supply temperature of 15°C)
- *2 At a boiler load factor of 40%



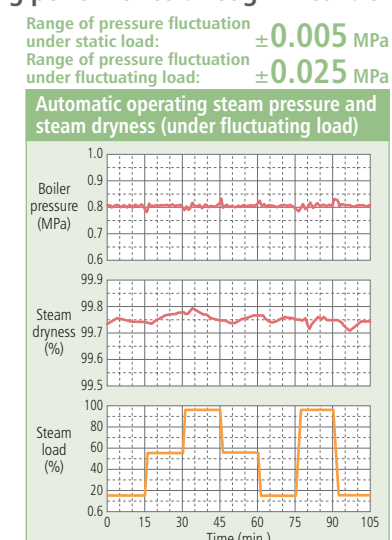
2 High-quality steam supply

The new product delivers steam dryness of at least 99.5% across a broad range of pressures.



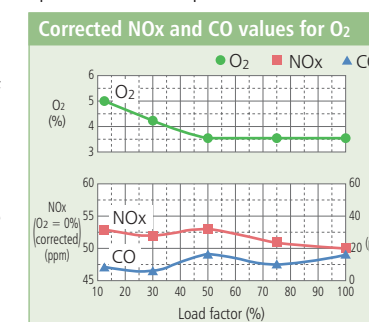
3 High load-tracking performance through PI control

The new product uses proportional integration (PI) pressure control, allowing it to supply high-quality steam by maintaining stable steam pressure and high steam dryness under all evaporation loads.



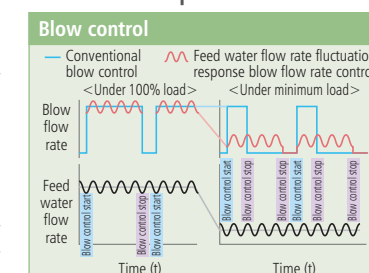
4 High turn-down ratio (8:1) and exceptional combustion performance

The boiler's newly developed burner is capable of low-air-ratio combustion, and it achieves NOx emissions of 55 ppm or less at an air ratio of 1.2. Furthermore, proportional control that varies the combustion amount from 12% to 100% allows the boiler to accommodate load requests in a fine-grained manner.



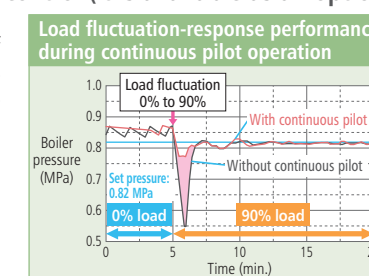
5 Feed water flow rate fluctuation-response blow flow rate control (patent No. 5826539)

Since the blow flow rate changes to accommodate changes in feed water flow rate during continuous blow operation, the boiler can recover heat from blow water efficiently under all boiler loads.



6 Continuous pilot control (it is available as an option)

The new boiler can minimize the drop-off in boiler pressure as the load increases from 0%.



7 Quietness

Thanks to a quiet design, the new boiler generates 74 dB or less noise measured in front of the unit (6 dB less than the previous model), making it compliant with the Boiler Noise Labeling Program (administered by the Japan Society of Industrial Machinery Manufacturers).

8 Connected installations

Multiple units can be connected together, yielding a space savings of about 20%*3.

*3 Compared to previous models

Awards Received from Outside Organizations

—Takuma's on-site regeneration system for catalyst denitrification equipment receives the METI Industrial Science and Technology Policy and Environment Bureau Director's Award at the 41st Outstanding Environmental Systems Awards*

Takuma's on-site regeneration system for catalyst denitrification equipment received the METI Industrial Science and Technology Policy and Environment Bureau Director's Award at the 41st Outstanding Environmental Systems Awards, which are hosted by the Japan Society of Industrial Machinery Manufacturers. As a leader in waste treatment, we look forward to continuing to propose systems which enable customers to reduce the environmental impact.

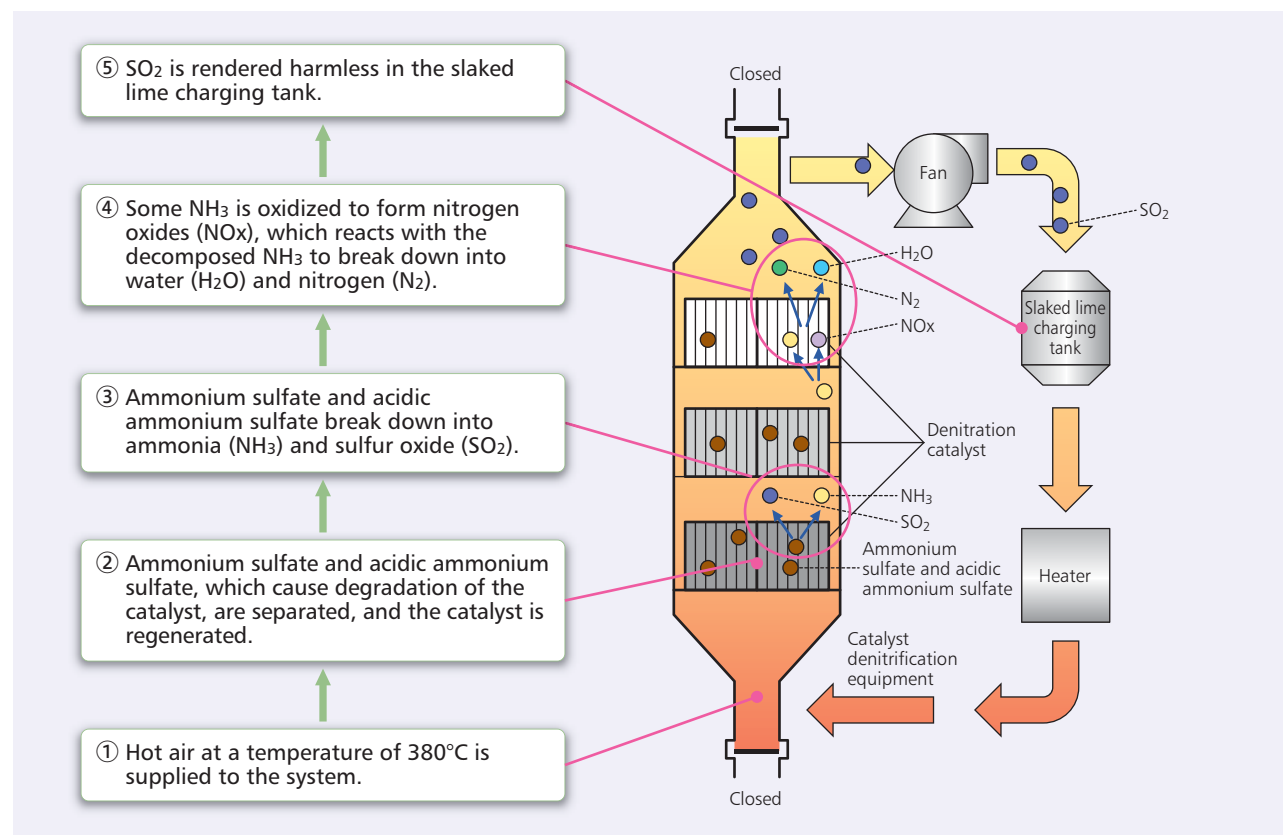
Catalyst denitrification equipment

Municipal waste incineration facilities typically install catalyst denitrification equipment to efficiently eliminate nitrogen oxides and dioxins from their exhaust gases. The catalysts, which are set in the catalyst denitrification equipment, must be regenerated at a regular interval in order to restore system functionality. In conventional systems, catalyst regeneration requires catalyzing equipment to be removed and transported to a specialized plant for regeneration.

Overview of Takuma's award-winning system

Takuma's on-site catalyst regeneration system allows catalyst regeneration to be performed without removing the catalyst from the catalyst denitrification equipment, dramatically reducing the risk that the equipment will be damaged as well as the time and cost associated with the regeneration process.

The system consists of a fan, slaked lime charging tank, heater, and circulating duct. With the exception of the circulating duct, a single system's equipment can be shared by multiple incinerators, thereby reducing the initial cost. The figure below illustrates the flow of gases through the system as well as the regeneration procedure.



* Outstanding Environmental Systems Awards

The Outstanding Environmental Systems Awards are held by the Japan Society of Industrial Machinery Manufacturers. The awards are conceived to contribute to the preservation of the environment and to facilitate R&D into environmental protection technologies as well as the widespread adoption of outstanding environmental systems by selecting outstanding environmental systems designed to address an increasingly diverse range of domestic- and global-scale environmental issues and recognizing their developers, manufacturers, and development partners.



CSR Initiatives

CSR Activities for the Future

Corporate Governance

Human Rights and Labor Practices

The Environment

Fair Business Practices

Consumer Issues

Participation in the Community

Contribution to Society

CSR Activities for the Future

To become a sustainable company while fostering and expanding a broader range of CSR activities, we began compiling a CSR activity roadmap, which we implemented and improved in FY2011. In FY2012, we chose a number of key issues based on international guidelines on corporate sustainability reporting published by the Global Reporting Initiative (GRI) as well as ISO 26000, an international standard on organizational social responsibility. We are currently working to resolve those issues.

Activity report for FY2015

Each department discussed CSR issues in line with those key issues and developed its own action program. At the end of the year, those departments then conducted self-evaluations to assess how well they had implemented their programs. (The table below outlines some of the results of that process.)

Future issues

Going forward, we plan to implement CSR activities using techniques that we consider appropriate while relying on guidance and advice from outside experts as we choose key issues and develop CSR issues and action programs.

The global business environment that characterizes the environmental and energy fields in which Takuma’s business operates grows increasingly diverse day by day, and that environment remains one of intensifying competition. Our technological capabilities in the environmental and energy fields, which we have refined over many years of experience, form the basis of our CSR management as well as our greatest strength as we look to make a broad contribution to society. We will continue to draw on this strength in our activities going forward.

* This partial list of CSR issues and FY2015 action programs is not exhaustive.

ISO 26000 core subjects	Key issue	CSR issue	Department		FY2015 action program	
					Action plan	Self-evaluation of results
Organizational governance	Executive leadership	Support from the executive leadership for the implementation of the manage- ment plan	Corporate Planning Division		Manage progress in implementing the Medium-Term Management Plan.	We managed progress in carrying out a variety of measures to implement the Medium-Term Management Plan and Annual Profit Plan through monthly and quarterly reports, among other means, to determine whether those measures are being implemented in an appropriate manner.
	Corporate governance	Verification of corporate administrative procedures	Internal Audit Division		Verify whether corporate activities adhere to predetermined governance procedures.	We conducted audits based on the Annual Audit Plan. The parameters under which these audits were carried out, including the number of audits, targeted departments, and examined aspects of operations, conformed to the plan.
		Reassessment of structures related to corporate governance	Corporate Planning Division		Consider and reassess corporate governance structures in line with the Corporate Governance Code.	We considered and reassessed corporate governance structures designed to ensure compliance with the various principles behind the code, including in the areas of changing organizational design (moving audit functions to an Audit & Supervisory Committee) and improving the administration of the Board of Directors.
	Compliance	Cultivation of a robust corporate culture	CSR Division		Raise awareness of CSR activities, spread awareness within the companies, and work to encourage employee participation, including for the Management Principles, Takuma Group Ethics Charter, and Takuma Group Code of Conduct.	In addition to spreading awareness of the Management Principles, Takuma Group Ethics Charter, and Takuma Group Code of Conduct through the CSR Report, we held readings of those documents as part of each department's CSR educational program in an effort to ensure that the underlying principles have penetrated the organization and that they are being practiced.
		Implementation of CSR education and sharing of information within divisions	Marketing Division		Use examples of compliance violations to share information during CSR education and increase employ- ees' issue awareness in this area by discussing those examples within divisions.	We held discussions about examples of compliance violations to increase employees' issue awareness.
	Risk management	Monitoring of risk management structures	Internal Audit Division		Monitor progress in the implementation of each division's risk management plan and contribute to the improvement of risk management structures.	We conducted an audit based on the Annual Audit Plan. The audit was carried out in accordance with plans with regard to targeted departments' risk management plans and report contents.
		Proposal of improvements to address legal risk	Legal Affairs Division		Assess legal risk for projects through the examination of contracts, legal consultations, internal joint workshops, and other means. Propose improvement methods to responsible departments and other involved entities and work to apply information horizontally across the organization as needed.	We found it effective to propose improvements from our division and to share information with other departments. Going forward, we hope to share information about improvement proposals and to continuously improve our ability to develop such proposals.
		Consideration of risk management techniques	Marketing Division		Reconsider the risk management techniques used in the past and implement preventive measures.	We were able to identify risks and implement preventive measures by creating and using risk manage- ment charts for each project.
			Engineering Division		Work to minimize the manifestation of project risk during the design and construction stages, focus on risk trends associated with external factors, and deal with them as appropriate.	We were able to apply information about defects that occurred during the design and construction stages to future projects.
	Information disclosure (fulfillment of account- ability requirements and assurance of trans- parency)	Fulfillment of accountability to customers and thorough practice of transparency	Marketing Division		Prepare and update materials such as documentation of company product track records and catalogs.	We prepared and updated materials such as documentation of company product track records and catalogs, and we also updated the content of our website.
		Appropriate disclosure of technical information to outside parties	Engineering Division		Publish the Takuma Technical Review and present findings to academic societies and other groups in a timely and appropriate manner.	We published technical information in a timely manner through both the Takuma Technical Review and the presentation of findings to academic societies. In addition, we disseminated information about outside awards on our website and by other means.
	Employee training on social responsibility	Promotion of employee understanding (awareness) of social responsibility and recom- mendation of autonomous behavior based on an awareness of social responsibility	Marketing Division		Discuss autonomous activities based on awareness of social responsibility internally in the context of the department's operations and leverage the experience to promote autonomous activities on the part of all employees.	We held readings of the Takuma Group Ethics Charter and the Takuma Group Code of Conduct to encourage self-awareness of social responsibility and conduct that accords with ethical standards.
	Stakeholder engagement	Engagement in active dialog with customers	Marketing Division		Create and take advantage of opportunities for dialog with customers.	We created opportunities for dialog using our Corporate Profile & CSR Report. Efforts to spread awareness about the company's compliance stance provided an opportunity for people to learn more about the company.
		Engagement in active dialog with business partners	Procurement Division		Carry out systematic visits to business partners and increase the number of opportunities for dialog.	We created multiple channels of communication, not only with business partners' sales coordinators, but also with coordinators with responsibility over manufacturing, production control, quality assurance, and other areas of operations.
Consumer issues	Safety and quality of products and services	Preventive measures related to risk concerning the safety and quality of products and services	Marketing Division		Prevent the emergence of risk related to safety and quality and implement stable plant operation by carrying out sufficient inspections in advance of periodic maintenance work.	We worked to ensure stable plant operation by preventing the emergence of risk by carrying out suffi- cient inspections in advance of periodic maintenance work.
			Marketing Division		Formulate a plan for addressing product and service issues when they occur and develop associated structures.	We analyzed areas where issues occurred and compiled a manual about preventing recurrences.
		Compliance with all laws related to quality	Manufacturing Division		Ensure that we do not ship or deliver defective products by having inspectors and managers reliably double-check legal compliance in product testing, post-treatment, and other aspects of operations.	We had inspectors and managers reliably double-check legal compliance in product testing, post-treat- ment, and other aspects of operations. No issues were found.
Fair operating practices	Compliance with the Antimonopoly Act	Understanding of the provisions of the Antimonopoly Act	Marketing Division		Educate employees by discussing specific examples of violations of the Antimonopoly Act at division meetings and analyzing differences and similarities with the company's own business environment.	We reviewed differences and similarities with the company's businesses and deepened employees' understanding using specific examples of recent violations of the Antimonopoly Act.
	Fair business relationships with customers and business partners	Implementation of fair transactions with business partners	Procurement Division		Have employees undergo regular education and training on the Subcontract Proceeds Act and offer divisional education to raise individual employees' awareness of associated issues.	We improved awareness on the part of employees involved with procurement by having them undergo outside training on the Subcontract Proceeds Act; focusing on that area in internal education; and offer- ing education to other departments.
			Manufacturing Division		Conduct a questionnaire of business partners asking about the terms of their transactions with the company to apply improvements in procurement operations.	We were able to verify compliance with the Subcontract Proceeds Act as a result of the questionnaire. Going forward, we plan to continue the process of taking corrective action.
	Respect of property rights	Protection of expertise	Engineering Division		Develop mechanisms for passing on expertise.	We utilized technological skill achievement checklists to develop educational mechanisms, but the content and frequency of that education remain inadequate.
Protection and utilization of intellectual property rights		Engineering Division		Strengthen educational activities related to patents and intellectual property rights and promote the protection and utilization of the same.	Whereas educational content had been directed towards beginners in the past, we offered courses with more advanced content in an effort to enhance employees' knowledge and raise their awareness.	
Labour practices and human rights	Appropriate employment relationships and labor conditions (including safety and health, social dialog, etc.)	Initiatives to address occupational safety and health	Safety Control Division		Carry out even more specific safety and health activities, establish specific targets concerning the number of occupational accidents, and strive to lower those numbers.	We undertook an even more aggressive program of occupational safety and health activities, but the number of occupational accidents increased despite those efforts. We will implement additional improvements in the future.
			Manufacturing Division		Promote awareness of latent hazards in the workplace and the measures currently in place to address them and reduce the number of risks with the potential to lead to accidents by carrying out risk assessment activities in which all plant personnel participate. In addition, work to visualize measures being implemented to reduce such risks.	We highlighted the need to remain aware of the risks that exist in plant workplaces and of procedures associated with measures to reduce those risks (for example, visualization) through such means as the Takuma Safety and Health Newsletter, which is issued monthly.
	Employee skill development (skill enhancement)	Provision of employee training and skill development	Account Division		Have individual employees reflect on their careers to date and their future career plans. Have employees set goals for their career development during this fiscal year based on those career plans and have them reflect on whether their careers have developed in line with those goals.	Although we have left career development to division employees in the past as something they should pursue on their own, we succeeded in raising awareness of the need to think about that aspect of profes- sional life. Going forward, we will continue our initiatives in this area while following up more closely.
			Engineering Division		Hold regular workshops to spread information about new technologies and examples of problems and apply that information to technical documentation such as purchase specifications.	In addition to holding monthly workshops, we provided information to division employees and applied examples to technical information on a timely basis.
Environment	Implementation of environmental management structures and reduction of environmental impacts	Compliance with legal laws and regulations related to the environment and energy	Engineering Division		Report in an appropriate manner to affected departments on the enactment, revision, and abolition of laws and other regulations related to the environmental and energy fields that affect the company's businesses.	We paid close attention to necessary legal trends and disseminated information about legal trends deemed particularly important to related departments.
	Contributions to resolving environmental problems	Pursuit of initiatives targeting renewable energy	Engineering Division		Develop new products in product groups related to renewable energy.	We verified the performance of some products and pursued development of new products.
			Engineering Division		Work to foster widespread adoption of incineration and power generation systems that will contribute to the utilization as a source of energy of sewage sludge, which is a type of biomass with a low energy utilization rate.	We worked with the Japanese government to compile and publish a guideline for introducing tech- nologies for use in sewage sludge-fueled power plants.
Community involvement and development	Contribution to Society	Contribution to the communities around our worksites	Marketing Division		Help improve the environment in nearby local communities by carrying out cleanup activities in areas near worksites.	We carried out annual cleanup activities in the areas near worksites, but branches failed to conduct voluntary cleanup activities on their own.

Stakeholder Dialog

We held another series of stakeholder dialogs in FY2016 in order to foster communication with stakeholders. This year, we asked customers who operate Takuma facilities for their views.

Misao Wakamatsu
Senior Managing Executive Officer, Rengo Co., Ltd.

Participants from Takuma
Shunichi Matsuhashi Executive Manager, Energy Plant Division
Shohei Ohara Assistant Manager, Section 1, Plant Sales Dept. I, Energy Plant Division



Mr. Ohara: Our Management Principles say, “Takuma will strive for social contribution, corporate value enhancement, long-term corporate development and the satisfaction of all stakeholders by providing goods and services that are needed and recognized as valuable in society.” In January 2016, we delivered a wood biomass boiler power generating facility (see page 30) to your company’s Yashio Mill and a biomass incineration facility (see page 31) to Marusan Paper Mfg. Co., Ltd., a group company of yours. Today, I’d like to ask you as our customer about initiatives in the area of corporate and social sustainable development.

Mr. Wakamatsu: Since its founder Teijiro Inoue shipped the first cardboard boxes from Japan to overseas customers in 1909, the Rengo Group has contributed to society by supplying the best possible packaging in order to increase the value of customers’ products and optimize their

distribution flows, all while accommodating the changing times in which it operates. As the social environment undergoes enormous change, the question in which our stakeholders are most interested is whether we can achieve sustained growth. In particular, they would find it unacceptable for us to avoid environmental responsibility or CSR in response to the question of what we’re doing to help make society sustainable or how we’re helping bring such a society about. We believe that resolving these issues will help lead the way to our own sustained growth. Today, I’d like to talk about how we take environmental concerns into account in our operations and how we’re working to reduce our environmental impact, both of which are areas in which our relationship with Takuma plays a major role. Rengo has adopted the concept of “Less is more,” signaling a commitment to creating a large amount of value with few resources, in its environmental management. (The idea is to create high-quality products with higher added value while consuming as little energy as possible and producing as little carbon dioxide as possible.) Cardboard is known to be great for recycling because it’s made primarily of used cardboard and is Earth-friendly. The fact that we utilize used paper means we don’t need to cut down any trees to produce pulp. This also contributes to biodiversity. In FY2014, our products were made from 98% used paper, satisfying our target of at least 97%. Apart from our group’s production process, we’re ensuring that our products themselves continue to evolve so that they use energy and resources more effectively while having a lesser impact on the environment by reducing material thickness and weight, all while maintaining the core functionality of cardboard. To address global warming, we’re also working to reduce CO₂ emissions. Our goal is to reduce CO₂ emissions in production

by 32% compared to FY1990 levels by FY2020 and by 50% compared to FY1990 levels by FY2050. Japan adopted the goal of a 26% reduction compared to FY2013 levels by FY2030 (a 25.4% reduction compared to FY2005) at the 21st Conference of the Parties (COP21) to the 1992 United Nations Framework Convention on Climate Change in December 2015. In response to that goal, our Environmental Committee adopted the same goal of a 26% reduction compared to FY2013 levels by FY2030. I believe it will be important to continue a consistent series of energy-saving activities throughout the group in order to achieve steady results as we work toward these goals. In the area of environmental investment, we’re working to transition from crude oil and coal to natural gas and LNG, and we’re actively introducing renewable energy such as solar power and biomass boilers from the standpoint of diversifying our energy use, using resources effectively, and preventing global warming. In particular, the biomass power facility you delivered to our Yashio Mill in August 2006 and the biomass incineration facility you delivered to our Toneyama Mill in February 2012 are helping us lower CO₂ emissions. As a result of energy-saving initiatives undertaken by all departments at the Yashio Mill, the facility was recognized for its exceptional pursuit of measures to address global warming by Saitama Prefecture, which certified it as a semi-top-level worksite in August 2012 and as a top-level worksite in April 2016.

Mr. Matsuhashi: I’m happy that the facilities we have supplied to you have met your expectations and helped you earn praise from outside the group. Going forward, what do you expect of Takuma?

Mr. Wakamatsu: First, facility reliability and operational stability will be important issues. The paper manufacturing industry is a process industry. Productivity is directly linked to management. Your facilities have excellent reliability and operational stability. Operators experience that stability directly, and I believe that it derives from the quality of facility planning, design, and maintenance. The next issue will be improving energy efficiency. Since our production processes use an extremely large amount of energy, even a 1% increase in energy efficiency would yield enormous benefits for both management and the environment. We expect the wood biomass boiler power generating facility recently installed at our Yashio Mill and the biomass incineration facility recently installed at Marusan Paper Mfg. to deliver those benefits. Your technological capability in reducing CO₂ emissions yields major benefits for operators as well as society at large.



Response from Takuma

The 21st yearly session of the Conference of the Parties to the 1992 United Nations Framework Convention on Climate Change and the World Summit on Sustainable Development, both held in 2015, set forth key considerations in building a sustainable society. Going forward, we believe it will be necessary to address stakeholders’ diverse and sophisticated needs. Takuma will work to resolve future issues by advancing its technology for reducing CO₂ emissions.

Corporate Governance

Corporate Governance

In order to strengthen the supervisory function of the Board of Directors and to enhance corporate governance, Takuma transitioned from an Audit & Supervisory Board to an Audit & Supervisory Committee at the General Meeting of Shareholders held on June 28, 2016.

As of June 28, 2016, the Board of Directors was comprised of six directors (excluding directors who are members of the Audit & Supervisory Committee) and four directors (of whom three were outside directors). The Board of Directors meets regularly once a month as a rule and whenever else it is necessary to make decisions about important issues related to business management and issues established by law and ordinances, as well as to oversee the execution of the directors' duties.

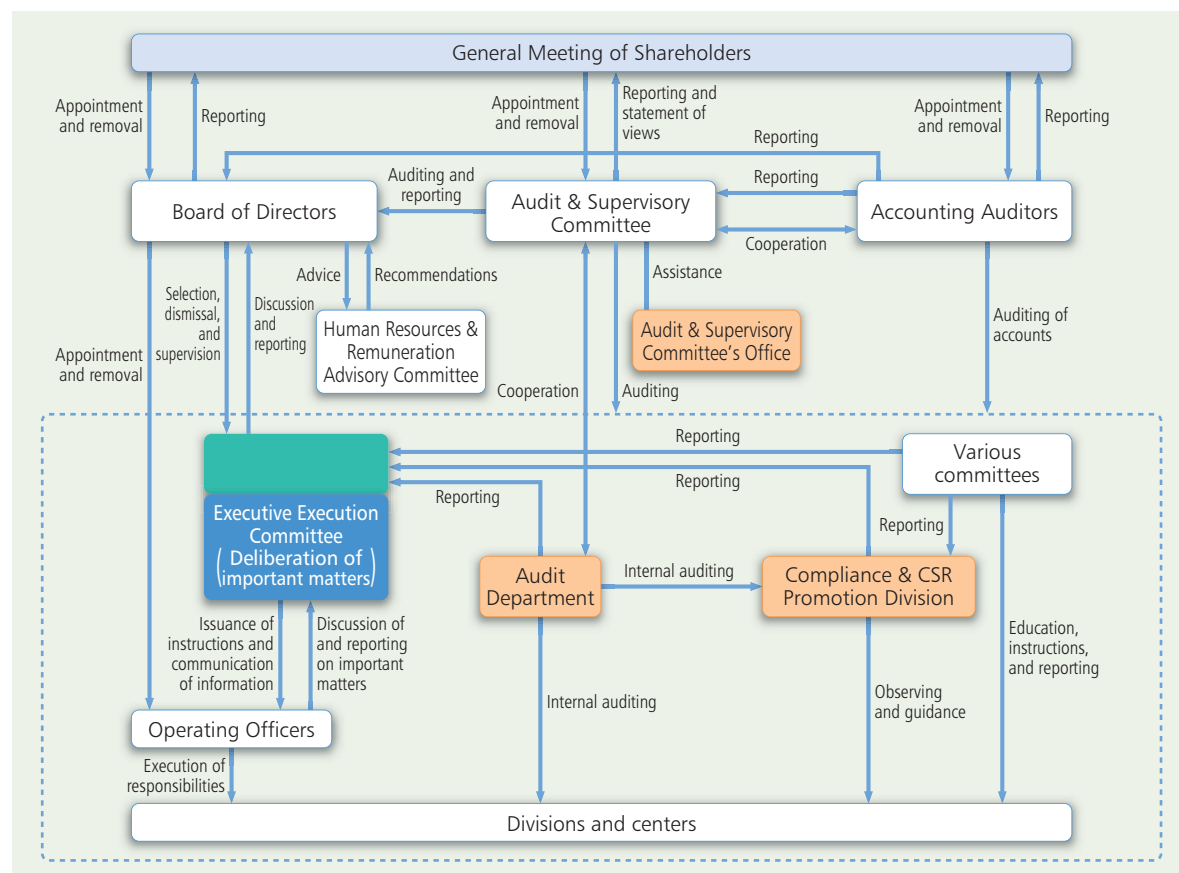
In order to accelerate management decision-making and clarify where management responsibilities are placed, we have adopted an operating officer system in which we appoint operating officers who are entrusted with the responsibility of executing our business activities. As of June 28, 2016, there were 14 operating officers (including those who also serve as directors). Moreover, we have also established an Executive Execution Committee, which is chaired by the president/chief operating officer, as an organization that deliberates matters that are brought up at meetings of the Board of Directors and other important issues related to the execution of our business activities. This committee communicates and provides direction about items decided by the Board of Directors and other important items related

to the execution of our business activities appropriately to the divisions that are to execute them.

An Audit & Supervisory Committee that consists of four members, of whom three are outside directors, is responsible for accounting and operational audits. Members of the committee attend important meetings, including those of the Board of Directors and the Executive Execution Committee, and they strive to understand and observe the status of business execution in a timely and appropriate manner. Drawing on their professional background and experience, they express their opinions as necessary from an objective perspective, and they conduct strict auditing of the business execution performed by the directors.

To facilitate the effectiveness of audits carried out by the Audit & Supervisory Committee, the president holds regular meetings with committee members to ensure good communication, and we have established an Audit & Supervisory Committee's Office to provide staff to help carry out the committee's work.

In addition to the above, we have established a Human Resources & Remuneration Advisory Committee comprised of independent officers, representative directors, and the officer in charge of human resources. The committee works to increase transparency and objectivity in the selection of candidates for director and operating officer positions and in the determination of compensation as well as to enhance the supervisory function of the Board of Directors.



Corporate governance structure

(As of June 28, 2016)

Internal Control

Takuma has adopted a Basic Policy for Establishment of an Internal Control System (the full text is available on our website) in accordance with the Companies Act. We continue to review and improve this policy in response to changing circumstances.

Working towards thorough compliance, Takuma built a compliance promotion organization in FY2006 in order to continuously implement enlightenment and educational activities that make corporate ethics, related laws and ordinances, and internal rules fully understood. To control the danger of loss, we have also prepared a "Risk Management Code" that determines the person in charge of each risk, and we set up our risk management organization according to that Code. When the unexpected

occurs, emergency headquarters are established with the company president as the director in charge of risk management, and an organization is put in place in order to minimize and prevent further damage through prompt action.

In this way, we are working to ensure thorough compliance while carrying out business properly and efficiently while also deepening risk management.

Internal control, constructed and evaluated in order to report on and prevent misstatements in our financial reporting, is based on the Financial Instruments and Exchange Act. This internal control on financial reporting for the Group has resulted in reports that indicate this system has been effective.

Compliance & CSR Promotion Structure

Led by the department in charge of compliance and CSR promotion (CSR Department), Takuma aims at encouraging that activity through the Compliance & CSR Promotion Organization that was installed for the purpose of enabling compliance and CSR to concretely permeate company-wide through an in-house organization.

This organization is composed of a chairman (the General Manager of the Compliance & CSR Promotion Division), a secretariat (positioned in the CSR Department), and an executing organization in each division, center, and department.

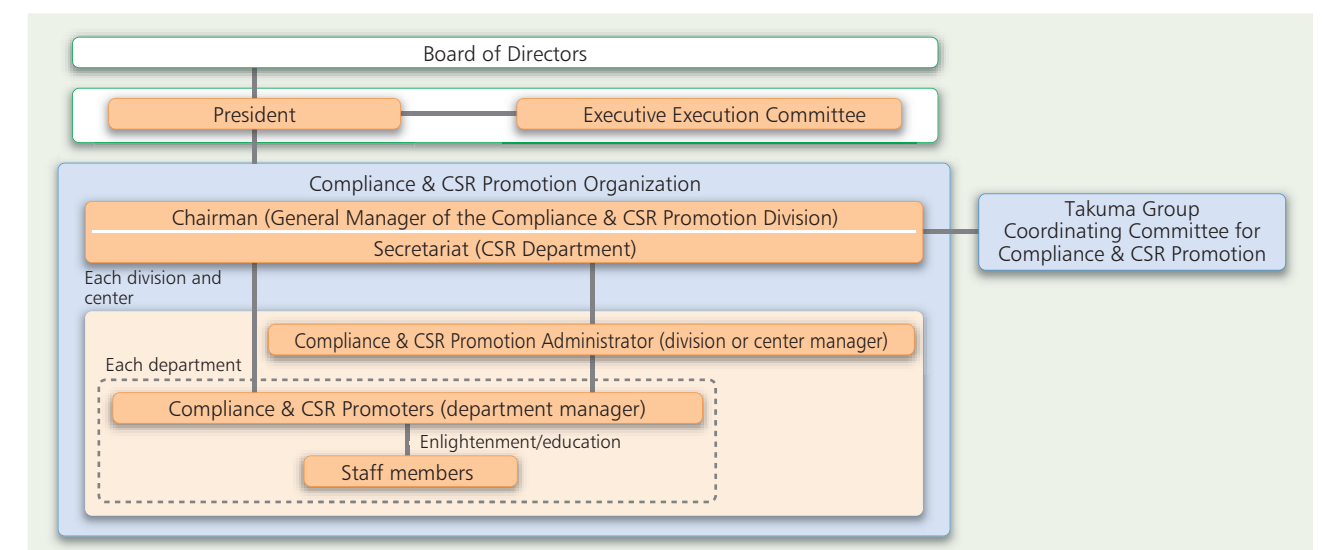
As the person in charge of promoting compliance and CSR in his or her division, each division or center manager is appointed as a "Compliance and CSR Promotion Administrator." As persons who implement awareness and education in compliance and CSR in their respective departments, department managers are appointed as "Compliance and CSR Promoters."

The meetings conducted within this mechanism include "regular meetings" and "departmental meetings."

Regular meetings are held once a year. The person in charge of promotion receives reports on the status of compliance and CSR promotion company-wide, as well as on the status of the implementation of compliance and CSR promotion education for the past year, etc., and participants deliberate on a promotion plan for the current fiscal year.

Promotion members convene departmental meetings once a quarter, with educational training aiming at the permeation of compliance and CSR in each department. After departmental meetings, promotion members implement compliance and CSR promotion education in their respective departments using training materials or in-house educational materials and report the result to the Secretariat. (Details of the compliance and CSR promotion education implemented in FY2015 can be found on page 57.)

We are also pursuing awareness-raising and educational activities targeting Group companies through our Takuma Group Coordinating Committee for Compliance & CSR Promotion to ensure thorough compliance and risk management throughout the Group.



Compliance & CSR promotion structure

Risk Management Structure

Takuma follows a “Risk Management Policy” that connects company-wide risks and separately classifies them into “project risks” related to our core business, i.e., plant construction; “DBO project risks” and “DBO project operation, maintenance and management risks” related to our DBO business; and “potential risks,” “actualized risks,” and “financial reporting risks” related to other corporate business activities.

We are also building the risk management organization shown below and constructing a system of risk management and promoting the strengthening of management for group companies as well through our “Takuma Group Coordinating Committee for Compliance and CSR Promotion.”

Risk Management Policy

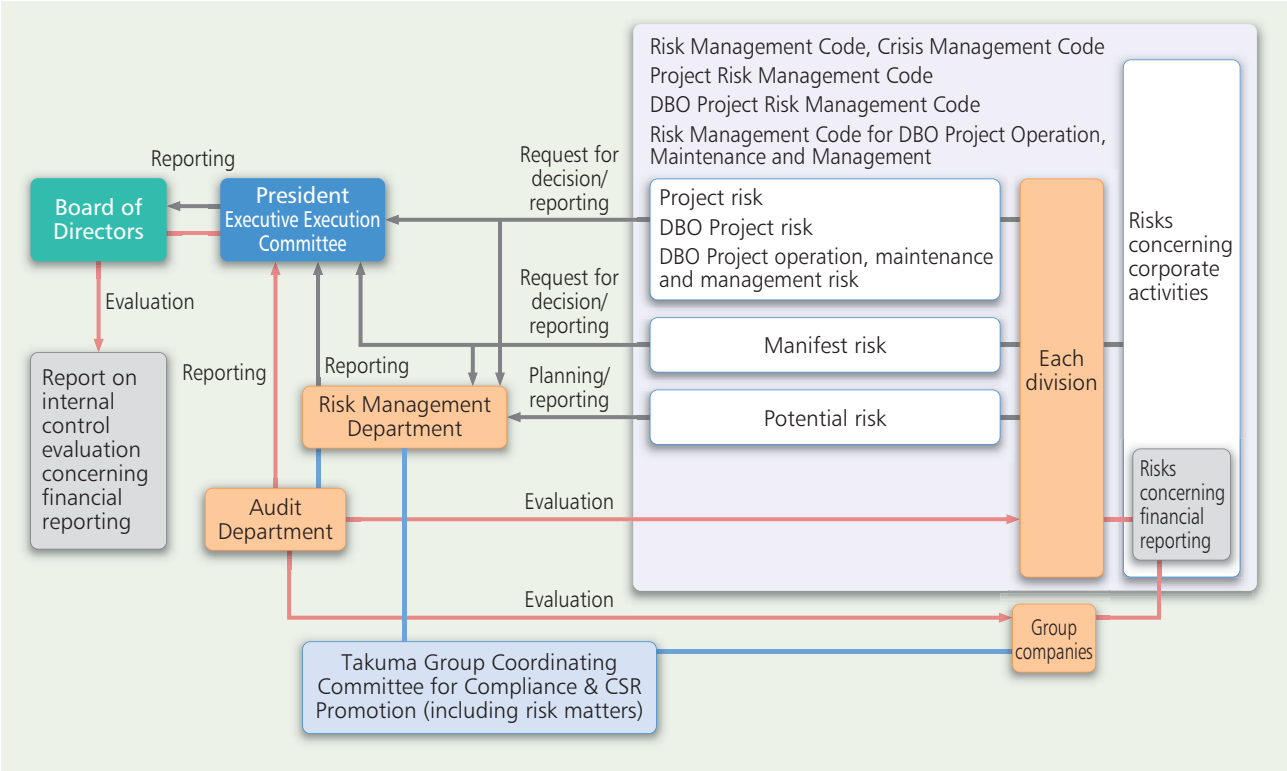
Basic purpose of risk management

Risk refers to all phenomena that interfere with the group’s ability to achieve its business objectives or cause losses or harm to the interests of stakeholders.

The Takuma Group practices risk management with the goal of increasing its corporate value by working to maximize returns while minimizing the negative impacts of risk.

Risk management action guidelines

1. The president and CEO is responsible for risk management at Takuma.
2. All officers and employees participate in risk management activities.
3. Risk management activities are carried out in accordance with applicable guidelines such as the Risk Management Rules.
4. Risk management activities are carried out in line with the Medium-Term Management Plan and annual plan, and we work to make improvements on an ongoing basis.
5. When risk manifests itself, we respond by taking responsible action quickly to minimize any damage and creating provisional organizational entities as necessary.
6. Group companies carry out risk management activities in accordance with their own policies and plans, with support from Takuma.



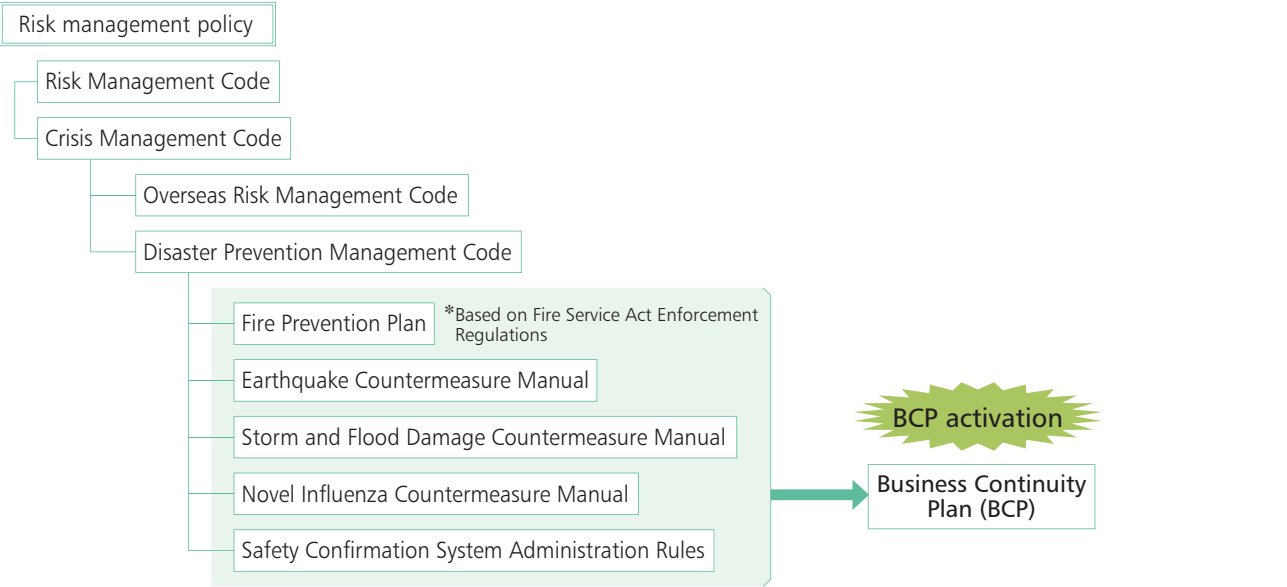
Risk management structure

Business Continuity Plan (BCP)

Takuma has formulated a Business Continuity Plan based on the following policies to ensure proper and appropriate continuity of business operations in the event of a large-scale disaster, pandemic, or other emergency:

1. In addition to implementing disaster-related measures to secure the safety of corporate officers and employees, maintain structures so as to enable continuity of business operations while minimizing damage in an emergency.
2. Strive to respond to customer needs and recover from damage quickly by working closely with suppliers and partner companies to continue business operations.
3. Earn the trust of numerous stakeholders, including employees, their families, shareholders, and nearby residents, and fulfill social needs by continuing business operations.

Disaster rule system diagram



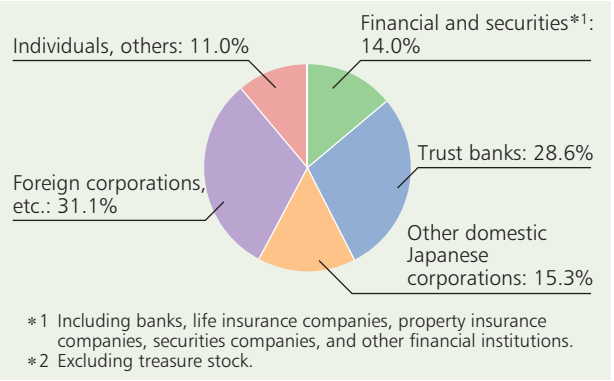
IR Activities

In keeping with the “Takuma Group Code of Conduct,” we provide our shareholders and investors with accurate corporate information in a timely and fair manner. As a part of this, we provide notifications on the convening of General Meetings of Shareholders, balance sheet information, timely disclosure information, marketable securities reports, annual reports in English and other business information, all on our website.

[Takuma website > IR information]
<http://www.takuma.co.jp/english/investor/index.html>



Shareholders Report



Composition of shareholders (as of March 31, 2016)

Directors and Executive Officers

(as of June 28, 2016)

Directors



Takaaki Kato
Representative Director
President and
Chief Executive Officer



Kengo Numata
Director
Senior Managing
Executive Officer



Hiroaki Nanjo
Director
Managing Executive Officer



Masahiko Izumi
Director
Executive Officer



Tsuyohito Nishiyama
Director
Executive Officer



Hideki Takeguchi
Director
Executive Officer



Yasushi Enomoto
Director
(Audit & Supervisory
Committee Member)

Executive Officers

Shiro Matsumura
Managing
Executive Officer

Shunichi Matsuhashi
Managing
Executive Officer

Takashi Manabe
Managing
Executive Officer

Ryoji Tani
Executive Officer

Norito Uchiyama
Executive Officer

Yoshiki Kita
Executive Officer

Mitsuaki Adachi
Executive Officer

Akira Taguchi
Executive Officer

In June 2016, we asked three outside directors who had been appointed to the new Audit & Supervisory Committee about their views on corporate governance at Takuma.

Outside Directors



Hiromichi Satake
Outside Director
(Audit & Supervisory
Committee Member)

Sensing changes in society and dealing with them appropriately

I was appointed two years ago as one of Takuma’s first outside directors. I’m a layman in the field, but as I have visited plants and seen how waste treatment facilities operate, I’ve been able to see how the company comes together to work on environmental issues and contribute to society, and I have gotten a sense for the seriousness of the company’s culture. We are continually pursuing corporate activities in an effort to meet a broad range of social demands and requirements, but because those demands and requirements are constantly changing, we must detect change and deal with it in an appropriate manner at all times. These days, companies are evaluated from a variety of perspectives, and we must maintain strong awareness of the fact that misapprehending risk and reacting in a delayed manner can harm the company’s image and destroy trust. Fortunately, Takuma is performing well, and meticulous explanation and serious discussion characterize the Board of Directors’ approach to governance. Recently, the role of outside directors is seen as an important one as companies move their audit functions into Audit & Supervisory Committees, and I look forward to continuing to offer my views and ask questions of internal directors from my standpoint as an outsider while bearing in mind the interests of all stakeholders, including shareholders, business partners, and employees.

Strengthening compliance and governance

In addition to its environmental plant business, which has focused primarily on waste treatment plants for many years, Takuma has moved rapidly to develop a biomass power plant business recently. Most environmental plants are delivered to local governments, and the biomass power plant business also has a strong public interest component that is related to national energy policy. All companies must serve society’s interests, but I believe Takuma is subject to particularly strong requirements in this regard due to the nature of its business. I believe my appointment as an outside director at Takuma four years ago reflects expectations that I would be able to draw on my long experience with government, primarily in police operations, to play the role of strengthening the company’s compliance and governance. Takuma’s relocation of its audit function from the Audit & Supervisory Board to the Audit & Supervisory Committee also reflects a strong awareness of this social perspective. Although my status has changed from outside auditor to outside director, I will continue to work to strengthen compliance and governance while redoubling the breadth of my perspective as an outsider.



Osamu Iwahashi
Outside Director
(Audit & Supervisory
Committee Member)

Ensuring that business activities continue in a stable manner

I believe that the most important thing for companies is to ensure that their businesses continue over time. Takuma contributes to society by maintaining infrastructure that supports people’s lifestyles and important equipment that supports companies’ business activities. These facilities and equipment are used over extended periods of time, and it is essential that Takuma continue to carry out its business activities in a stable manner in order to enable customers to use its products with peace of mind. However, companies are prone to occasionally lose sight of what society requires when they focus too exclusively on their businesses. It is essential to exercise caution at all times so that the company’s assumptions and internal conventional wisdom don’t lead it off the path it ought to be following. I believe that the role of outside directors is to verify the company’s direction by checking its business from a different point of view. Such verification enables the company to continue its business activities in a stable manner so that it can provide value to customers in the form of peace of mind.



Minoru Murata
Outside Director
(Audit & Supervisory
Committee Member)

Human Rights and Labor Practices

Respect for Human Rights and the Abolition of Discrimination

Our company sets out its respect for basic human rights and prohibition of discriminatory acts in the Takuma Group Ethics Charter, Takuma Group Code of Conduct and labor regulations. In addition, we also support respect for human rights, without contributing to human rights violations, elimination of forced labor/child labor and the abolition of discrimination through participation in the UN Global Compact. We are also working to promote employment of disabled and elderly individuals.

- **Takuma Group Ethics Charter (excerpt)**
 - 4. We shall respect fundamental human rights and never practice discrimination.
- **Takuma Group Code of Conduct (excerpt)**
 - Respect for basic human rights
 - 9. Prohibition of discriminatory actions
 - 10. Respect of individuality, personal quality and privacy
 - 11. Safe work environment

Working with Our Employees

Approaches toward employees

Our company sets “establishing a work environment allowing each employee to challenge their goals, as well as getting on with their work through appropriate assessment” as its basic policy. Specifying the following three approaches as critical items, we introduce various systems for each.

1 Increase employee motivation by ensuring transparency as well as satisfaction with HR assessments

● Objective management system

We utilize an Objective management system in which work objectives are set at the beginning of the fiscal year and the degree to which they are achieved is evaluated at the end of the fiscal year. The objectives, which are based on company policies, are decided through meetings and interviews with superiors to include the work tasks that each individual is to undertake over the year and the roles they are expected to fill.

● Work group transfer system

We have created a work group transfer system to facilitate movement from clerical and labor positions to the main career track so that motivated and skilled employees can pursue success regardless of their gender or academic background. We also provide opportunities for employees to be promoted to management positions.

● In-house commendation system

Every year on the anniversary of the company's founding on June 10, we recognize employees with the following awards:

- Takuma Prize*
- Invention and idea commendations
- Safety and Health Award in Construction Division
- Qualifications acquisition commendations
- Takuma Technical Review Outstanding Paper Award
- Years-of-service commendations

* The Takuma Prize is awarded to employees who have demonstrated outstanding achievements in their work or in their efforts on behalf of society outside of work, including lifesaving, disaster prevention, and volunteer service.



2 Provide capacity building assistance to employees

● Junior employee exhibition

As a part of the education of our junior staff, ten-year company employees give presentations that reflect on their experiences and indicate the future growth that they are looking for, and technological exhibitions are held for second-year employees in order to improve their ability to make presentations.



● Technical training sessions

We hold technical training sessions to provide opportunities for employees to increase their technical knowledge. These events range from inviting outside researchers or university professors to give lectures to having employees in technical positions give presentations on issues on which they are currently working.

● English education support

We periodically administer the TOEIC test at the company to help employees improve their language skills. Employees who earn a high score are eligible to receive a bonus from the company.

● Support for self-study

Takuma encourages employees to acquire various licenses and certifications as part of the skill development process, for example by reimbursing them for the cost of testing needed to earn official certifications and licenses that are necessary for operational reasons and offering incentives for successful completion of such tests. We also provide information about a range of distance learning and e-learning opportunities.

● Grade-specific educational programs

- New employee training
- General employee training
- Line manager training

3 Improve the work environment, facilitating employees' efforts to address business tasks without anxiety

● Work-life balance

Takuma offers the following programs in order to help employees harmonize their jobs and private lives, balance their work and child-raising responsibilities, and make the most of their skills and abilities:

- Paid time off in half-day increments
- Childcare leave
- Nursing care leave
- Discretionary work
- Flextime
- Telework

● Other enhancements to workplace environments

- Measures to counter sexual/power harassment
- Listening to opinions within the company*

* To enhance “ideal working conditions” for employees, our company absorbs a wide range of views from employees by placing an “opinion box,” as well as communication via e-mail and telephone concerning their working environments

● Labor-management relations

The labor union is an organization which conducts periodic deliberations and collective negotiations in terms of annual salary, working hours and other working conditions and establishing a stable employee-employer relationship.

● Employee health management

Takuma carries out the following health management measures:

- Improvement program for lifestyle-related diseases
- Lifestyle-related disease prevention checkups
- Mental health measures
- Health consultations
- Dissemination of health information (in-house newsletter and website)
- Wellness Fair (cosponsored with the Health Insurance Union and cafeteria operator)



● Development of general employer action plans

We have developed the following general employer action plans in accordance with the Act on Advancement of Measures to Support Raising Next-generation Children and the Act on Promotion of Women's Participation and Advancement in the Workplace.

(April 1, 2015)

General employer action plan compiled in accordance with the Act on Advancement of Measures to Support Raising Next-generation Children

We hereby establish the following action plan in order to put in place an employment environment in which employees can make the most of their skills and abilities while fulfilling both their work and parenting responsibilities:

1. Plan period
Five-year period from April 1, 2015, to March 31, 2020
2. Plan content
 - (1) Expand the scope of the company's flex-time system as a way to support parenting of children in the third grade and younger.
Measures: Starting in April 2015
 - ① Discuss with the labor union.
 - ② Inform employees, for example by providing information on the company's internal website.
 - (2) Offer a subsidy to help offset the cost of service for children in the third grade and younger.
Measures: Starting in April 2015
 - ① Study the terms of the subsidy.
 - ② Inform employees, for example by providing information on the company's internal website.

(March 22, 2016)

General employer action plan compiled in accordance with the Act on Promotion of Women's Participation and Advancement in the Workplace

- 1 Plan period
April 1, 2016, to March 31, 2021
- 2 Company issues
There are few female employees in core positions and comprehensive positions that offer career advancement potential.
- 3 Objective
To double to 20 the number of female employees in core positions and comprehensive positions (including unofficial appointments) that offer career advancement potential by March 31, 2021.
- 4 Initiatives and implementation timing
 - ① Work to increase the number of female applicants and hires.
Hold an information session for female students at least once every year starting in April 2016.
Update the career website to entice more female students to apply for positions with Takuma starting in October 2016.
 - ② Put in place a workplace environment that is conducive to flexible work arrangements and continuous employment.
Study expanding the scope of the flex-time system starting in April 2016.
Inform employees about work-life balance support programs on the internal website and through other means starting in July 2016.

● Cafeteria plan

We offer a cafeteria plan as an employee benefit program as part of our effort to meet the full range of diverse employee needs. Employees can choose from a menu of programs including support for skill development, child-raising and nursing care, and health maintenance and promotion. The company then reimburses them for the cost of using those services, subject to an annual cap. The selection of programs is reviewed on an ongoing basis.

Efforts for Occupational Safety and Health

Occupational safety and health initiatives

Since FY2006, we have introduced TK-COHSMS based on an occupational safety and health management system for the construction industry and worked actively and independently to improve our safety and health activities. We believe that among these efforts, the manner in which (1) safety inspections, (2) education for construction site representatives, and (3) SSA, a system of pre-work safety procedure checklists, have been steadily adopted by all departments and used to consistently improve the level of knowledge about Takuma's safety and health is particularly noteworthy.

We have adopted the following safety and health objectives for FY2016: for construction sites, eliminating all fatal accidents; for branches, pursuing a thorough program of safety and health education, ensuring adherence to safety inspection guidelines, and achieving the objectives set forth in the safety inspection annual plan; and for the Safety and Health Cooperative Association, strengthening collaboration with partner companies. We will work to revitalize safety and health activities throughout the company by carrying out that role.

Going forward, we will redouble our safety and health activities with a focus on each and every employee so as to ensure that all workers are aware of the vital importance of Takuma's philosophy of respecting people.

Safety and health activities and their results

1. Safety inspection system

We maintain a system where any construction or installation work starts only after the safety and health manager or other responsible official in each department conducts a successful safety inspection based on safety and health plans for the construction or installation work as prepared by our primary partner companies.

We strive to ensure a safe work environment at all construction sites by eliminating potential hazards and risk factors identified by those inspections.

- FY2015
Number of safety inspections done: 177
(Initial inspection pass rate: 94%)



A safety inspection

2. Safety patrols and field education

Based on an annual plan, safety patrols are carried out by the Safety and Health Committee (comprised of committee members and advisors), Safety Control Department, and construction-related sections along with safety education in the field in a precisely targeted and efficient manner.

By focusing on the early discovery and elimination of risk in safety patrols and on the improvement of safety awareness among workers through communication skills in field education, these activities contribute to the safety of Takuma's workplaces.

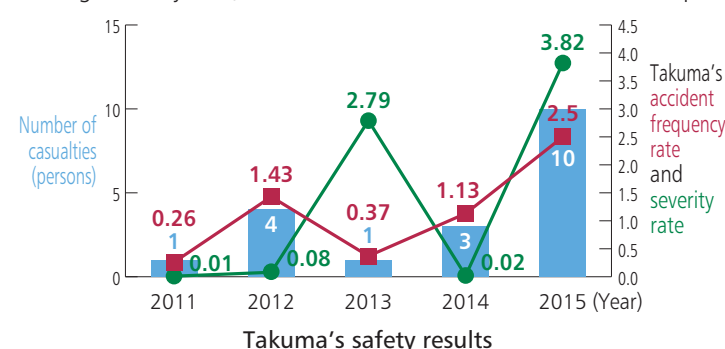
- Number of safety patrols implemented in FY2015
By Safety and Health Committee (members, advisors): 84
By Safety Control Department: 354
By construction-related divisions: 378



Safety patrols and field education

Takuma's safety results in recent years

Despite a tight labor market in the construction industry nationwide, our total working hours in 2015 greatly exceeded the figure for the previous year. Despite undertaking a variety of safety and health activities, our accident frequency rate and severity rate both exceeded national averages, highlighting an urgent need for improvement. We take this situation extremely seriously, and we will work to ensure even more thorough risk management, strengthen and enhance our safety and health management system, and redouble our resolve to eliminate occupational accidents.



Year	Accident frequency rate	Accident severity rate
2011	0.85	0.21
2012	0.83	0.05
2013	1.25	0.23
2014	0.91	0.07
2015	0.92	0.21

* Accident frequency rate
Indicates the frequency with which accidents occur as the number of fatalities caused by occupational accidents per 1 million actual working hours.

$$\frac{\text{Number of fatalities}}{\text{Total actual working hours}} \times 1,000,000$$

* Accident severity rate
Indicates the seriousness of accidents as the number of work-days lost per 1,000 actual working hours.

$$\frac{\text{Total work-days lost}}{\text{Total actual working hours}} \times 1,000$$

Reference: Nationwide accident frequency and severity rates for the construction industry (general construction)

Safety and health education (education for construction site representatives)

We continuously provide education to increase the levels of safety awareness and knowledge of our employees and affiliated contractors. As indicated below, more than 13,000 trainees have passed the completion exam. We are involved in a variety of initiatives to prevent accidents, including by assigning workers with extensive knowledge in areas such as safety-related laws and ordinances to individual construction sites.

- April, 2004 to March, 2016
Cumulative number of trainees: 28,899
Number of trainees passing the completion exam: 13,099



Education for construction site representatives

Takuma is recognized for its record of safety, health, and contract fulfillment at the FY2016 Quality Construction Awards, hosted by the Ministry of the Environment's Fukushima Office for Environmental Restoration

A FY2013 government-run project in which Takuma served as a contractor involving disposal of disaster waste from the Great East Japan Earthquake by means of a temporary incinerator in Soma City and Shinchi Town was recognized for its record of safety, health, and contract fulfillment at Quality Construction Awards hosted by the Ministry of the Environment's Fukushima Office for Environmental Restoration.

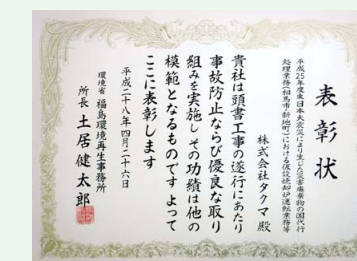
The award ceremony was held on April 26, 2016, at Corasse Fukushima (in Fukushima City, Fukushima Prefecture). Takuma was represented by Mr. Mitsuhashi, General Manager of the Safety Control Dept., who headed up the construction project; Mr. Umezawa, Site Manager of Takuma Technos, who oversaw facility operations; Mr. Shiroki, Manager of the Plant Service Dept. (Tokyo); and Mr. Mafune, Manager of the Construction Dept. (Tokyo).

The award, which was also granted to a general-construction joint venture and local companies, praised the safety and health activities undertaken as part of the project by citing it as an "excellent site that is recognized as a model for others due to accomplishments such as a record of completing work without any accidents and actively undertaking initiatives to reduce risk in the workplace."

Apart from this project, Takuma is also doing its part in the larger reconstruction effort by working to dispose appropriately of disaster waste from the Great East Japan Earthquake through the installation and operation of temporary incinerators in Miyako City and Iwanuma City.



Mr. Mitsuhashi, General Manager and Mr. Umezawa, Site Manager



Temporary incinerator (Soma City and Shinchi Town)
*The incinerators were dismantled and removed in FY2015.

The Environment

Basic Environmental Policy

Our company has established the "Basic Environmental Policy" as follows, aiming to ensure employees contribute to global environmental conservation. This basic policy applies to the activities of all company departments.

Environmental Philosophy

Takuma is committed to preserving the environment and realizing an affluent society through business activities under the Company Motto: "Value Technology, Value People, Value the Earth."

Operational Guidelines

- 1. All Takuma Group companies will recognize the importance of maintaining a balance between preservation of the environment and business activities.
- 2. Continuously develop activities to preserve the environment that comply with applicable environmental laws and ordinances, and ensure environmental control and assessment systems conform to international environmental standards.
- 3. Promote development of improved technologies and products for society that preserve the environment.
- 4. Address resource conservation, energy efficiency, recycling, and minimization of waste generated by all business activities.
- 5. Improve employee awareness and understanding about the importance of preserving the environment through environmental education and internal promotional activities.
- 6. Provide the community with information on the activities of Takuma to preserve the environment.

Environmental Management

■ The situation concerning the acquisition of ISO 14001

Our Harima Factory has acquired ISO 14001 certification and has been implementing environmental management activities based on an environmental management system established to comply with international standards. Our group companies Nippon Thermoener Co., Ltd., Takuma Technos Co., Ltd., and Dan-Takuma Technologies Inc. have also acquired ISO 14001 certification.



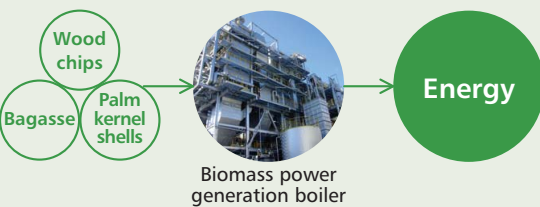
Takuma's CO₂ Reduction Technologies

We convert waste/biomass into energy and reduce CO₂!



Reducing CO₂ with biomass power generation boilers

A classic example of biomass power generation can be found in sugar factories. Factories that make sugar produce large quantities of residue from sugarcane, the raw material used to make sugar. Sugarcane is crushed into a pulp, and sugar is extracted in a mill. The remaining fiber is called bagasse and can be used as boiler fuel. The steam produced is used as the plant's heat source, and any remaining steam is used to generate electricity that is utilized to operate the plant and, if any remains, sold to the electric power company. The amount of power generated at sugar factories has grown greatly, with examples of single plant that generate 50,000 kW.



What is biomass?

Biomass is any recyclable organic material derived from a living organism, but does not include fossil fuels, such as oil and coal. For example, even though CO₂ is emitted if wood waste products are incinerated, when trees grow again, they absorb CO₂ to offset the emissions from incineration, so there is no increase in CO₂ in the atmosphere. By using the heat produced by incinerating biomass to generate power, the amount of power generated using fossil fuels can be reduced, and this contributes to decreasing CO₂.

CO₂ reduction from waste incineration plants

Garbage, or waste, is an important source of energy. About 500 kW** of power can be generated from one ton of garbage. In Europe and the Americas, waste incineration plants are often called Energy from Waste (EfW) plants, and recovering energy from garbage has become the norm. Waste must be seen as a "resource," so Takuma is seeking to be the best in the world with our technologies to convert waste into energy and reduce CO₂.

**Presumes waste with a calorific value of 8,800 kJ per kg and a power generation efficiency of 20%

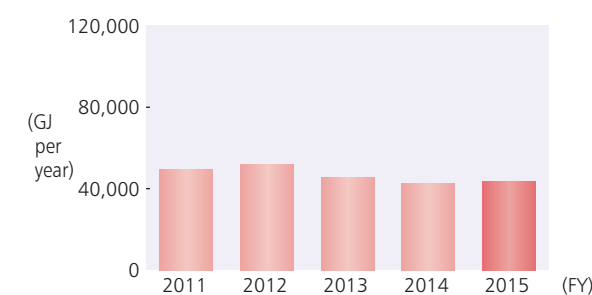


Environmental Reporting

Takuma reports the environmental impact of its business activities as well as the manner in which it takes environmental considerations into account in accordance with the *Environmental Reporting Guidelines* (issued by the Ministry of the Environment). This environmental reporting program includes not only environmental information extracted from our overall business activities from an environmental standpoint, but also information about related economic and social aspects of those activities.

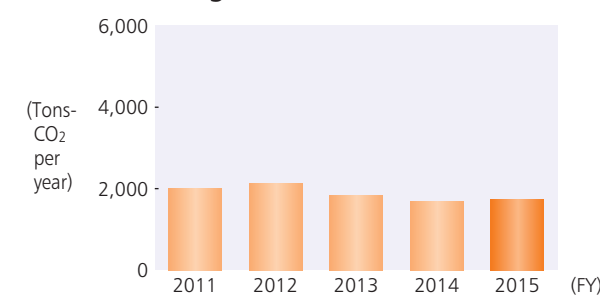
Environmental data (non-consolidated)

● Total energy consumption



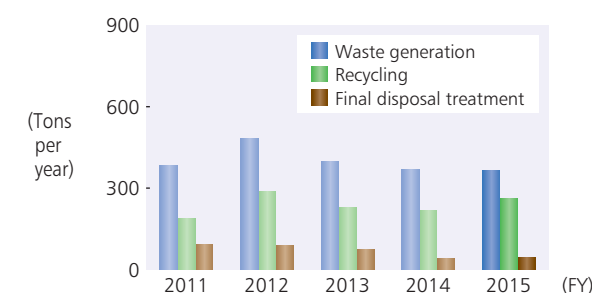
The total energy expenditure of the fuel and the electricity consumed at Takuma during FY2015 held steady at FY2014 levels. We will continue to promote energy savings from here on out.

● Greenhouse gas emissions



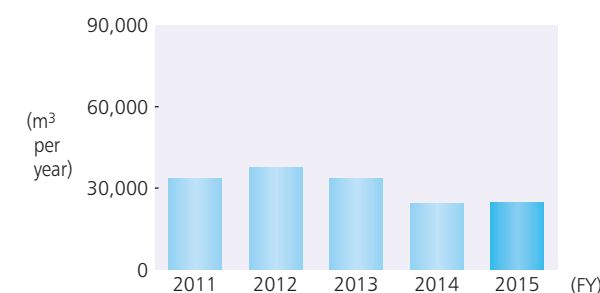
The greenhouse gas emissions created by our company are limited to carbon dioxide (CO₂). The amount of CO₂ emissions in FY2015 held steady at FY2014 levels. We will continue striving to reduce CO₂ emissions.

● Waste generation



Our company sells recyclables and reusables from the waste generated through its business activities to scrap dealers, while outsourcing the treatment of non-recyclables and non-reusables to haulers, processors and final disposal dealers, in accordance with the Industrial Waste Control Manifest system.

● Water usage



Takuma's water consumption during FY2015 held steady at FY2014 levels. Going forward, we will continue to work to lower our water use.

PRTR Target Substance Emissions

Although our business activities do not involve a wide variety of chemical substances on a massive scale, we use a few designated chemical substances. Consequently, we report and register such chemical substances designated under the Pollutant Release and Transfer Register (PRTR), in accordance with relevant laws and ordinances, with the local government.

● Dichloromethane (CAS No. 75-09-2)

FY	2011	2012	2013	2014	2015
Emissions (tons per year)	0	0	0	0.3	0.4

● Xylene (CAS No. 1330-20-7)

FY	2011	2012	2013	2014	2015
Emissions (tons per year)	2.0	1.8	1.4	3.4	2.2

● Toluene (CAS No. 108-88-3)

FY	2011	2012	2013	2014	2015
Emissions (tons per year)	0.06	0.05	0.08	0.08	0.26

These materials are used for antirust painting of boiler structures and so on.

Environmental accounting

Environmental accounting is the process by which companies and other entities recognize the cost of environmental conservation in their business activities as well as the effects of those activities and measure and communicate them in as quantitative a manner as possible (either in terms of monetary amounts or amounts of materials) with the goal of pursuing environmental conservation initiatives in an efficient and effective manner while maintaining a good relationship with society so as to facilitate sustainable development.

In FY2006, we introduced and disclosed our own environmental accounting system based on the "Environmental Accounting Guidelines 2005" issued by the Ministry of the Environment. As our business activities mainly involve environmental conservation plants and their equipment, Takuma Group employees have a significant awareness of the need for environmental conservation, and we have been implementing approaches toward such issues within the Takuma Group.

● Environmental conservation cost

According to the "Environmental Accounting Guidelines," environmental conservation costs measure on a monetary basis investments and expenditures on preventing, controlling, or avoiding environmental impacts, eliminating their effects, recovering from associated damage, and initiatives to aid in the same.

Item	Investment (thousand JPY)	Costs (thousand JPY)
Business area costs		
Pollution prevention costs	—	16,924
Global environmental conservation costs	12,900	25,480
Resource recycling costs	—	10,669
Management activity costs	—	38,563
Research and development costs	307,565	1,235,292
Social activity costs	—	8,123
Total	320,465	1,335,051

● Environmental conservation effect

According to the "Environmental Accounting Guidelines," environmental conservation effects measure on a material basis the effects of preventing, controlling, or avoiding environmental impacts, eliminating their effects, recovering from associated damage, and initiatives to aid in the same.

Item	FY2014	FY2015
(1) Environmental conservation effect concerning resources input for business activities		
Total energy input (GJ)	98,809	92,458
Water resources input (m³)	49,732	44,342
(2) Environmental conservation effect concerning environmental loads and wastes created by business activities		
Greenhouse gas emission volume (tons-CO ₂)	4,253	3,883
Waste generation (tons)	876	834
Final disposal volume (tons)	74	77
Total drainage volume (m³)	48,502	42,482
BOD emissions (kg)	2,744	2,273
COD emissions (kg)	2,918	2,443
T-N emissions (kg)	695	626
T-P emissions (kg)	118	111

Environmental efficiency

Even as total environmental impacts must be reduced, it is necessary from a business management standpoint to pursue environmental initiatives that are characterized by a high degree of economic efficiency. We report environmental efficiency using an index calculated in accordance with examples provided by the Ministry of the Environment in its Environmental Performance Indicators Guidelines for Organizations.

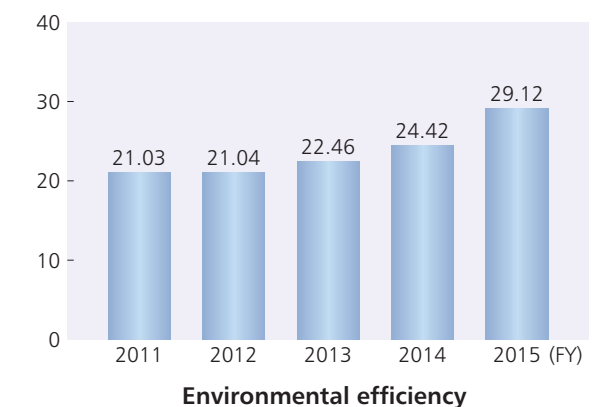
At the Takuma Group, we calculate environmental efficiency as the ratio of consolidated net sales to greenhouse gas emissions. In FY2015, this value improved compared to FY2014.

The Takuma Group's definition of environmental efficiency

$$\frac{\text{Consolidated net sales (million JPY)}}{\text{Greenhouse gas emissions (tons-CO}_2\text{)}}$$

Scope of data collected

- Period covered:
April 1, 2015, to March 31, 2016
- Companies targeted
[12 domestic companies]
 - Takuma Co., Ltd. (Head Office, other offices including overseas sites and the Harima Factory)
 - Nippon Thermoener Co., Ltd.
 - Takuma Technos Co., Ltd.
 - Hokkaido Sanitary Maintenance Co., Ltd.
 - Takuma Technos Hokkaido Co., Ltd.
 - Sun Plant Co., Ltd.
 - Takuma Engineering Co., Ltd.
 - Takuma System Control Co., Ltd.
 - Dan-Takuma Technologies Inc.
 - Kyoritsu Setsubi Co., Ltd.
 - Kankyo Sol-Tech Co., Ltd.
 - Takuma Plant Service Co., Ltd.
- [2 overseas subsidiaries]
 - Taiden Environtech Co., Ltd.
 - SIAM TAKUMA Co., Ltd.



Fair Business Practices

Compliance/CSR Promotion Education

Takuma offers compliance and CSR promotion education through the Compliance & CSR Promotion Organization (see page 44), which was established in order to spread awareness of compliance and CSR issues among employees.

During FY2015, we implemented education focusing on compliance and CSR promotion in four separate stages in keeping with our policy of pursuing a sustained and thorough program of improving compliance and CSR awareness and risk management based on a consideration of internal conditions and the characteristics of Group companies in response to social requirements and expectations in accordance with our priorities of cultivating a robust corporate culture, accommodating environmental change, and practicing risk management as set forth in the Compliance & CSR Promotion Division’s medium-term plan under the 11th Medium-Term Management Plan.

1st term: SNS use and risk

We offered an educational program focusing on factors employees should consider when using SNS (Social Networking Services), which have exploded in popularity in recent years, and on associated risks. The program went beyond the typical risks posed by use of SNS to offer content that closely tracks the reality of today’s online services by exploring examples of actual incidents.

3rd term: Strengthening protection of trade secrets

We offered an educational program on strengthening protection of trade secrets in response to the July 2015 revision of the Unfair Competition Prevention Act. In addition to the changes to the law, the program explored topics such as the typical manner in which information leaks and how Takuma responds to such incidents in an effort to deepen participants’ knowledge and awareness of trade secrets.

2nd term: Bid rigging and the Antimonopoly Act; traffic safety; and dealing with occupational accidents

We offered a training session on bid-rigging and the Antimonopoly Act featuring an instructor from the Fair Trade Institute. We also offered an educational program on traffic safety in response to an increase in accidents involving employees. Finally, we offered an educational program exploring precautions that should be borne in mind when dealing with occupational accidents that are particularly closely related to Takuma’s businesses.

4th term: Forward-looking CSR activities: CSR issues and action programs; Takuma’s internal reporting system

We offered an educational program related to forward-looking CSR activities and conducted a self-assessment of our implementation of FY2015 action programs as planned by each department. We also offered an educational program about Takuma’s internal reporting system based on the results of the FY2015 CSR Awareness Survey that was carried out during the third term.

Compliance Measures

● Measures related to the Antimonopoly Act

Enacting rules and regulations
Towards ensuring permanent compliance with the Antimonopoly Act, Takuma enacted “Regulations Concerning Management of the Pledge of Anti-Monopoly Act Compliance,” which provides for the submission of a written oath in regard to observing the Antimonopoly Act. “Rules on Controlling Contact with Competitors’ Sales Departments, Etc.,” defines the procedure for an employee to contact the sales department, etc., of a competitor and specifies that an application should be made to and an approval should be obtained from the affiliated division or center manager in advance to ensure fair business contact.

- Holding training sessions
We held a training session about the Antimonopoly Act to deepen participants’ understanding of the act and to ascertain the latest information about it. Management-level employees also participated in the session, which was designed to cultivate a company-wide awareness of the need to adhere to the act’s provisions.



● Introducing Legal Change Information System

In order to allow its employees to gain a continuous grasp of the latest information on revised laws and ordinances, Takuma introduced a “Legal Change Information System.” In this system, legal alerts highlighting changes to laws and ordinances are sent by email in advance to employees, who can also review detailed information about the corresponding law or ordinance on the website as needed. In addition to current laws and ordinances, the system lets users search for legal precedents and public comments to facilitate an even greater understanding of relevant laws and ordinances.

CSR Awareness Survey

As a means of understanding the level of awareness of compliance and CSR and the level of permeation of education that promotes these priorities, and employing that data as reference for the integrated activities carried out during each fiscal year and for the following fiscal year’s action plan, we have conducted the “CSR Awareness Survey” every year since FY2008 with the end goal of utilizing that information for future compliance and CSR promotion activities. The survey has included Group companies since FY2013.

We actively use survey results in our activities, for example by offering additional education in areas that received lower scores than in the previous survey. We will continue to offer this survey and use its results to improve compliance and CSR promotion education on an ongoing basis.

In-house Reporting System

Takuma has been operating an in-house reporting system since FY2006, with the aim of promoting compliance management by uncovering illegal or unfair acts as early as possible and undertaking corrective measures. Reporting contacts are set up at our Compliance & CSR Promotion Division and at an outside law office, as well as a dedicated outside report contact for anonymous e-mail reporting. Our “In-house Reporting Code” and the “Takuma Group Code of Conduct” further declare that no informant shall be subjected to disadvantageous treatment simply due to his or her having filed a report. Furthermore, in order for this system to be correctly understood and utilized, we distribute a card to all employees with information on the reporting contacts and regularly publicize the system.



In-house reporting process

Material Procurement Policy

Takuma carries out procurement activity in accordance with its Material Procurement Policy. We provide fair opportunities for all suppliers, irrespective of nationality, company size, or transaction history. Suppliers are selected based on our comprehensive evaluation of their reliability and safeness in terms of quality, price, delivery, etc., as well as their abilities in technological development and supply capabilities. Long-term stable transactions with dependable suppliers result in improved product reliability and greater corporate value. We, therefore, seek to establish relationships of mutual trust and mutual development with our suppliers. While also respecting relevant laws and regulations as well as social norms, we strictly control and maintain any confidential information that we obtain through our business transactions. Takuma procurement procedures and required items are posted on the following website.

[Takuma website > Material Procurement] <http://www.takuma.co.jp/procurement/index.html> (content in Japanese)

Material Procurement Policy

1. Treat all candidates fairly when selecting a supplier.
2. Strive to discover new manufacturers.
3. Strictly control confidential information.
4. Strive to acquire new and pertinent information.
5. Promote green procurement.
6. Comply with laws and ordinances related to business dealings.
7. Always keep VA and VE in mind.
8. Strive for self-development.

Consumer Issues

Activities Involving Product Quality

In addition to defining our Quality Policy, registering for “ISO 9001: Management Systems” certification (Registration No.: JQA 1952), and improving product quality based on our quality management system, we carried out concrete activities to enhance customer satisfaction. The present status for ISO 9001 certification includes having switched to ISO 9001:2000 in FY2002 and then to ISO 9001:2008 in FY2010.

Takuma Co., Ltd., has adopted the following Quality Policy in order to provide satisfying products that meet customer expectations and earn a high level of trust while continuously improving the effectiveness of its quality management system.

Quality Policy

Manufacturing products that result in customer satisfaction

In order to produce products that customers truly appreciate, it is necessary not only to boost the quality of the product itself, but also to improve the content of that work as well as each individual’s ability to create a good product in each process up to delivery (sales, design, procurement, manufacture, construction, and management).

Based on that Quality Policy, Takuma is pursuing a variety of measures in each sales, design, procurement, manufacture, construction, and management process towards improving the quality of our products and services.

- Improving organizational operations

As measures for heightening the quality of the products as a whole, we establish quality objectives in each section and department at the beginning of the fiscal year and regularly report (twice per year) the status of achievements to the QM committee (quality management review).
- Improving individual employees’ capabilities

We created a “Work (Technical Capability) Achievement Checksheet” in order to improve the work capability of the personnel required for each process. In addition to allowing us to assess current skill levels of individual employees on a regular basis, this system is used to review targets.
- Internal quality audit

We raise the accuracy of each job through standardization of the work procedure within each process, confirm the operating status of the quality management system by carrying out internal quality audits in each section and department, and enhance work content as necessary.

These audits are carried out on a regular basis by employees who have been certified as internal audit members by completing internal quality audit member training seminars that are taught by lecturers from outside organizations. These seminars enable those personnel to acquire knowledge ranging from fundamental knowledge about ISO 9001 to specific methods for implementing internal audits.
- Review of quality control and processes

Quality control is an important aspect of producing excellent products.

When a non-compliant product is discovered, we implement the measures (remedies) provided in the corresponding manual (standard). Even in processes that did not go so far as to produce a non-compliant product, a review is carried out on processes that might have caused the issue as a preventive measure.

In order to also prevent procurement of noncompliant products, we provide further education (instruction) positively for all suppliers.

● Customer satisfaction survey

We created the Customer Satisfaction Survey Committee in FY2007 and have been conducting customer satisfaction surveys since as an initiative to improve quality by asking customers how they feel about delivered products and Takuma staff and using their feedback to improve quality.

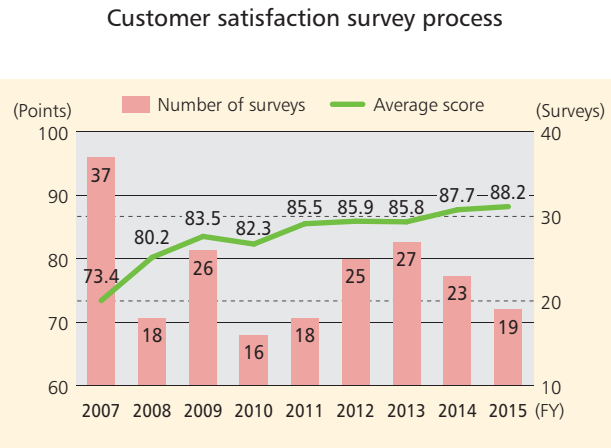
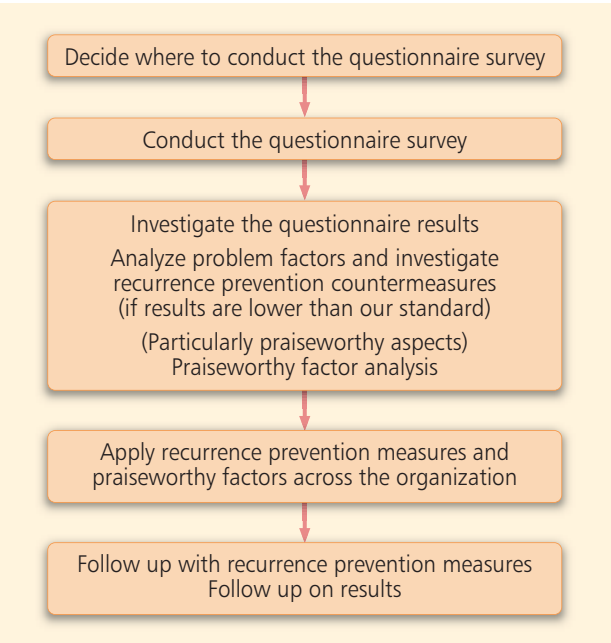
The figure to the right illustrates how the survey is administered.

First, we administer questionnaires targeting customers who had construction work done by asking them to assess the overall experience after the work is completed, including the nature of the work performed, suitability of delivered equipment, and the level of service provided by Takuma staff.

Next, the committee calculates a score for each item based on the survey results as well as a report and explanation from the responsible department. The committee then analyzes the resulting data.

If we find a problem, for example an item receiving an evaluation score of less than 70 or a score of 1 (dissatisfied) or 2 (rather dissatisfied) on a 4-point scale, the committee analyzes the cause of the problem and studies measures to prevent recurrence based on interviews with the department in question. We also evaluate aspects of our products and services that receive especially high praise from customers and work to further enhance customer satisfaction by combining problem areas and praiseworthy areas and applying them horizontally across involved departments at the company.

For customers targeted for problem analysis and consideration of preventive measures based on the survey results, we also conduct a follow-up survey to discern whether those measures were reliably implemented and whether their level of satisfaction has indeed improved.



Number of questionnaire surveys and average score



Participation in the Community

Disaster Preparedness Agreement Signed

Takuma has entered into an “Agreement on Use as a Temporary Evacuation Center in Case of Tsunamis, Etc.,” a Disaster Preparedness Agreement, with Amagasaki City.

Our corporate Head Office is located in Amagasaki where, based on lessons learned from the Great East Japan Earthquake, they are advancing the establishment of temporary evacuation areas in preparation for disasters, such as those that may be generated by tsunamis from earthquakes in the Tonankai and Nankai areas that are anticipated in the near future, as well as those from flooding caused by typhoons, heavy rain, and high tides.

To that end, we concluded a Disaster Preparedness Agreement with that city defining our Head Office as a temporary evacuation center and enabling the local populace free access whenever there is a possibility of one of the above disasters occurring. Our corporate Head Office is thus designated by Amagasaki City as a “Temporary Evacuation Center in Case of Tsunamis, Etc.”



Yotteko-mura, Arai

Takuma offers the “Takuma Club” recreation facility located in our Harima Factory free of charge as the village office for “Yotteko-mura, Arai,” a resident exchange facility that was launched in Takasago City’s Arai district under Hyogo Prefecture’s “Kenmin Koryu Hiroba” (Civic Exchange Plaza) project. “Yotteko” means “come on over” in Banshu (southwestern part of Hyogo Prefecture) dialect, and “Yotteko-mura” is being used as a new local community venue in which anyone can participate at any time.



Contribution to Society

Takuma strives to contribute to society through activities such as the following:

● Social contribution activities by Takuma employees

● Takuma Group coordinated cleanup activities

In line with World Environment Day on June 5, we organized a series of coordinated cleanup activities to clean the area around our offices from May to June 2015.

The entire Group participated on a volunteer basis in what was the ninth effort of its kind. Since the number of participants has been increasing, particularly at the Head Office, we divided volunteers into groups and held multiple separate activities. The cleanup provided an opportunity to think afresh about the environment and community. We will continue this activity in the future in order to make a contribution to local communities.



● Participation in the “Osaka Marathon ‘Cleanup’ Campaign”

Volunteers from Takuma’s Plant Service Department (Osaka) participated in the “Osaka Marathon ‘Cleanup’ Campaign,” a cleanup activity that is held every year in Osaka City.

The activity, which brought together organizational, group, and individual volunteers to beautify Osaka’s public spaces, was held in October 2015 as part of a tie-up with the 5th Osaka Marathon.



● Blood donation campaign

Takuma supports blood donation activities through the Japanese Red Cross Society. Our Head Office held two drives in October 2015 and March 2016, and the Harima Factory held one drive in November. A total of 157 people donated blood, and the Harima Factory received a letter of appreciation from the Hyogo Prefecture Branch of the Japanese Red Cross Society in recognition of its long-running cooperation with the organization’s blood drives. We plan to continue this activity in the future.



● WFP fundraising activities

Takuma serves on the Board of Trustees of the Japan Association for the World Food Programme, the official supporting partner of the World Food Programme in Japan.

Each year, we display WFP posters at the entrances to company buildings and in cafeterias during a campaign that lasts from June through August. The campaign serves both to increase employee interest in the world’s food problems and to collect donations to address them. According to the UN WFP, about 800 million people suffer from hunger worldwide. Through the Japan Association for the World Food Programme, we will continue to raise funds to help people suffering from food scarcity.



● Contributions to NPOs

● Purchasing UNICEF Christmas cards

Takuma purchases UNICEF Christmas cards. A portion of the proceeds is used to fund UNICEF in their work to help children around the world.

● Donating calendars to a charity calendar market

Takuma donates unused calendars to a calendar market sponsored by the NPO “Nippon Volunteer Network Active in Disasters.”

In FY2015, we donated more than 100 calendars. The proceeds are used to provide aid for victims of natural disasters and other crises.

● Activities at schools

In October 2015, second-graders at Amagasaki City’s Kinrakuji Elementary School, which is located adjacent to our Head Office, toured the Head Office building during a “Town Explorer” field trip.

Ms. Serizawa, Manager of the Technology Planning & Administration Dept., provided an easy-to-understand explanation of Takuma’s businesses as well as waste incineration plants, recycling facilities, and sewage treatment plants using slides. The children exhibited a high level of awareness of waste-related issues, showing great interest and asking many questions.



● Group company activities

● Tochigi High Trust Co., Ltd.

Tochigi High Trust employees volunteered as part of the Moka Environmental Partnership Meeting in Moka City, Tochigi Prefecture. Activities included weeding to protect the natural environment near the Okubo River and participating in fellowship and exchange with local residents. The facility has also been accredited as a Tochigi Prefecture Eco Keeper Worksite (with a rank of three stars).



● Anan High Trust Co., Ltd.

Anan High Trust is striving to open itself to the surrounding community through a series of initiatives that include cleanup activities in the area around its facilities, environmental learning sessions held at its on-site Management Education Center, and a variety of events.



● Kashihara High Trust Co., Ltd.

Activities by Kashihara High Trust include cleaning and beautifying nearby roads, weeding in the surrounding area, conducting patrols for illegal dumping, manning a booth at local business meetings, and cooperating with locally held events.



Financial Data

Trend in Principal Management Indicators and Other Financial Data

Consolidated Balance Sheets

Consolidated Statements of Operations

Consolidated Statements of Comprehensive Income

Consolidated Statements of Changes in Net Assets

Consolidated Statements of Cash Flows

Financial Data

■ Trend in Principal Management Indicators and Other Financial Data

Fiscal year	107 th (Millions of yen)	108 th (Millions of yen)	109 th (Millions of yen)	110 th (Millions of yen)	111 th (Millions of yen)	112 th (Millions of yen)	112 th (Thousands of U.S. dollars)
End of fiscal year	March 2011	March 2012	March 2013	March 2014	March 2015	March 2016	March 2016
Net sales	¥ 89,141	¥ 101,015	¥ 96,384	¥ 96,334	¥ 103,875	¥ 113,088	\$1,003,626
Operating income	¥ 3,563	¥ 6,429	¥ 6,241	¥ 8,424	¥ 8,223	¥ 9,189	\$ 81,553
Ordinary income	¥ 4,397	¥ 7,336	¥ 7,168	¥ 9,449	¥ 9,116	¥ 9,646	\$ 85,607
Profit attributable to owners of parent	¥ 1,821	¥ 4,212	¥ 6,145	¥ 8,835	¥ 8,030	¥ 7,817	\$ 69,374
Comprehensive income	¥ 638	¥ 4,935	¥ 6,712	¥ 9,935	¥ 9,398	¥ 7,149	\$ 63,448
Net assets	¥ 23,901	¥ 28,308	¥ 34,653	¥ 43,889	¥ 52,516	¥ 58,809	\$ 521,916
Total assets	¥ 100,848	¥ 107,028	¥ 106,754	¥ 108,520	¥ 123,127	¥ 132,614	\$1,176,912
Net assets per share	¥ 286.27	¥ 339.20	¥ 415.92	¥ 527.50	¥ 631.53	¥ 708.18	\$ 6.28
Net income per share	¥ 22.03	¥ 50.94	¥ 74.32	¥ 106.86	¥ 97.12	¥ 94.55	\$ 0.84
Diluted net income per share	—	—	—	—	—	—	—
Capital adequacy ratio (%)	23.5	26.2	32.2	40.2	42.4	44.1	44.1
Return on equity (%)	7.8	16.3	19.7	22.7	16.8	14.1	14.1
Price-to-earnings ratio	12.9	8.1	7.4	6.9	9.7	10.7	10.7
Cash flows from operating activities	¥ (3,895)	¥ 4,565	¥ 17,465	¥ 8,270	¥ 21,727	¥ 6,728	\$ 59,711
Cash flows from investing activities	¥ 230	¥ 270	¥ (59)	¥ (1,430)	¥ (160)	¥ (445)	\$ (3,953)
Cash flows from financing activities	¥ 8,000	¥ (2,494)	¥ (8,887)	¥ (5,867)	¥ (3,707)	¥ (2,900)	\$ (25,733)
End-of-year balance of cash and cash equivalents	¥ 15,510	¥ 17,384	¥ 26,005	¥ 27,030	¥ 45,008	¥ 48,335	\$ 428,961
Number of employees	3,235	3,187	3,288	3,315	3,266	3,366	3,366

Note:

1. U.S. dollar amounts are shown solely for the convenience of readers and are translated at the rate of ¥112.68 to U.S.\$1.00, the exchange rate prevailing at March 31, 2016.
2. Ordinary income is a measure of accounting profit that equals operating income plus other income minus other expenses, except for extraordinary items under Japanese GAAP.

Financial Data

■ Consolidated Balance Sheets

TAKUMA CO., LTD., and Consolidated Subsidiaries
As of March 31, 2016, and 2015

	Millions of yen		Thousands of U.S. dollars
	2016	2015	2016
ASSETS			
Current assets:			
Cash and time deposits	¥ 48,916	¥ 45,650	\$ 434,115
Notes and accounts receivable:			
Trade	44,935	38,057	398,786
Unconsolidated subsidiaries and affiliated companies	1,457	1,281	12,930
Other	289	456	2,565
Less allowance for doubtful accounts	(39)	(51)	(349)
Total	46,642	39,743	413,932
Inventories	4,041	3,812	35,866
Deferred tax assets	2,803	3,359	24,873
Other	607	722	5,387
Total current assets	103,009	93,286	914,173
Property, plant and equipment:			
Land	3,018	3,082	26,789
Buildings and structures	12,219	12,228	108,437
Machinery, equipment, lease assets and construction in progress	11,123	11,918	98,713
Total	26,360	27,228	233,939
Less accumulated depreciation	(16,764)	(17,372)	(148,774)
Total property, plant and equipment	9,596	9,856	85,165
Investments and other assets:			
Investment securities	11,136	12,013	98,825
Investments in:			
Unconsolidated subsidiaries and affiliated companies	5,556	5,702	49,313
Other	823	784	7,301
Less allowance for doubtful accounts	(467)	(477)	(4,145)
Total	5,912	6,009	52,469
Deferred tax assets	2,648	1,709	23,501
Other	313	254	2,779
Total investments and other assets	20,009	19,985	177,574
Total assets	¥ 132,614	¥ 123,127	\$ 1,176,912

	Millions of yen		Thousands of U.S. dollars
	2016	2015	2016
LIABILITIES AND NET ASSETS			
Current liabilities:			
Short-term loans payable	¥ 7,750	¥ 7,850	\$ 68,779
Current portion of long-term debt	673	1,896	5,969
Notes and accounts payable:			
Trade	34,584	27,516	306,924
Unconsolidated subsidiaries and affiliated companies	575	694	5,108
Other	1,111	1,075	9,856
Total	36,270	29,285	321,888
Accrued income taxes	1,256	304	11,146
Advances received	7,700	8,692	68,336
Allowance for guarantees on completed work	141	70	1,257
Allowance for losses on sales contracts	5,164	6,895	45,829
Other	4,190	4,620	37,182
Total current liabilities	63,144	59,612	560,386
Long-term liabilities:			
Long-term debt	1,396	2,069	12,393
Allowance for directors', executive officers' and corporate auditors' retirement benefits	189	181	1,676
Net defined benefit liability	8,668	8,294	76,925
Other	408	455	3,616
Total long-term liabilities	10,661	10,999	94,610
Total liabilities	73,805	70,611	654,996
Contingent liabilities			
Net assets:			
Common stock	13,367	13,367	118,632
Authorized: 321,840,000 shares Issued: 83,000,000 shares			
Capital surplus	3,768	3,768	33,442
Retained earnings	38,754	31,764	343,934
Treasury stock, at cost	(232)	(228)	(2,066)
328,764 shares in 2016 and 324,240 shares in 2015			
Total shareholders' equity	55,657	48,671	493,942
Unrealized gains on securities	3,586	4,097	31,825
Deferred gains and losses on hedges	(27)	24	(236)
Foreign currency translation adjustments	(11)	25	(100)
Remeasurements of defined benefit plans	(660)	(605)	(5,855)
Total accumulated other comprehensive income ..	2,888	3,541	25,634
Non-controlling interests in consolidated subsidiaries	264	304	2,340
Total net assets	58,809	52,516	521,916
Total liabilities and net assets	¥ 132,614	¥ 123,127	\$ 1,176,912

Financial Data

■ Consolidated Statements of Operations

TAKUMA CO., LTD., and Consolidated Subsidiaries
For the years ended March 31, 2016, and 2015

	Millions of yen		Thousands of U.S. dollars
	2016	2015	2016
Net sales	¥ 113,088	¥ 103,875	\$1,003,626
Cost of sales	89,744	81,774	796,452
Gross profit	23,344	22,101	207,174
Selling, general and administrative expenses	14,155	13,878	125,621
Operating income	9,189	8,223	81,553
Other income (expenses):			
Interest and dividend income	366	310	3,253
Interest expense	(105)	(157)	(934)
Amortization of negative goodwill	-	195	-
Gain on sales of investment securities	-	262	-
Loss on disposal of property, plant and equipment	(167)	(25)	(1,483)
Equity in earnings of affiliated companies	287	431	2,543
Reversal of provision for loss on litigation	-	523	-
Impairment loss	(267)	(1,425)	(2,368)
Other, net	76	140	675
Other income (expenses), net	190	254	1,686
Income before income taxes	9,379	8,477	83,239
Income taxes:			
Current	1,558	903	13,828
Deferred	11	(468)	100
Total income taxes	1,569	435	13,928
Profit	7,810	8,042	69,311
Profit (loss) attributable to non-controlling interests in consolidated subsidiaries	(7)	12	(63)
Profit attributable to owners of parent	¥ 7,817	¥ 8,030	\$ 69,374
Per share:			
Net income	¥ 94.55	¥ 97.12	\$ 0.84
Diluted net income	-	-	-
Cash dividends applicable to the year	11.00	9.00	0.10

■ Consolidated Statements of Comprehensive Income

TAKUMA CO., LTD., and Consolidated Subsidiaries
For the years ended March 31, 2016, and 2015

	Millions of yen		Thousands of U.S. dollars
	2016	2015	2016
Profit	¥ 7,810	¥ 8,042	\$ 69,311
Other comprehensive income:			
Unrealized gains (losses) on securities	(511)	1,606	(4,536)
Deferred gains and losses on hedges	(41)	8	(362)
Foreign currency translation adjustments	(55)	81	(484)
Remeasurements of defined benefit plans	(54)	(339)	(481)
Total other comprehensive income	(661)	1,356	(5,863)
Comprehensive income	¥ 7,149	¥ 9,398	\$ 63,448
Comprehensive income attributed to:			
Owners of the parent	¥ 7,165	¥ 9,358	\$ 63,587
Non-controlling interests	(16)	40	(139)

■ Consolidated Statements of Changes in Net Assets

TAKUMA CO., LTD., and Consolidated Subsidiaries

For the years ended March 31, 2016, and 2015

	Millions of yen							
	Common stock	Capital surplus	Retained earnings	Treasury stock, at cost	Total shareholders' equity			
For the year ended March 31, 2016								
Balance at the beginning of current period ...	¥ 13,367	¥ 3,768	¥ 31,764	¥ (228)	¥ 48,671			
Cash dividends (¥9.00 per share)	-	-	(827)	-	(827)			
Profit attributable to owners of parent	-	-	7,817	-	7,817			
Purchase of treasure stock	-	-	-	(4)	(4)			
Other changes during the year, net	-	-	-	-	-			
Balance at the end of current period	¥ 13,367	¥ 3,768	¥ 38,754	¥ (232)	¥ 55,657			
	Millions of yen							
	Unrealized gains on securities	Deferred gains and losses on hedges	Foreign currency translation adjustments	Remeasurements of defined benefit plans	Total accumulated other comprehensive income	Non-controlling interests in consolidated subsidiaries	Total net assets	
For the year ended March 31, 2016								
Balance at the beginning of current period ...	¥ 4,097	¥ 24	¥ 25	¥ (605)	¥ 3,541	¥ 304	¥ 52,516	
Cash dividends (¥9.00 per share)	-	-	-	-	-	-	(827)	
Profit attributable to owners of parent	-	-	-	-	-	-	7,817	
Purchase of treasure stock	-	-	-	-	-	-	(4)	
Other changes during the year, net	(511)	(51)	(36)	(55)	(653)	(40)	(693)	
Balance at the end of current period	¥ 3,586	¥ (27)	¥ (11)	¥ (660)	¥ 2,888	¥ 264	¥ 58,809	
	Thousands of U.S. dollars							
	Common stock	Capital surplus	Retained earnings	Treasury stock, at cost	Total shareholders' equity			
For the year ended March 31, 2016								
Balance at the beginning of current period ...	\$ 118,632	\$ 33,442	\$ 281,897	\$ (2,028)	\$ 431,943			
Cash dividends (\$0.08 per share)	-	-	(7,337)	-	(7,337)			
Profit attributable to owners of parent	-	-	69,374	-	69,374			
Purchase of treasure stock	-	-	-	(38)	(38)			
Other changes during the year, net	-	-	-	-	-			
Balance at the end of current period	\$ 118,632	\$ 33,442	\$ 343,934	\$ (2,066)	\$ 493,942			
	Thousands of U.S. dollars							
	Unrealized gains on securities	Deferred gains and losses on hedges	Foreign currency translation adjustments	Remeasurements of defined benefit plans	Total accumulated other comprehensive income	Non-controlling interests in consolidated subsidiaries	Total net assets	
For the year ended March 31, 2016								
Balance at the beginning of current period ...	\$ 36,356	\$ 213	\$ 226	\$ (5,374)	\$ 31,421	\$ 2,698	\$ 466,062	
Cash dividends (\$0.08 per share)	-	-	-	-	-	-	(7,337)	
Profit attributable to owners of parent	-	-	-	-	-	-	69,374	
Purchase of treasure stock	-	-	-	-	-	-	(38)	
Other changes during the year, net	(4,531)	(449)	(326)	(481)	(5,787)	(358)	(6,145)	
Balance at the end of current period	\$ 31,825	\$ (236)	\$ (100)	\$ (5,855)	\$ 25,634	\$ 2,340	\$ 521,916	

	Millions of yen				
	Common stock	Capital surplus	Retained earnings	Treasury stock, at cost	Total shareholders' equity
For the year ended March 31, 2015					
Balance at the beginning of current period ...	¥ 13,367	¥ 3,841	¥ 27,799	¥ (3,606)	¥ 41,401
Cumulative effect of changes in accounting policies	-	-	(175)	-	(175)
Restated balance	13,367	3,841	27,624	(3,606)	41,226
Cash dividends (¥7.00 per share)	-	-	(579)	-	(579)
Profit attributable to owners of parent	-	-	8,030	-	8,030
Change in scope of consolidation	-	-	(6)	-	(6)
Purchase of treasure stock	-	-	-	(1)	(1)
Sales of treasury stock	-	(0)	-	1	1
Retirement of treasury stock	-	(73)	(3,305)	3,378	-
Other changes during the year, net	-	-	-	-	-
Balance at the end of current period	¥ 13,367	¥ 3,768	¥ 31,764	¥ (228)	¥ 48,671

	Millions of yen						
	Unrealized gains on securities	Deferred gains and losses on hedges	Foreign currency translation adjustments	Remeasurements of defined benefit plans	Total accumulated other comprehensive income	Non-controlling interests in consolidated subsidiaries	Total net assets
For the year ended March 31, 2015							
Balance at the beginning of current period ...	¥ 2,491	¥ 16	¥ (29)	¥ (266)	¥ 2,212	¥ 276	¥ 43,889
Cumulative effect of changes in accounting policies	-	-	-	-	-	-	(175)
Restated balance	2,491	16	(29)	(266)	2,212	276	43,714
Cash dividends (¥7.00 per share)	-	-	-	-	-	-	(579)
Profit attributable to owners of parent	-	-	-	-	-	-	8,030
Change in scope of consolidation	-	-	-	-	-	-	(6)
Purchase of treasure stock	-	-	-	-	-	-	(1)
Sales of treasury stock	-	-	-	-	-	-	1
Retirement of treasury stock	-	-	-	-	-	-	-
Other changes during the year, net	1,606	8	54	(339)	1,329	28	1,357
Balance at the end of current period	¥ 4,097	¥ 24	¥ 25	¥ (605)	¥ 3,541	¥ 304	¥ 52,516

■ Consolidated Statements of Cash Flows

TAKUMA CO., LTD., and Consolidated Subsidiaries
For the years ended March 31, 2016, and 2015

	Millions of yen		Thousands of U.S. dollars
	2016	2015	2016
Cash flows from operating activities:			
Income before income taxes	¥ 9,379	¥ 8,477	\$ 83,239
Adjustments to reconcile income before income taxes to net cash provided by operating activities:			
Depreciation	840	900	7,455
Impairment loss	267	1,425	2,368
Amortization of negative goodwill	-	(195)	-
Gain on sales of investment securities	-	(262)	-
Increase (decrease) in allowance for doubtful accounts	(21)	(67)	(189)
Increase (decrease) in allowance for bonuses	107	268	948
Increase (decrease) in allowance for losses on sales contracts	(1,731)	3,956	(15,365)
Increase (decrease) in allowance for losses on litigation	-	(690)	-
Increase (decrease) in net defined benefit liability	325	69	2,880
Interest and dividend income	(367)	(310)	(3,253)
Interest expense	105	157	934
Equity in losses (earnings) of affiliated companies	(287)	(431)	(2,543)
Net decrease (increase) in notes and accounts receivable and advances received ...	(7,951)	2,468	(70,565)
Decrease (increase) in consumption tax receivable	0	0	0
Decrease (increase) in other current assets	42	1,224	374
Increase (decrease) in consumption tax payable	0	0	0
Increase (decrease) in other current liabilities	(587)	(835)	(5,210)
Other	152	73	1,352
Subtotal	6,903	22,343	61,260
Interest and dividend received	623	582	5,529
Interest paid	(108)	(160)	(954)
Compensation for damages payments	-	-	-
Net cash provided by operating activities	6,728	21,727	59,711
Cash flows from investing activities:			
Net decrease (increase) in time deposits	42	13	377
Proceeds from subsidies	-	-	-
Purchase of intangible fixed assets	(82)	(40)	(736)
Purchase of investment securities	(91)	(209)	(813)
Sale of investment securities	152	181	1,352
Disbursement for loans receivable	(25)	(31)	(222)
Collection of loans receivable	243	187	2,160
Other	(28)	85	(248)
Net cash used in investing activities	(445)	(160)	(3,953)

	Millions of yen		Thousands of U.S. dollars
	2016	2015	2016
Cash flows from financing activities:			
Net increase (decrease) in short-term bank loans	(100)	(450)	(887)
Proceeds from long-term debt	-	200	-
Payment of long-term debt	(1,896)	(2,805)	(16,823)
Purchase of treasury stock	(4)	(1)	(38)
Payment of cash dividends	(827)	(579)	(7,337)
Dividends paid to non-controlling interests	(25)	(16)	(219)
Other	(48)	(56)	(429)
Net cash used in financing activities	(2,900)	(3,707)	(25,733)
Effect of exchange rate changes on cash and cash equivalents	(56)	69	(495)
Net increase (decrease) in cash and cash equivalents	3,327	17,929	29,530
Cash and cash equivalents at beginning of year	45,008	27,030	399,431
Increase in cash and cash equivalents from newly consolidated subsidiaries	-	49	-
Cash and cash equivalents at end of year	¥ 48,335	¥ 45,008	\$ 428,961

Outside Expert Opinion

Outside Expert Opinion



Hiroji Tanaka

Trustee and Chief Researcher
Business Ethics Research Center
Professor Emeritus
Tokyo College of Transport Studies
(former President)

In its Corporate Profile & CSR Report 2016, which encompasses both financial data and non-financial information, the Takuma Group fulfills its accountability to stakeholders by explaining how it practices CSR management to achieve sustained growth together with society in line with its Company Motto, Management Principles, and other core beliefs.

Exceptionally praiseworthy accomplishments

First, the company declares its commitment to playing an essential role for society as a leading company in the utilization of renewable energy and in the field of environmental protection in the “Message from Top Management” section, which highlights its diligent pursuit of the 11th Medium-Term Management Plan (FY2015 to FY2017).

In addition, the Takuma Group has delineated its path forward as it works to achieve sustained growth while accommodating changes in the business environment by adopting the Company Motto, Management Principles, Ethics Charter, and Code of Conduct as the basis for CSR management.

Second, in its “Business Summary” and “Business Development” sections, the Company Profile provides a meticulous, far-reaching description of how it is providing new value to society in the fields of the environment and energy, with coverage extending from initiatives in areas such as its municipal solid waste treatment plant business, energy plant business, water treatment plant business, and overseas markets to social contributions through its businesses and products. The explanation makes good use of photographs and diagrams of sites and plants, making it immediate and engaging.

Third, in its CSR initiatives Takuma has developed a FY2015 action program through discussions of CSR issues in each department following the selection of priority issues with reference to international guidelines published by the Global Reporting Initiative (GRI) and the ISO 26000 international standard (including seven core subjects). Having each department conduct a self-assessment in line with its action program’s implementation plan is an extremely good way to implement CSR management.

Fourth, the Takuma Group is paying close attention to human rights and labor practices while taking into account

the characteristics of its business development. This consideration is truly fine-grained, extending from respect of human rights and elimination of discrimination to initiatives to put in place a workplace environment in which employees can do their jobs with peace of mind, efforts to ensure occupational safety and health, and environmental management activities that contribute to the protection of the global environment.

Furthermore, the CSR Awareness Survey that Takuma launched in FY2008 has included Group companies since FY2013, and I applaud the company for actively utilizing the results of those surveys in its actual CSR activities.

Fifth, the company is managing and administering its approach to corporate governance, an area that has attracted much attention in recent years, in an appropriate manner that accords with the actual facts on the ground, including in terms of internal controls, compliance and CSR promotion structures, risk management structures, and IR activities. Furthermore, the company has earned stakeholders’ trust and satisfied social requirements by drawing up a Business Continuity Plan for activation in the event of an emergency such as a large-scale natural disaster or pandemic.

Areas where Takuma can do more

First, it is desirable that Takuma expand its stakeholder dialog. I expect the company to augment its current approach of asking Takuma Group customers for their views by expanding the scope of the dialog to include experts in specialized fields and regions, plant users, and the media as conditions dictate. In addition, the range of Group participants should be expanded to include executive officers, general managers, and employees who are responsible for operations on the ground so that a further-reaching exchange of views can be achieved.

Second, when financial information consists exclusively of figures, the average stakeholder may not be able to understand the significance and background of that data. By adding several lines of extremely simple comment or explanation about the characteristics and outcomes embodied by the most important financial data, Takuma can deepen stakeholders’ understanding while making the content much more immediate and familiar.

Response to the Outside Expert Opinion



Masahiko Izumi

Executive Officer
General Manager
Compliance & CSR Promotion Division &
Corporate Service Division

I would like to thank Mr. Tanaka of the Business Ethics Research Center for offering his valuable insights on the Corporate Profile & CSR Report 2016.

The purpose of this report is to provide an easy-to-understand introduction to the activities and initiatives of the Takuma Group. This year marks the 10th edition of the report, and with each successive edition, we have worked to provide information about those businesses and initiatives in which stakeholder’s interest runs high.

Mr. Tanaka has identified five areas as exceptionally praiseworthy in his outside expert opinion. Having edited the report in accordance with the purpose I described above, I’m extremely happy that he praised it for its far-reaching, meticulous explanation of the Group’s various business initiatives and associated social contributions and for its immediate and engaging character, which derives from its use of photographs and diagrams. I’m also grateful for his praise concerning our practice and pursuit of CSR management.

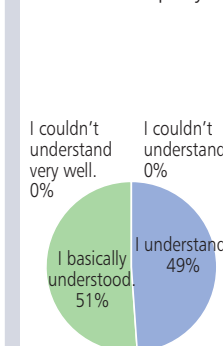
Mr. Tanaka has also provided valuable insight where he discusses areas where we can do more. Concerning the expansion of stakeholder dialog and enrichment of financial information, I believe we must identify what stakeholders expect of the Takuma Group, and what the Group would like stakeholders to understand—in other words, we must figure out how to share each other’s values. The business environment in which companies operate is changing dramatically. To accommodate those changes, it is necessary to share values with society. Going forward, we will work to communicate more effectively with stakeholders and to pursue CSR management in order to achieve sustained growth with society as well as the goals of the 11th Medium-Term Management Plan.

We value Mr. Tanaka’s observations and take them seriously, and I would request the continued support and encouragement of customers, shareholders, investors, and everyone else who is involved with Takuma as we work to practice CSR management and enhance our CSR Report.

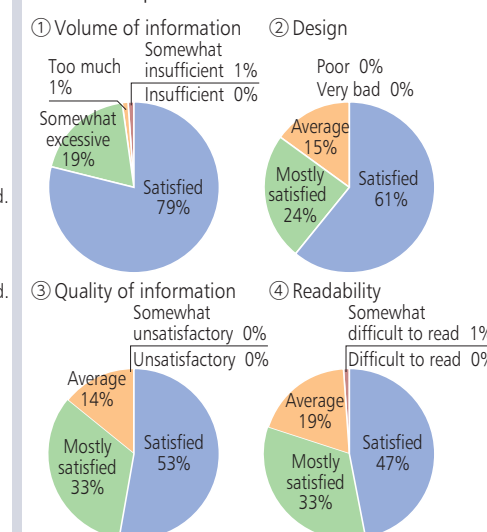
Takuma Corporate Profile & CSR Report 2015 Questionnaire Survey Results

Survey period: June 2015 to June 2016
Number of respondents: 806

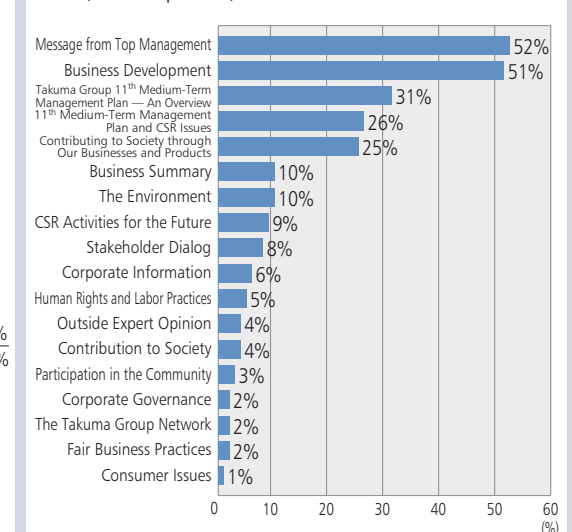
Q1. Did you understand the activities of our company?



Q2. What is your level of satisfaction regarding this Report?



Q3. Which items were you interested in? (Select up to 3.)





TAKUMA CO., LTD.

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■ Editorial Policy

We have prepared this document as a combined Corporate Profile and CSR Report, with both a guide to our corporation and a report on our CSR activities.

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■ Data Collection Period

From April 1, 2015, to March 31, 2016, in principle. In addition, some activities in FY2016 are included.

■ Coverage

This report applies to Takuma Co., Ltd., and its affiliates in principle.

■ Time of Issue:

Current issue: July 2016
Next issue: Scheduled for July 2017
Last issue: June 2015

This report employs the following measures in consideration of protecting the Earth's environment.

■ Printing



Printed using "waterless printing," which does not generate hazardous waste.



Printed using environmentally friendly vegetable oil ink.

■ Paper



Printed on FSC™-certified paper (made from trees from responsibly managed forests).



Printed on paper made with wood from forest thinning. "Morino Chonai-Kai" (Forest Neighborhood Association)– Supporting sound forest management.