TAKUMA

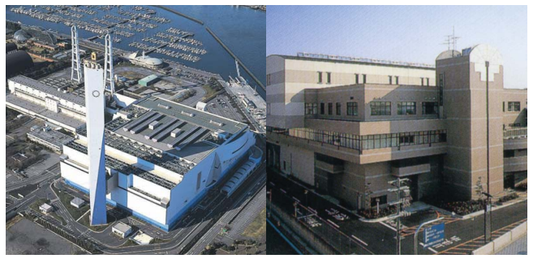
Corporate Profile & CSR Report 2015

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

Takuma develops a variety of technologies around a core set of combustion technologies, including waste treatment and water treatment components.
Our businesses in the environmental and energy fields are dedicated to resolving environmental issues such as global warming and to helping achieve a recycling-oriented society.
At Takuma, our mission is to pursue technologies for coexisting in harmony with nature in order that humankind and the Earth might enjoy a truly rich and fulfilling future.

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.



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.

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.

Energy plants

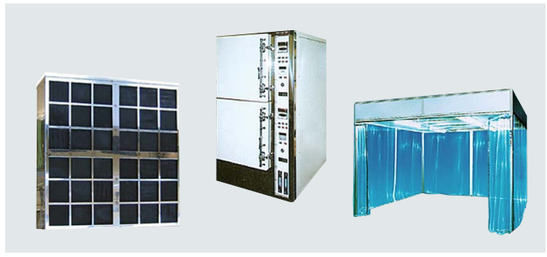
Takuma's core technologies are utilized in various types of boilers such as biomass fuel boilers as well as total systems.

Water treatment plants

We are working to purify dirty water 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

We will achieve sustained growth together with society under the basic policies outlined in our new Medium-Term Management Plan.

The Takuma Group has undertaken initiatives to address such priorities as strengthening its ability to propose solutions to customers and its cost competitiveness and expanding its line of products under a vision put forth in 2012 that calls for the Takuma to maintain its role of being an indispensable presence in society as a leading company in the field of renewable energy utilization and environmental protection and to achieve an ordinary profit of JPY 10 billion in FY2020. To that end, our 10th Medium-Term Management Plan (FY2012 to FY2014) focused on strengthening the foundation of our business to ensure consistent profits and preparing to expand profits during the next stage of our growth. The Group's operating environment during the 10th Medium-Term Management Plan was characterized by robust demand, particularly for wood chip biomass power plants, that was fueled in part by Japan's feed-in tariff (FIT) for renewable energy. At the same time, the procurement environment was characterized by challenges such as significant increases in earthwork and construction costs stemming from firming demand from the ongoing reconstruction effort following the Great East Japan Earthquake and infrastructure development work being undertaken in advance of the Tokyo Olympics as well as rising material and equipment prices caused by Japan's economic recovery and the weakening yen. Nonetheless, operations proceeded largely in line with our plans, and our business performance significantly exceeded our targets.

New Medium-Term Management Plan

Our 11th Medium-Term Management Plan (FY2015 to FY2017), which began this April, sets forth six basic policies designed to facilitate initiatives focusing on sustained growth and to steadily expand our business in terms of both quantity and quality in a continued effort to build on the results of the previous Medium-Term Management Plan so that we can achieve our Corporate Vision.

The first policy is to maintain and expand our market position through our EPC* business. This business, which consists of new construction of waste treatment plants, water treatment plants, and boiler plants, comprises the foundation on which infrastructure development and corporate business activities are built. While the domestic Japanese market is showing signs of maturity, customer needs with regard to these types of plants have become increasingly sophisticated and diverse in recent years. By drawing on the strength of our extensive track record of deliveries and experience, we will fulfill customer needs and tap plant demand in order to maintain and expand our market position.

The second policy is to expand the business that provides our base revenue. The plants we deliver to customers as part of our EPC business are important operational assets that enable our customers to provide public services or pursue business activities. By ensuring that these assets are used efficiently by customers over an extended period of time, we are able not only to facilitate customer profit, but also to provide a basis for long-term, stable revenue for the Takuma Group. We will work both to increase customer satisfaction and to expand the Group's base revenue through the maintenance management and operation of existing plants.

The third policy is to capture business in growth markets. To achieve sustained growth, it is essential to capture business not only in existing, mature markets, but also in new growth markets. Demand in the environmental and energy sectors in overseas markets is forecast to grow over the medium and long term, particularly in Southeast Asia, which is enjoying striking economic growth. Demand for biomass power plants continues to be strong in Thailand and surrounding countries. In addition, plans for constructing waste-fueled power plants are proceeding worldwide in the face of continued urbanization and rising environmental awareness. The Takuma Group will enhance the overall corporate capabilities it needs to develop its businesses overseas in this business environment, focusing on the products and services which best exploit its strengths. We will also work to transform our operations in the domestic Japanese market into an engine for growth by accelerating our efforts to develop peripheral markets around existing markets and product development.

The fourth policy is to further enhance our financial strength. Many of the Takuma Group's businesses operate over long periods of time on the order of 20 to 30 years, extending from plant construction to plant maintenance management and operation. It is essential that we establish an unshakably strong financial basis that can withstand changes in the business environment so that we are able to inspire and maintain customer trust and peace of mind as a business that is capable of providing high-quality products and services on an ongoing basis. Going forward, we will continue to undertake initiatives to enhance our financial strength.

* EPC: Engineering, procurement, and construction. EPC refers to the sequence of processes that includes engineering design, materials and equipment procurement, manufacture, and construction. In plant construction, terms such as "EPC method" and "EPC business" are used to refer to the execution of contracts for this entire process.

The fifth policy is to manage human resources effectively. We have built an organizational culture founded on honesty and good faith and motivated by our Management Principles of striving 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. To carry on this culture while pursuing further growth, we will assign human resources strategically and hire and train talented personnel while working to reform human resources structures and developing a work environment that accords with the general direction of our businesses.

The sixth policy is to foster the development of a robust organizational culture. CSR management at the Takuma Group is founded on the Company Motto, Management Principles, Takuma Group Ethics Charter, and Takuma Group Code of Conduct. We have spread awareness of the importance of compliance and CSR throughout the Group by carrying out awareness-raising and educational activities that focus on these guideposts to ensure employee familiarity with corporate ethics, including applicable laws and internal rules. Going forward, we will tirelessly continue and improve these efforts. In addition, Takuma joined the United Nations Global Compact in 2006, and we support the ten principles it outlines in the four areas of human rights, labor, environment, and anti-corruption. We will develop our businesses going forward while understanding and supporting these universal values, which have been adopted and accepted worldwide.

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 issue and contribute to the sustained development of society.

June 2015

Takaaki Kato
President and CEO
Takuma Co., Ltd.

Takaaki Kato

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.
UN Global Compact http://www.unglobalcompact.org/

Network Japan
WE SUPPORT

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 period of Meiji and Taisho (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 report
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 (FY2015 – 2017)
— Achieving Sustained Growth

1 Summary of the 10th Medium-Term Management Plan (FY2012 – 2014)

Positioning

The period covered by this medium-term management plan was positioned as a time for reinforcing the business foundation for stability and profitability and preparing for the next expansion of profits.

Policies

- Establishment of a firm business foundation
- Preparation for a stage of profit expansion
  ① Development of competitive technologies, products, and services
  ② Structuring of optimum business scheme within global reach
- Transmission of know-how and development of human resources
  ① Development of know-how transmission system
  ② Development of human resources to lead the next business expansion
- Permeation and establishment of compliance

Results and issues

- We achieved a certain level of results thanks to initiatives to establish a firm business foundation, for example by earning top share in the FIT* market with wood chip biomass power plants and securing profits in our maintenance business.
- Efforts to develop future products and enhance our product lines, for example by developing a sewage sludge-fueled power system, are proceeding generally according to schedule.
- Preparing a stage for overseas expansion and developing human resources continue to be important issues.
- Thanks to momentum surrounding renewable energy, we achieved financial results that significantly exceeded our targets.

* FIT: Feed-in tariff, a program that facilitates fixed-cost purchases of renewable energy.

Biomass Power Plant

Sewage Sludge-Fueled Power System

(Billion JPY)

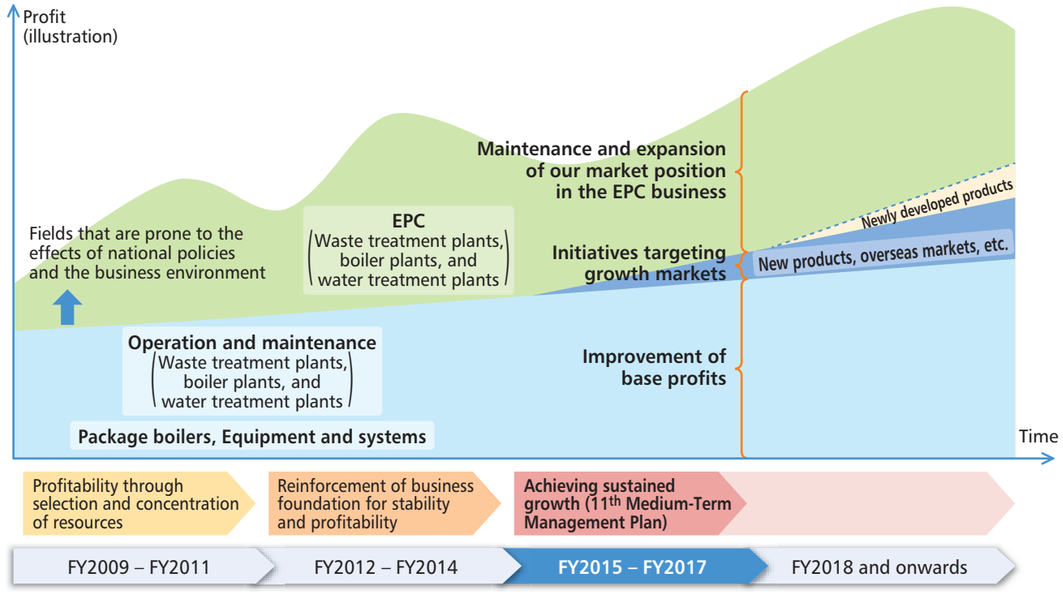
	FY 2012	FY 2013	FY 2014	3-year total	Target
Order Value	109.2	148.0	113.7	371.0	–
Sales	96.3	96.3	103.8	296.5	–
Ordinary Profit	7.1	9.4	9.1	25.7	JPY 15.0 billion or more
Ordinary Profit Ratio	7.4%	9.8%	8.8%	8.7%	5% or above
Equity Ratio	32.2%	40.2%	42.4%		35% or above

2 Business Directions

① Positioning of the 11th Medium-Term Management Plan

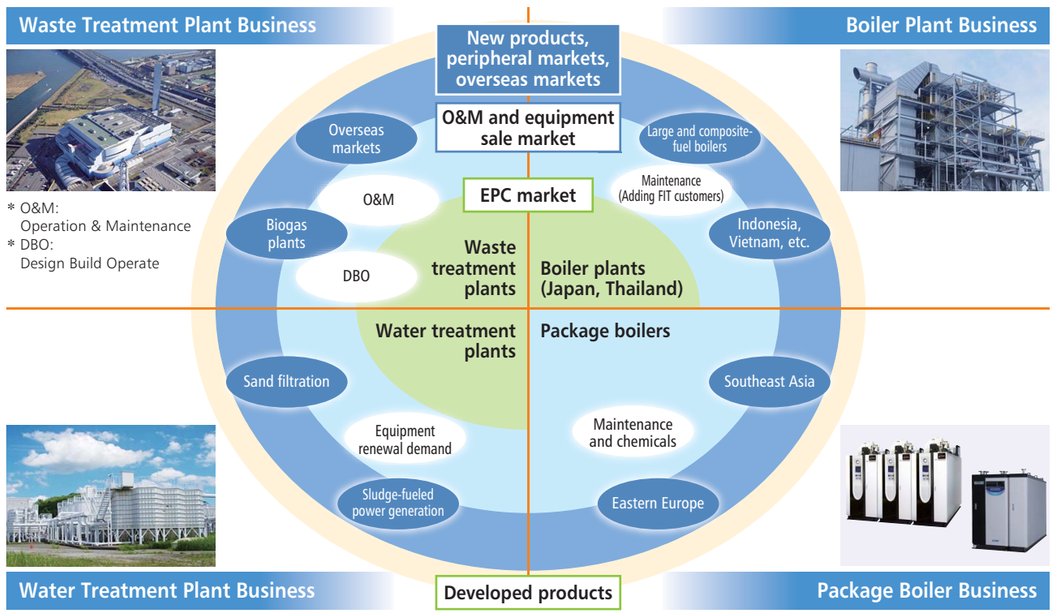
Achieve sustained growth by targeting growth markets while maintaining and expanding our market position in the EPC business and using businesses that generate base profits as a foundation for growth.

* 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.



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

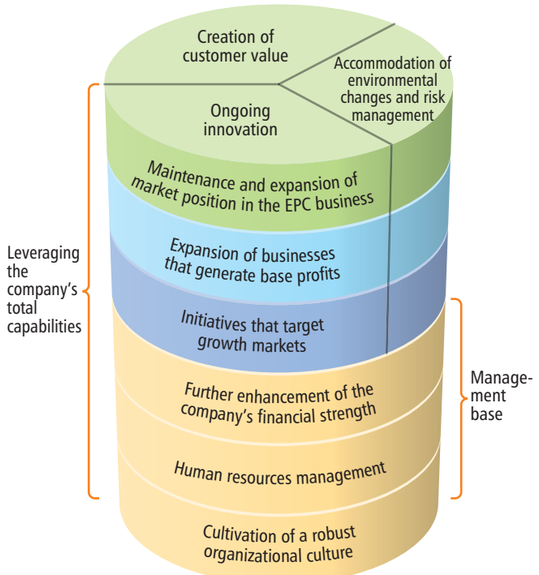
Policies

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

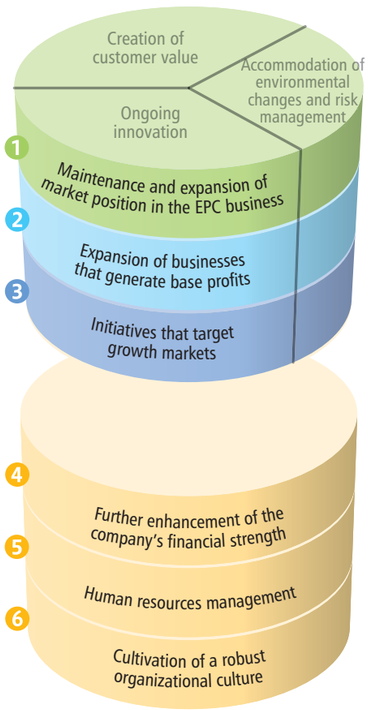
Perspectives

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

Achieving sustained growth



① Policies



1 Maintenance and expansion of market position in the EPC business
Leverage the strength of the company's track record and accumulated experience to meet customers' increasingly complex needs and tap plant renewal demand to maintain and expand our market position.

2 Expansion of businesses that generate base profits
Existing plants that have been delivered to customers in the EPC business are their important business assets used to offer public services or to engage in business activities. Work to expand base profits by building win-win relationships with customers in the operation and maintenance management of these assets.

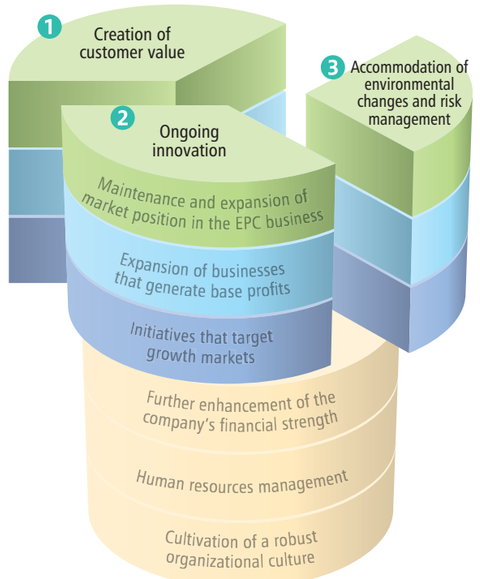
3 Initiatives that target growth markets
Steadily increase the company's total capabilities needed in order to develop its businesses overseas around products and services that let us leverage our strengths. Pursue peripheral market development and product development in existing markets in the Japanese market as well and cultivate those markets as an engine for growth.

4 Further enhancement of the company's financial strength
Continue to carry out initiatives to enhance the company's financial strength to ensure that customers will patronize the company over an extended period of time with a sense of trustworthiness, recognizing it as a corporation that can provide high-quality products and services on an ongoing basis.

5 Human resources management
Carry out human resources system reforms and develop a workplace environment that is consistent with the company's business direction. Allocate human resources strategically, hire talented personnel, and work to foster their professional development.

6 Cultivation of a robust organizational culture
Awareness of the importance of compliance and CSR has spread throughout the Group and taken hold. Going forward, continue to carry out related initiatives without neglecting the need to make improvements.

② Perspectives



1 Creation of customer value
Strive to create new value from the customer's perspective and avoid price competition by working closely with, and developing a deep understanding of, customers.

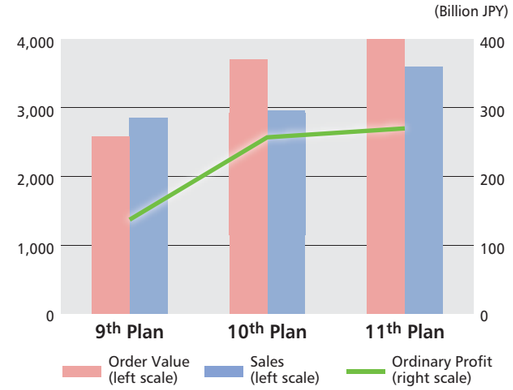
2 Ongoing innovation
Achieve sustained differentiation by pursuing innovation in terms of both technologies and business models, and leverage that differentiation to create the value demanded by customers.

3 Accommodation of environmental changes and risk management
Adapt to changes in which the company operates (e.g., changes in the economic climate, revisions to applicable laws, and changes in customer needs) and strengthen initiatives to treat environmental changes as business opportunities.

4 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.



(Billion JPY)

	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	FY 2015 – FY 2017
Order Value	70.5	97.0	90.4	257.9	109.2	148.0	113.7	371.0	**400Billion JPY** (3-year cumulative total)
Sales	95.1	89.1	101.0	285.3	96.3	96.3	103.8	296.5	**360Billion JPY** (3-year cumulative total)
Ordinary Profit	2.0	4.4	7.3	13.7	7.2	9.4	9.1	25.7	**27Billion JPY** (3-year cumulative total)

5 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.

Hitachinaka Tokai Clean Center
DBO Project
Treatment capacity: 220 tons/day
Generating output: 4,600 kW

Wakayama Aogishi Energy Center
Primary equipment improvement project
Treatment capacity: 400 tons/day
Generating output: 4,300 kW

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.

Sludge-Fueled Power System
Demonstration Plant
Treatment capacity: 35 wet tons/day
(with moisture content of about 70%)
Generating capacity: About 100 kWh/h

Osaka Hirano Sewage Treatment Plant
Upflow moving bed sand filtration
system (high-speed)
Treatment capacity: 120,000 m³/day

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.

Wood Chip Biomass Power Plant
(Miyazaki Prefecture)
Generating output: 18,000 kW

Wood Chip Biomass Power Plant
(Kochi Prefecture)
Generating output: 6,250 kW

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 differentiate products.

Bagasse Fired Boiler Plant (Thailand)
Capacity: 165 tons/hour
×10.5MPa×520°C

Bagasse Fired Boiler Plant (Thailand)
Capacity: 125 tons/hour
×4.2MPa×485°C

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.

Energy from Waste Plant (UK)
Treatment capacity: 1,370 tons/day
Generating output: 36,650 kW

Energy from Waste Plant (Beijing, China)
Treatment capacity: 1,600 tons/day
Generating output: 30,000 kW

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.

Super Eqos
EQi Series

Super Vacotin Heater
GTL Series

11th Medium-Term Management Plan and CSR Issues

Takuma's division and center executive managers introduce CSR issues of which they have become aware as their divisions carry out their missions with regard to the company's businesses in the context of the 11th Medium-Term Management Plan, which began in FY2015, as well as associated initiatives to resolve them.

Corporate Marketing Group

● Administration Division

Kengo Numata
Executive Manager
Corporate Marketing Group &
Administration Division

Due to the increasing complexity of the business environment in which the company operates and the remarkable speed of social change, the risk associated with the possibility of sizable losses in projects undertaken as part of our core plant construction, DBO/O&M, and other businesses is growing increasingly diverse.

Against this backdrop, the Administration Division has identified limiting project risk by strengthening risk management and minimizing lost profit in all sales divisions as key policies under the 11th Medium-Term Management Plan.

To strengthen risk management in this way, it is necessary both to remain constantly aware of social change and to redouble the collection of information from customers, suppliers, and business partners so as to deal precisely with a variety of risk factors. In this way, we will move aggressively to minimize losses by preventing project risk from materializing and developing and implementing countermeasures quickly in the event that risk does manifest itself.

● Energy Plant Division

Shunichi Matsuhashi
Executive Manager
Energy Plant Division

The Energy Plant Division is pursuing the following three key initiatives.

First, we are focusing on ensuring compliance as the minimum acceptable level of responsibility in our daily operations, including observance of all applicable laws as well as safety measures.

Second, we are working to promote adoption of biomass-fueled boilers worldwide, and we take pride and joy in fulfilling that task, which we consider to be our mission. Such boilers are a flagship Takuma product, and they have great social significance in that they can help address the problem of reducing greenhouse gas emissions and energy demand by tapping a renewable energy source.

Third, as a department with front-line contacts with customers in a broad range of industries, we are striving to offer precisely targeted maintenance so that Takuma products can operate to their full potential and to strengthen proposal-based sales so that we can address customers' environmental and energy issues.

We in the Energy Plant Division look forward to carrying out our CSR by resolving environmental and energy issues faced by our customers and society as a whole and by contributing to the creation of dynamic regional communities.

● Environmental Plant Division

Shiro Matsumura
Executive Manager
Environmental Plant Division

The Environmental Plant Division's Medium-Term Business Plan consists of three parts: waste plant new construction and primary equipment improvements, waste OH and O&M, and water treatment.

The key priority in waste plant new construction and primary equipment improvements is to expand the businesses that provide base revenue by maintaining and expanding Takuma's market position through new boiler orders and by unearthing demand for primary equipment improvements in existing boilers. In waste OH/O&M, key priorities include securing ongoing, stable revenue from waste OH projects and enhancing stable, efficient operation of O&M projects. In water treatment, the key priorities are securing a favorable market position in the sewage sludge energy market and expanding foundation orders by increasing sales of existing products.

I believe that the most necessary factor in order to achieve these goals is acting from the customer's perspective. Regardless of how sophisticated and advanced a proposal may be, it will not be accepted it if fails to coincide with the customer's wishes. We will strive to achieve the objectives of our Medium-Term Management Plan by building relationships of trust with customers and providing products and services that adequately reflect their wishes and desires.

● International Operations Division

Masafumi Nakagawa
Executive Manager
International Operations Division

In developing our businesses overseas, I believe it is important to have an understanding of socioeconomic conditions and future forecasts, not to mention an awareness of national and regional differences in culture, history, religion, laws, business practices, and value systems. For the Takuma Group to increase the value of its existence in the localities in which it operates, we must not only provide products and services while precisely complying with local laws and business practices, but also work to sell plants while giving consideration to the development of industry and environmental protection and the need to contribute to regional society.

Even as the basis of the Group's CSR activities remains unchanged overseas, we must adapt associated initiatives to reflect the realities of each country and region. Consequently, we must work to secure and update accurate information—through local subsidiaries in regions where we already operate, or in partnership with domestic and overseas institutions in regions where we are developing new businesses—and to thoroughly share information locally. In this way, I believe we can discover how to fulfill CSR locally and prioritize initiatives appropriately.

11th Medium-Term Management Plan and CSR Issues

Engineering Group

● Management Center

Daisuke Ayukawa
Executive Manager
Engineering Group & Management Center &
Planning & Development Center

Takuma contributes to society through the products it offers in the marketplace. In operating at a level of performance that allows us to earn orders, ensure the company's profit margins, complete plants according to contract terms, and satisfy customers, it goes without saying that we must consider the booming biomass boiler market, soaring construction prices, the difficulty of selecting contractors in the face of labor shortages, and the need to use local companies in order to revitalize regional economies. We believe that the environment in which we operate is a challenging one.

The Management Center is responsible for cost and process management. We strive to secure profit margins and to complete projects on schedule by carrying out various measures, including to maintain costs, expand the number of partner contractors, and strengthen risk management. Next, we work to build cost structures that secure our position in the markets to which we introduce new products. Use of renewable energy is lively overseas as well, and we are striving to strengthen our ability to handle overseas projects. Our goal is to create the cost structures and processes that will make it possible for our core products and new products to do well in conventional as well as new markets.

● Planning & Development Center

The Planning & Development Center is responsible for gathering and developing information about goods and services that are needed and recognized as valuable in society, as described in our Management Principles. By exploring the needs of customers in various sectors through the collection of information from central government agencies and other sources and then disseminating that information throughout the company, we help shape the direction that guides product development and expand the adaptability of the company's products.

In development, new products slated for introduction into the biomass boiler, waste treatment facility, and sewage and sludge treatment fields have progressed to the demonstration stage and the market introduction stage. In addition to working to strengthen product competitiveness through demonstration testing and the ability of products to satisfy customer needs, we are working to accelerate the development process by the renewal of the pilot plants in Harima Factory.

As a manufacturer, it is essential for us to maintain and extend the technological capabilities that are demanded by our customers. We are dedicated to ensuring that the company's technologies are passed down to a new generation of workers through a variety of means, including on-the-job training.

● Project Center

Hiroaki Nanjo
Executive Manager
Project Center

To fulfill the company's social responsibility by creating goods and services that are needed and recognized as valuable in society, the Project Center works to reduce environmental impact and to contribute to the resolution of environmental issues through such means as municipal solid waste treatment, the transformation of sewage sludge into energy, and utilization of biomass.

For municipal solid waste treatment plants, we provide waste incineration facility plans that incorporate technological proposals including technological development and system improvements and suggest primary equipment improvements with high-value-added technological proposals based on customer needs. In addition, we are working to build sewage sludge incineration and power generation technologies, to expand the markets in which such technologies can be applied, to enhance their suitability for use in biomass power generation, and to boost the efficiency of associated operations.

With regard to execution, we will hold fast to our stance of creating new value from our customers' perspective and goods and services that have social value. Compliance is an essential part of corporate activities, and we will continue to raise awareness of compliance-related issues and ensure the observance of corporate ethics in order to foster the development of a healthy corporate culture.

● Plant Construction Center

Yoshitake Hiramatsu
Executive Manager
Plant Construction Center

As the result of a reorganization that took effect on April 1, 2015, the responsibilities of the Plant Construction Center, which is responsible for most of Takuma's EPC (engineering, procurement, and construction) functions, were broadened to include OH construction and maintenance operations at existing plants in addition to new plant construction. To accommodate these changes, which are designed to improve EPC capabilities and to increase the profitability of maintenance operations, we have put in place structures capable of integrating operations ranging from new plant construction to OH construction and maintenance. Going forward, we will continue to provide products and services with advantages for customers by developing and implementing design, procurement, and construction plans designed to reduce life-cycle costs in a more robust manner.

While it is important to secure profit margins, honor schedules, and ensure quality and safety, we will also give top priority in our operations to observing the Subcontract Proceeds Act and transaction-related regulations (in the procurement of materials and equipment) and the Construction Business Act and construction-related regulations (in construction work). We will also give similarly high priority to addressing soaring construction work costs and preventing labor accidents on new construction and OH construction worksites.

Corporate Profile

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, 2015)
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):	806 (as of March 31, 2015)
Number of employees (consolidated):	3,266 (as of March 31, 2015)

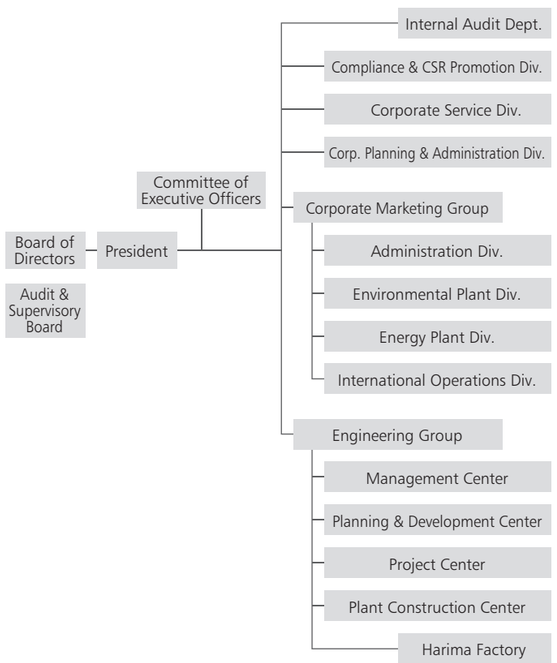
Permits and registrations

Head Office, branch offices and other business offices
Construction license (Minister of Land, Infrastructure, Transport and Tourism license, Special 22-6129)
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)
Certification for the manufacture of boilers and first-class pressure vessels (Nippon Kaiji Kyokai)
Manufacture of specific high-pressure gas facilities (High Pressure Gas Safety Institute of Japan)

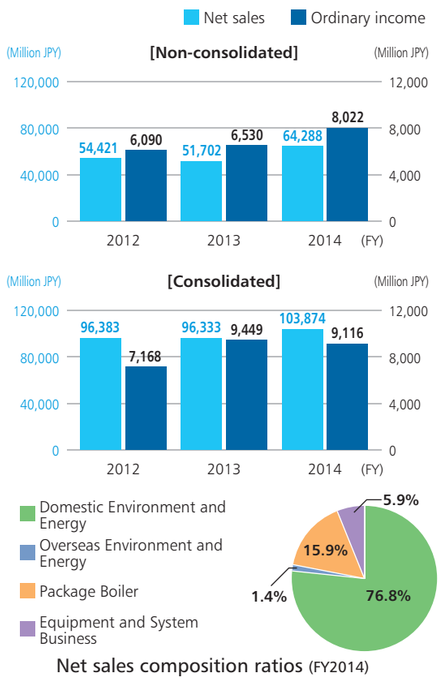
JQA-1952
ISO 9001
certification
Head Office, Osaka Office, Tokyo Branch, Chubu Branch, Kyushu Branch, Hokkaido Branch and Harima Factory

JQA-EM0313
ISO 14001
certification
Harima Factory

Corporate structure (as of April 1, 2015)



Balance sheet overview and net sales composition ratios



Net sales composition ratios (FY2014)

The History of Takuma

1912 The first "Takuma boiler" introduced by our founder, the venerable Tsunekichi Takuma


The venerable Tsunekichi Takuma

1930 The venerable Tsunekichi Takuma commended as one of the ten great inventors of Japan during the Meiji and Taisho periods (1868–1926)

1938 Takuma Boiler Manufacturing Co., Ltd. founded
Company Motto instituted: "Service to the nation through boiler manufacturing"


Amagasaki Factory

1942 Operation begins at Harima Factory


Harima Factory under construction

1949 Company listed on the Osaka and Tokyo stock exchanges

1949 Bagasse fired boiler, the first product of its kind in the industry, exported

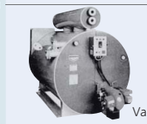
1953 Head Office moved to Osaka's Kita-ku District

1958 Business expanded into the environmental facility sectors, including waste incineration and water treatment plants

1963 Japan's first waste incineration plant delivered
Sewerage treatment facility delivered


Japan's first waste incineration plant

1972 Company renamed Takuma Co., Ltd.


Vacotin heater

1975 Bulk production begins on "vacotin heater", the world's first vacuum-type hot water heater

1986 The first overseas delivery of a waste treatment facility completed (U.S.A.)

1992 New Company Motto instituted: "Value Technology, Value People, Value the Earth"

1995 Amagasaki Head Office Building completed

1997 ISO9001 certification obtained

1999 ISO14001 certification obtained for our Harima Factory

1998 Japan's largest Energy from Waste plant delivered (Tokyo Shinkoto Waste Treatment Plant capacity: 1,800 tons per day)

2004 Takuma's first "Environmental Report" issued
The "Takuma Group Code of Conduct" instituted

2005 The "Takuma Environmental Policy" instituted
The "Personal Information Protection Policy" instituted

2005 Takuma Hanyokikai Co., Ltd., a subsidiary involved in the manufacture and sale of small boilers, and Ebara Boiler Co., Ltd., merged and renamed Nippon Thermoener Co., Ltd.

2006 The "Compliance Declaration" instituted
The "Takuma Group Ethics Charter" instituted
Takuma participates in the UN Global Compact

2007 Takuma's first "CSR Report" issued

2010 The "Corporate Profile & CSR Report" issued

2010 Energy from Waste plant delivered in Europe (U.K.)

2013 Operation of the Takuma Solar Power Plant began

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

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

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

Water treatment plants

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

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


Continuous up-flow sand filter


Purification of park pond water

Package boiler

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.

- 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

Equipment and systems business

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.

- Building Equipment
- Air-conditioning Equipment
- Cleaning and Drying Devices
- Clean Room
- Clean Devices
- Chemical Filters


Chemical Filters


Clean Oven


Clean Booths

The Takuma Group Network

Takuma technology is spreading worldwide.

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
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 060-0042, Japan
TEL +81-11-221-4106 FAX +81-11-241-0523

5 Tohoku Branch
NOF Sendai Aoba-dori Bldg., 2-1-2 Ichibancho, Aoba-ku, Sendai 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 450-0002, Japan
TEL +81-52-571-5211 FAX +81-52-581-3005

7 Hokuriku Branch
Asahi Seimei Kanazawa Daini Bldg., 1-2-20 Kohrinboh, Kanazawa, Ishikawa 920-0961, Japan
TEL +81-76-262-5380 FAX +81-76-263-2394

8 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

9 Okinawa Branch
1-11-12 Mashiki, Ginowan 901-2224, Japan
TEL +81-98-898-6650 FAX +81-98-898-6657

10 Harima Factory
1-2-1 Shinhama, Arai-cho, Takasago 676-8540, Japan
TEL +81-79-443-6511 FAX +81-79-443-6599

11 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, part sales for plants of the same and after-sales service
18th Floor, Sinn Sathorn Tower, 77/69 Krungdhonburi Rd., Klongtonsai, 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 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 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, feedwater/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 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 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/

18 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

19 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

20 Kashihara High Trust Co., Ltd.
Operation and maintenance management of municipal solid waste treatment facilities
1038-2 Kawanishi-cho, Kashihara, Nara 634-0826, Japan
TEL +81-744-26-6227 FAX +81-744-26-6228

21 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/

22 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/

23 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

24 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/

25 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

Activities of Our Waste Treatment Plant Business

—Moving beyond conventional approaches to waste treatment to create facilities that are embraced by their host communities

In recent years, a comprehensive evaluation system in which contractors' technological capability and bid price are both considered has become the most common approach to bidding for waste treatment facility construction projects. Furthermore, the DBO* approach, in which the customer places a single order for construction, operation, and management, is becoming more common. Against this backdrop, Takuma is actively developing its business by taking advantage of advanced technological capabilities and expertise based on its track record of delivering the most such facilities of any company in Japan.

*In DBO (design, build, operate) projects, a public entity obtains funding to construct a facility and then places an order for the design and construction with a private-sector company. The public entity retains ownership of the completed facility but contracts long-term operation and maintenance management to a private-sector company.

Activity policy

For local governments and residents, waste treatment facility construction and operation are important tasks that are closely related to local government and lifestyles.

By taking advantage of technological capabilities and expertise based on its extensive track record to reliably meet the needs of local governments, communities, and society, Takuma provides facilities that are welcomed by residents.

Recent projects

Thanks to the favorable light in which Takuma's technological and proposal capabilities are viewed, we have received a steady stream of orders under the comprehensive evaluation system, including for DBO projects.


Neighborhood of the lake Administrative Affairs Association (DBO project)


Imabari City (DBO project)


Uwajima Wide-area Administrative Association


Kizugawa City

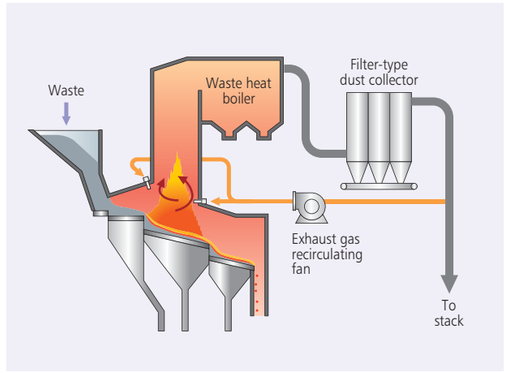
Introduction to Takuma's technologies and expertise

① Plant design that takes advantage of Takuma's technological capabilities

● Initiatives to create energy

Takuma is involved in a variety of initiatives to improve heat recovery and to boost the efficiency of power generating systems at waste treatment facilities.

- We use advanced combustion technologies such as exhaust gas recirculation to deliver stable, low-air-ratio combustion. We are also implementing stable power generation using steam turbines by minimizing fluctuations in boiler evaporation with advanced combustion control while simultaneously limiting emissions of harmful substances such as dioxins.
- Since our high-efficiency dry exhaust gas treatment technology, which uses sodium-based chemicals, can minimize the amount of steam used in operations other than power generation, it enables us to maximize the supply of steam generated using energy from waste to steam turbines, helping to maximize power production.

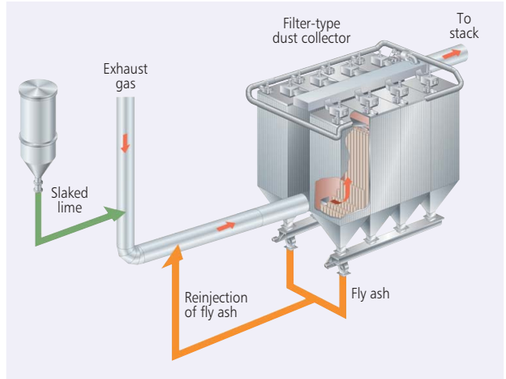


Exhaust gas recirculation technology

● Initiatives to lower LCC

Takuma is working to develop and commercialize new technologies in order to further lower life cycle cost (LCC).

- We are lowering maintenance management costs by working to improve durability and lengthen equipment service life by using a water-cooled fire grate with exceptional cooling performance.
- We are lowering chemical costs and final disposal costs by using a fly ash circulation system that is able to reuse unreacted chemicals in fly ash.
- We are lowering chemical costs by using safe, inexpensive urea made possible by urea decomposition technology that breaks down urea into ammonia.
- We are lowering catalyst maintenance management costs by using technology to regenerate the catalysts used to remove nitrogen oxides without removing them from the system.



Fly ash circulation system

② Coexisting with local communities

● Proposing a variety of environmental learning programs

We are taking a creative approach to enabling visitors to learn about environmental issues in an enjoyable manner, for example by actively opening up areas of waste treatment facilities that had not been accessible to visitors in the past.

● Striving to construct facilities that are welcomed by their communities

We propose facilities designed to be welcomed by their communities, for example by incorporating building designs that local residents will find attractive and disaster response functions.

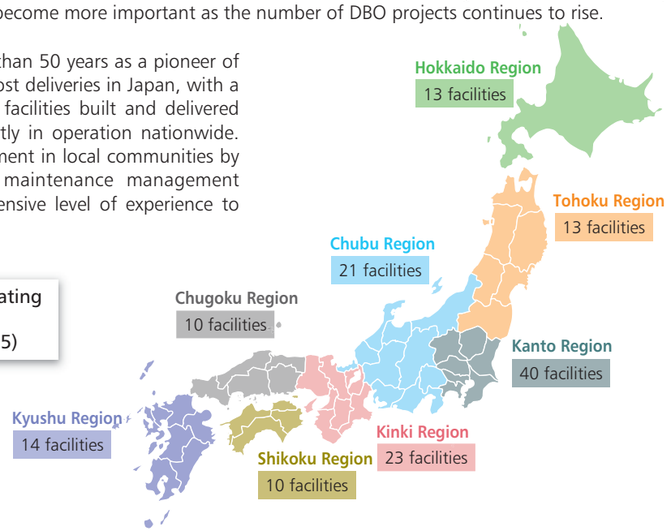
Activities of Our Maintenance Business

—Contributing to stable waste treatment in communities around Japan

Proper maintenance is essential in order to ensure stable operation of waste treatment facilities. Because facilities incorporate an extensive range of expertise into their designs and because the rate at which they deteriorate is affected by the properties of the waste that is treated, such maintenance demands advanced technological capabilities and experience. Furthermore, maintenance will only become more important as the number of DBO projects continues to rise.

Takuma boasts a history of more than 50 years as a pioneer of waste treatment facilities and the most deliveries in Japan, with a cumulative total of more than 350 facilities built and delivered and more than 140 facilities currently in operation nationwide. We contribute to stable waste treatment in local communities by harnessing the technologies and maintenance management expertise made possible by this extensive level of experience to offer optimal maintenance.

144 facilities operating nationwide
(as of April 2015)



Approach to maintenance

Because they process waste with a variety of properties and in a variety of states, waste treatment plants are prone to equipment degradation, corrosion, and other issues, making it necessary to perform proper maintenance on a regular basis. Ultimately, the service life of the facility is greatly affected by the quality of this maintenance.

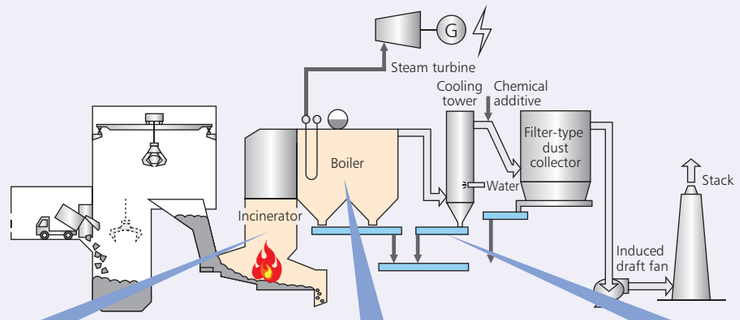
Takuma precisely ascertains the state of each facility by carefully carrying out site surveys and diagnostic assessments of facility functions. Based on the findings of those efforts, we then carry out the right maintenance at the right time in order to achieve both stable operation and long service life.

Utilizing our comprehensive operation, maintenance, and management support system

By centralizing facility operation records, daily inspection data, and maintenance data under a comprehensive operation, maintenance, and management support system at our Head Office in Amagasaki, we are able to monitor the status of facility and equipment operation in real time.

In addition, by utilizing accumulated data from multiple facilities, we are able to further improve the precision of our maintenance services.

Example maintenance project



Incinerator: Fire-resistant bricks

Boiler: Water tubes

Conveyor belt

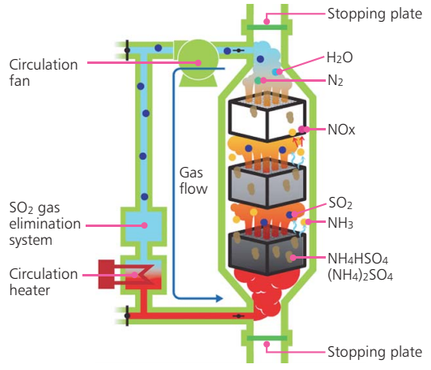
Diverse after-sales service

① Introducing the latest technologies

The latest technologies that are being used in new boiler construction can also be applied to existing facilities. Our services are designed to improve facilities, not only by restoring compromised functionality, but also by improving equipment energy efficiency and operability. Our state-of-the-art catalyst regeneration system has been installed at a number of existing facilities, where it continues to operate smoothly.

② Optimizing operational control

The systems used to control facilities need to be adjusted according to the materials being treated. Takuma helps ensure stable operation by optimizing system configuration so that facilities can operate in an optimal manner despite changes over time in waste properties and the substances targeted for treatment.



Catalyst regeneration system

Activities of Our Waste Treatment Plant Primary Equipment Upgrade Business

—Striving to achieve a recycling-oriented society

In FY2010, "upgrades to primary equipment of general waste treatment facilities" was added to the Ministry of the Environment's program of subsidies to promote formation of a recycling-oriented society. The addition, which is intended to extend the service life of waste treatment facilities and counteract global warming, allows upgrades of existing equipment that had been carried out using funds from local governments alone to be funded with subsidies as primary equipment improvement projects as long as they provide a certain level of benefit in terms of reducing greenhouse gases.

Takuma is working on primary equipment improvement projects that will help form a recycling-oriented society based on expertise in extending facility service lives developed through its maintenance business and on energy-saving technologies and advanced heat use technologies that it has cultivated over many years as a boiler and environmental plant manufacturer.

Maximizing use of subsidies

Upgrades to primary equipment of general waste treatment facilities, which are part of the government's program of subsidies to promote formation of a recycling-oriented society, requires more effective measures to reduce CO_2 in order to achieve a set CO_2 reduction rate.

By conducting a meticulous study and review of the status of the target facility, Takuma proposes primary equipment improvement projects that make maximum use of government subsidies to promote formation of a recycling-oriented society.

CO_2 reduction rate	Subsidy rate
3% to 20%	1/3
20% or more	1/2

*The approach used to determine the subsidy rate may change in the future.

Proposing primary equipment improvement plans based on meticulous site studies

In proposing a primary equipment improvement project for a given facility, Takuma meticulously studies the operating conditions and other characteristics of the target facility and selects the energy-saving measures and heat-use technologies that are best suited to effectively reduce CO_2 emissions.

① Reducing power consumption

Power consumption can be dramatically reduced by installing inverter control systems on blowers and waste cranes, which are characterized by high rates of operation. In addition, facility energy efficiency can be maximized by replacing pump and conveyor motors with high-efficiency motors.

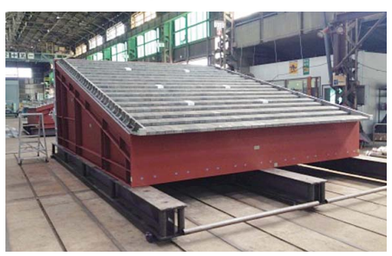
② Enhancing surplus heat use

By installing hot water utilization equipment and waste heat boilers at water injection-type waste treatment facilities, it is possible to maximize use of waste heat and surplus steam that had gone unused in the past in order to control CO_2 emissions.

③ Improving waste-fueled generating capacity

By improving combustion systems to achieve low-excess-air combustion and enhancing waste heat boilers and steam turbines so as to improve waste-fueled generating capacity, Takuma is able to simultaneously control CO_2 emissions and lower facility running costs.

Boosting blower efficiency



Improving combustion equipment

Enhancing steam turbine generators

Example of a primary equipment improvement project

Aogishi Energy Center City of Wakayama (treatment capacity: 400 tons per day)

[Project highlights]
- Enhancement of waste heat boiler, steam turbine, and low-pressure steam condenser (to improve generating capacity)
- Improvement of efficiency of waste crane, blowers, pumps, and conveyors (to reduce power consumption)
- Consolidation and improvement of efficiency of air compressors (to reduce power consumption)
- Updating of filter-type dust collectors
- Improvement of central control system

CO_2 reduction rate: 20% or more

Kogasaki Incineration Facility City of Kitakyushu (treatment capacity: 810 tons per day)

[Project highlights]
- Improvement of combustion equipment (to improve generating capacity)
- Enhancement of waste heat boiler and steam turbine (to improve generating capacity)
- Improvement of efficiency of blowers, pumps, and conveyors (to reduce power consumption)
- Consolidation and improvement of efficiency of air compressors (to reduce power consumption)
- Improvement of central control system

CO_2 reduction rate: 20% or more

Kumagaya Sanitation Center No. 2 Plant (Osato Regional Municipality Association) (treatment capacity: 180 tons per day)

[Project highlights]
- Improvement of efficiency of waste crane and conveyors (to reduce power consumption)
- Adoption of low-temperature catalysts (to reduce use of natural gas)
- Enhancement of water heating system (to use surplus heat)
- Installation of a new gas desuperheater

CO_2 reduction rate: 20% or more

Sakado West disposal center (treatment capacity: 80 tons per day)

[Project highlights]
- Improvement of combustion chamber
- Improvement of efficiency of waste crane, blowers, pumps, and conveyors (to reduce power consumption)
- Consolidation and improvement of efficiency of air compressors (to reduce power consumption)
- Modification of type of exhaust gas treatment equipment used (to reduce power consumption)
- Installation of a compact generator (to use surplus heat)

CO_2 reduction rate: 20% or more

Activities of Our Energy 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 repeatedly developed, improved, and enhanced combustion technologies for a broad range of biomass fuels, in the process establishing a top-tier track record in Japan and overseas.

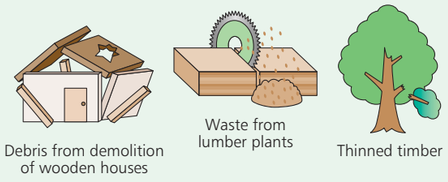
Going forward, we will continue to actively pursue development of technologies for effectively using energy in a way that gives priority to both humankind and the planet while simultaneously meeting customer needs.

Social landscape

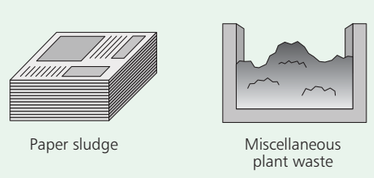
The Great East Japan Earthquake of 2011 threw the safety of nuclear power plants into question and led many to begin focusing on renewable energy, which is characterized by a low environmental impact, as an alternative source of energy. Biomass-fueled power generation in particular promises beneficial 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.

Renewable energy

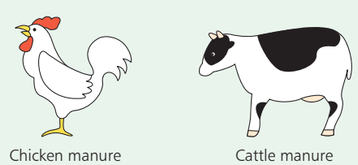
Forestry-derived biomass fuels



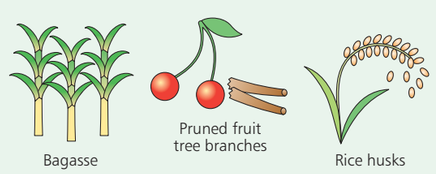
Industry-derived biomass fuels



Livestock-derived biomass fuels



Agriculture-derived biomass fuels



Sample delivered biomass boilers by area of Japan

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

- Since 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 can be found throughout Japan, we have constructed facilities that use these types of fuel in many regions.
- We have constructed many facilities 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) in Kyushu and Okinawa.


Wood waste-fired boiler


Chicken manure-fired boiler


Bagasse-fired boiler

Papermill sludge-fired boiler

＊"Other fuel" includes livestock manure, bagasse, miscellaneous plant waste, and sludge.

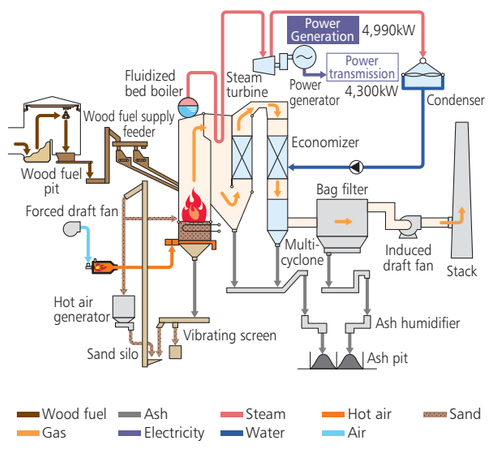
Wood chip firing power plant

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 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.



Flowchart

Activities of Our Water Treatment Business

—Striving to protect water environments

Takuma provides characteristic technologies while developing revolutionary new technologies to aid in protecting the water environment, actively utilizing renewable energy, and reducing emissions of greenhouse gases.

Initiatives to protect the water environment

Takuma provides a variety of characteristic technologies to help protect the water environment and build a society based on water recycling.

Upflow moving-bed filtration

Upflow moving-bed filtration has long been a best-selling water purification technology that is used in more than 2,500 facilities in Japan. The technology allows continuous filtration while simultaneously cleaning the sand and offers superior maintainability.

The technology, which can remove suspended solids (SS) in water, is used in a variety of fields, including treatment to remove contamination from river water prior to use as drinking water and in final treatment of sewage.

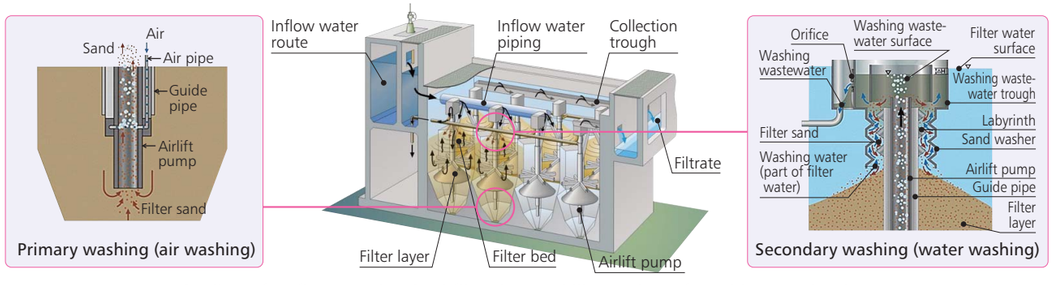
We offer a number of variants of the system, from a standard configuration featuring typical filtration speeds to a high-speed model with a filtration speed that is two to three times faster as well as denitrification and dephosphorization models that augment SS removal with functionality for removing nitrogen and phosphorus.

These products can be incorporated into fixed-bed civil engineering enclosures, and we can modify and update existing facilities with a high degree of flexibility.

In recent years, we have received an increasingly large number of orders for high-speed and denitrification models, as described below:

- High-speed type:
  Osaka City　Hirano Sewage Treatment Plant
  Treatment capacity: 120,000 m³ per day
  Osaka City　Suminoe Sewage Treatment Plant
  Treatment capacity: 245,000 m³ per day
  Ibaraki Prefecture　Kasumigaura Sewage Treatment Plant
  Treatment capacity: 18,000 m³ per day (under construction) and others
- Denitrification type:
  Fukuoka City　Municipal Shinseibu Sewage Treatment Plant
  Treatment capacity: 15,400 m³ per day

Example of a denitrification sand filtration bed constructed by Takuma



Outline of upflow moving-bed filtration and illustration of washing mechanism

Anammox process

The anammox process is a new technology for removing nitrogen using anammox bacteria, a dark red microbe. In addition to being able to remove 80% or more of nitrogen content, the process is cheaper and more energy efficient than conventional nitrogen removal technologies.

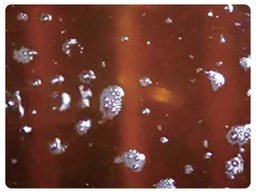
The technology was adopted by the Ministry of Land, Infrastructure, Transport and Tourism's B-DASH Innovative Sewage Technology Demonstration Project in FY2012. An anammox facility capable of treating 50 m³ per day was constructed at the Tobu Waste-water Treatment Plant at Kumamoto City and run to provide operating data over an extended period of time. The results of the demonstration project were compiled and published in a series of Guideline for introducing a Technology (draft) in August 2014.

The technology, which utilizes the digestive chamber dewatering filtration method for removing nitrogen used in sewage treatment plants, can be used at a broad range of customer facilities, including when constructing a new digestive chamber or accepting biomass from an outside source for digestion, for example in sludge concentration and treatment facilities and MICS* projects.

* MICS project (ministries-collaborative wastewater treatment facility construction works): A type of sewage treatment facility joint development project used to develop infrastructure for use by multiple treatment facilities, for example sewer pipes, wastewater facilities in agricultural communities, and joint treatment and purification tanks, in order to bring sewer service to all areas.

Anammox demonstration plant

Anammox bacterium attached to a carrier



Generation of decomposing gas (nitrogen)

System for generating power from sewage biomass

Sewage sludge is considered biomass by virtue of its biological origins, and expectations are high that it can be used as a source of renewable energy. However, conventional sewage sludge incinerators require auxiliary fuel and only operate as part of energy-intensive systems that consume large amounts of electricity. Takuma is working to develop and broadly market a new type of energy-yielding sewage sludge treatment system that provides several advantages over this older type of system.

Specifically, we are implementing an energy-yielding system that consists of three technologies: sludge dehydration using an inside double coagulation type centrifugal dehydrator, energy recovery using a next-generation progressive furnace (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 B-DASH Innovative Sewage Technology Demonstration Project in FY2013. Seasonal data and a range of performance data were gathered through FY2014, indicating that the system can deliver the initially envisioned target performance while operating in a stable manner without using auxiliary fuel, that it can generate electricity using heat recovered from steam, and that at least 100 kW of power can be generated per hour while incinerating 35 tons (wet) of dehydrated sludge per day. Application of the technology can be expected to yield the following benefits:

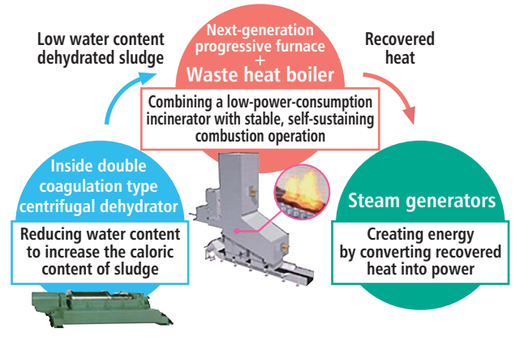
① Reductions in energy use and operating costs

Overall energy use by conventional sewer treatment plants can be reduced by about 30% thanks to reductions in the amount of auxiliary fuel used, energy savings yielded by a low-power-consumption incineration system, and energy creation in the form of power generation using recovered heat. In addition, lower operating costs promise to help reduce sewer treatment costs.

② Reductions in greenhouse gas emissions

Reductions in use of auxiliary fossil fuels and power consumption will lead to reductions in greenhouse gas emissions. In addition, the progressive furnace (stoker furnace) used by the technology enables emissions of the greenhouse gas nitrous oxide (N_2O) to be reduced to about one-sixth of those associated with previous technologies. These benefits promise to reduce greenhouse gas emissions from conventional sewer treatment plants about 40%.

Apart from this system, we continue to work to meet customer needs by means of heat utilization technologies, one of our core competencies, in order to optimize sewage sludge treatment, for example by using steam to dry sludge and generate electricity.



Demonstration plant

Activities of Our Overseas Business

—Biomass-fired power plants and Energy from Waste plants overseas

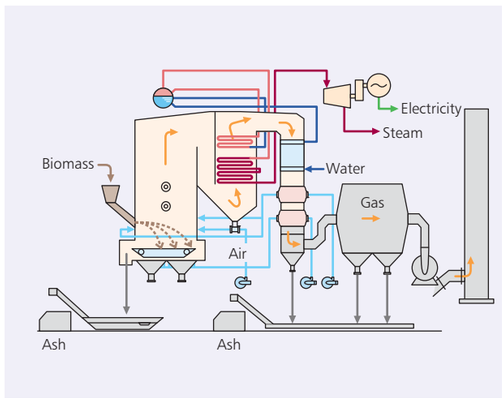
Biomass-fired power plant sales in the Southeast Asian market

For more than half a century, Takuma has contributed to industrial growth and economic development in Southeast Asia by supplying biomass-fired boilers and power plants. Our biomass-fired power plant help materialize coexistence of both environmental protection and energy supply.

Introduction of cogeneration plants that generate electricity using high-temperature, high-pressure, high-efficiency boilers fired by residual biomass from agricultural and forest products is becoming a major trend in the local market where the companies process agricultural and forest resources, for example in Southeast Asia's sugar industry as they look to secure stable profits by combining electricity sales with their production activities.

An energy supply company located adjacent to a sugar refinery in Thailand has been operating a Takuma high-temperature, high-pressure boiler power plant using bagasse (fibrous matter left over after sugarcane is crushed) with excellent results according to plan since February 2014. The plant has been attracting significant attention in the market.

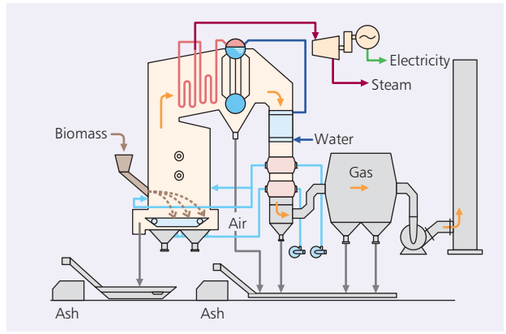
- Steam capacity: 165 tons per hour
- Design pressure: 12.5 MPaG
- Steam pressure: 10.5 MPaG
- Steam temperature: 520˚C
- Design: Single drum, Vertical type, Natural circulation, Membrane design
- Combustion method: Traveling stoker
- Fuel: Bagasse
- Principal emissions treatment: Electrostatic precipitator
- Quantity: 1 boiler



High-temperature/high-pressure boiler

The bagasse-fired boiler plant sends a stable supply of high-temperature, high-pressure steam to a turbine generator, which consistently generates about 35,000 kW of power. Profits from the sale of power generated from biomass fuel and the use of renewable energy are combining to benefit nearby communities.

We are also an active supplier of medium-pressure biomass-fired boiler power plants, which rationally and efficiently facilitate stable production activities along with the sale of surplus power to off-site customers, in response to market demand.



Medium-temperature/medium-pressure boiler

Takuma is supplying not only bagasse-fired boiler power plants to Thailand's sugar industry, but also biomass and multi-fuel fired power plants that make effective use of renewable energy to customers throughout Southeast Asia. In this way, we are making a broad contribution to the supply of clean energy, the achievement of a low-carbon society, the protection of the environment, and the development of industry.

Overseas Energy from Waste plant business

Demand for Energy from Waste (EfW) plants is growing rapidly worldwide against the backdrop of accelerating urbanization and growing environmental awareness. In developing nations, where urbanization is occurring at the most rapid pace, there is pressure to take safety and environmental factors into consideration along with infrastructure development, and expectations for renewable energy are growing along with demand for power. The market and competitive environment is expected to become more globalized as Chinese and South Korean companies join their Japanese counterparts in responding to high demand for EfW plants.

At the same time, most developing nations need appropriate diagnostic information, advice, and guidance concerning this type of facility, and the close exchange of information with customers in each country is an essential part of pursuing this business. Thanks to the extensive experience and track record that come from holding top market share in Japan and the high praise that the nine EfW plants delivered overseas have earned for their stable operation and other performance, Takuma is able to provide optimal proposals in response to each country's unique needs.

Currently, the number of companies from different countries that are active in overseas markets is increasing, and competition in the sales environment is gradually becoming more intense. Takuma will continue to work to develop its overseas EfW plant business in line with the needs of target countries and regions by developing markets in which it can take advantage of its strengths and by building optimal business models. Furthermore, we will help environmental protection going forward, including the supply of power and reductions in CO_2 emissions, by developing our EfW plant business.

An overseas waste-fueled power plant (Lakeside Energy from Waste Plant in the UK)

Main Installations

The following are the main facilities supplied by Takuma during FY2014.

Municipal solid waste treatment plants

■ Ota Incineration Plant

Project name	Ota Incineration Plant construction
Capacity	Incineration facility: 600 tons per day (300 tons per day × 2 units) Generating capacity: 22,800 kW
Location	Tokyo Prefecture

■ Kohnan Clean Center

Project name	Kohnan Clean Center Service Life Extension Project
Capacity	Incineration facility: 220 tons per day (110 tons per day × 2 units) Generating capacity: 1,400 kW
Location	Okayama Prefecture

■ Kumagaya Sanitation Center No. 2 Plant

Project name	Kumagaya Sanitation Center No. 2 Plant Primary Equipment Upgrade Project
Capacity	Incineration facility: 180 tons per day (90 tons per day × 2 units)
Location	Saitama Prefecture

Energy plants

■ Mie Ene Wood Co., Ltd.

Project name	Woody Biomass Fired Boiler and Power Generation Plant Project
Capacity	Fuel: Wood fuel Steam conditions (normal operation): 28 tons per hour × 5.98 MPaG × 425˚C Generating capacity: 5,800 kW
Location	Mie Prefecture

■ Gifu Biomass Power Co., Ltd.

Project name	Woody Biomass Fired Boiler and Power Generation Plant Project
Capacity	Fuel: Wood fuel Steam conditions (normal operation): 28 tons per hour × 5.98 MPaG × 425˚C Generating capacity: 6,250 kW
Location	Gifu Prefecture

■ Tosa Green Power Co., Ltd.

Project name	Tosa Green Power Plant Construction Project
Capacity	Fuel: Wood fuel Steam conditions (normal operation): 28 tons per hour × 5.98 MPaG × 425˚C Generating capacity: 6,250 kW
Location	Kochi Prefecture

■ Ibuki Green Energy Co., Ltd.

Project name	Ibuki Green Energy Power Plant Project
Capacity	Fuel: Wood fuel Steam conditions (normal operation): 22.6 tons per hour × 2.8 MPaG × 360˚C Generating capacity: 3,550 kW
Location	Shiga Prefecture

Main Installations

Energy plants

■ **Hyuga factory, Chugoku Mokuzai Co., Ltd.**

Project name	Chugoku Mokuzai Biomass-fueled Power Plant (Hyuga)
Capacity	Fuel: Wood fuel Steam conditions (normal operation): 75 tons per hour × 6.0 MPaG × 460˚C Generating capacity: 18,000 kW
Location	Miyazaki Prefecture

■ **WoodOne Co., Ltd.**

Project name	Wood Biomass-fueled Power Generation Equipment Installation Project
Capacity	Fuel: Wood fuel Steam conditions (normal operation): 28.6 tons per hour × 6.0 MPaG × 425˚C Generating capacity: 5,800 kW
Location	Hiroshima Prefecture

Water treatment plants

■ **Seibu Sludge Center at Sapporo City**

Project name	Seibu Sludge Center at Sapporo City Steam Power Generation Equipment Project
Capacity	Type: 5 series compact steam generator Generating capacity: 160 kW × 1 unit
Location	Sapporo City

■ **Kasumigaura Sewage Treatment Plant**

Project name	Kasumigaura Sewage Treatment Plant No.7 Series Water Treatment Equipment Machinery (Phase 1) Project
Capacity	Sand filtration bed (high-speed type): M50 × 3 units × 2 ponds Water treatment capacity: 18,000m^3 per day
Location	Ibaraki Prefecture

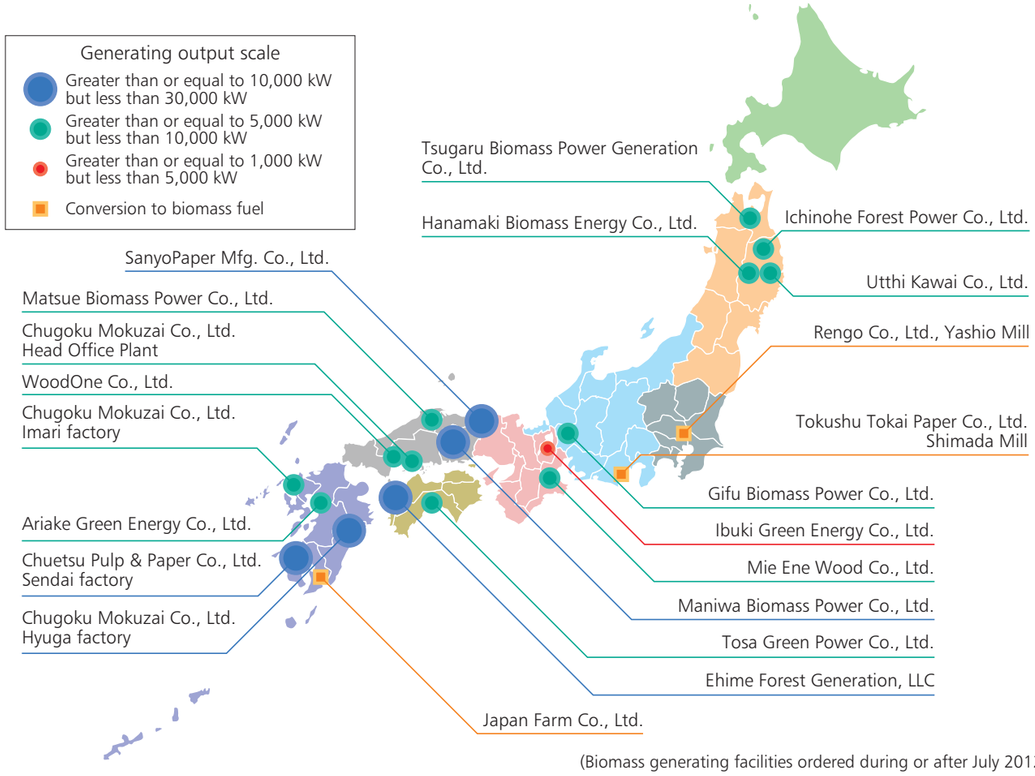
Contributing to Society through Our Businesses and Products

1. Pursuing Biomass Power Generation
2. Entering the Power Retail Market
3. Awards Received from Outside Organizations

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 generating facilities ordered during or after July 2012)

Biomass fuel under the feed-in tariff program [Yen per kWh]: Unit price for sale of electricity under the FIT program (FY2015)

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, and driftwood from dams.

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

For biomass power plants, combustion furnaces play an important role as core power generation equipment, and the choice of combustion furnace type exerts a significant influence on biomass power businesses. This page introduces some typical Takuma combustion methods that are widely used in wood biomass power generation.

Step grate stoker

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

Example installation: Hyuga factory, Chugoku Mokuzai Co., Ltd.

Chugoku Mokuzai Co., Ltd., which has the largest generating capacity of any company in Japan's lumber industry, operates a generating business at three sites in the country. The company offers an extensive product line ranging from lumber to laminated lumber and precut lumber, and currently it is also actively involved in generating electricity using byproducts from its plants' sawing and drying processes as biomass fuel.

The step grate stoker system delivered by Takuma to the company's Hyuga factory is designed to accommodate biomass fuels of a variety of shapes and properties based on the customer's expectation that available fuel sources may become increasingly diverse in the future.

Equipment overview
Location: Hyuga City, Miyazaki Prefecture
Generating output: 18,000 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 heat values, water content, and shapes.

Example installation: Maniwa Biomass Power Co., Ltd.

Maniwa Biomass Power Co., Ltd., one of only a few wood biomass generating companies in Japan, was established by nine public- and private-sector investors, including Meiken Lamwood Corporation, Ltd., one of Japan's largest manufacturers of laminated lumber; Maniwa City; and the Maniwa Lumber Business Cooperative Association.

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

Fluid 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 fluid bed systems. They can accommodate a variety of different types of fuel, including fuels with high moisture content.

Example installation: Gifu Biomass Power Co., Ltd.

Gifu Biomass Power Co., Ltd., is a wood biomass generating company established with Gisen Co., Ltd., as an investor with the goal of contributing to the development of Gifu Prefecture's extensive forest resources through their effective use, the reduction of CO_2 emissions through use of renewable energy, and pursuit of a recycling-oriented society founded on the principle of local production for local consumption.

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

Entering the Power Retail Market

—Striving to expand the benefits for generating companies and power consumers by launching a new power business

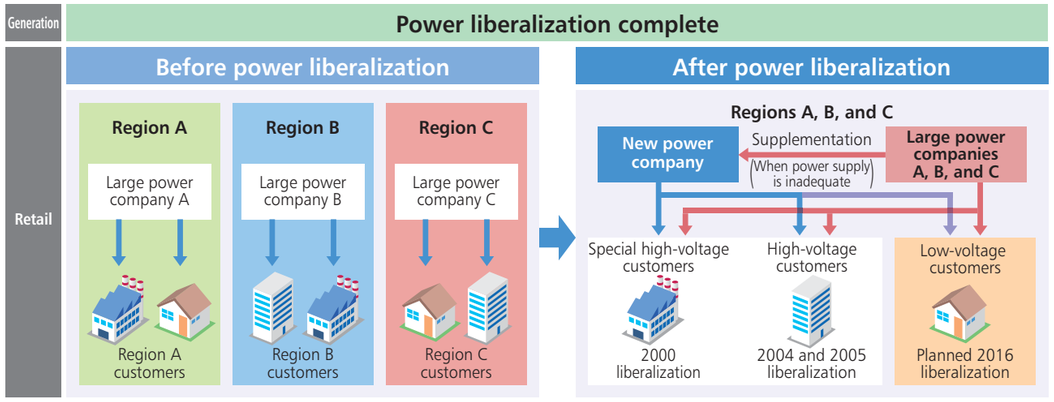
What is power liberalization?

Power liberalization refers to the process of liberalizing the sale and purchase of electricity so that not only large, regional power companies, but also new power companies (which have been assigned to the new category of power producer and supplier, or PPS) and large power companies from other regions can participate in the market.

Power liberalization involves the generation and retail sides of the market, the former of which has already been fully liberalized. On the retail side, the market consisting of customers that consume 50 kW or more has already been liberalized, and the remainder of the market is slated to be fully liberalized in 2016.

The value of the market that will be opened up by these measures has been estimated to be about JPY7.5 trillion, and companies in the power industry are working actively to earn customers' business.

When a new generating company supplies electricity under the provisions of the new, liberalized regulations, that electricity is transported to customers' premises using the same power distribution network as is used by large power companies. Consequently, there is no degradation of power reliability or quality relative to their product.

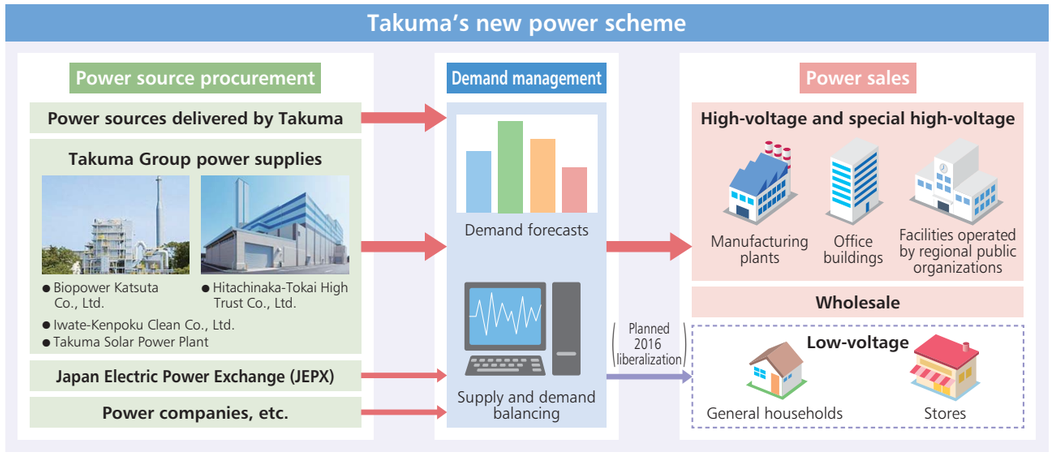


∗The system is set up so that conventional power companies will cover any shortfall in the event of inadequate supply from new power companies.

Takuma's entry into the new power business

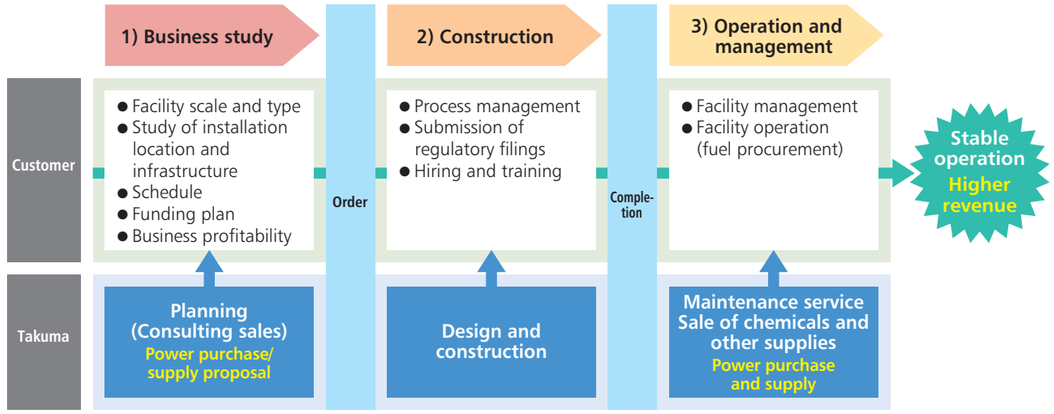
In April 2015, Takuma entered the new power market following the sector's liberalization.

We are able to offer customers a range of comprehensive services, including power purchases, thanks to our status as a plant manufacturer that has constructed numerous biomass-fueled generating plants and waste-fueled generating plants, which have been attracting a high level of attention in the energy market in recent years, and that has extensive expertise in the characteristics of such facilities.



Comprehensive services

As a plant manufacturer, Takuma has been involved in ensuring stable plant operation and maintenance management following delivery of newly built facilities through maintenance service and sales of chemicals and other supplies. By launching a new power business to augment these relationships, Takuma will be able to offer a comprehensive suite of services that includes power purchasing and supply to customers seeking to boost revenue from biomass- and waste-fueled generating plants.



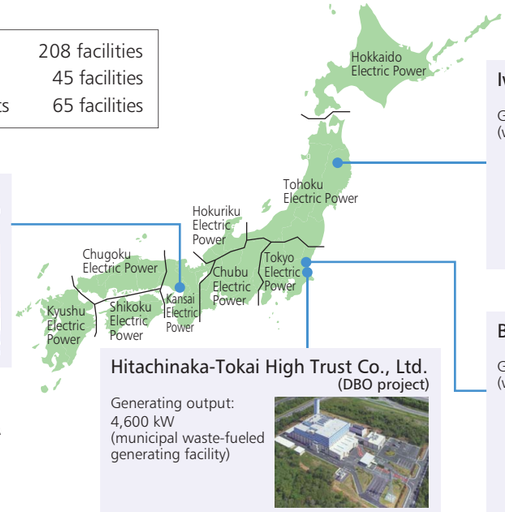
Power sources in Takuma's new power business

Takuma, which has delivered numerous facilities as a boiler and environmental plant manufacturer, is involved not only with plant construction, but also joint ventures and PFI projects* with private-sector companies. As a result, the Takuma Group, which operates a number of biomass- and waste-fueled generating plants, has its own power sources. In addition to these Group sources, we will also propose power purchases to customers.

Going forward, we will purchase electricity generated by the plants we have built in recognition of its clean value and return it to society as power with added value.

∗PFI (private finance initiative) project: A technique for realizing the construction, maintenance management, operation, and other aspects of projects such as public facilities using funds, management skills, and technological skills from the private sector.

● Generating plants in Japan	208 facilities
Biomass power plants	45 facilities
Waste power generation plants	65 facilities



Takuma Solar Power Plant
(owned by Takuma)
Generating output: 1,950 kW (solar power system)

Hitachinaka-Tokai High Trust Co., Ltd.
(DBO project)
Generating output: 4,600 kW (municipal waste-fueled generating facility)

Iwate-Kenpoku Clean Co., Ltd.
(PFI project))
Generating output: 860 kW (waste-fueled generating facility)

Biopower Katsuta Co., Ltd.
(Takuma joint venture)
Generating output: 4,990 kW (wood biomass-fueled generating facility)

Awards Received from Outside Organizations

—Takuma's combined system of methane fermentation and incineration for municipal solid waste receives the New Energy Foundation's Chairman Award as part of the FY2014 New Energy Awards

A combined system for municipal waste methane fermentation and incineration developed by Takuma received the New Energy Foundation's Chairman Award as part of the FY2014 New Energy Awards, which were hosted by the New Energy Foundation.

The system was recognized both for its novelty as a combined fermentation/incineration system and its suitability for widespread use at waste treatment facilities operated by comparatively small-scale local governments.

System overview

The system is a combination of two subsystems used in municipal waste treatment: (1) a biomass subsystem used to treat suitable collected burnable waste by means of a high-temperature, dry methane fermentation process and (2) a heat recovery subsystem used to incinerate waste that cannot be treated using methane fermentation as well as residue left over from methane fermentation.

In the biomass subsystem, kitchen garbage and other waste that is suitable for methane fermentation are sorted by a newly developed mechanical sorting system and supplied to the methane fermentation process, allowing waste to be collected in an unsorted state. The subsystem is the first small-scale facility in Japan to supply both heat and electricity generated by a high-efficiency gas engine using methane gas from the fermentation process.

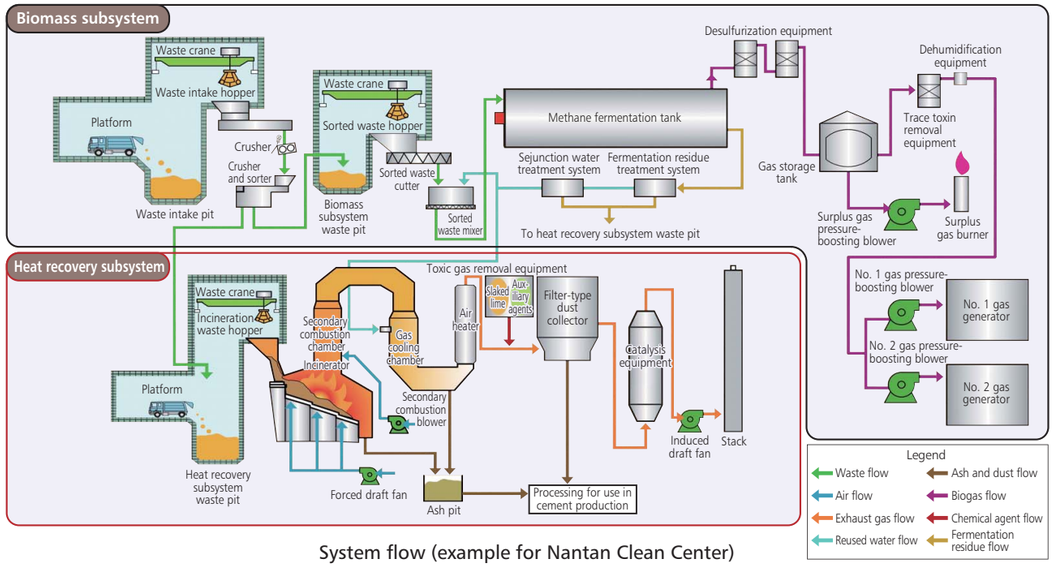
The system also yields economic benefits in the form of dramatically lower running costs through the sale of generated electricity to electric companies by means of Japan's feed-in tariff (FIT) system for renewable energy. It also yields much lower greenhouse gas (CO_2) emissions than plants that incinerate all collected waste, contributing to the realization of a low-carbon society.

The Nantan Clean Center (located in Asago City, Hyogo Prefecture), which became operational in August 2013, is the first facility in Japan to use this new system.

Overview of the Nantan Clean Center

- Facility capacity
  Biomass subsystem: 36 tons per 24 hours × 1 system (high-temperature, dry methane fermentation)
  Heat recovery subsystem: 43 tons per 24 hours × 1 system (stoker incinerator)
- Energy recovery (planned values)
  Electricity generation from biogas: 382 kW (max. value with a generating efficiency of 37%)
  Heat recovery by incineration system: Heat recovery rate of 15.3% (year-round, except winter)

Nantan Clean Center



System flow (example for Nantan Clean Center)

CSR Initiatives

CSR Activities for the Future

To become a sustainable, forward-looking company while fostering and expanding a broader range of CSR activities, we began compiling, implementing, and improving a CSR activity roadmap in FY2011. In FY2012, we chose a number of key issues, which we are currently working to resolve.

● **Activity report for FY2014**

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**

Objectivity is important in choosing key issues and developing CSR issues and action programs. Going forward, we plan to implement CSR activities using techniques that we consider appropriate while relying on guidance and advice from outside experts.

The Global Reporting Initiative (GRI), which offers international guidelines on corporate sustainability reporting, requires all companies to choose key issues. While the GRI process requires key issues to be chosen through a process that includes such components as a stakeholder engagement element, we believe that companies with businesses such as ours must study whether outside views can be accepted as-is. Going forward, we will continue to discuss which key issues are most appropriately pursued by Takuma as a sustainable company.

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 increasingly intense competition that brooks no relaxation of attention. Our ability to develop new technologies in environmental engineering and new energy engineering, which we have refined over many years of experience, forms the basis of our CSR management as well as our greatest strength as we look to make a broad contribution to society in the tumultuous 21st century. We will continue to draw on this strength in our activities going forward.

＊This partial list of CSR issues and FY2014 action programs is not exhaustive.

Category	No.	Key issue	CSR issue	Department		FY2014 action program	
						Action plan	Self-evaluation of results
Organizational administration	1	Executive leadership	Exchanges between executives and employees	Human Resources Division		Hold dialog sessions with the president.	We held dialog sessions with the president for about 90 employees.
			Executive support	Corporate Planning Division		Foster close communication between division managers and subordinate personnel with executives and share management policies.	There were extensive discussions and dialog between division managers and subordinates with executives on a daily basis.
	2	Corporate governance	Verification of corporate administrative procedures	Internal Audit Division		Verify whether corporate activities adhere to predefined administrative procedures.	We verified the extent of adherence to procedures by means of an internal audit in accordance with the annual plan and worked to make improvements and corrections.
	3	Compliance	Implementation of measures related to areas such as compliance structure development and education; assessment and improvement of adherence	Marketing Division		Work to develop and administer compliance structures in the department.	We were able to raise compliance awareness through explanations in educational materials and by holding periodic read-throughs.
			Extent of penetration of compliance awareness	Marketing Division		Have division and section managers facilitate dialog and other communication with personnel and verify the extent to which awareness of compliance has permeated the organization.	Although we worked to put in place structures to allow mutual checks during daily operations in addition to holding periodic educational programs, we feel that there is still the need to facilitate the spread of compliance awareness.
	4	Risk management	Improvement of risk management methods	Marketing Division		Work to review and share an overview of risk management planning, risk reduction and avoidance methods, risk evaluation methods, and other associated factors when creating risk management plans.	We spread awareness of the risk management plan internally through efforts by division and section managers based on past examples.
			Monitoring of risk management structures	Internal Audit Division		Monitor progress by individual departments in achieving the risk management targets they have put in place and contribute to the development of risk management structures.	We monitored progress in the risk management plan being implemented by each department. We conducted more detailed checks of specific measures in pursuit of targets and results, pointed out changes as needed, and pursued improvements and corrective action.
	5	Information disclosure (fulfillment of accountability requirements and assurance of transparency)	Fulfillment of accountability to rating agencies and assurance of transparency	Account Division		Work with related departments, group companies, and other stakeholders to collect effective materials (information) and to create easy-to-understand, compelling request materials.	After ascertaining key considerations in the rating process based on resources such as rating methods announced by rating agencies, we gathered materials based on those considerations from related departments and Group companies.
			Appropriate disclosure of technical information to outside parties	Engineering Division		Publish Takuma Technical Review papers and present findings to academic societies and other groups in a timely and appropriate manner.	In addition to publication of the Takuma Technical Review and presentations of findings to academic societies, we disseminated technical information in a timely manner.
	6	Employee training on social responsibility	Promotion of employees' understanding of social responsibility	Marketing Division		Discuss social responsibility not only in companywide education, but also in the context of the department's operations and share awareness of the importance of this aspect of operations.	We had all department personnel read through information such as a risk overview, countermeasures, and the results of actions taken; discussed each item; and requested self-evaluation comments concerning the action program.
			Promotion of employee understanding (awareness) of social responsibility and recommendation 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 activity on the part of all employees.	We had department personnel and Group company employees read through the Takuma Group Ethics Charter and Code of Conduct and promoted activities based on an awareness of social responsibility and ethics.
	7	Stakeholder engagement	Development of relationships of trust with customers	Marketing Division		Organize customer information and information about past issues and share it in order to help address issues; take the initiative to provide information that can be used as a tool in proposal-based sales.	We organized customer information and similar issues that have arisen in the past and used that information to resolve issues by sharing it with customers.
			Active dialog with business partners	Procurement Division		Hold sessions to exchange views with business partners (subcontractor information, environmental information, information about cost reductions, etc.).	We held sessions to exchange views with business partners and shared information by disclosing meeting minutes.
			Implementation of fair transactions with business partners	Manufacturing Division		Conduct a questionnaire for business partners about the status of their transactions with the company and verify that transactions are being conducted in a fair manner by each coordinator.	Although we conducted an awareness questionnaire about subcontractor transactions and found that there were no issues with internal awareness, we were not able to conduct a similar questionnaire for business partners.
			Active dialog with local communities	Manufacturing Division		Hold tours of plants and solar power facilities for area residents and introduce Takuma's businesses.	Although we held tours of plants and solar power facilities for customers, nearby companies, labor unions, and affiliates, among other groups, we were not able to hold such tours for area residents.
Consumer issues	8	Safety and quality of products and services	Emergency measures when problems occur with products and services	Marketing Division		Offer internal education about the operational process used when problems occur at facilities that are under construction or facilities that have already been delivered.	Although problems occurred at facilities that have already been delivered, we dealt appropriately with each.
			Provision of high-quality, high-performance products that contribute to customer satisfaction	Engineering Division		Review all customer requirements during the planning and design process and work to ensure thorough customer understanding. Continue to earn customer trust by performing preventive maintenance in a reliable manner after each facility has been transferred.	We propose specifications other than customer specifications as appropriate during the planning and design stage as part of the specifications finalization process in order to deal with issues. We also propose repairs or replacements to customers as necessary after the transfer of each project in order to deal with issues.
			Preventive measures related to risk concerning the safety and quality of products and services	Engineering Division		Identify risks requiring preventive measures at the planning stage and study how to address them.	We were able to identify risks and study preventive measures through such means as using plan policy sheets and risk management charts and by holding design study meetings as appropriate.
			Measures to prevent the recurrence of issues related to the safety and quality of products and services	Procurement Division		When an issue involving the safety or quality of a Takuma product or service occurs, request business partners to take corrective action and work to prevent a recurrence by checking the measures taken to prevent future occurrences and sharing associated information.	When issues occurred, we took action to prevent any recurrence, noted requests for business partners to take action to address it in a chart, and spread awareness of the incident internally by providing an overview to employees.
Fair business practices	9	Compliance with the Anti-Monopoly Law	Understanding of the provisions of the Anti-Monopoly Law	Marketing Division		Discuss specific, recent examples of warnings and disclosures of violations of the Anti-Monopoly Law at department meetings, analyze and evaluate those incidents, and offer internal education.	We had employees read over past educational materials and had them review problem areas and points requiring particular caution during the departmental education process.
	10	Fair business relationships with customers and business partners	Implementation of fair transactions with business partners	Procurement Division		Offer education on preventing corruption and complying with the Subcontract Proceeds Act and review the state of compliance. To ensure Takuma's ability to supply high-quality products, maintain good relationships with business partners and work to ensure fairness.	We participated in a study session on the Subcontract Proceeds Act held by the company and verified that our operations are in legal compliance. We visited business partners' facilities and evaluated their operations from a quality and process management standpoint.
	11	Respect of property rights	Protection and utilization of intellectual property rights	Engineering Division		Work to raise employee awareness concerning protection and utilization of intellectual property rights through educational activities.	We offered education on the protection and utilization of intellectual property rights by holding an internal lecture course.
Labor practices and human rights	12	Appropriate employment relationships and labor conditions (including health and safety, social dialog, etc.)	Initiatives to address occupational health and safety	Safety Control Division		Carefully survey administration of the TK-COHSMS (Takuma Construction Occupational Health and Safety Management System), identify areas requiring improvement, and work to make improvements through the Safety and Health Committee. Strive to eliminate accidents involving work stoppages by offering education and guidance on the establishment of targets for safety activities.	We performed an extensive range of activities, including oxygen deficiency training and joint safety patrols with partner companies, but disappointingly, an accident involving a work stoppage occurred nonetheless.
			Assurance of appropriate labor conditions and initiatives to address work-life balance	Human Resources Division		Earn the ability to display the Kurumin next-generation certification mark.	We completed a trial of a telecommute program and will implement the system starting in FY2015 in order to earn Kurumin mark certification.
			Assurance of appropriate labor conditions	Construction Division		Assign coordinates appropriately based on a consideration of work process content and difficulty. Instead of leaving everything to individual employees, adopt structures to provide backup as needed.	We believe we have assigned coordinators appropriately. We offered assistance from managers on an as-needed basis as a backup structure.
	13	Employee skill development (skill enhancement)	Employee training, skill development, and passing down of technical skills	Engineering Division		Identify topics of interest in areas such as combustion technologies and exhaust gas treatment technologies and plan and carry out study sessions for mid-level and young engineers in order to pass down technologies.	Section personnel chose study session topics and reported on their findings at departmental meetings and elsewhere, after which discussions were held. We worked to increase section employees' skills by inviting instructors from other departments to speak at study sessions.
			Enhancement of management skills	Engineering Division		Work to enhance individual employees' management skills through a broad range of operational activities in areas such as technology, marketing, and legal affairs.	We undertook an autonomous initiative to address follow-up operations for the Engineering Division and Marketing Division. This effort expanded individual employees' knowledge and experience, helping to improve management skills in the department.
			Technical employee training and improvement of skills	Engineering Division		Hold technological training sessions in order to improve and share technical knowledge. In addition, plan and hold a companywide educational program with the goal of increasing technical employees' skills and awareness.	We planned and held technology training sessions on basic boiler knowledge and research and development results. We offered education for young technical employees jointly with the Technology Training Committee and Human Resources Division.
Environment	14	Implementation of environmental management structures and reduction of environmental impacts	Compliance with environmental laws and regulations	Engineering Division		Identify laws and regulations related to the environment and clarify changes accompanying revisions to regulations in order to disseminate information and provide education inside the company on an as-needed basis.	We paid attention to the enactment of new laws and trends in the revision of existing laws in the areas of the environment and energy, both of which affect Takuma's operations. When we found changes, we disseminated information to the affected departments as necessary or held internal briefing sessions.
	15	Contributions to resolving environmental problems	Initiatives to save energy and reduce CO_2 emissions	Engineering Division		Study how to contribute actively to the resolution of environmental issues by pursuing measures to reduce plant energy consumption and CO_2 emissions during the planning stage.	We studied how to contribute actively to the resolution of environmental issues by proposing facilities characterized by reduced energy use and CO_2 emissions and receiving orders for those products and services.
			Reduction of use of waste from construction sites	Construction Division		During planning, create a waste treatment plan that includes waste forecasts, reduction targets, and reduction measures. After the end of construction work, create a waste management report to evaluate associated measures.	We took action to ensure that each site develops a waste treatment plan, processes waste appropriately, and manages the process using manifests. We also reported on these activities to the Head office.
Community involvement and development	16	Regional and social impact of business activities	Contributions to the region and society through public environmental facilities	Engineering Division		Contribute to the development of sewage treatment systems with low energy consumption and low greenhouse gas emissions by publicizing the company's sewage treatment systems.	We held about 10 tours and promoted the energy efficiency and low greenhouse gas emissions of our sewage treatment systems to customers and consultants.

Stakeholder Dialog

Continuing a program that we held last year, we held a series of stakeholder dialogs with experts who have detailed knowledge of Takuma's business in order to foster communication with stakeholders.

Minoru Kumazaki
Chairman, Japan Woody Bioenergy Association
Chairman, Japan Wood Pellet Association

Participants from Takuma:
Shunichi Matsuhashi Executive Manager, Energy Plant Division
Mitsuaki Adachi General Manager, Energy Plant Division, Plant Department II

Mr. Adachi: Following the start of the feed-in tariff (FIT) for renewable energy in July 2012, we've seen brisk activity on the part of companies addressing the power generation business using wood biomass fuel, and Takuma has received numerous orders for wood biomass power boiler construction. Today, I'd like to discuss how you become involved with promoting wood biomass, issues affecting wood biomass, and Takuma's role in the future.

Mr. Kumazaki: Back at the beginning of the 1990s, Japanese facilities such as lumber plants were paying ¥10,000 to ¥20,000 per ton to dispose of wood chips from lumber manufacture. Around the same time, Sweden was already using wood chips as an important boiler fuel, and I became acutely aware of the importance of using this resource as a source of energy. Later, there were new developments in this area in Austria and Germany, somewhat later than they had occurred in Northern Europe. As the price of lumber for construction use fell worldwide and made it more challenging for lumber plants to operate, companies in Austria and Germany discovered a way to use waste lumber left over from those plants in an effective manner. It became standard practice at large lumber plants to incinerate bark in order to generate electricity and to use wood chips and planer chips in order to manufacture pellets. Drying the raw materials is an essential step in manufacturing pellets, and waste heat from the incineration of bark in order to generate electricity was used as the heat source for the drying process. In this way, "cascading use," a term that refers to the thorough, waste-free use of the entire log at lumber plants, made a dramatic contribution to these plants' bottom line. Incidentally, this approach to cascading use had not been implemented at Japanese lumber plants at the time. Due to the facilities' small size, they were unable to install wood chip boilers for drying lumber and instead used fuel oil for that purpose. Consequently, wood waste such as bark with low utilization value was being disposed of as industrial waste until extremely recently. With the soaring cost of crude oil in recent years, there has been a move to switch from fuel oil boilers to wood fuel boilers. However, it was extremely unusual for operators to incorporate a power generation system.

Mr. Matsuhashi: With the introduction of FIT, all that changed in an instant.

Mr. Kumazaki: FIT makes it an extremely good idea to use lumber from tree thinning as a renewable energy resource, and I believe we must make skillful use of such lumber. However, a boost in purchase prices due to FIT doesn't mean that such lumber will be magically supplied from our mountain forests. Japan's forestry industry has faced extremely challenging business conditions due to the switch from wood to fossil fuels as an energy source and increases in the volume of imported lumber. As a result, we are not making proper use of our forests, and lumber from tree thinning is not being supplied smoothly to the market from those mountain forests for a number of reasons, including stagnation in the development of road networks in forests to facilitate harvesting, falling numbers of forestry industry employees, and the aging of those employees. To resolve these issues, it will be important to develop mechanisms for supplying lumber from tree thinning in a way that leads to good forestry policy and to establish a supply chain. If we can do that, I believe we will be able to properly maintain forests that have been neglected and to rebuild both forests and the forestry industry. At the same time, wood biomass generating plants are being built nationwide in response to the introduction of FIT. If use of wood biomass as an energy source continues to grow, we will see those plants competing for raw materials with companies that manufacture products such as paper pulp and wood boards. It is desirable that the industry develop with a good balance between use of wood biomass resources for energy and other use for material manufacturing.

Mr. Matsuhashi: Takuma has delivered numerous wood biomass boilers to private industry. We're seeing more inquiries as a result of FIT. As part of our new three-year Medium-Term Management Plan, which began this April, we're planning to develop larger, more efficient plants as well as plants with a generating capacity of less than 2,000 kW using wood biomass from sources such as thinned lumber. We're hoping to create long-term relationships with customers that include regular maintenance service. In this regard, we would love to hear more about your expectations toward Takuma as well as any advice you might have.

Mr. Kumazaki: Going forward, I suspect that small facilities will be the rule, rather than large ones. However, a facility with a capacity of less than 2,000 kW running on wood biomass from thinned lumber will require a system that excels at supplying heat and electricity. It would be difficult for such a facility to operate profitably just from about 2,000 kW of electricity generation. I think it would be important for such a facility to incorporate innovations that enable it to make effective use of heat as well. In Europe, plants with generating capacities ranging from several hundreds of kilowatts to 1,000 kW use ORC*. I would expect facilities with a generating capacity of about 2,000 kW to incorporate either ORC or a system that enables them to accommodate a broad range of biomass fuel.

Mr. Matsuhashi: Takuma Group company Nippon Thermoener Co., Ltd., sells pellet boilers, which it has delivered to a number of customers. Going forward, we plan to supply products that satisfy customers through a Group-wide effort, with Takuma offering large boilers and Nippon Thermoener offering general-purpose boilers.

Mr. Kumazaki: Pellets lend themselves to storage as a fuel. Takuma should be able to accommodate the wishes of various regions and customers thanks to the wide range of boilers it offers and its delivery track record.

* ORC (Organic Rankine Cycle): A system that evaporates a macromolecular organic media instead of water vapor to generate electricity using a turbine.

Response from Takuma

There are about 20 million square meters of unutilized thinned lumber that could be used as wood biomass in Japan (according to the Forestry Agency's website), but the quality and quantity of such unutilized lumber varies greatly by region. Takuma has a history of delivering a broad range of wood biomass power boilers, and we have a track record of supplying optimal systems to our customers. Going forward, we will work to help resolve social issues while accommodating our customers' wishes.

Masaki Takaoka
Professor, Department of Global Ecology, Kyoto University Graduate School of Global Environmental Studies
Professor, Department of Environmental Engineering, Kyoto University Graduate School of Engineering

Participants from Takuma:
Kenichi Shishida　General Manager, Sewerage Engineering Department
Shigeki Kobatake　General Manager, CSR Department

Mr. Shishida: In FY2013, Takuma participated in a joint research group carrying out the Demonstration Study of Power Generation System with Sewage Sludge Incineration as part of the Ministry of Land, Infrastructure, Transport and Tourism's Breakthrough by Dynamic Approach in Sewage High Technology Project (B-DASH Project*). I'd like to ask about your views on how sewage sludge will be used in the future.

Mr. Takaoka: Sewage sludge is a type of biomass, and it can be considered both a waste product and a resource. Sewage is collected via sewer pipes, but those pipes have already been built as infrastructure. Consequently, it's easy to treat the sewage sludge that is output by the process used to purify sewage as a resource that has been accumulated in our cities. If sewage sludge can be effectively used as a biomass resource, it can serve as a source of energy.

Mr. Shishida: The Ministry of Land, Infrastructure, Transport and Tourism has issued a series of guidelines on technologies for converting sewage sludge into energy, and the Japanese government seems to be moving toward promoting this type of use. To date, there have been two methods of converting sewage sludge into a source of energy: methane fermentation and fuel conversion. Working with you, we developed a third approach: incinerating sewage sludge to generate electricity. What are your expectations with regard to this new approach?

Mr. Takaoka: Since sewage sludge is a biomass resource, it has the property of being carbon neutral. In short, since the CO_2 that is released when sewage sludge is burned does not count toward global warming, this is a major benefit in the conversion of sludge into energy. Methane fermentation is a good technology, but organic materials remain after fermentation, necessitating additional treatment. As fuel conversion works in Japan, sewage sludge is transported to coal-fired power plants and cement plants, which use it in a comparatively efficient manner. Fuel conversion includes drying and carbonization. The issue of unpleasant odors in drying necessitates countermeasures, and it's unlikely that many facilities would accept the resource as-is. While fuel conversion contributes to CO_2 reductions, you have to keep in mind that the process itself requires an injection of energy. Although there has only been one large-scale treatment plant in Japan incinerating sewage sludge to generate electricity, we're currently conducting new research with Takuma that removes a substantial amount of moisture from the sludge, allowing self-sustaining combustion and power generation. Sewage treatment plants generally consume energy, and experts believe they account for 0.8% to 1% of Japan's total power consumption. In light of these plants' energy consumption, I see the ability of this technology to create power as extremely significant. Although there are various sewage sludge incineration facilities in Japan, most of them use fluidized-bed furnaces. The current project has demonstrated that if a sufficient amount of moisture can be removed from the sludge, it is possible to burn it in a stoker furnace, enabling waste-free recovery of energy.

Mr. Shishida: I think the fact that stoker furnaces consume less power than fluidized-bed furnaces and yield a large amount of surplus power is a key characteristic of the new approach. Regarding the fact that sewage treatment plants account for 0.8% to 1% of Japan's total power consumption, we have calculated that our technology could be used to reduce the amount of power used in sewage treatment by 30%. How would you describe your expectations of Takuma as you've offered us a range of guidance?

Mr. Takaoka: My expectations concern heat recovery for sewage sludge. While working together on the B-DASH Project, I realized that if state-of-the-art technology from not only sludge dehydration, but also other processes could be incorporated into the system, it would be possible to incinerate sludge using a stoker furnace without adding fuel and then to recover energy from the process. Consequently, my hope is that Takuma will shepherd this technology into widespread use. Concerning the significance of combining the technology with waste treatment, the fact that you've established your stoker furnaces in a solid position in waste treatment means that if you combine those products with dehydration for sewage sludge, both technologies together would enable highly efficient heat recovery.

Mr. Kobatake: Sewage sludge accounts for the greatest volume of all industrial waste products, but it seems to me that the key questions are how effectively we can make use of the calories contained in the sludge and how well we can design a system to do that. What are your thoughts?

Mr. Takaoka: I agree. We generate about 40 million tons of municipal waste every year and about 10 million tons of sewage sludge, even after a typical amount of dehydration (removing 80% of moisture). Sewage sludge accounts for one-fourth of municipal waste, making it a waste product that is generated in extremely high volume. However, because sewage sludge is comparatively easy to collect, as I mentioned earlier, I believe that we should make effective use of it. Experts predict Japan's population will decline in the future, which means that we must create efficient mechanisms if we are to ensure the continuity of society. I believe that we have to think about pursuing solutions that deliver efficiency, consolidation, and compound effectiveness when we consider the overall direction for society. I believe that cascading use of waste is efficient. Methane fermentation is an effective approach if the goal is to break down the waste more easily and gain a large amount of energy, and that approach is being used in tandem with incineration. However, excessive reliance on that approach may require auxiliary fuel when incinerating leftover residues. In addition, when considering how to combine waste and sewage sludge treatment, we must bear in mind the fact that the optimal treatment approach depends on the properties of the waste in question. If we also think about other types of infrastructure according to the characteristics of each region, I think we'll be able to create good systems.

Mr. Kobatake: Would you share your thoughts on how to use the ash that remains after incineration?

Mr. Takaoka: Sewage sludge contains large amounts of phosphorus, and I think it's important to recover that element. Phosphorus is essential in the production of food, but Japan has to import most of its supply. There are also concerns about phosphorus depletion. Recovery technologies are being used in some facilities in Japan, but they have not been adopted widely due to cost issues. Phosphorus is a resource, so I think we have to use it effectively. Fifteen years have passed since the enactment of the Basic Act on Establishing a Sound Material-Cycle Society. It's a tricky problem, but it seems to me that in cases where a substance can be used as a resource but economically feasible technologies have not yet been established, we should store that resource temporarily until suitable technologies can be developed.

* B-DASH Project (Breakthrough by Dynamic Approach in Sewage High Technology Project): A Ministry of Land, Infrastructure, Transport and Tourism project to achieve dramatic cost reductions in sewer projects, create renewable energy, and support the overseas development of Japanese companies' water businesses by accelerating research, development, and commercialization of new technologies.

Response from Takuma

Sewage sludge is a biomass resource that is an inevitable byproduct of human life, and it is characterized by stability in terms of both quality and quantity. Further, since it can be aggregated efficiently in urban areas, which are also centers of energy consumption, we believe that incinerating sewage sludge to generate electricity is an extremely effective approach. Takuma will continue to contribute to the resolution of social issues through technological innovation.

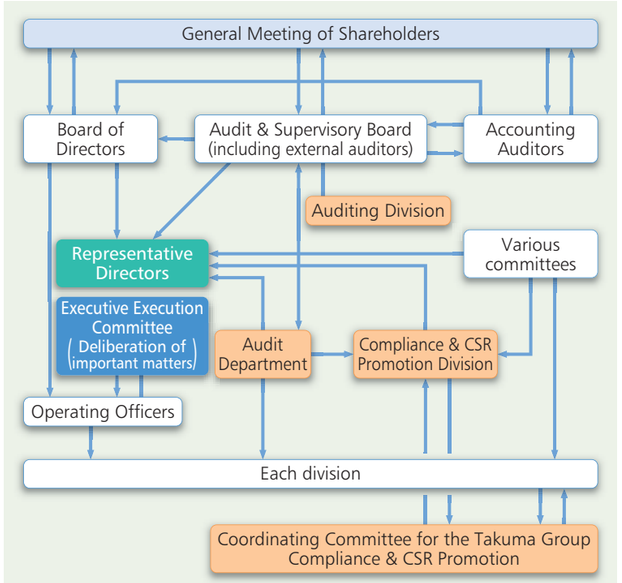
Corporate Governance

Corporate Governance

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 to execute our business activities. 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, as well as to oversee the execution of the directors' duties. 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.

As of March 31, 2015, the Board of Directors was comprised of 9 members (of whom one was an outside director), and 16 operating officers (including some who are also directors) had also been appointed.

For corporate auditing, we have adopted an auditor system, and our Audit & Supervisory Board, which consists of three auditors, including two auditors from outside the company, is in charge of it. Auditors 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. They express their opinions as necessary, and they conduct strict auditing of the business execution performed by the directors. This includes conducting self-assessments and evaluations related to the internal control system by operating officers at the end of each term. Furthermore, they receive reports from accounting auditors and the Audit Department about auditing plans, the status of auditing, and other issues and otherwise conduct regular information exchanges. They cooperate together as they do this and undertake auditing of every business place, division and subsidiary company in accordance with the auditing policies, divisions of work and other stipulations established by the Audit & Supervisory Board. We also work to facilitate communication and information exchange with directors, auditors, and other personnel at subsidiaries, from whom we solicit reports on business operations as necessary.



Internal Control

In accordance with the Companies Act, the Basic Policy for Establishment of an Internal Control System (full text is available on the Web) was adopted at the Board of Directors' meeting in May 2006. 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.

We also strive for awareness and education in each Group company through our "Takuma Group Coordinating Committee for Compliance and CSR Promotion," so that management of both compliance and risk is realized throughout the whole of the Takuma Group.

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 Law. This internal control on financial reporting for the Group has resulted in reports that indicate this system has been effective.

We updated our Basic Policy for Establishment of an Internal Control System to reflect the revision of the Companies Act in May 2015.

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

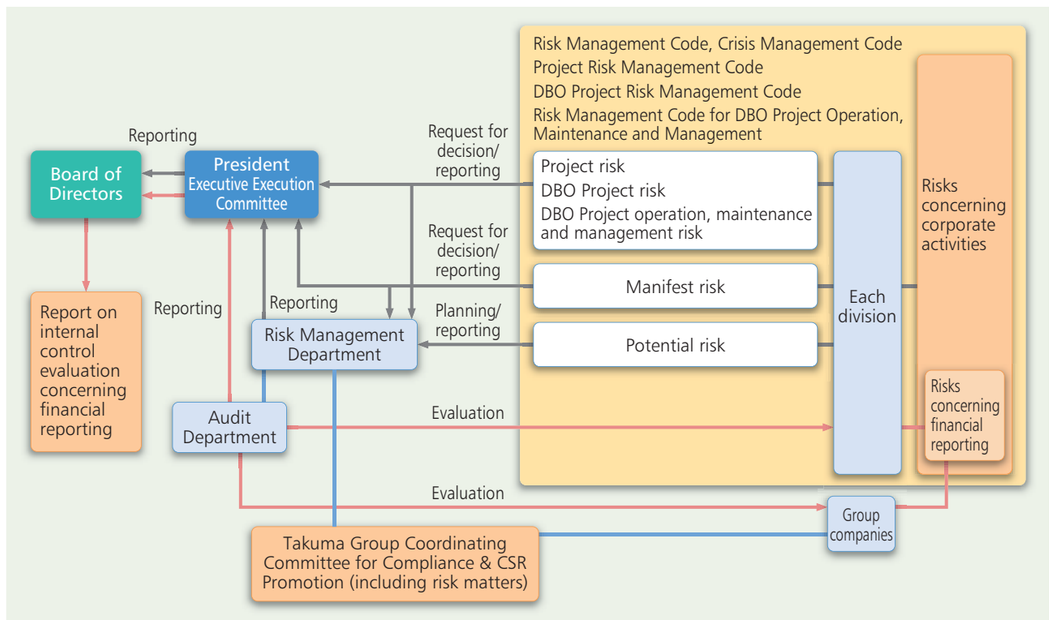
Basic purpose of risk management

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.



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 and 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 headquarters and department.

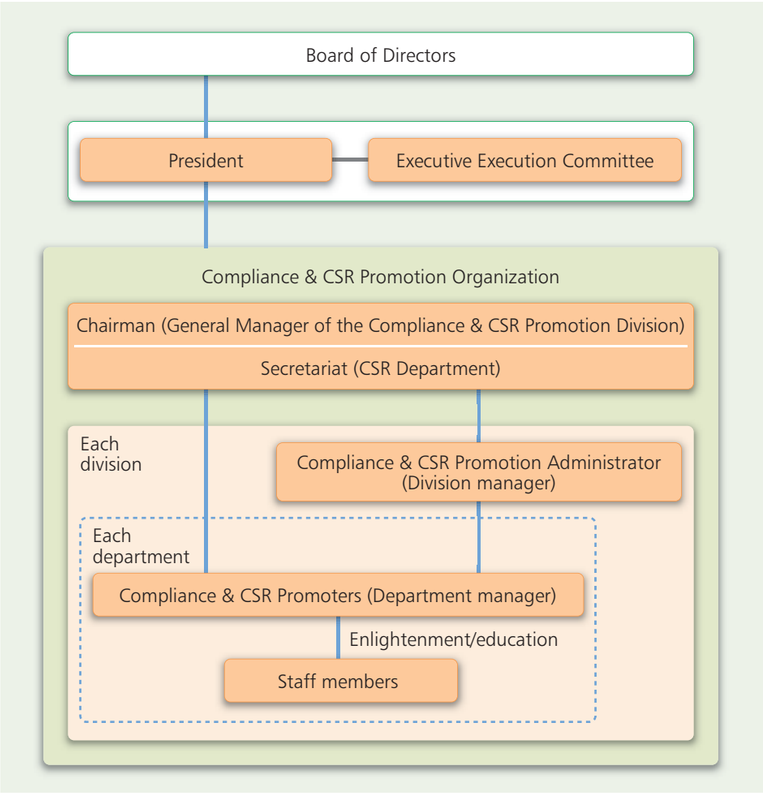
As the person in charge of promoting compliance and CSR in his or her division, each division manager is appointed as a "Compliance and CSR Promotion Administrator." As persons who implement awareness and education in compliance and CSR in their respective departments, department managers are appointed 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 about 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 FY2014 can be found on page 61.)

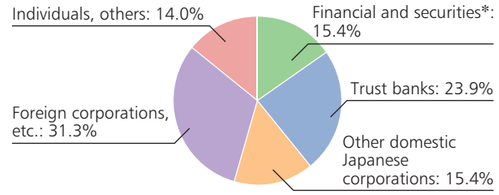


Compliance & CSR promotion structure diagram

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



* Banks, life insurance companies, nonlife insurance companies, securities firms, and other financial institutions

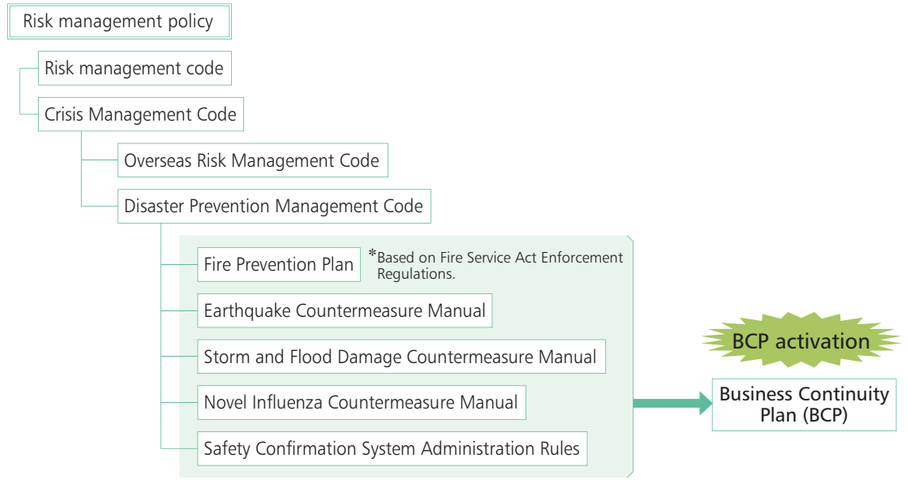
Composition of shareholders (as of March 31, 2015)

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



● Earthquake shelter-in-place exercise ("shakeout" exercise)

Our Harima Factory held an earthquake shelter-in-place exercise ("shakeout" exercise) in January 2015.

This exercise is designed to help employees memorize a series of priority actions designed to ensure their safety in the event of an earthquake. When an earthquake strikes, people may have mere seconds after first feeling the intense swaying or shaking motion of the temblor to protect themselves from falling objects. The purpose of this exercise is to teach employees to protect themselves wherever they are during those first few seconds. In another exercise that simulated a looming tsunami, employees gathered in a designated location, responded to a roll call by evacuation leaders, and made reports.

Human Rights and Labor Practices

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
- 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're 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 worker training

● Round-tables with the president

We held a series of round-tables with the president for young and mid-level employees during FY2014 to deepen mutual understanding and boost morale so that employees could adopt a cheerful, energetic approach to their work. During each event, the president spoke about his management philosophy and what he expects of employees, while participants communicated their feelings about everyday problems and other thoughts directly to the president.

The round-tables consisted of dialog and discussion in a small group setting without any predetermined topics, giving participants an opportunity to speak about everyday thoughts and ideas (whether related to work or their private lives). Participants have indicated that they felt the experience was extremely meaningful.

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

● Balancing work and private life

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 (introduced in FY2015)

● 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)

● 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.

Recruitment

● Graduate recruitment

We implement the periodic recruitment of new graduates every year, from the perspectives of long-range outlook and human resource cultivation. As part of our hiring process during the upcoming fiscal year, we will continue to implement fairer and more highly transparent recruitment activities by providing information from the student's perspective.

● Recruitment of handicapped persons

Currently, nine handicapped employees are active in the company (as of April 1, 2015). We will continue to work to increase the employment rate of handicapped people, for example by participating in local job interview sessions, visiting schools, and welcoming visitors to experience what it's like to work at Takuma.

● Internship

We have an internship program that accepts university and technical college students during their school summer breaks.

● Reemployment system for employees who have reached the mandatory retirement age

We have introduced a system that allows all retirees who wish to do so to work until age 65, and we have been providing employees who wish to work actively after retirement with the opportunities to continue playing an active role. As of April 1, 2015, Takuma has 47 such employees.

[Takuma website > Recruitment info]
http://www.takuma.co.jp/saiyou/index.html (content in Japanese)

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're 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

Efforts for Occupational Health and Safety

Occupational health and safety initiatives

Since FY2006, we have introduced TK-COHSMS based on an occupational health and safety management system for the construction industry and worked actively and independently to improve our health and safety activities. We believe that among these efforts, the manner in which (1) safety inspections, (2) education for worksite 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 health and safety is particularly noteworthy.

This year, we are adopting the following threefold series of health and safety objectives while working to raise awareness of our priorities in this area throughout the company: reducing both accidents that do not result in stoppages at worksites as well as those that do by 50% from the previous year, ensuring adherence to safety inspection guidelines at branches while simultaneously increasing the annual plan patrol implementation rate to at least 95% and increasing the worksite representative education completion exam pass rate to at least 70%, and strengthening collaboration with partner companies through the Safety and Health Cooperative Association.

Going forward, we will redouble our health and safety 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.

Occupational 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 health and safety 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 worksites by eliminating potential hazards and risk factors identified by those inspections.

- FY2014
  Number of safety inspections done: 177
  (Initial inspection pass rate: 97%)

A safety inspection

2. Safety patrols

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 in a precisely targeted and efficient manner.

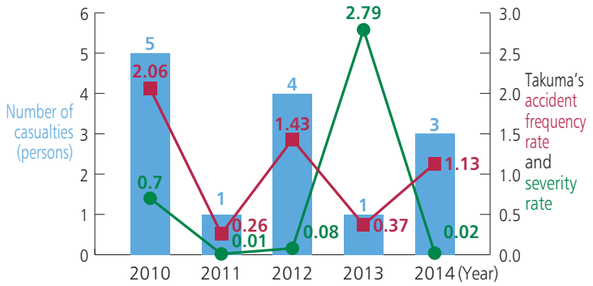
By focusing on reviewing SSA checklists and strengthening leadership, these patrols contribute to the safety of Takuma's workplaces.

- Number of safety patrols implemented in FY2014
  By Safety and Health Committee (members, advisors): 140
  By Safety Control Department: 141
  By construction-related sections: 355

Safety patrols

Takuma's safety results in recent years

Despite a tight labor market in the construction industry nationwide, our safety programs were relatively successful, with an accident severity rate that was lower than the national average during FY2014 and only a few serious injuries. Nonetheless, even though there were only three employees suffered accidents, the accident frequency rate, which indicates how frequently accidents occur, rose above its FY2013 level, triggering concerns. We take all accidents very seriously and will continue to implement an aggressive program of risk management, strengthen and enhance our health and safety management system, and redouble our resolve to eliminate occupational accidents.



Takuma's safety results

Year	Accident frequency rate	Accident severity rate
2010	1.56	0.61
2011	0.85	0.21
2012	0.83	0.05
2013	1.25	0.23
2014	0.91	0.07

Reference: National averages for accident frequency rate and severity rate in the construction industry

Education for worksite representatives (safety and health education)

We continuously provide education to increase the levels of safety awareness and knowledge of our employees and affiliated contractors. As indicated below, more than 11,500 trainees have passed the completion exam. We're 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 worksites.

- April, 2004 to March, 2015
  Cumulative number of trainees: 27,289
  Number of trainees passing the completion exam: 11,776

Education for worksite representatives

Feedback from a worksite representative trainee

Shunichi Shimokawa
Section manager, Safety and Environment Department, Seibu Engineering Co., Ltd.

I'm grateful for being able to participate in an excellent training session that was unique in the construction industry. I felt that the text we were given was well organized. The instructor did an excellent job of conducting the course, and the content was compelling; I paid attention until the end, without losing interest. As a result, I gained an understanding of Takuma's deep commitment as a company to eliminating accidents.

Like other companies, we are working to eliminate accidents, and we've been able to achieve record safety over the last several years as a result. This accomplishment is the fruit of our worksite representatives' and employees' hard work.

I am grateful for the realization that the training gave me that our head office had not been following up adequately on operations in the field. I've taken what I learned back to my company, where I look forward to putting it to good use in future activities.

Going forward, I will work with Takuma to eliminate accidents.

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.**

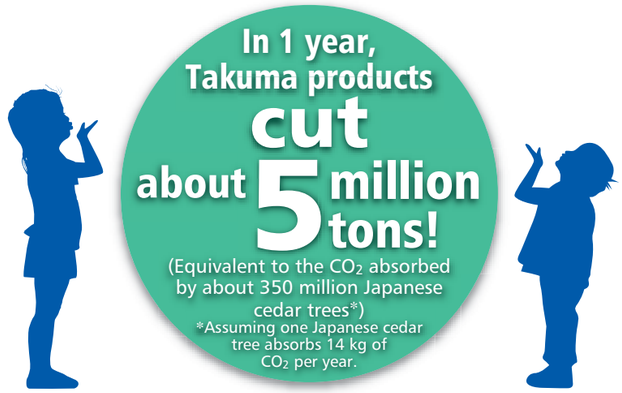
Environmental Management

■ 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 the 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 CO_2 Reduction Technologies

We convert waste/biomass into energy and reduce CO_2!



Reducing CO_2 with biomass power generation boilers

A classic example of biomass power generation can be found in sugar refineries. Factories that make sugar produce large quantities of pomace form sugarcane, the raw material used to make sugar. Sugarcane is crushed into a pulp, and sugar is extracted in a compressor. 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 a power company. The amount of power generated at sugar refineries has grown greatly, with examples of single plants that generate 50,000 kW.

In 1 year, down about 4 million tons!
CO_2 reduction achieved by Takuma's biomass power generation boilers (as of end of FY2014)

Biomass power generation boiler

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 CO_2 is emitted if wood waste products are incinerated, when trees grow again, they absorb CO_2 to offset the emissions from incineration, so there is no increase in CO_2 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 CO_2.

CO_2 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 CO_2.

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

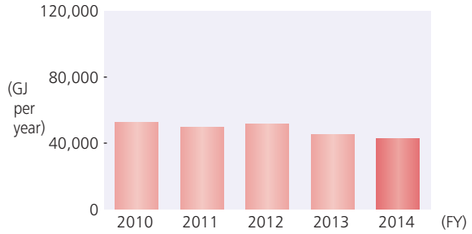
In 1 year, down about 1 million tons!
CO_2 reduction achieved by Takuma's municipal solid waste incineration plants and industrial waste incineration plants (as of end of FY2014)

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.

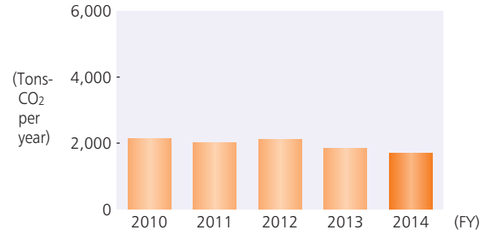
Environmental data (non-consolidated)

● Total energy consumption



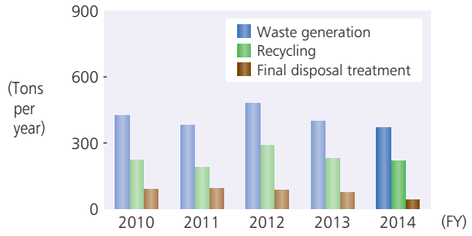
The total energy expenditure of the fuel and the electricity consumed at Takuma during FY2014 fell slightly in comparison with FY2013. We will continue to promote energy savings from here on out.

● Greenhouse gas emissions



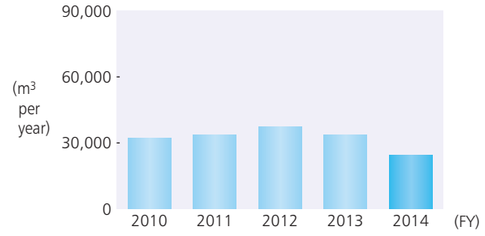
The greenhouse gas emissions created by our company are limited to carbon dioxide (CO_2). The amount of CO_2 emissions in FY2014 was slightly less than in FY2013. We will continue striving to reduce CO_2 emissions.

● 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 FY2014 fell from its level during FY2013. 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)

Rustproofing paint on structural steel for boilers

FY	2010	2011	2012	2013	2014
Emissions (tons per year)	0	0	0	0	0.3

● Xylene (CAS No. 1330-20-7)

Rustproofing paint on boiler structures

FY	2010	2011	2012	2013	2014
Emissions (tons per year)	1.4	2.0	1.8	1.4	3.4

● Toluene (CAS No. 108-88-3)

Used for chemical analyses inside analytical laboratories

FY	2010	2011	2012	2013	2014
Emissions (tons per year)	0.03	0.06	0.05	0.08	0.08

After use, all materials are taken away by waste-solvent dealers for disposal.

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	—	19,543
Global environmental conservation costs	46,915	25,279
Resource recycling costs	—	13,669
Management activity costs	—	36,595
Research and development costs	3,770	1,016,238
Social activity costs	—	7,810
Total	50,685	1,119,134

● 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	FY2013	FY2014
(1) Environmental conservation effect concerning resources input for business activities		
Total energy input (GJ)	100,278	98,809
Water resources input (m^3)	64,225	49,732
(2) Environmental conservation effect concerning environmental loads and wastes created by the business activities		
Greenhouse gas emission volume (tons-CO_2)	4,289	4,253
Waste generation (tons)	893	854
Final disposal volume (tons)	106	74
Total drainage volume (m^3)	57,894	48,502
BOD emissions (kg)	3,302	2,744
COD emissions (kg)	3,504	2,918
T-N emissions (kg)	824	695
T-P emissions (kg)	139	118

Scope of data collected

● Period covered:
April 1, 2014, to March 31, 2015

● 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.

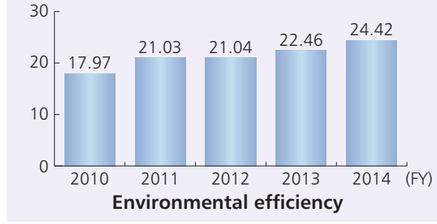
Environmental efficiency

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 FY2014, this value improved slightly compared to FY2013.

The Takuma Group's definition of environmental efficiency

$$\frac{\text{Consolidated net sales (million JPY)}}{\text{Greenhouse gas emissions (tons-}CO_2\text{)}}$$



Fair Business Practices

Compliance/CSR Promotion Education

Takuma offers compliance and CSR promotion education through the Compliance & CSR Promotion Organization (see page 51), which was established in order to spread awareness of compliance and CSR issues among employees.

During FY2014, we implemented education on compliance and CSR promotion in four separate stages in keeping with our policy of pursuing a sustained and thorough program of improving compliance awareness and risk management based on a consideration of social requirements and internal conditions in accordance with our priorities of aggressively implementing and fixing compliance in the 10th Medium-Term Management Plan and deepening risk management.

1st term: Power harassment and sexual harassment

We offered an educational program designed to closely match reality with elements such as introductions to the latest information and specific incidents. Information about power harassment was based on the report of a Ministry of Health, Labour and Welfare working group, while information about sexual harassment was based on new policies added as part of the revision of the Equal Employment Opportunity Law.

3rd term: Takuma's environmental business and compliance

We had attorney Izumi Sato give a lecture on compliance issues as they relate to Takuma's environmental business entitled "Takuma's Environmental Business and Compliance," and individual departments applied her insights to their operations. Her talk touched on recent developments and incidents as well as overseas trends, giving participants an opportunity to learn about areas requiring special caution and likely future developments.

2nd term: Environmental class (second session)

We offered employees a chance to explore fundamental knowledge related to the environment, which is essential for a company like Takuma whose business involves the environment, in the form of this second environmental class. This session, which focused on how society can coexist with nature and how a low-carbon society could be realized, offered participants an opportunity to learn about topics such as technologies and products through which Takuma can make a contribution in this area while referring to a number of data sources detailing world and Japanese initiatives and future directions.

4th term: Power harassment, sexual harassment, and a forward-looking CSR activity: CSR issues and action programs

We offered another educational program on power harassment and sexual harassment based on the results of the CSR Awareness Survey conducted during the third term. We also conducted a self-evaluation of the implementation status for the FY2014 action programs planned by individual departments as a forward-looking CSR activity.

● CSR lectures for corporate management

In February 2015, Professor Joji Nakaya of the Kinki University Faculty of Business Administration gave a lecture entitled "What Is the 'Ethics' in Corporate Ethics—Thinking about Ethics" for Takuma's management.

Professor Nakaya began by introducing ethical theory and then held a lively discussion with attendees in which he helped them actually think about how that theory is applied through the issues raised by actual incidents. The lecture provided a valuable opportunity for Takuma's management to think about the role of ethics in management.

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.

Since FY2013, we have administered the survey to Group companies as well. We offered 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.

Compliance Measures

● Measures related to the Anti-Monopoly Law

Towards ensuring permanent compliance with the Anti-Monopoly Law, Takuma enacted "Regulations concerning Management of the Pledge of the Anti-Monopoly Act Compliance," which provides for the submission of a written oath in regard to observing the Anti-Monopoly Law.

"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 be made to and approval obtained from the affiliated division manager in advance to ensure fair business contact.

● Legal Change Information System

In order to enable its employees to gain a continuous grasp of the latest information on revised and abolished laws and ordinances, Takuma introduced a "Legal Change Information System." In this system, the most recent information on revisions and changes to laws and ordinances is distributed by e-mail, and the details of the corresponding law or ordinance can be checked on the Internet.

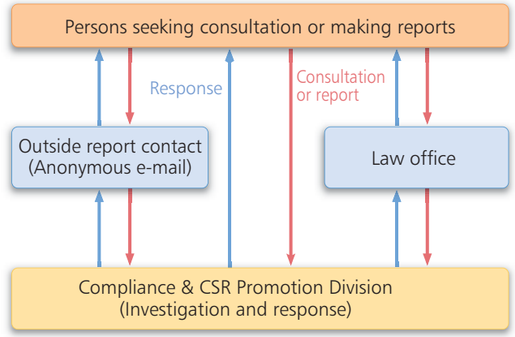
In addition to current laws and ordinances, the system lets users search for legal precedents and public comments to facilitate an even greater understanding of relevant laws and ordinances.

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 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 and publicize a card to all employees with information on the reporting contacts.



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.

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.**

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

Consumer Issues

Activities Involving Product Quality

In 1997, in addition to defining our Quality Policy of "Manufacturing products that result in customer satisfaction," 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.

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 organization 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).

● 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.

● Improving individual employees' capabilities

We create 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.

● Review of quality control and processes

Quality 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) 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.

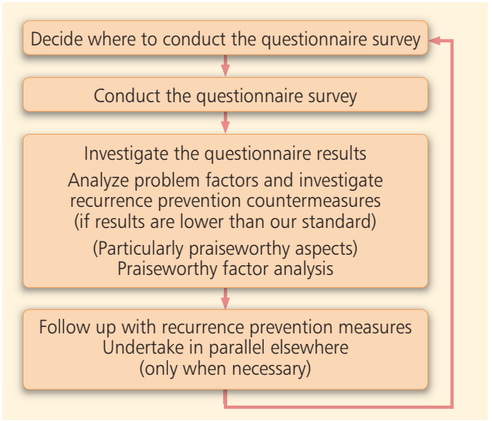
Next, the committee calculates a score for each item based on the survey results as well as a report and explanation from the responsible department. The committee then analyzes the resulting data.

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.

Starting with the second year, the average score for these questionnaires has been 80 points or higher, as shown in the table to the right. We believe that the rising trend for scores indicates that our initiatives are functioning effectively.

In this way, we work to improve quality so that all customers are satisfied.



Customer satisfaction surveys

FY2007: 73.4 points (37 plants)
FY2008: 80.2 points (18 plants)
FY2009: 83.5 points (26 plants)
FY2010: 82.3 points (16 plants)
FY2011: 85.5 points (18 plants)
FY2012: 85.9 points (25 plants)
FY2013: 85.8 points (27 plants)
FY2014: 87.7 points (23 plants)

Average evaluation scores from questionnaire surveys (out of a possible 100 points)

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 of 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," which was launched in Takasago City's Arai district with support from 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:

● Chairman gives lecture at international exchange session of the Korea Society of Waste Management and the Japan Society of Material Cycles and Waste Management

Takuma's Hajime Tejima, who was chairman of the company at the time, attended an international exchange session held jointly by the Korea Society of Waste Management and the Japan Society of Material Cycles and Waste Management at Dong-eui University in Busan, South Korea, in May 2014.

Addressing the theme of "Waste to Energy" as one of the presenters from Japan, Tejima introduced a number of topics including dioxin countermeasures, boiler temperature, high-pressure boiler designs, and combined facilities that use biogas.

Going forward, Takuma will continue to contribute to the development of environmental systems and technologies.

● 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 2014.

A total of 551 volunteers from throughout the Group participated in what was the eighth effort of its kind. The cleanup provided an opportunity to think afresh about the environment and community at the Head Office, branch offices, other business offices, and the Harima Factory. 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 2014 as part of a tie-up with the 4th Osaka Marathon.

• Blood donation campaign

Takuma supports blood donation activities through the Japanese Red Cross Society. We called on people to donate blood and register as bone marrow donors during two drives at our Head Office in October 2014 and March 2015. A total of 150 people donated blood, and 22 people registered as bone marrow donors.

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 summer, we display WFP posters at the entrances to company buildings and in cafeterias during a campaign that lasts about one month. The campaign serves both to increase employee interest in the world's food problems and to collect donations to address them. 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

• Donating emergency food supplies to Food Bank Kansai

In December 2014, Takuma donated 1,374 meals' worth of emergency food supplies that it had been storing to Food Bank Kansai for use in the event of a natural disaster.

Food Bank Kansai is a not-for-profit organization whose volunteers distribute food donated by companies and private individuals to foster homes, facilities that help disabled individuals live independently, and other institutions free of charge.

• Purchasing UNICEF Christmas cards

Takuma purchases UNICEF Christmas cards. Fifty percent of the proceeds are 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."

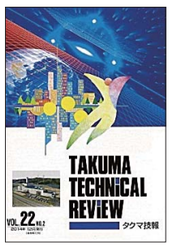
In FY2014, we donated more than 150 calendars. The proceeds are used to provide aid for victims of natural disasters and other crises.

● Takuma Technical Review

We issue the Takuma Technical Review twice a year to introduce technologies being developed by Takuma. In FY2014, content included a profile of biomass gasification technology as well as reports on changes in sewage treatment technologies, primary equipment improvement projects, garbage disposal facility operation, biomass equipment operation, demonstration testing, and observations made during an overseas visit.

Abstracts are available at the Takuma website.

[Takuma website > Technical Information > Technical Review]
http://www.takuma.co.jp/english/gijutu/gihou.html



● Activities at educational institutions

In January 2015, Takuma participated in the Green Technologies Tomorrow Global MBA Course at Doshisha Business School.

Energy & Environment Plant Export, Biomass Boiler & Power Plan Sales Section manager Akira Shiozaki of the International Operations Division and Marc Nyhan, a member of the Sales Section, introduced attendees to the use of energy by means of biomass boiler generation to address the theme of "Contributing to the Utilization of Renewable Energy." The two also introduced Takuma's initiatives in the areas of energy technology and the environment and participated in an energetic exchange of views with the group of international students who attended the session.

● Exhibitions

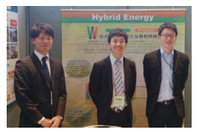
• Exhibiting at "From Japan! Power that supports your life: Sewage Works Exhibition '14 Osaka"

We exhibited at "From Japan! Power that supports your life: Sewage Works Exhibition '14 Osaka," which was hosted by the Japan Sewage Works Association in July 2014.

The exhibition introduces the latest technologies, machinery, and other systems related to sewer works. We offered technical explanations of environmental products such as our energy-creating sludge incineration furnaces as well as tours of a demonstration plant.

• Exhibiting at the "Life and Environment National Conference"

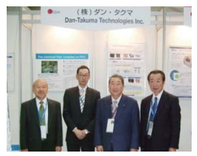
When the 58th Life and Environment National Conference was hosted by the Japan Environmental Sanitation Center in Toyama Prefecture in October 2014, we exhibited at the event's "Life and Environment Exhibition." Our booth offered exhibits and presentations featuring high-efficiency raw fuel recovery facilities such as the Nantan Clean Center, and Takuma staff members assigned to the event focused on explaining the advantages of combining biomass facilities and heat recovery facilities.



● Activities by Group companies

• Exhibiting at SEMICON Japan 2014 [Dan-Takuma Technologies Inc.]

Takuma Group company Dan-Takuma Technologies Inc. exhibited at SEMICON Japan 2014, which was hosted by Semiconductor Equipment and Materials International (SEMI) in Tokyo in December 2014. The company introduced flagship products such as chemical filters and energy-saving modules for vacuum pumps.



SEMICON, the world's largest semiconductor manufacturing equipment and materials exhibition, has been held for the last 37 years.

Outside Expert Opinion

Outside Expert Opinion

Hiroji Tanaka

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

The Takuma Group published a new report in 2015 combining an overview of the company and its businesses with a survey of its CSR initiatives in a format that is easy to understand for stakeholders, putting its Company Motto of "Value Technology, Value People, Value the Earth" on the cover.

Praiseworthy accomplishments

First, the report provides a clear overview of the 11th Medium-Term Management Plan, which covers FY2015 to FY2017. The report provides a concise description of topics including the company's business directions, basic policies and perspectives, quantitative plans, key data by principal business, and an introduction of the division and center managers who are responsible for developing management plans and addressing CSR issues.

Second, the company overview, which begins with a timeline of Takuma's history and includes a business overview as well as descriptions of the company's network, principal business developments, and contributions to society through its businesses and products, has been designed so that even laypeople can understand its content. Site photographs and illustrations have been designed so that each topic area is similarly accessible.

Third, the Takuma Group's key issues, CSR issues, involved departments, and FY2014 action programs have been organized into a table summarizing its CSR initiatives based on the seven key principles outlined in ISO 26000. It is especially praiseworthy that department-specific information has been provided for action plans and a self-evaluation of their implementation status.

Fourth, the company has held stakeholder dialogs that bring together experts with extensive knowledge of Takuma's business with division and department managers with related responsibilities to engage in passionate discussions about how to resolve social issues. These discussions are an important source of information for society about topics such as initiatives to generate power using wood biomass fuel and utilization of sewage sludge as a resource.

Fifth, the message from top management provides specific information about the six basic policies in the new Medium-Term Management Plan as business strategies from the perspective of the company's top leadership. This year, the company has responded to a high level of interest from stakeholders by articulating the interrelationship between core business strategies and the development of the company's businesses. It is a powerful declaration of how the Takuma Group will achieve sustained growth while working to resolve social issues.

Areas where Takuma can do more in the future

First, I would like to see future adoption of mechanisms that allow the company to share information internally by organizing basic policies, quantitative plans and results, and evaluations and other analysis by fiscal year from FY2015 to FY2017 based on the Medium-Term Management Plan. I'm confident that this process would accelerate the basic policies of human resources management and cultivation of a robust organizational culture.

Second, although this report has been formatted in a way that is easy to understand for stakeholders by combining an overview of the company and its businesses with a survey of its CSR initiatives in a single document, I would like to see the Takuma Group respond to the contemporary trend toward publication of integrated reports by compiling a report that would give stakeholders pleasure by incorporating even more financial and non-financial information in a well-balanced manner.

Third, concerning the stakeholder dialogs, I would like to see the company organize discussions between experts and company officials and apply the results to action plans and other aspects of operations through internal meetings. Furthermore, I would recommend that the company broaden the scope of the dialogs to include regional and other experts with various areas of specialization, members of the mass media, users of various plants, and others in an effort to facilitate far-ranging dialog that will enable those participants to exchange views with Takuma representatives.

It is my hope that the Takuma Group will be able to contribute to the resolution of social issues and the sustained development of our society by integrating its core businesses with CSR management while valuing technology, people, and the Earth.

Response to the Outside Expert Opinion

Masashi Goto

Managing Executive Officer
Executive Manager,
Compliance & CSR Promotion Div.
& Corporate Service Div.

I would like to thank Mr. Tanaka of the Business Ethics Research Center for offering his valuable insights on CSR Report 2015.

In 2007, we began publishing the CSR Report by reworking what had been our Environmental Report. This year's edition is the report's ninth, and most recently we have structured the content around an introduction of the Takuma Group's activities and initiatives based on ISO 26000. I am overjoyed to hear Mr. Tanaka's praise for this editorial approach.

We also worked to explain our 11th Medium-Term Management Plan, which began with this fiscal year, in a way that would be easy to understand for our stakeholders.

The new Medium-Term Management Plan's six basic policies include two new additions: human resources management and cultivation of a robust organizational culture. Mr. Tanaka offered three observations on how we might better accelerate implementation of those policies in the "Areas where Takuma can do more in the future" section of his opinion: (1) adopting mechanisms for sharing information internally, (2) publishing an integrated report that incorporates the Takuma Group's financial and non-financial information in a well-balanced manner, and (3) organizing dialog and discussions with a broad range of stakeholders and applying the results to action plans and other aspects of our operations. I am deeply grateful to him for identifying and encouraging direction for us to take in the future.

Our Corporate Vision is "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."

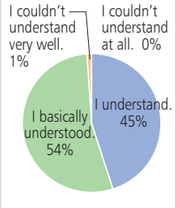
Energy technologies and environmental technologies comprise Takuma's DNA. For us to contribute to the sustained development of society by providing exceptional products and services created from those technologies, I believe that it will be important for us to continue a program of CSR activities that accords with our business characteristics, establish the PDCA cycle by listening seriously to the requests and expectations of society, and work to disclose information in an appropriate and careful manner. Going forward, I look forward to pursuing CSR activities that meet stakeholders' expectations while considering new possibilities such as the publication of an integrated report and asking what information we should communicate to stakeholders and how we can do so in a more easy-to-understand manner.

Finally, I would request the continued support and encouragement of customers, shareholders, investors, and everyone else who is involved with Takuma.

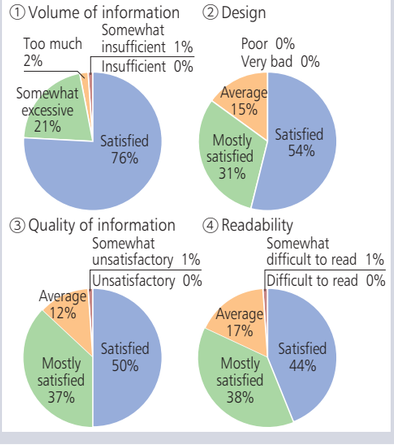
Takuma Corporate Profile & CSR Report 2014 Questionnaire Survey Results

Survey period: June 2014 to May 2015
Number of respondents: 782

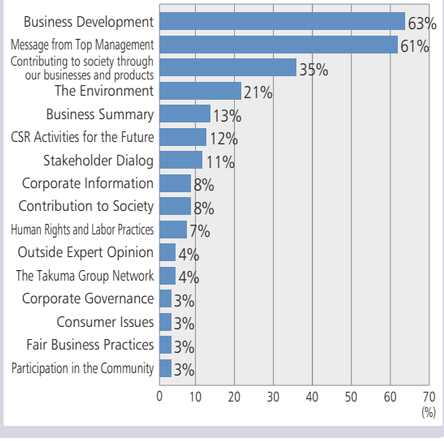
Q1. Did you understand the activities of our company?



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



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



TAKUMA CO., LTD.

2-2-33 Kinrakuji-cho, Amagasaki, Hyogo 660-0806, Japan
Website: http://www.takuma.co.jp/english/

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

■ Printing

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■ 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.

■ **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.

■ **Publisher and Contact for Inquiries**
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■ **Data Collection Period**
From April 1, 2014, to March 31, 2015, in principle.
In addition, some activities in FY2015 are included.

■ **Coverage**
Takuma Head Office, Business institutions, Harima Factory, and some group companies
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.; Taiden Environtech Co., Ltd.; and SIAM TAKUMA Co., Ltd.

■ **Time of Issue:**
Current issue: June 2015
Next issue: scheduled for June 2016
Last issue: June 2014