



Company Profile

BESTERRA CO., LTD
Securities code: 1433

Company Overview

Trade Name	BESTERRA CO., LTD A compound word of Best and <i>Terra</i> (Earth in Latin)
Business Description	Plant demolition work and other related business
Office Location	Head Office: 4-24-3 Kotobashi, Sumida-ku, Tokyo Chiba Office: 1969-52 Yawatakaigan-doori, Ichihara-shi, Chiba West Japan Office: 3-10-27 Minamiteshiro-cho, Fukuyama-shi, Hiroshima
Established	February 20, 1974
Capital	¥412,505,300 (as of the end of January 2017)
Representative Director	Yoshihide Yoshino
Number of Employees	52 people (as of the end of January 2017)

Company History



®

Sep. 2015 - Listed on the Tokyo Stock Exchange: Mothers ●

Jan. 2015 - Starts *3D Measurement Service* specialized in plant structure measurement ●

Jan. 2013 - Starts *Staffing Agency* to solve labor shortage ●

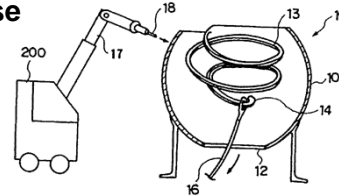
Apr. 2010 - Develops melt-cutting Robot, *Apple☆Star* ●



● Sep. 2007 - Patents *Boiler Disassembling Method* for thermal power plants, etc.

● Nov. 2004 - Receives Special Construction Business License

● Jul. 2004 - Patents *Apple Peeling Method*



● Feb. 1974 - Establishes *BESTERRA CO., LTD*
Receives Ordinary Construction Business License



The head office building



Business Concept (Fundamental concept)

1

Builders cannot demolish

We started saying "No!" to the false belief that demolishing is the opposite of building. Not merely reversing the building process, we view plant demolition from an entirely new perspective. Additionally, we verified our ideas through actual demolition work and established new techniques and methods. We patented these methods.

2

A unique company specialized in plant demolition

We specialize in the plant demolition of steel structures, which requires advanced techniques. For about 40 years we have undertaken the business of plant demolition, such as steel manufacturers and power, gas, and oil plants, which demand a high level of safety.

We have accumulated experience in environment-related work to take measures against specified chemical substances like PCB, asbestos, dioxin, and soil pollution, which is virtually mandatory for plant demolition work.

As a leading company for demolishing heavy plants, a Japanese key industry, we respond to social needs, fulfill our responsibilities, and work toward social contributions.

Corporate Philosophy, Code of Conduct

Corporate Philosophy

We will contribute to the global environment with flexible thinking, creativity, and techniques utilizing these concepts.

Code of Conduct

We fulfill our professional responsibilities.

We always create new techniques. With the mottos "*Safety is the topmost priority*" and "*Faster, cheaper, and safer,*" we will provide those techniques and further comfort to customers.



Gas holders
(apple peeling method)

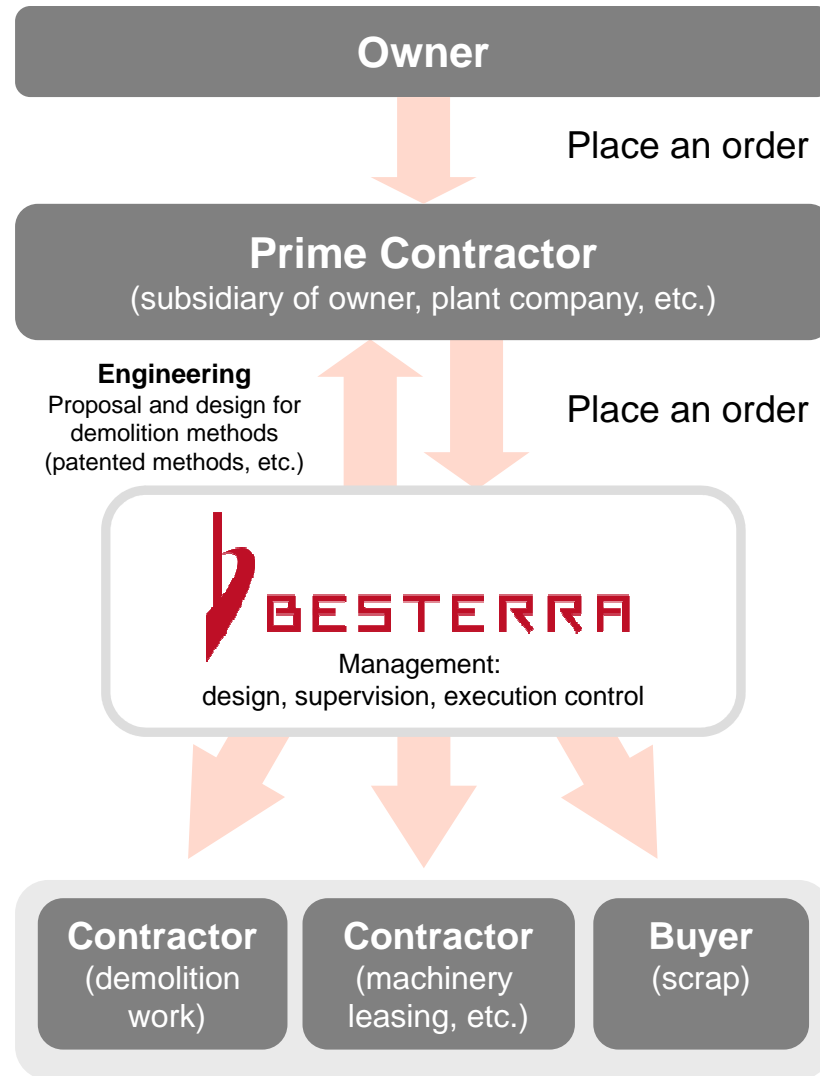


Thermal power plant
(apple peeling method)

Business Model (Business system diagram)

- 1 Role of the core in large plant demolition:
Engineering (proposal, design, plan execution)
Management (supervision, control execution)
- 2 Contractors conduct demolition tasks and BESTERRA mainly supervises and manages worksites.
- 3 Our core competence is providing methods and techniques for plant demolition.

(Management by not-owning)
We do not possess heavy machinery or a workforce.
→ Avoiding risk of holding assets
We do not buy materials or make production deals.
→ Avoiding risk of holding stock



Our Strengths

1

Good customer base

We have developed a good customer base centered on engineering subsidiaries of big companies, such as steel manufactures and power, gas, and oil plants.

2

Efficient demolition management based on abundant work experience

We provide *plant demolition total management* based on about 40 years of experience. The entry barriers are high because of the work inside the plants.

3

Intellectual property, such as patented methods

A variety of techniques and know-how rooted in environmental countermeasures are explicit and implicit intellectual property strengths.

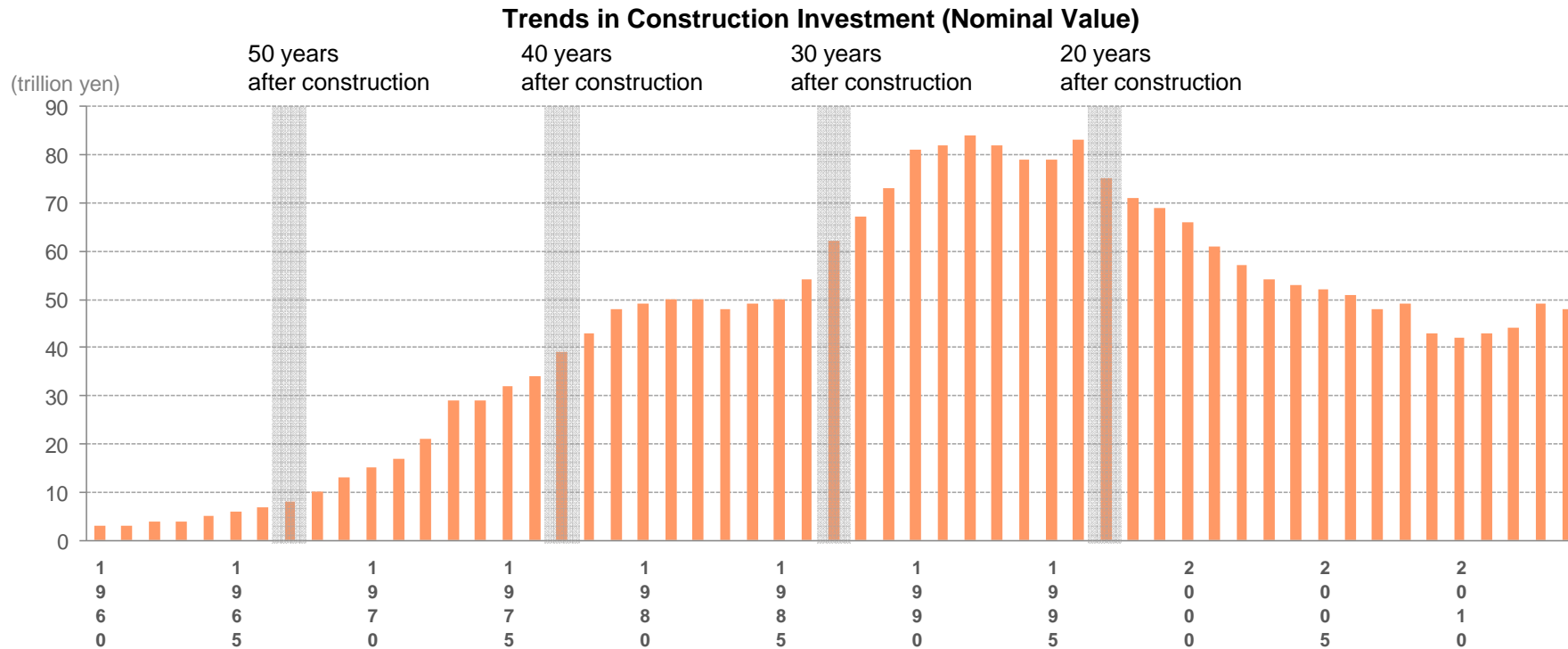
Highly important intellectual property is a good number of patented methods that no other demolition companies can match (14 granted patents, 5 pending patents).

We also have copious knowledge about recycling waste materials.

Trends in Construction Investments (Increase in demolition and update demands)

The ratio of facilities more than 50 years old will increase rapidly in 30 years.

- Plants built during and after the rapid growth period of the 1960s will rapidly deteriorate.
- Restructuring will increase, such as company consolidation and overseas transfers, to enhance competitiveness.
- Investigating and managing all facilities is necessary because aging facilities are not understood.



Source: MLIT, FY2014 "Estimate of Construction Investment"



Government Policy for the Plant Industry

The government is also promoting consolidation and restructuring in the plant industry toward efficiency.

1

(Government policies)

Enforcement of the Industrial Competitiveness Enhancement Act and Act on the Promotion of Use of Nonfossil Energy Sources and Effective Use of Fossil Energy Materials by Energy Suppliers (elimination of surplus capacity)

For business consolidation and updates to new energy, the government has decided on a variety of policies, such as subsidies. Demands for plant demolition and updates are expanding.

Increase in subsidies for energy use streamlined business operators

¥41 billion in FY2015 to ¥51.5 billion in 2016 (budget base)

Expansion of plant demolition market (BESTERRA's field of expertise)

2

(New license classification in the construction business)

Demolition work is a newly established license classification in the construction business


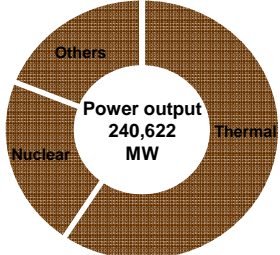

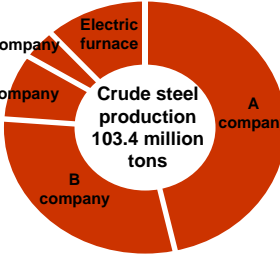
MLIT reviewed the license classification for the first time in 43 years.

Demolition work became a professional business and now a license is necessary to conduct demolition work of 5 million yen or more per job.


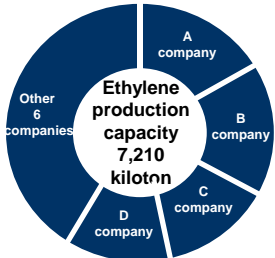
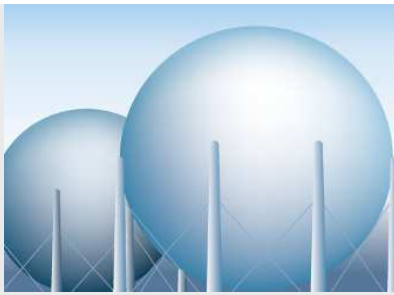
* This rule is sequentially enforced, taking three years from June 2016. Consequently, the safety execution management system of demolition work will be strengthened.

Higher quality is required for demolition work and it is expected that BESTERRA can take further advantage of its strengths

Trends in the Plant Industry (Power, steel manufacturing)

Power		Topics	<p>Power deregulation: Full deregulation of entry into the retail business</p> <p>Nuclear power plant: Decommissioning of Mihama, Genkai and Tsuruga reactors</p> <p>JERA: Joint venture between TEPCO and Chubu Electric Power based on a comprehensive alliance</p>
	<p style="background-color: #c0c0c0; padding: 5px; font-weight: bold; font-size: 24px;">Market size</p> <p>About 13.6 trillion yen (according to our estimates)</p>	 <p>Source: ANRE, Survey of Electric Power Statistics</p>	<p>Thermal: The number of approved and notified plants (output of which is 1,000 kW or more) is 185. The total output is 143,286 MW.</p> <p>Nuclear: The number of plants is 59, including those under decommissioning and demolition. The total output is 51,103 MW.</p> <p>Others: 46,233 MW, including hydroelectric, wind, and solar power</p>
Steel manufacturing		Topics	<p>JFE Steel: Kawasaki Steel x NKK</p> <p>NSSMC: Nippon Steel x Sumitomo Metal Industries</p> <p>Acquisition of Nisshin Steel as a subsidiary</p>
	<p style="background-color: #c0c0c0; padding: 5px; font-weight: bold; font-size: 24px;">Market size</p> <p>About 1.7 trillion yen (according to our estimates)</p>	 <p>Source: Each company's IR report</p>	<p>Blast furnace: The number of furnaces is 32. Crude steel production is 90.4 million tons.</p> <p>Electric furnace: The number of furnaces is 44. Production of normal furnaces is 8.8 million tons. Production of special steel is 4.2 million tons.</p>

Trends in the Plant Industry (Oil/petrochemicals, others)

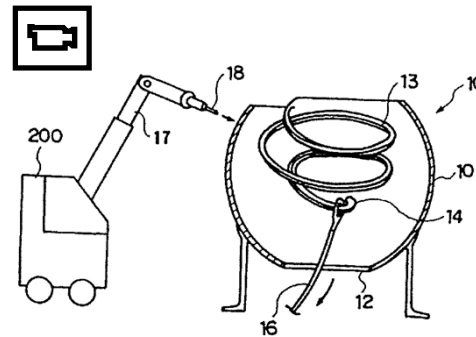
Oil/Petrochemicals		Topics	<p>Industry consolidation: JX Holdings x Tonen General Sekiyu Showa Shell Sekiyu x Idemitsu Kosan</p> <p>Shale gas boom: Partial suspension of domestic production in the chemical industry</p> <p>Complex: Physical and economic deterioration</p> <p>Mitsubishi Chemical HD: Mitsubishi Chemical x Mitsubishi Plastics x Mitsubishi Rayon Mitsui Chemicals: Mitsui Toatsu Kagaku x Mitsui Petrochemical Industries</p>
	<p style="font-size: 24px; color: white;">Market size</p> <p>About 28.5 trillion yen (according to our estimation)</p>	 <p style="font-size: 12px;">Source: METI Statistics 2012</p>	<p>Refinery: The number of refineries is 23. The capacity is 5,792 (thousand barrels per day).</p> <p>Petrochemicals: 14 complexes. The ethylene production capacity is 7,210 kilotons.</p> <p>Others: Plants where the main product is not ethylene have not been counted.</p>
Others		Topics	<p>Paper industry: Oji HD (Oji Paper x Honshu Paper x Kanzaki Paper) Nippon Paper merged with Daishowa Paper</p> <p>Shipbuilding industry: Japan Marine United (Universal Shipbuilding x IHI Marine United)</p> <p>Cement industry: Taiheiyo Cement (Chichibu Onoda x Nihon Cement)</p> <p>Electric industry: Mitsubishi Hitachi Power Systems (business integration between Mitsubishi Heavy Industries x Hitachi) Streamlining the home electronics business of Sharp, Toshiba, etc.</p>

Competent Demolition Methods

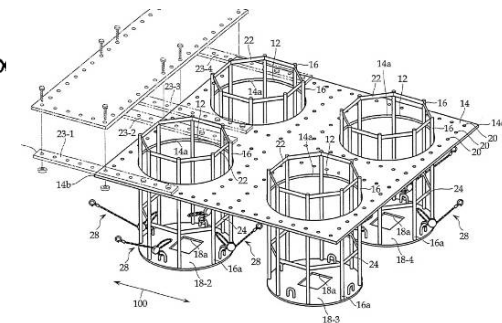
(1) Patented demolition methods

We propose demolition methods with competitive patents and put them into practical use.

Granted patents	Pending patents
Dismount method of large-sized tank by cutting the same and jack mechanism employed therefor	Aggregate stack demolishing scaffold apparatus and method for demolishing aggregate stack using the apparatus (international application)
Method for cutting and disassembling a large globular-shaped storage tank (apple peeling method) *Fig.1	Method for disassembling a large storage tank (improvement patent on apple peeling method)
Method for disassembling a cylindrical structure, and equipment	Method for pushing down a wind power generation windmill (international application)
Scaffold equipment for disassembling a stack, and method for disassembling a stack using the equipment *Fig.2	Method for disassembling a boiler
Method for disassembling a boiler	Joint application/Pending patents
Method for disassembling a boiler and a support structure	
Method for pushing down a regenerative furnace of air heating furnace	Multiple mobile robots for magnetic adsorption vehicle (Robot Gunryu)
Method for pushing down a steel tower supported stack structure	
Method for disassembling a boiler	
Method for disassembling a boiler	
Method for cutting and disassembling a large storage tank	
Method for disassembling a large storage tank	
Method for disassembling a goliath crane	
Method for disassembling an H-steel support system and a building using the system	



* Fig.1 Method for cutting and disassembling a large globular-shaped storage tank (apple peeling method)



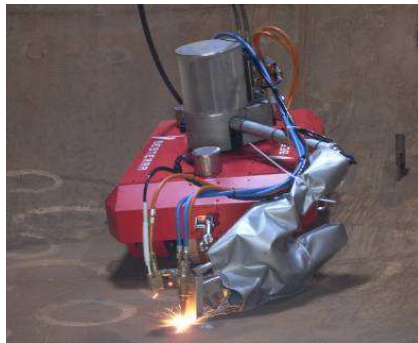
* Fig. 2 Scaffold equipment for disassembling a stack, and method for disassembling a stack using the equipment

Competent Demolition Methods

(2) Robot demolition methods

We develop melt-cutting robots for further safety and have been accumulating work experience.

- Expansion of usage by developing new attachments to *Apple ☆Star*
- Development of auto recognition robots through collaborative study with Kyoto University and Yamaguchi University



Apple ☆Star



Gunryu



Competent Demolition Methods

(3) Environment-related demolition methods

We have expertise in **fireless and quasi-fireless methods** for outdoors or indoors. We are able to execute cutting and slicing.

We are able to cut a thickness beyond common practice in the industry by preventing motor seizing and by recycling blades.



Establishment of Three Major Business Domains

We expand our services to plant demolition related fields and aim to strengthen plant demolition total management (providing strategic asset management).



Plant Demolition Business



BT STAFF

Staffing Agency



3D Measurement BIM/CIM

Why We Do 3D Measurement Business in Plant Demolition

It is projected that in the future systems with 3D data will be required for the efficient management of plant facilities.

1

(3D digitization of updated paper data)

Most of the plants designed at the time of construction during the rapid growth period (several decades ago) are managed with paper data during demolition and renovation.

In most cases, the present status of the facilities and the paper data differ because of many years of renovation and aging.

2

(Visualization and sharing by 3D digitization)

We digitize the target plant facilities in 3D, visualize and share them with the head office of customers, the head offices of contractors, and the worksite offices, which allows us to improve the safety and efficiency of the demolition work.

3

(New value creation by IoT x Demolition)

We compile a database (using cloud computing) of all plant facilities' 3D data and unify the management of 3D point cloud data, 3D CAD data, design book data, images, videos, and 2D CAD data, centered on GIS (Geographic Information System), the database which enables the total management of plant facilities.

At the same time, we proceed with developing autonomous operation robots that move in accordance with preset 3D data.

Perfect 3D, 3D Demolition

Five Step Action Plan in the 3D measurement business

IoT x Demolition

Creation of new social value

Facility measurement



3D measurement modeling

Data processing of 3D measured point cloud by a high performance scanner and modeling to 3D CAD data


Application measurement



Perfect 3D

Batch 3D measurement of existing facilities by aerial laser, MMS, ground laser and underwater sonar

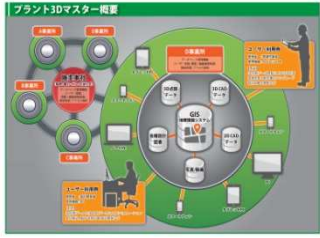
Demolition/renovation



3D demolition

Demolition/renovation simulations to improve decision making procedures in the process of work

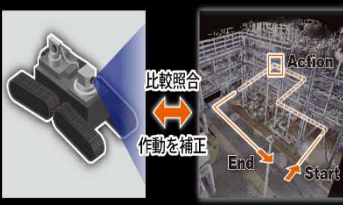
Compilation of the database



Plant 3D master

Cloud-based integrated management system of plant facility information

Information measures



3D point cloud Map robot

Automatic operation by IoT (plant monitoring, management)/autonomous operation robots

**Measure
(see)**

**Execute
(demolish)**

**Manage
(IoT, automation)**

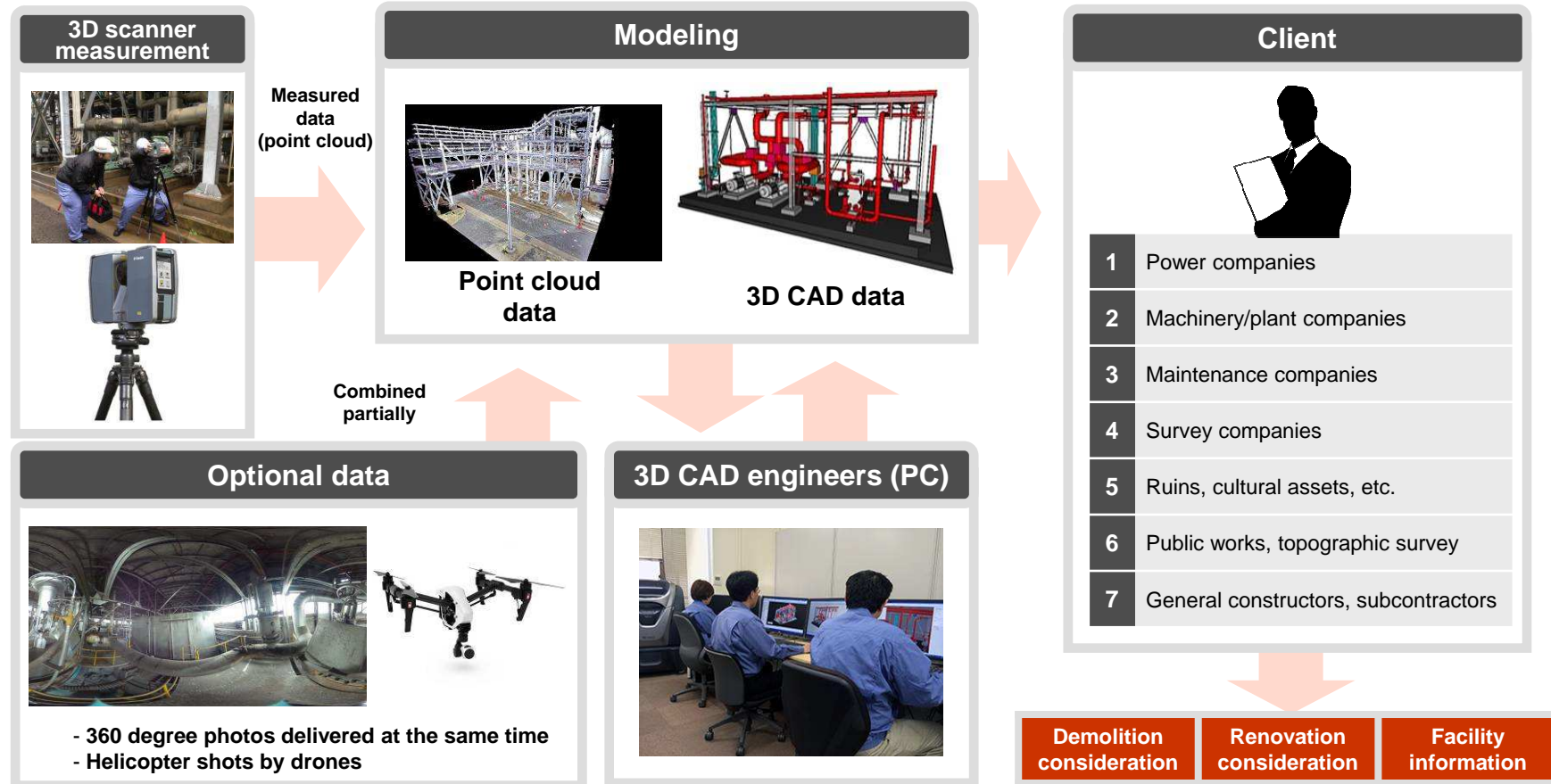


<Step 1> 3D Measurement, Modeling

Overview of 3D Measurement Business



We convert paper data from the time of construction (30 years ago or older) into cutting-edge 3D data, defying conventional wisdom in the demolition industry.



<Step 2> Perfect 3D

Perfect 3D Digitization from Air, MMS, Ground, and Sea



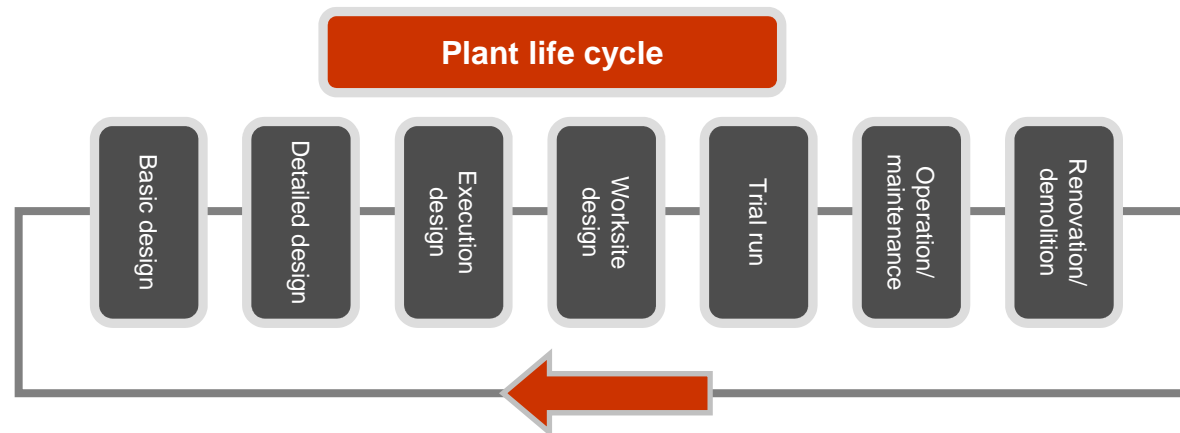
(1) Batch measurement of different types of 3D information

- Aerial laser
- MMS*(on-board/traveling type laser measurement)
- Ground laser
- Harbor sonar

(2) Providing comprehensive 3D information of plants

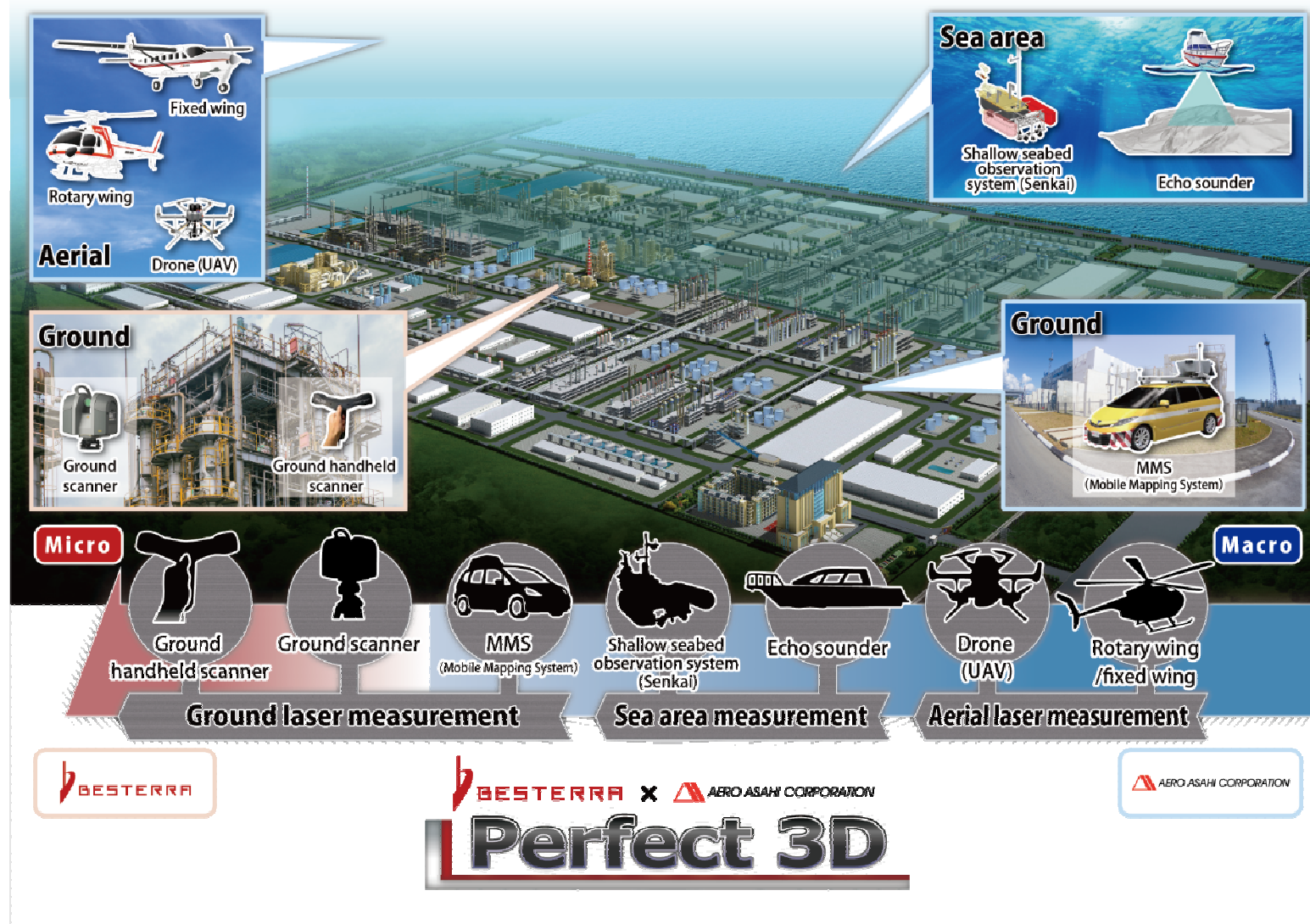
3D digitization of facility information that became complicated because of many years' renovations and aging

(3) Aggressive entry to plant life cycle management



* MMS: A system to gather live 3D data by mounting a scanner on a car (Mobile Mapping System)

<Step 2> Perfect 3D Conceptual Drawing



<Step 3> 3D Demolition (Demolition work based on 3D measured data)

Demolition Work with *Visualized Process*



(1) Visualized execution process

- Visualized collision points of heavy machinery and visualized places subject to environmental countermeasures
- Execution of demolition simulations and sharing of the results
- Systemization of demolition procedures and its manualization

(2) Improved communication skills with customers and safety management

- Reduced miscommunication between worksites and the head office by visualization
- Sophisticated and clear work instructions



Cutting-edge 3D scanners
and equipment



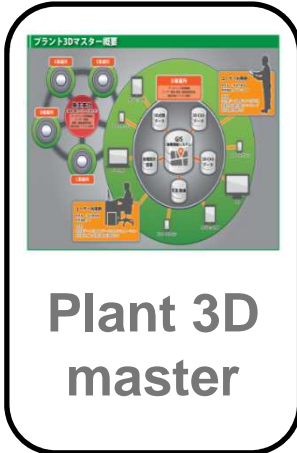
Measuring



Point cloud data

<Step 4> Plant 3D Master (Database of 3D information)

Unified Management of Individual Plant Facility Data Using Cloud Computing

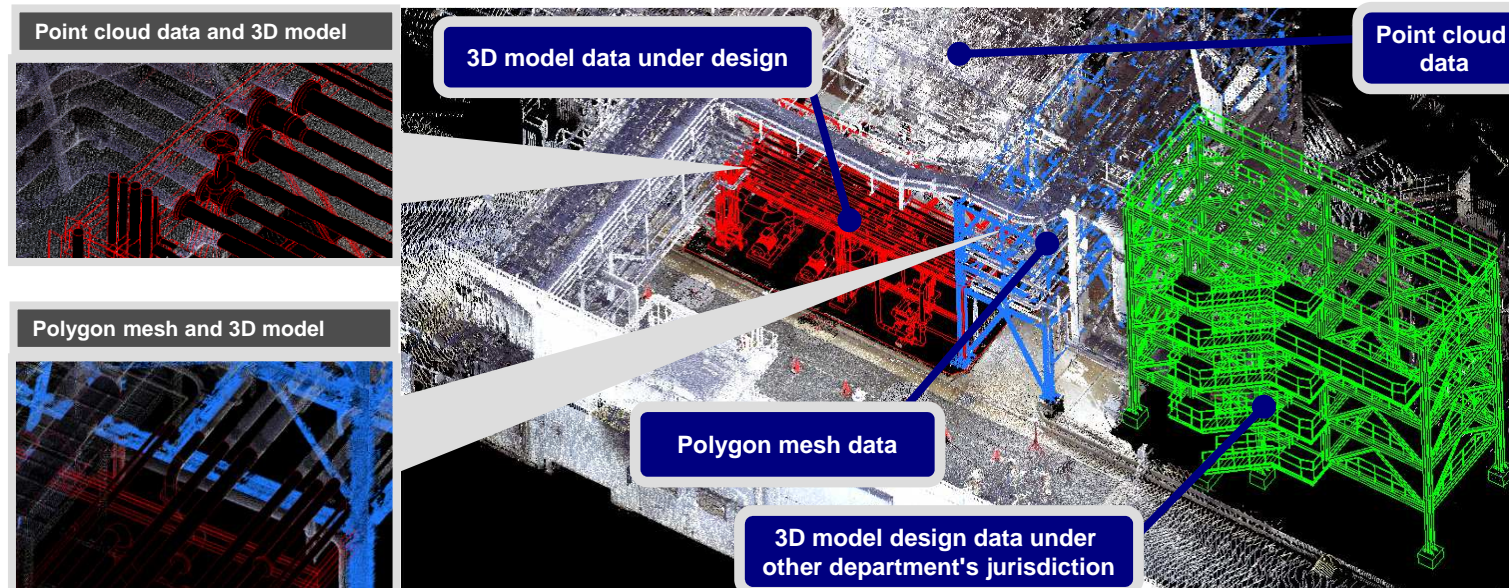


(1) Unified management of plant facility data by cloud computing

- Shared data management between plant worksites and the head office

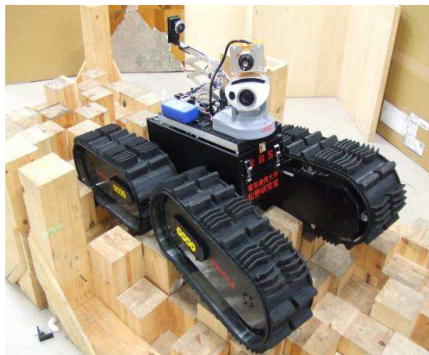
(2) Intuitive data management by maps

- Grasping all plant facilities by embedding 3D model data of individual facilities into plant point cloud maps
- Browsing and editing at the worksite by tablets (two-way, real time)
- Using a database for project management



<Step 5> 3D Point Cloud Map Robots (Autonomous operation robots)

Realization of Automatic Plant Monitoring and Information Measures



Reference: Matsuno Lab
KOHGA2&KOHGA3

(1) Automatic operation by IoT

- Realization of SLAM* (autonomous traveling by self position recognition and mapping)

(2) Operation on the 3D point cloud map

- Autonomous operation within a closed space, combining 3D point cloud maps with SLAM technology

(3) Automatic plant monitoring

- Continuous data gathering along the route on the 3D point cloud map
- Transferring gathered data to plant 3D master
- Sounding an alarm on abnormal data beyond the prescribed value

(4) Information measures

- Programming demolition simulation data on the 3D point cloud map
- Autonomous demolition by the robot equipped with attachments

* SLAM: Technology where a robot recognizes the positional information of itself and its surroundings and moves autonomously while mapping the environment where it is placed.

<Reference> 3D Point Cloud Map Robot Operation Image

1 Programming of autonomous moving and working robots
 Input the workplace and basic route and indicate tasks.

Operating program

- Executes demolition actions such as cutting
- Moves toward target positions using the 3D point cloud map
- Goes back to the designated position and finishes

Reference image of working robot

2 Autonomous moving and working based on computer vision
 Avoids obstacles detected by computer vision along the basic route on the 3D point cloud map and executes tasks autonomously.

Perspective information from a visual sensor

Input 3D point cloud map

Cases of use

- Automatic plant monitoring**
By comparing perspective information gathered by a visual sensor with the 3D point cloud, it adjusts its behavior in real-time.
- Automatic execution of various tasks**
We aim toward autonomous monitoring and execution under circumstances where persons are not able to enter.
- Demolition of a nuclear power plant**

Profit Allocation Policy, Shareholder Return Policy

➤ Resource allocation policy against net income (guide)

(1) *Investment for future growth*

(2) *Internal reserve for strengthening business foundation*

(3) *40% of profit is returned to shareholders (dividend)*

Growth investment	Equipment investment	(robots, 3D measurement equipment)	} Reasonable allocation ratio
	R&D investment	(method development, robot development)	
	System investment	(3D systems, BIM/CIM)	
	Strategic business investment (M&A, etc.)		

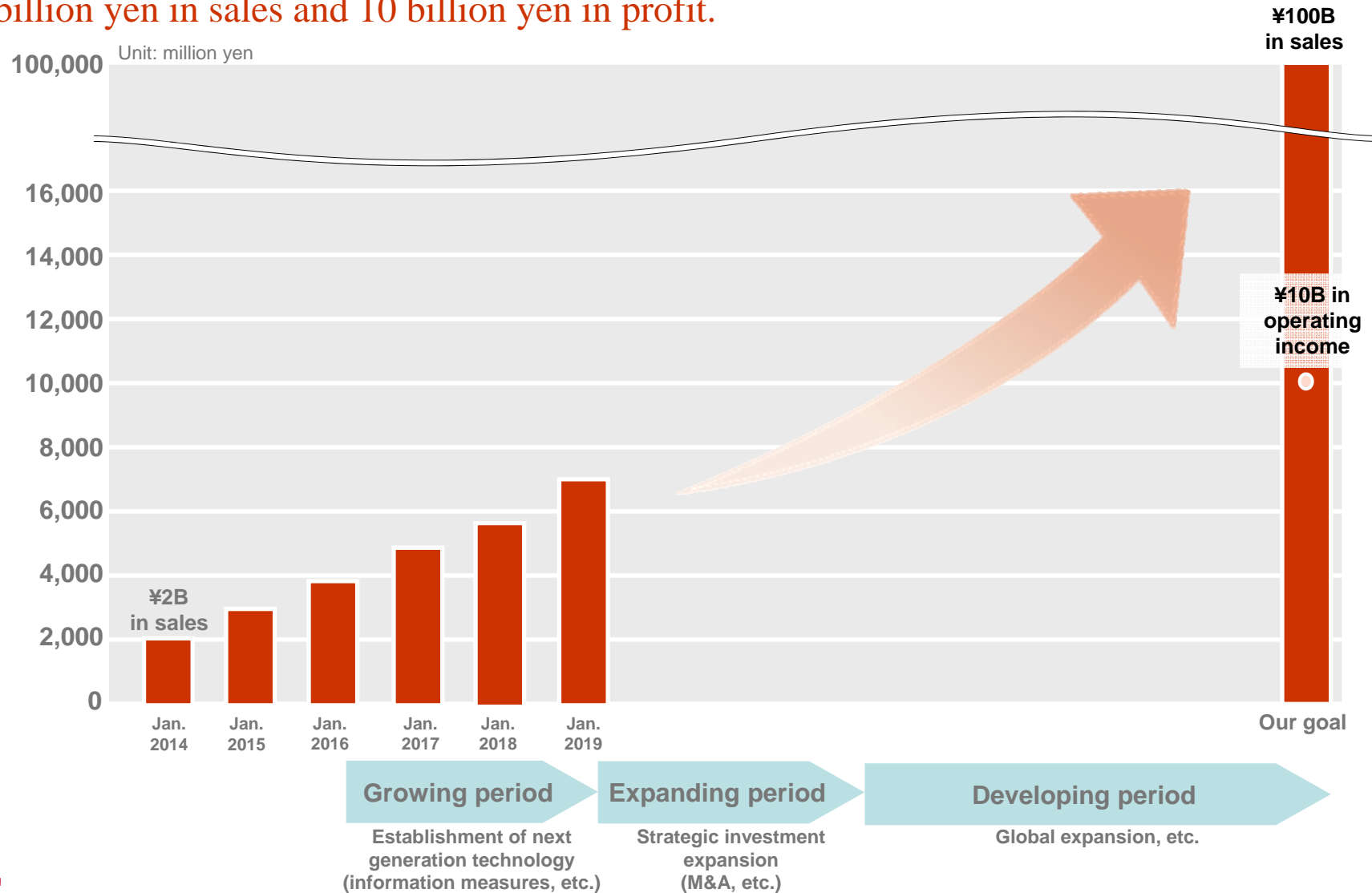
■ We aim to improve shareholder value by improving the company value.

■ Guide of dividend payout ratio is 40%.

■ We will develop an environment where shareholders can easily invest.

Long Term Mission: Our Goal

We will provide innovative technology to the plant demolition industry and aim at 100 billion yen in sales and 10 billion yen in profit.



Important Notice about this Document

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