



**Introduction of
EBARA Corporation,
Building Services & Industrial + Infrastructure
Company**

**FY2026 Pacific Island Countries Waterworks
Workshop, Palau Island**

**Looking ahead,
going beyond expectations**
Ahead > Beyond

Background (Yap Chin Foo)

1. Long History with Ebara Engineering Singapore Pte Ltd from Project Engineer to Director from 1988 till to date
2. Water and waste water treatment engineer background before taken up responsibility in machinery division
3. Completed at more than 38 projects in the past years.
4. Education: M Sc (Environment) NUS and B Eng (Chemical Engineering) NUS
5. Looking after FMD from 2002 till now.
6. Professional affiliates : MIES (Member of Institute of Engineer Singapore)
EES (Environment Engineering Society of Singapore)

Contents

- 1. EBARA Corporation**
- 2. BS&I Group**
- 3. Infrastructure Company**
- 4. Our Products & Service**
- 5. Main Factories and Global Service Network**
- 6. Our Supply Records**

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Factory in Ebara-town, Tokyo founding place



Founder
Issey Hatakeyama



Dr. Ariya Inokutty

Beginning of EBARA's Challenge

EBARA was established in **1912** as a university venture to manufacture
“Inokutty type volute pump”

Founding Spirit “Passion and Dedication”



(Netsu to Makoto)

“Passion and Dedication” is the words that Issey Hatakeyama, the founder of EBARA Corporation, lived by.

Based on this Founding Spirit of EBARA, we contribute to society through high-quality technologies and services relating to water, air and the environment.

Founded in

1912



Paid-in Capital

¥79.8
Billion Yen



**EBARA Group's
Global Network**

116
Companies



Headquarters

Haneda 
Tokyo, Japan

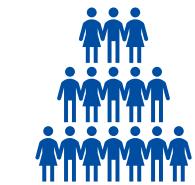
Revenue

¥680.8
Billion Yen



No. of Employees

19,095
Consolidated



(As of Dec.31, 2023)

History of EBARA's products



1912

Modernization of Japan

1945

Post-WWII Reconstruction
Japan's Economic Miracle

1980

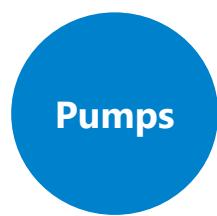
Development
of Information Society

2000

Search for Path to Sustainability

2020～

More Diverse and Inclusive Society



1912 Founded as
Inokuti Type
Machinery Office

1931 Completed first domestically produced rapid filter for waterworks

Water treatment plants

1961 Delivered first stoker-type refuse incinerator

Stoker-type refuse incinerators

Salt production plants

Chemical processing plants

1977 Delivered first fluidized bed incinerator for city refuse

Fluidized bed incinerators

1938 Completed first large-scale compressor

Compressors and turbines

1968 Began a technical alliance for compressors
with Elliott Company of the United States

1930 Completed first domestically produced turbo chiller

Chillers

1963 Received first order for absorption chiller

Fans

1921 Started production of fans

1958 Began promoting sales of standard pumps

Pumps

1968 Completed Japan's first feed water pump for super critical pressure

1982 Began to sell cryogenic pumps
developed and produced in-house

1990 Delivered the first plating system

Plating systems

1992 Delivered the first CMP system

CMP systems

1987 Commenced sales of gas abatement systems

Gas abatement systems

1986 Delivered first roots-type dry vacuum pump

Dry vacuum pumps

Target Market



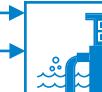
Solid waste
treatment



Oil and gas,
electricity,
new energy



Building and
industry
equipment

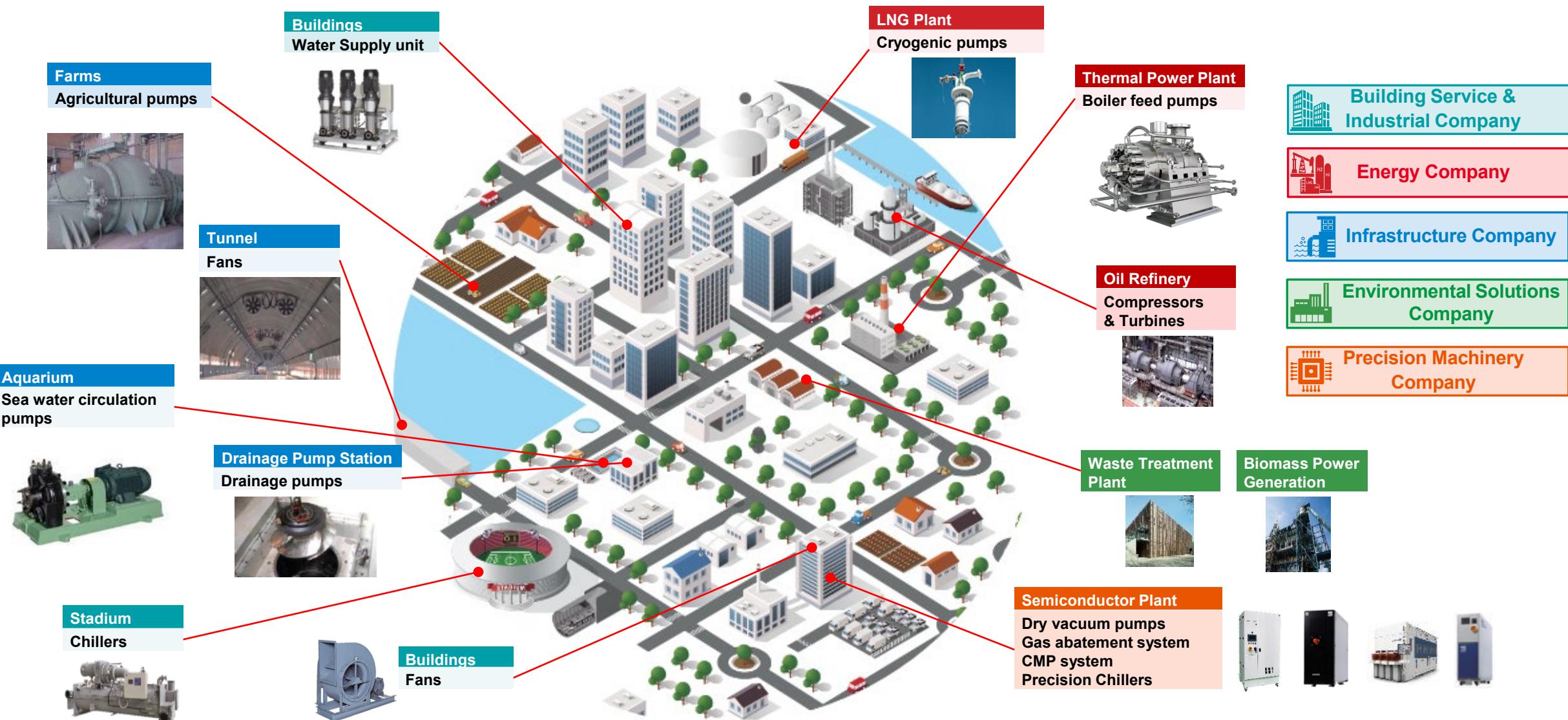


Water-related
infrastructure

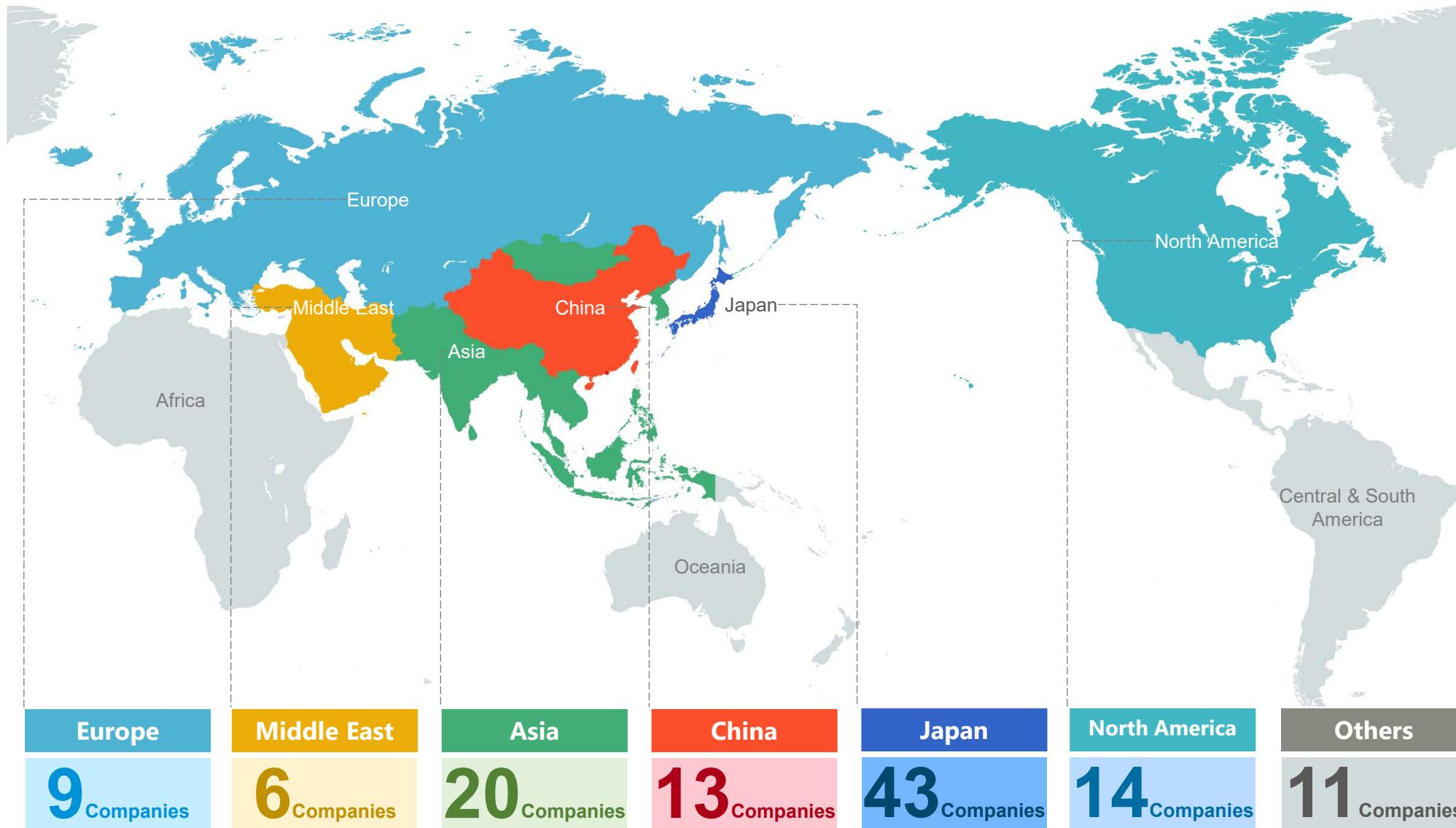


Semiconductor
manufacturing

Our Service, Products



EBARA GROUP – Global Network



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BS&I Group President



The Building Service & Industrial Company provides feedwater and air conditioning systems that are essential for daily life and business. Our standard pumps and cooling towers boast the highest domestic market share and are used in many residential apartments, factories, and commercial facilities across Japan.

Our products are now widely used overseas. The percentage of overseas sales grew to 55%, exceeding domestic sales. We are expanding our business hubs around the world, and as a company playing a central role in supporting the foundation of EBARA, we deliver water to people around the world.

We have set the goal of supplying water to 600 million people around the globe in E-Vision 2030, and we are working to achieve that goal. There are still areas in developing countries with underdeveloped water and sewage systems. A stable supply of water enables industry to grow, creating a comfortable life for local communities. We continue to take on new challenges to empower global industries to overcome barriers.

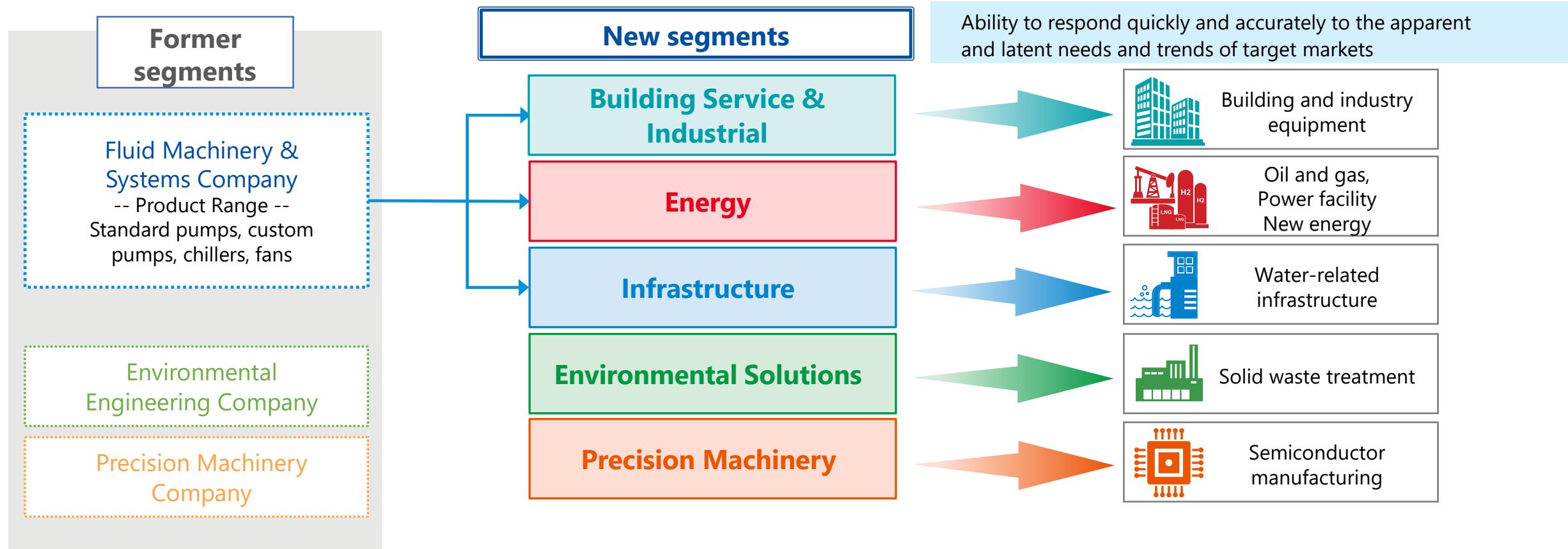
Superior quality and energy-saving technologies honed in Japan. Making what is standard in Japan, standard around the world. We believe that EBARA's technology, which has been honed over more than 100 years, will serve as the driving force to make the world a better place.

On the other hand, what is common in Japan may not always be applicable overseas. Land area, urban environments and climate. Different national characteristics and cultures require different values. For this very reason, we need to link such requirements with our technology from a customer perspective. We aspire to develop human resources who can provide products and services from undiscovered needs and establish new water and air standards around the world.

Setting a new standard for water and air that the world demands.

Our Business

To achieve more market-oriented, customer-driven value creation, we have shifted from a product-based organization to a target market organization.



FY22 Financial Results



EBARA's performance and each company's sales revenue

Revenue
680.8

Operating
Profit
70.5

OP Ratio
10.4%

(in billion yen)

Building Service &
Industrial

Revenue
Composition
29%

195.1



Energy

Revenue
Composition
21%

143.6



Infrastructure

Revenue
Composition
7%

44.6



Environmental
Solutions

Revenue
Composition
11%

73.7



Precision
Machinery

Revenue
Composition
33%

222.2



Looking ahead, going beyond expectations
Ahead Beyond



We provide a wide range of pumps blowers, chillers, and cooling towers that meet a wide variety of needs, such as water supply and drainage for daily life, heating and cooling of buildings and commercial facilities, air supply and exhaust air, transportation of various liquids, and cooling of production processes.

■ Main Target Market



Building Facilities

Industrial Facilities

■ Main Products & Service



Pumps

Standard pumps for use in buildings, condominiums, and other construction facilities.



Fans

Fans used for "ventilation" to send fresh air indoors or to let dirty air out.



Chillers

Chillers, cooling towers and related systems used in the heating and cooling systems of buildings and large commercial facilities.

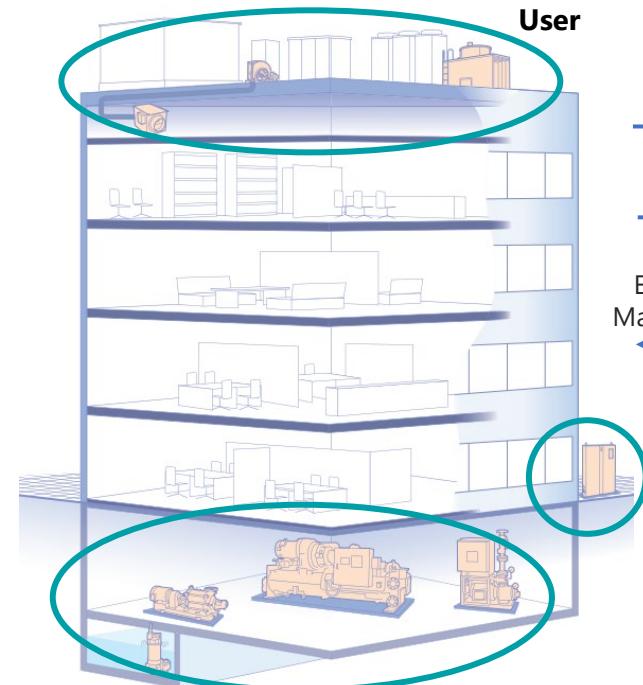
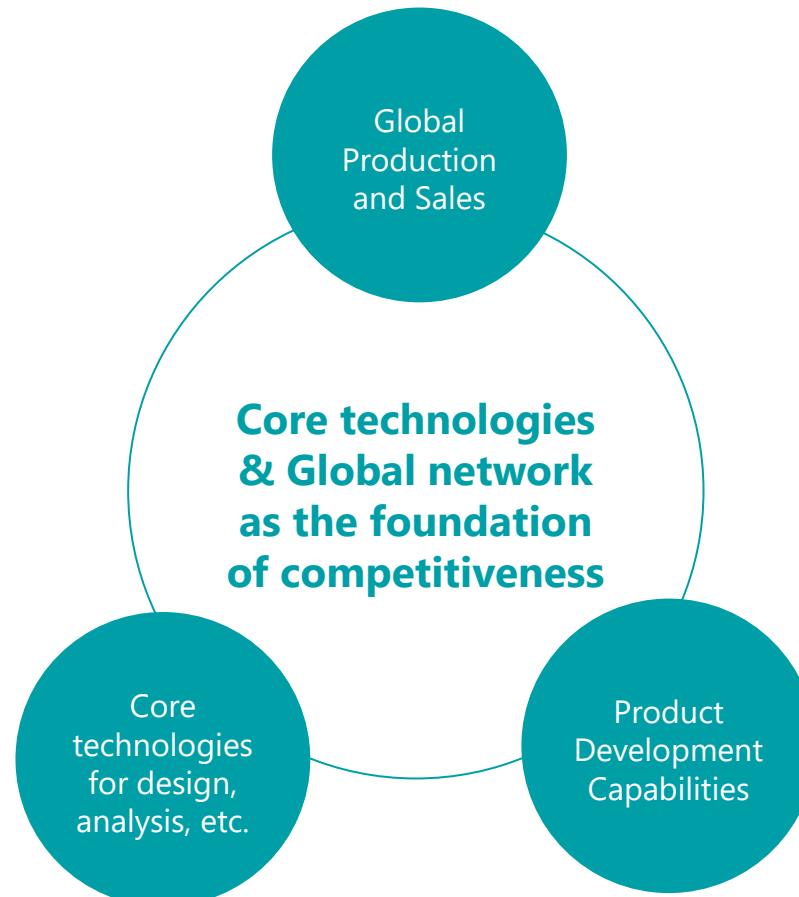
Looking ahead, going beyond expectations



Strengths of Building Service & Industrial Company



We provide comprehensive solutions by leveraging our broad product coverage



【EBARA Maintenance Cloud】

We provide after-sales services that customers can rely on, such as predictive failure diagnosis, fault location identification, and quick quotation and ordering through cloud computing, based on a wealth of products and technical capabilities.



⇒ we provide new solutions to solve customers' issues with our ability to make proposals across a wide range of product lines.

Looking ahead, going beyond expectations



**Standard Pumps
production volume
per year**

Approx. 1300K

**Standard Pumps
market share
in Japan**

No.1



**Chillers
market share
in Japan**

No.1



based on our research

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We provide comprehensive support from new construction to after-sales service, inspection and maintenance for infrastructure facilities such as pumping stations, sewage treatment plants, water purification plants, and tunnels.

■ Main Target Market Water infrastructure



■ Main Products & Service



Customized Pump

We provide river drainage pumps, rainwater drainage pumps for sewage systems, water transmission and distribution pumps for water supply systems, and waterlogging prevention and drainage pumps for agricultural use.



Fan

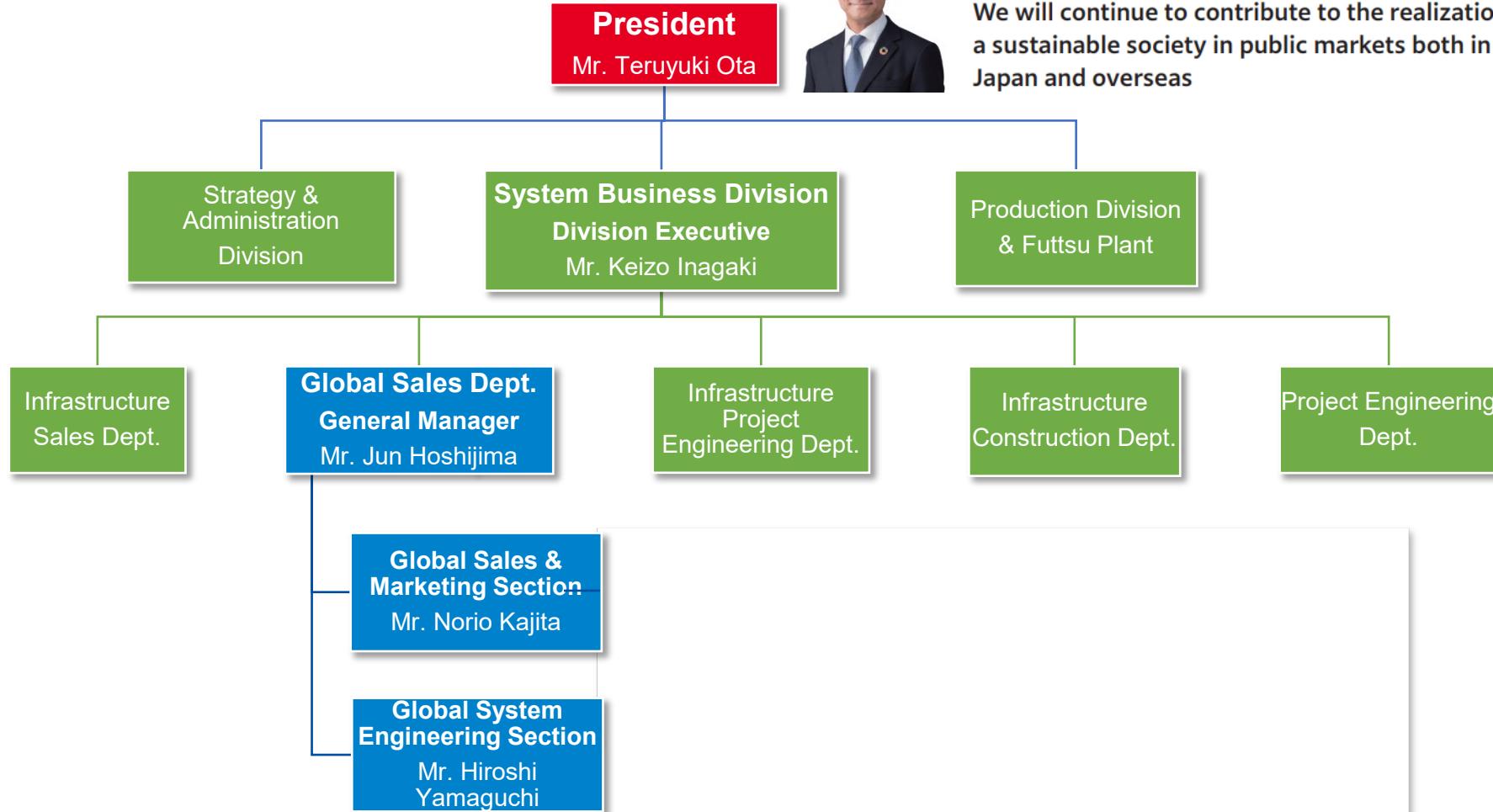
The environment inside the tunnel is monitored using data from measurement equipment, and optimal ventilation control is implemented to provide a safe environment for passing vehicles at all times.



Organization Chart of Infrastructure Company



We will continue to contribute to the realization of a sustainable society in public markets both in Japan and overseas



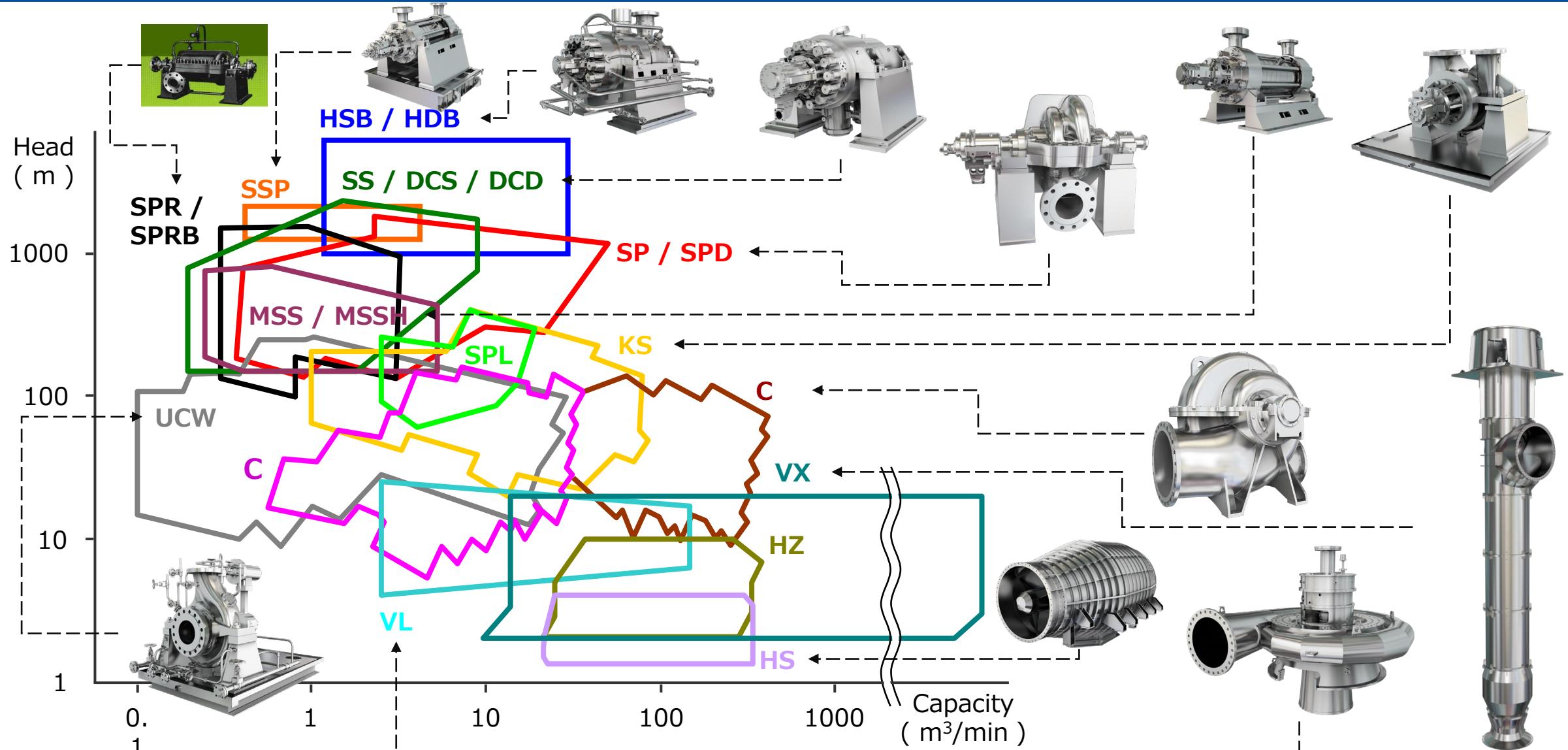
(As of Dec.31, 2023)

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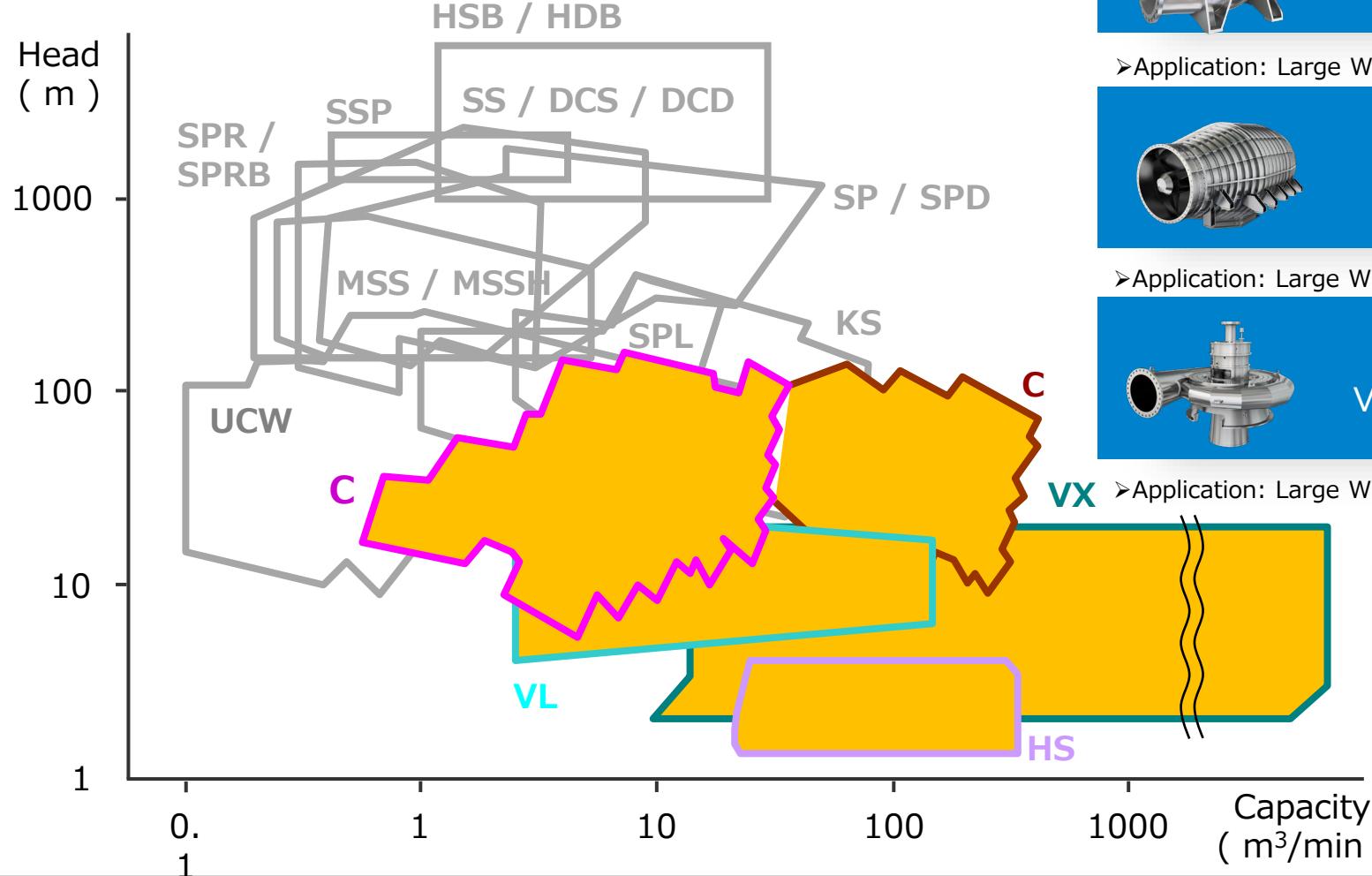


Typical Production Map - Customized Pumps



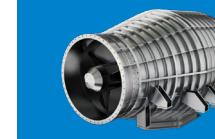


Customized Pumps for Water Infrastructure



CN/CW :
Horizontal Split-casing
Centrifugal Pump

- Flow : 80~36,000m³/h
- Head : 3~300m
- Temp. : ~120°C



HST/HDT :
Tubular Pump

- Application: Large Water Transfer Project, Rain & Sewage Water Drainage
- Flow : ~144,000m³/h
- Head : ~ 8m
- Temp. : ~60°C



VL :
Vertical volute pump

- Application: Large Water Transfer Project, Rain & Sewage Water Drainage
- Flow : ~270,000m³/h
- Head : ~ 150m
- Temp. : 80°C



VX :
Vertical Mix
Flow Pump

- Flow : ~90,000m³/h
- Head : ~100m
- Temp. : ~ 80°C
- Application: Large Water Transfer Project, Rain & Sewage Water Drainage



Truck pump

Fast and Easy
Drainage operation

Example of Working situation of Truck Pump mounting Super Light Pump for Disaster



High capacity



Flow capacity : 7.5m³/min/unit

Total head : 10m

Gross weight : 34kg(Without caple)

Light weight



Flow capacity: 5.0m³/min/unit

Total head : 10m

Gross weight: 21kg(Without cable)





Main Industrial Pumps for Water Infrastructure

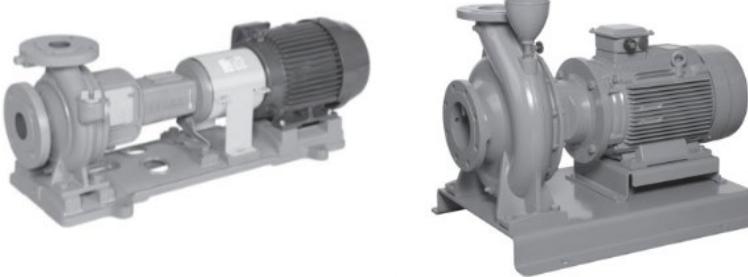


FS/IFW :

Single Centrifugal Pump

➤ Flow : 2.4~1,800m³/h

➤ Head : 2~150m



MS/MS420 :

Multistage Centrifugal Pump

➤ Flow : 1.2~270m³/h

➤ Head : ~ 300m



BHS :

Submersible pump for well

➤ Flow : 1.2~270m³/h

➤ Head : ~ 300m

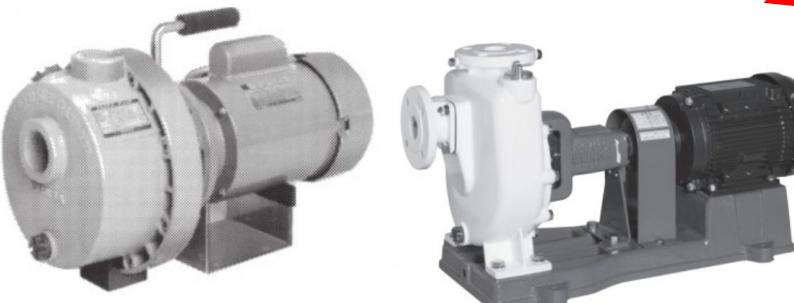


SQ/FPS :

Seawater pump

➤ Flow : 0.6 ~ 600m³/h

➤ Head : 2 ~ 60m



Production of
more than 1.1
million units
per year
worldwide



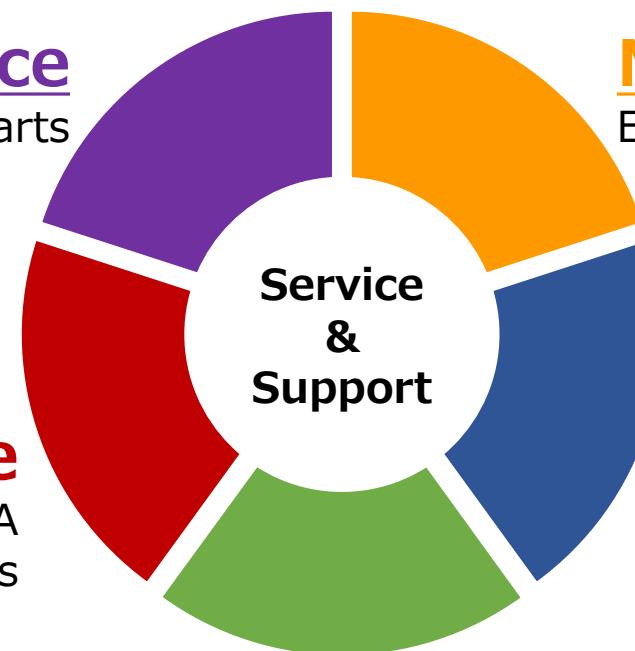
After installation and operation of the pumps, we understand the other key importance for a customer is **Service and Support**.

Spare parts Service

Genuine EBARA spare parts

Overhaul Service

EBARA and Non-EBARA pumps



Modification/Replacement

EBARA and Non-EBARA pumps

Technical Support

Technical Advisor for on-site inspection, commissioning and Training Services

LTSA Service

Long Term Service Agreement

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Our Mother Factory.
Fully customized design
up to any size



■ **Location:** Futtsu Town, Chiba, Japan

■ **Site Area:** 103,217m²

■ **Main Facilities**

- Power Receiving Capacity: Testing: 25,000kVA
General use: 5,000kVA

Machine Facilities

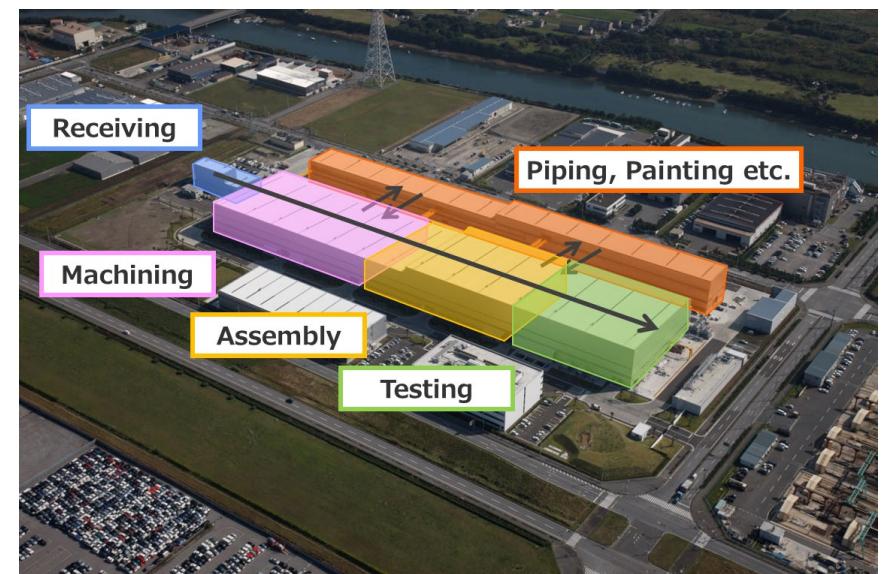
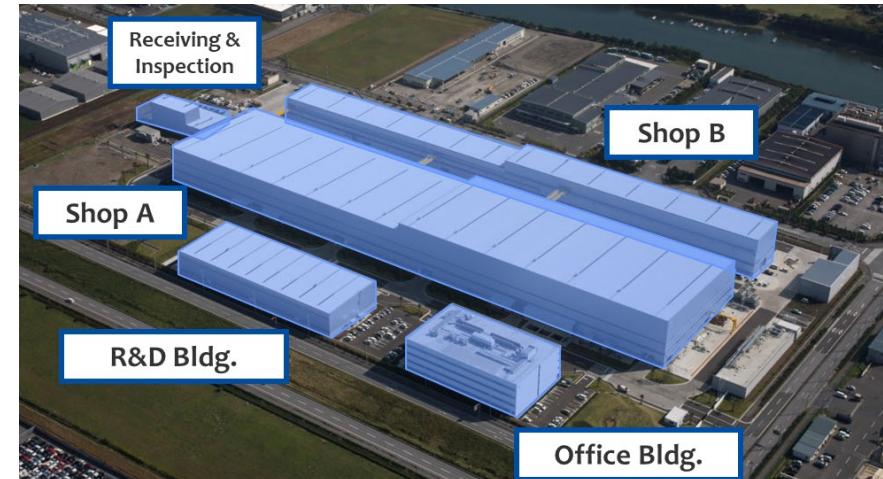
- Vertical Turning Machine: 11.5m(Dia) × 4.1m(H), 10tons
- Plano Miller: 3m(W) × 8m(L), 35tons

Assembly Facilities

- Ceiling Crane: 75tons
- Dynamic Balancing Machine: 10tons

Test Facilities

- Test Power Supply: 10,000kW
- Large Scales Pumps: Tests 4 pumps Simultaneously,
Max.22m³/s
- Hi-Pressure Pumps: Tests 2 pumps Simultaneously,
Max.4,595m³/h
- Medium Pressure Pumps: Tests 1 pump,
Max.110m³/min





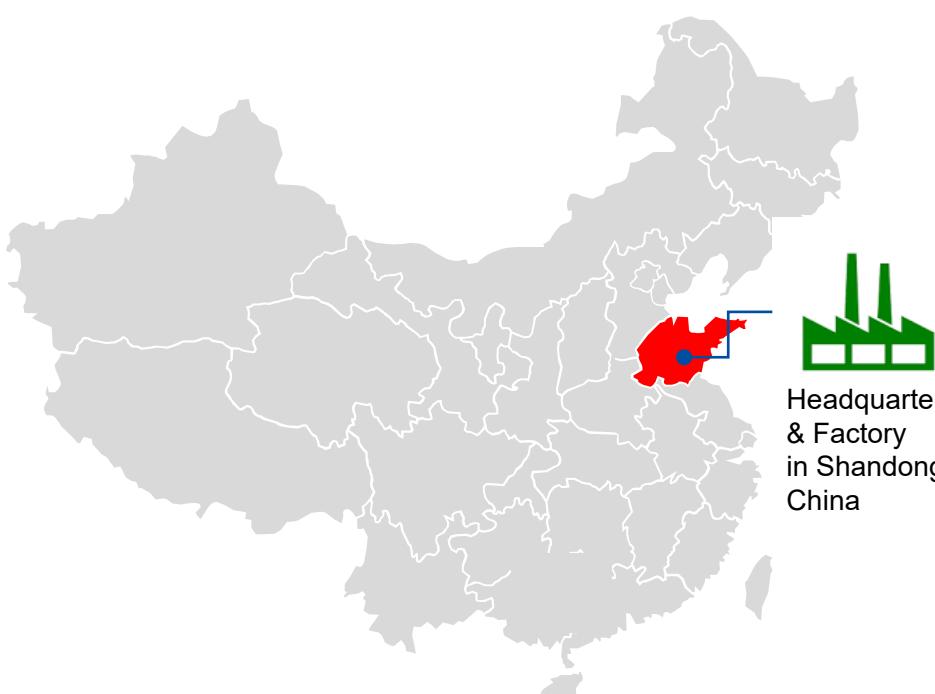
2005
Established



284 Million RMB
registered capital



500 (Resident Japanese 6)
Employees



Headquarter & Factory
in Shandong,
China

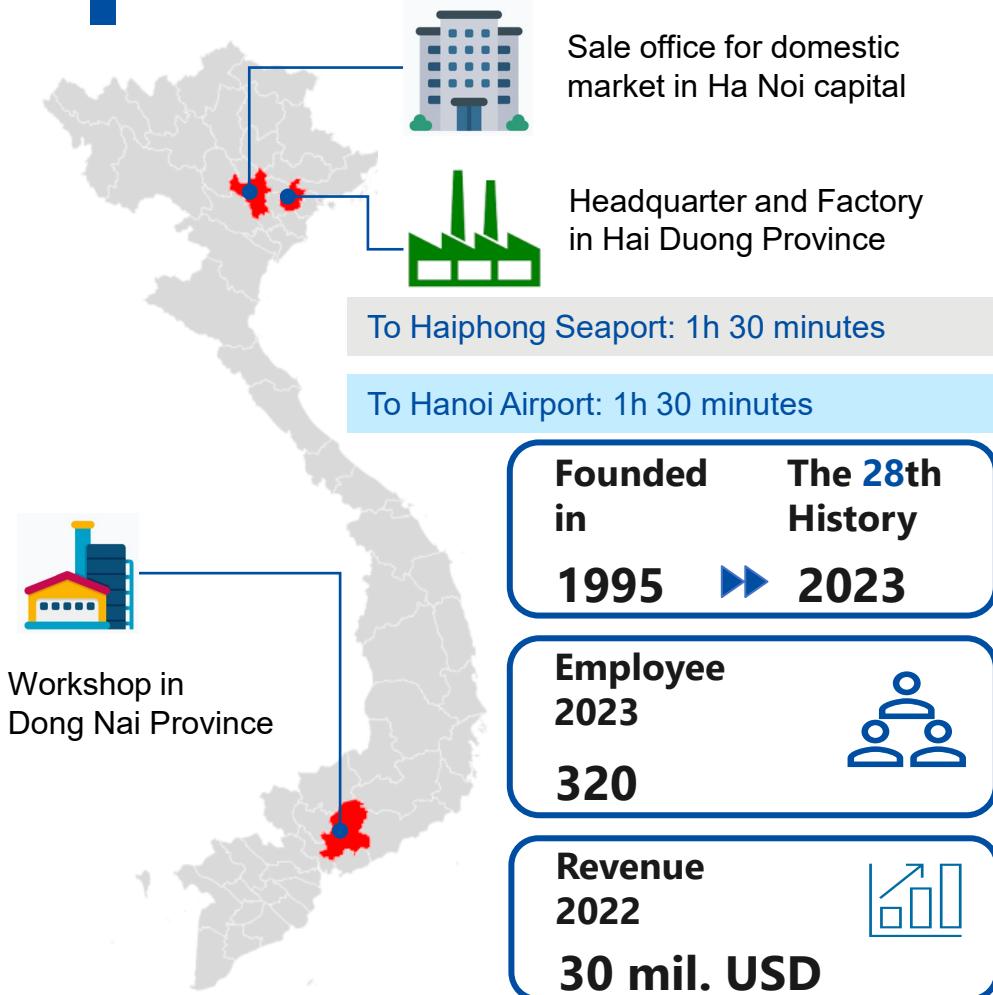
- 100% Ebara Corporation Share holding
- Total investment of Phase I & II 105.64 million USD
- Area: 68,000m²
- Business Scope: Customized pump, Large size pump , High pressure pump etc.



✓ Design hydraulic parts by using inverse design method and analysis flow pass parts	✓ Qualifications can guarantee to provide the most reliable products to our customers.	✓ Concept of product designing: To make the pumps according to customers' requirement.	✓ Full digitalized testing system, Automatic record system for vibration, noise and bearing.	✓ 365 days of comprehensive response with the emergency response mechanism.
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Overview



Service and Products



Treatment and Irrigation



Sewage



Drainage



Water supply



Dirty water



Chemical Industry



Pressure Boosting



Hot & cold-water circulation



EVPC also provide repair, maintenance, revert engineering services for not only EBARA pump products but also other pump manufacturers.



Head office
& Factory
In Jakarta



- Established 1980
- Total 500 employees
- Area: 51,000m²
- Business Scope: Manufacturing and Selling of Centrifugal pumps for various industries, Air conditioning equipment (Chillers, Cooling towers, etc.), Maintenance and management services.

Service



Building Infrastructure



General Industry



Power Plant



Water Resources



Cooling System



Global Service Network of EBARA Factories

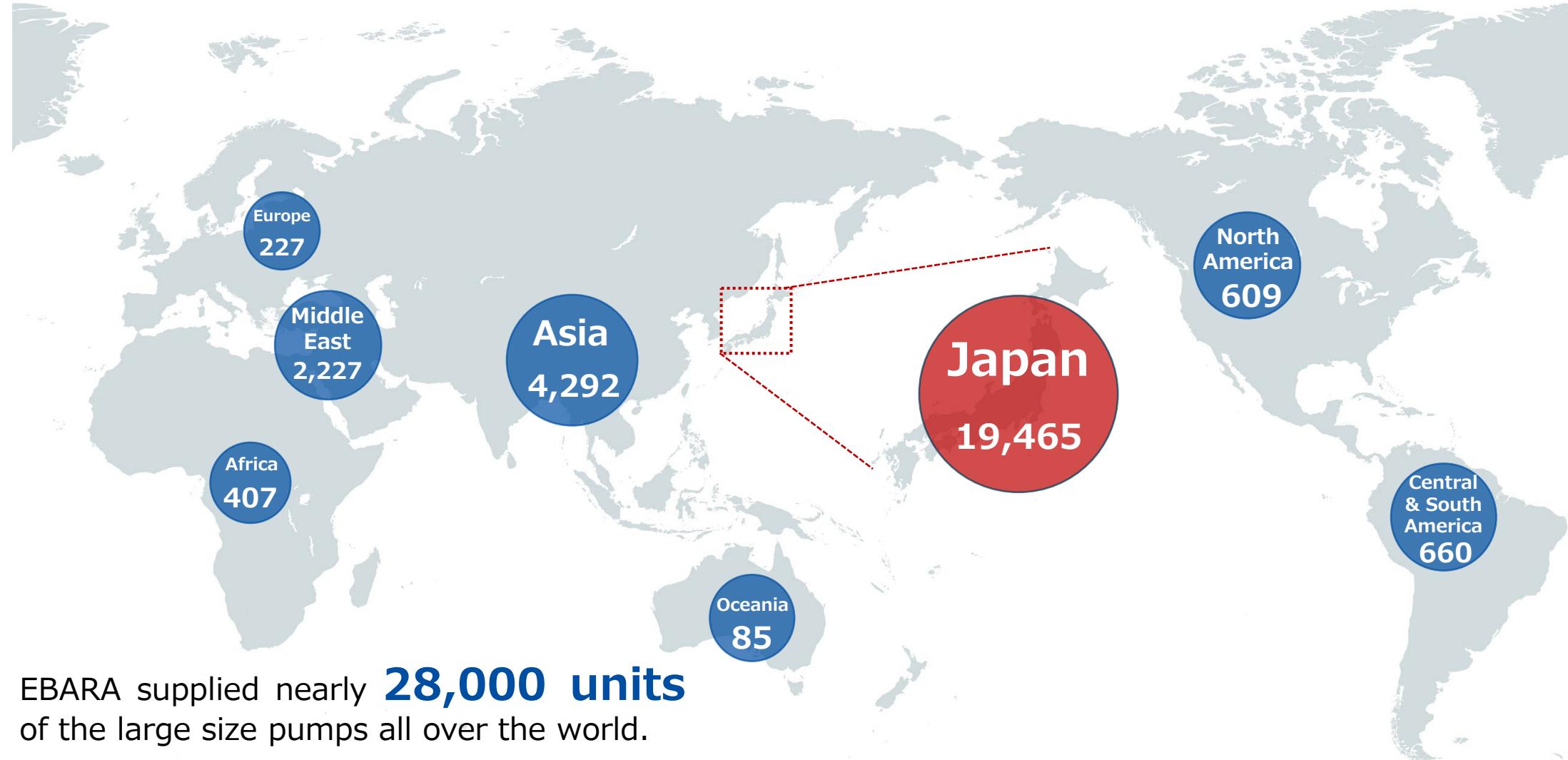


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Worldwide Supply Records of Large size Centrifugal Pumps*



Ebara supplied nearly **28,000 units** of the large size pumps all over the world.

* Large size pumps: Pump's Suction Pipe Diameter over 350mm

As of Dec. 31, 2023

Created with mapchart.net



Ebara Engineering Singapore Pte Ltd experience

Looking ahead,
going beyond expectations
Ahead > Beyond

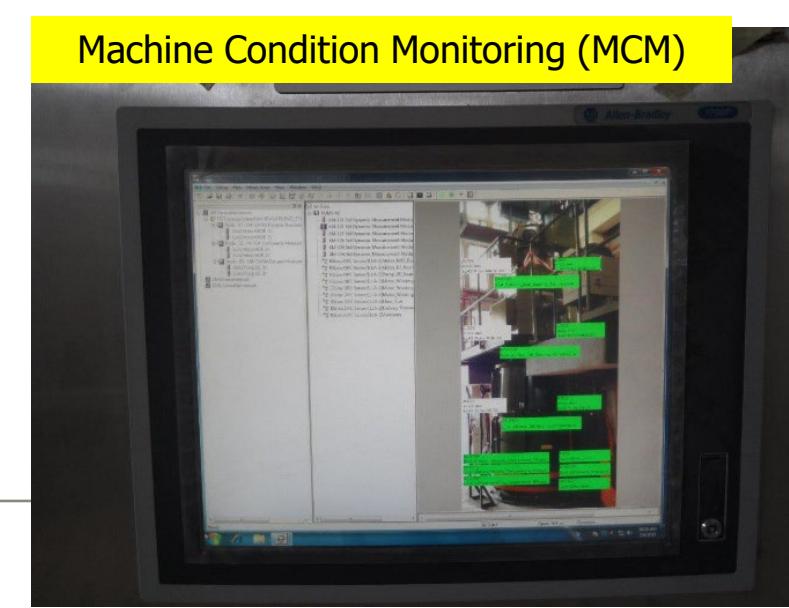
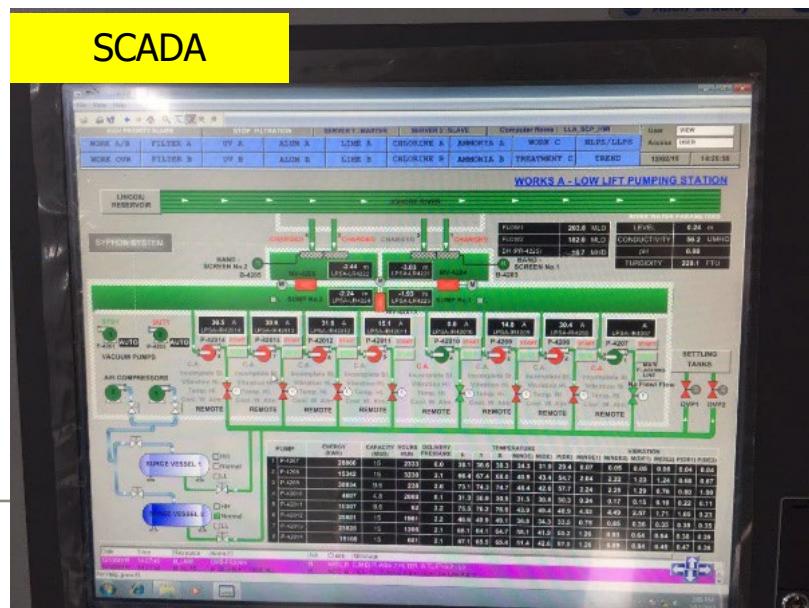
November 9, 2017

EBARA CORPORATION

(1) M&E Turn-key Pumpset Replacement Project (2013~2015)



5~15mgdi Vertical Turbine Pumps



M&E Turn-key Pumpset Replacement Project (2013~2015)



River Water Pumps

5~15 mgdi Vertical Turbine Pumps



132~506kW Slip Ring Motor



Control panel
Starter panel
Capacitor bank panel

M&E Turn-key Pumpset Replacement Project (2019~2021)



34mgdi Vertical Split Casing pumps & pipeworks



ead, going beyond expectations
Ahead Beyond

M&E Turn-key Pumpset Replacement Project (2019~2021)



Looking ahead, going beyond expectations
Ahead Beyond

M&E Turn-key Pumpset Replacement Project (2019~2021)



Looking ahead, going beyond expectations
Ahead Beyond

M&E Turn-key Pumpset Replacement Project (2019~2021)



Inlet fans



Exhaust fans



Roof fans



Looking ahead, going beyond expectations
Ahead Beyond

Supply of Pumpsets

Choa Chu Kang Waterworks (CCKWW)



Quick Introduction:

- Choa Chu Kang Waterworks (CCKWW) is the **second largest waterworks in Singapore**.
- It has a **treatment capacity of 80 million gallons per day** (364 MLD).
- Mainly **draw water from Kranji, Pandan, and Tengah Reservoirs** to homes, businesses, and industries across **western region of Singapore**.

Chronological Development of CCKWW:

1975~198

1

CCKWW was **built in two phases**.

June 2016 ~June 2019

Construction of a new facility, installation of ceramic membranes and the inclusion of ozone-biological activated carbon (BAC) treatment for the plant.

The ceramic membrane system, the world's largest in a single plant, will treat up to 40 million gallons of water per day. Filtering out particles as minute as 0.1 micrometres in size, there will be 12 vessels with 90 ceramic membrane elements in each vessel!

2024~2028 (Tentative)

Aims to replace aging infrastructure with state-of-the-art facilities, including high-rate clarifiers, advanced membrane filtration systems, and automated chemical dosing systems.

The reconstruction will also **integrate smart technologies for real-time monitoring and predictive maintenance**, enhancing operational efficiency and safety .

Looking ahead, going beyond expectations

Ahead Beyond

Enhanced water treatment process at CCKWW

Ceramic Membrane Filtration

- 1 Pressurised water is fed into the membranes.
- 2 The membranes keep particles out while clean water passes through.



Ozone Treatment

- 1 Ozone generators produce ozone gas which is diffused into the water.
- 2 The ozone molecules destroy microbes and oxidise other contaminants in the water.



Biological Activated Carbon Treatment

- 1 Water passes through a layer of biological activated carbon media by gravity.
- 2 The biological activated carbon media removes organic matter while clean water passes through.



More durable

Ceramic membranes are able to last 20 years while polymeric membranes need to be replaced about every 5 years.

Ceramic membranes can withstand harsher chemicals at a pH range of 2 to 13.

Less water loss

With ceramic membranes, only 1% of the water is lost during treatment compared to 5% for polymeric membranes.

Latest water treatment technology

Ceramic membranes are the latest in water treatment technology.

More efficient

Producing sufficient ozone gas to treat 80 mgd of water, the three new ozone generators are just as efficient as the 12 older ozone generators.

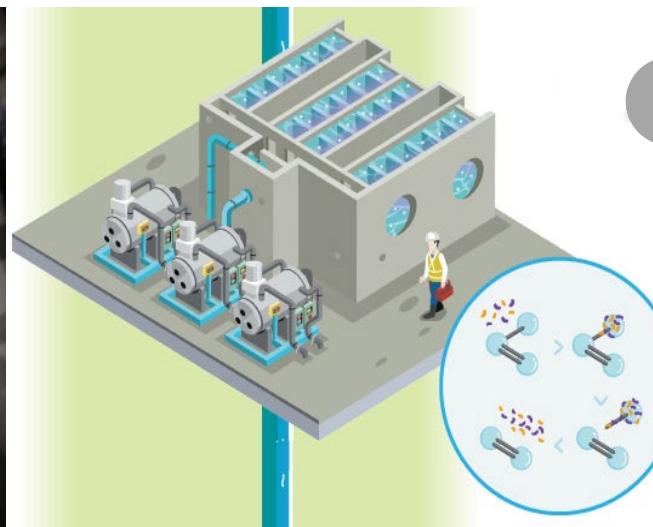
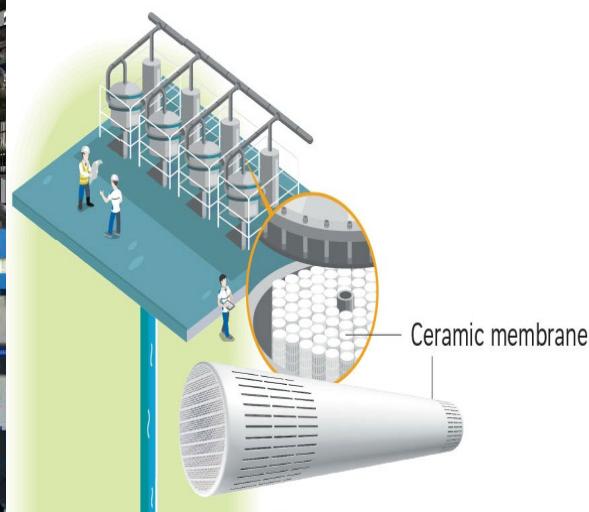
Smaller footprint

The three new ozone generators occupy a smaller space in the plant.

More effective

Biological activated carbon filtration is one of the most effective processes in removing organic matter from water.

Steps of water treatment process at CCKWW



1

Ceramic Membrane Filtration

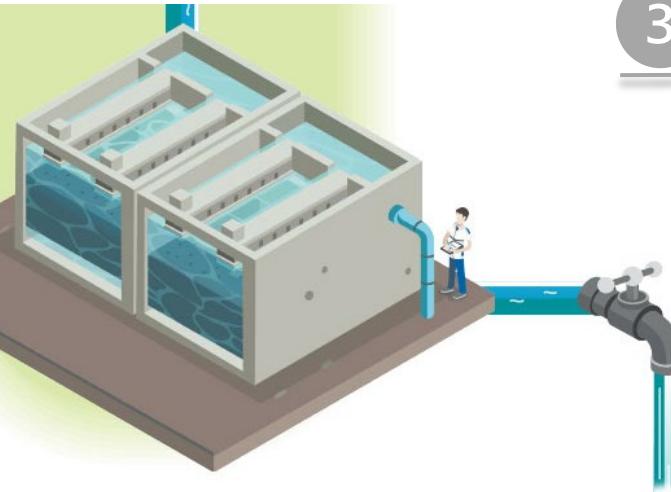
- The ceramic membrane system, the world's largest in a single plant, will treat up to 40 million gallons of water per day.
- Filtering out particles as minute as 0.1 micrometers in size, there will be 12 vessels with 90 ceramic membrane elements in each vessel.
- Pressurised water is pumped through the ceramic membranes.
- Ceramic membranes are highly durable and expected to last 20 years, four times longer than polymeric membranes.
- Water loss is reduced significantly from 5% to 1% with the use of ceramic membrane

2

Ozone Treatment

- Just three ozone generators are needed, a reduction from 12 previously.
- Bubbles of ozone gas are mixed into the water.
- The ozone destroys microbes and removes other contaminants.

Steps of water treatment process at CCKWW



3

Biological Activated Carbon Treatment

- Water passes through a biological active carbon media via gravity.
- Helpful bacteria cultivated in the carbon help consume remaining organic matter.
- Also remove taste and odour compounds such as MIB and Geosmin.

Roles of Ebara Engineering Singapore in CCKWW



- Ebara Engineering Singapore supplied pumps during the last refurbishment of CCKWW in 2016 to 2019.
- Supplied total of 11 units of pumps for various functions in the CCKWW with total sales close to SGD87k.

	Pump Details	Functions	Unit
1	100X80FSS2HC Ebara S/S End Suction Complete Pump Set	Backwash Filling Pump	2 Units
2	80X65FSS2GC Ebara S/S End Suction Complete Pump Set	Neutralization Pump	2 Units
3	FHA 65-200 Ebara End Suction Complete Set with Motor	Ozone Motive Water Pump	5 Units
4	32x32FSS2GC Ebara S/S End Suction Complete Pump Set	Off-Gas Water Collection Pump	2 Units
5	CDXL 70/05 Ebara S/S Single Impeller Centrifugal Pump	Sampling Pump (Feed)	2 Units
6	CDXL 70/05 Ebara S/S Single Impeller Centrifugal Pump	Sampling Pump (Filtrate)	2 Units

SGD87k

Supply of Pumpsets



Singapore Iconic Landmark

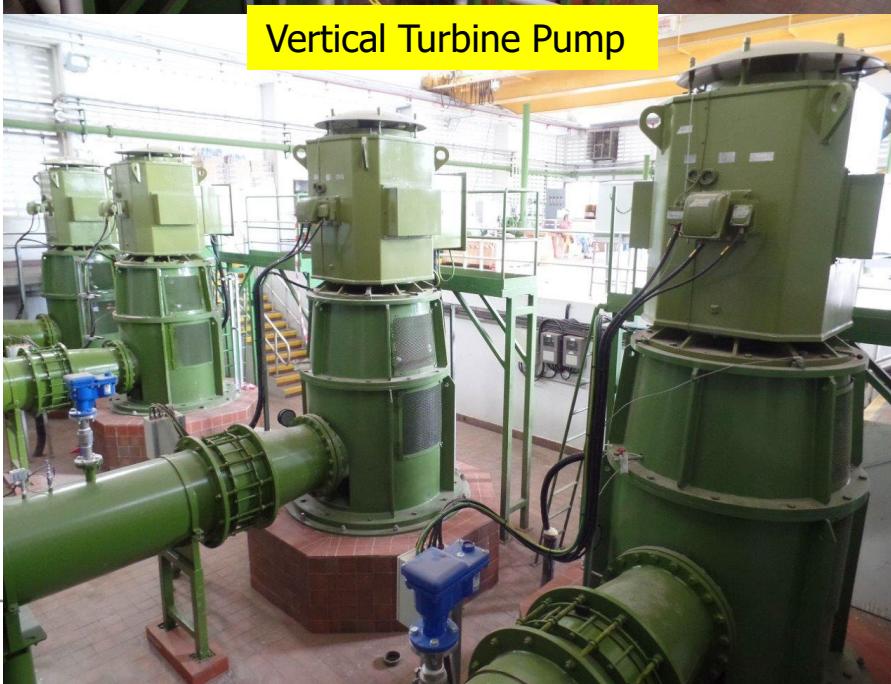
Application:

- Merlion Statue, Singapore Iconic Landmark
- Pump for Water spouting from Merlion, Since 2001
- Sea/blackish/Reservoir water



Vertical Turbine Pump

Supply of Pumpsets



Application:

- Reservoir water transfer
(2013~2015)
- 15mgdi Vertical Turbine pumps
- 380kW motors
- 22m long column pipe



Pump Column 22m long below floor

head, going beyond expectations
Ahead Beyond

Supply of Pumpset



Factory Performance Test @ Ebara Vietnam

Looking ahead, going beyond expectations
Ahead Beyond

Supply of Pumpsets



Application:

- Reservoir water transfer (2012~2015)
- 39mgdi Horizontal Split Casing pumps
- 508kW Slip Ring Motors



Supply of Pumpsets



Application:

- **District Cooling System for aircon service**
- **Chilled & condenser water transfer (2009~2010)**
- **0.5~16 mgdi pumps**
- **22 ~ 450kW Motors**



End Suction pump

Supply of Pumpsets



Application:

- Mobile portable water booster system including truck for Low & high rise building (2015~2016)
- 800 l/min@120m Vertical Inline pumps
- 80kVA Generator Set for power supply to pump motor



On duty

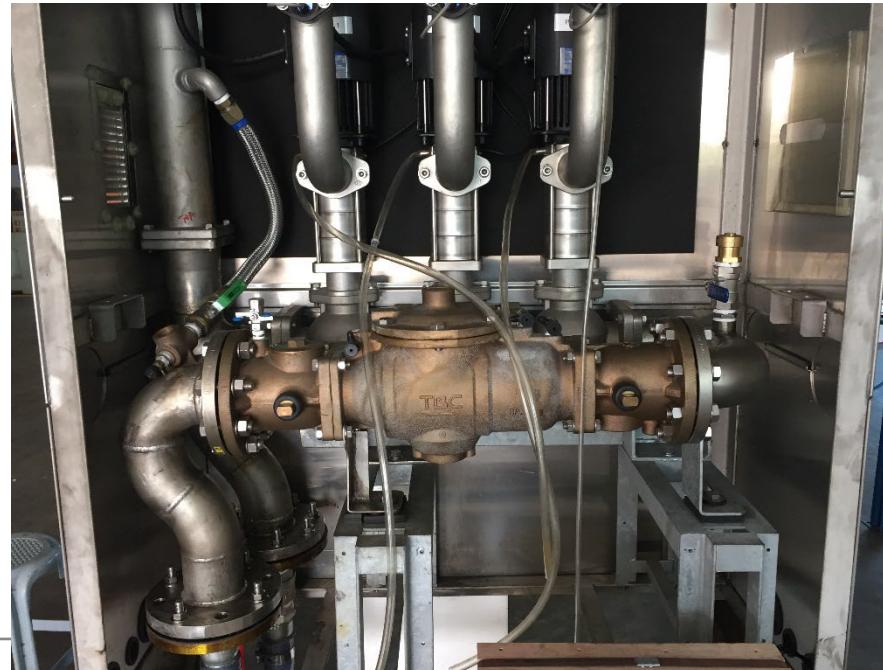
Supply of Pumpsets



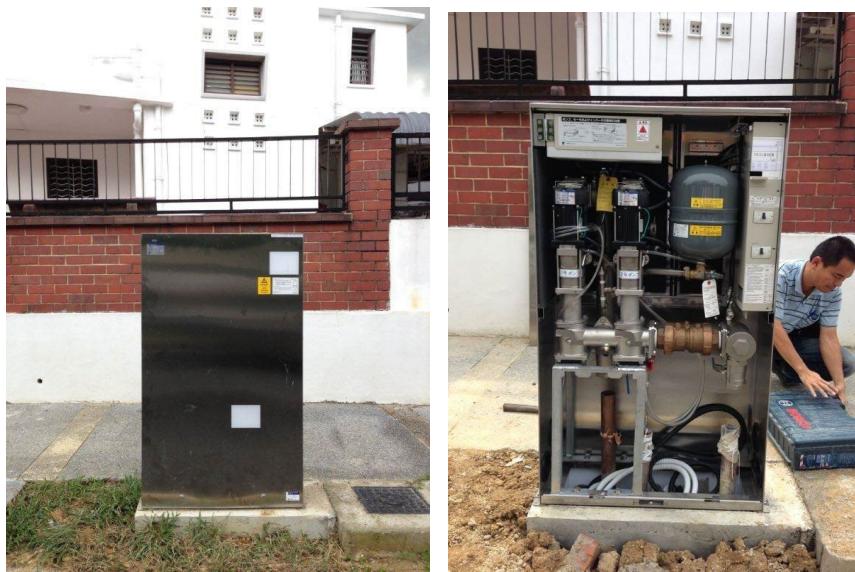
Compact Booster System

Application:

- Compact booster system for cluster of landed household (2014~2015)
- 570 l/min@ 54m Vertical Inline pumps
- High speed 7200rpm
- Permanent magnet motor
- Size 485Dx1080Lx1696mmH



Supply of Pumpsets



Application:

- **Compact booster system for cluster of landed household (2011~2012)**
- **295 l/min @ 10m Vertical Inline pumps**
- **High speed 7200rpm**
- **Permanent magnet motor**
- **Size 272Dx800Lx1300mmH**

Supply of Pumpsets



Application:

- **Booster system for utilities usage, non-portable (2022~2023)**
- **5m³/hr @ 48.8m Vertical Inline pumps**



Looking ahead, going beyond expectations
Ahead Beyond

Supply of Pumpsets



Application:

- Large booster system for water supply network (2016~2017)
- 19mgdi @ 23.4m Vertical Split Casing pumps
- 300kW motors



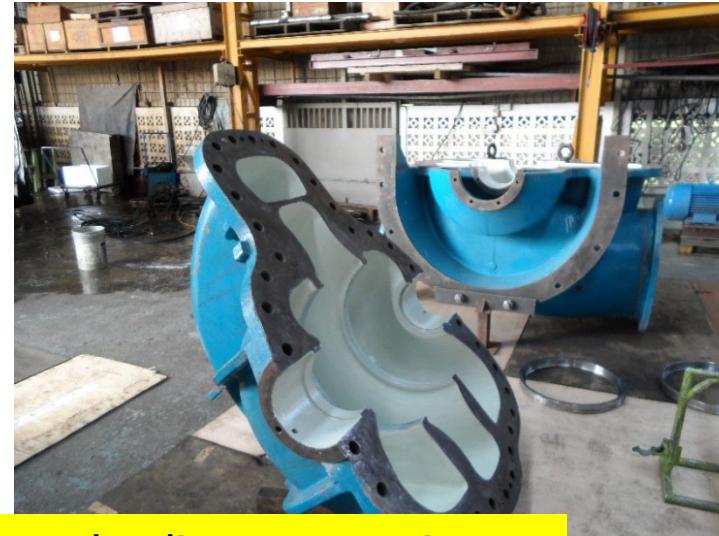
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Pump Overhaul Service

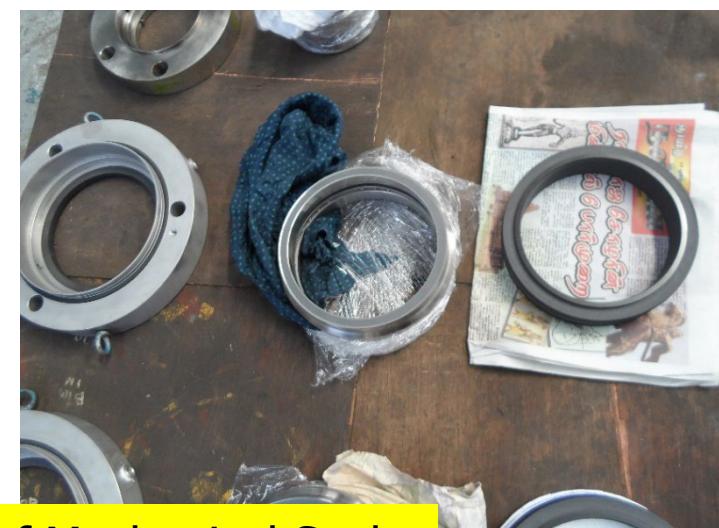
Pump for overhaul service:

- Ebara & others pump manufacturer brand
- Vertical Turbine type
- Horizontal & Vertical Split Casing type
- End Suction type
- Inline booster pump type
- Submersible type

Pump Overhaul Service



Repaired by coating on horizontal split pump casing



Reconditioning of Mechanical Seal

(3) Pump Overhaul Service



Repaired by coating on Vertical Turbine Pump parts

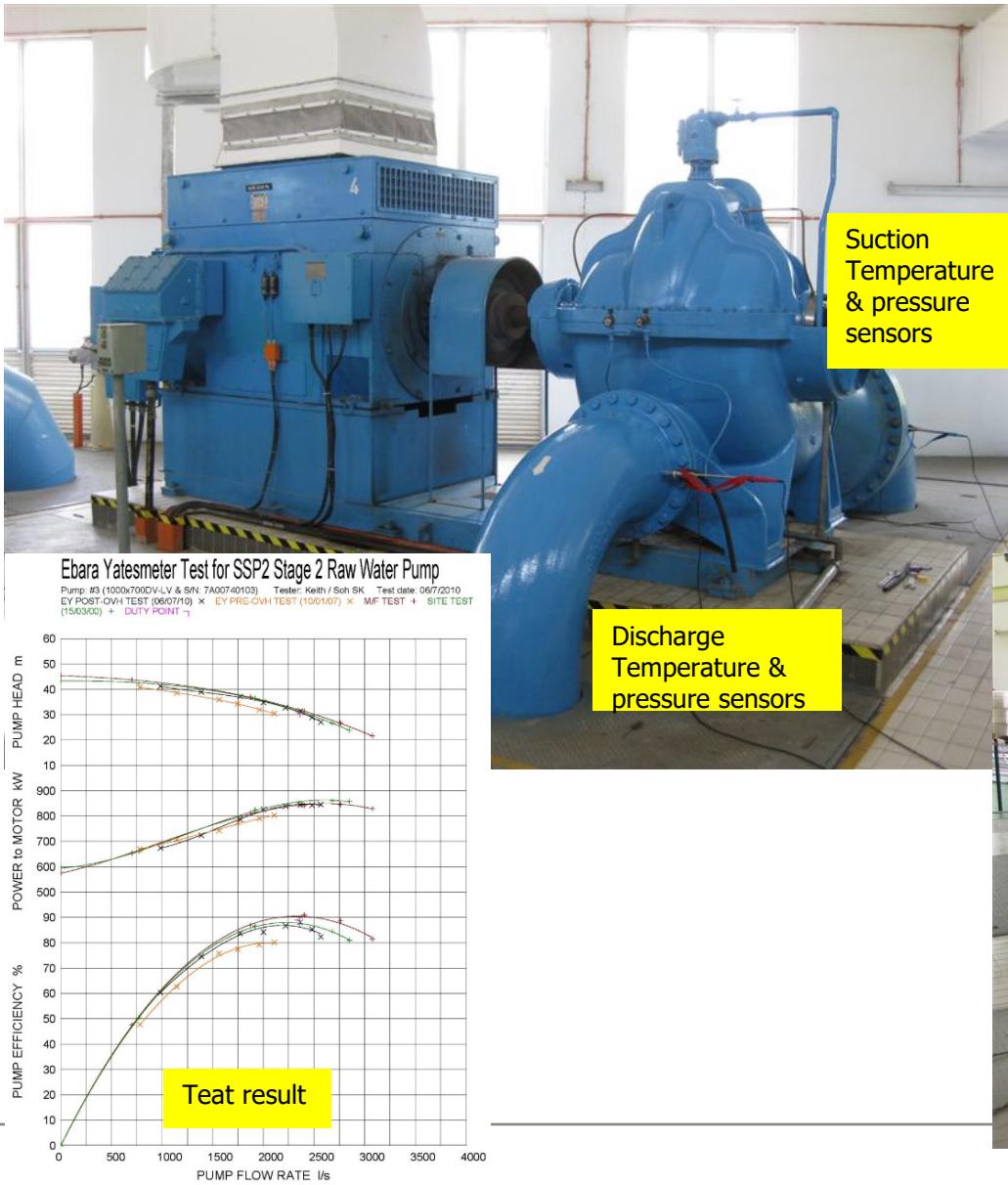


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(3) Pump Overhaul Service



(4) Yatesmeter Testing for Pump Performance



Theory :

- Thermal dynamic method
- Using temperature, Pressures, power, without knowing flowrate
- Measures milli Kevin (mK) or different btw suction and discharge temp.
- Measure & display each pump performance without disturbing pump daily operation after initial setup



(4) Yatesmeter Testing for Pump Performance



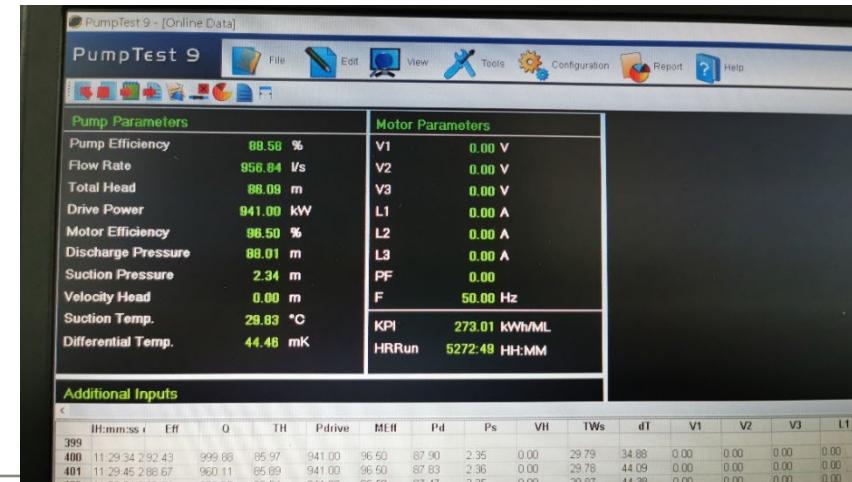
Latest version:
Permanent type



Permanent Pump Performance Monitoring System (Automatic)



Power meter



Software

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(4) Consultancy & Engineering Service



STUDY REPORT

Hydraulic Studies

Client / Customer:	PUB Singapore
End User:	PUB Singapore
Prepared By:	Approved By:
Name: Keith Lee Designation: Engineer Date: 29 August 2014	Name: Lai Tian Ming Designation: Manager Date: 29 August 2014

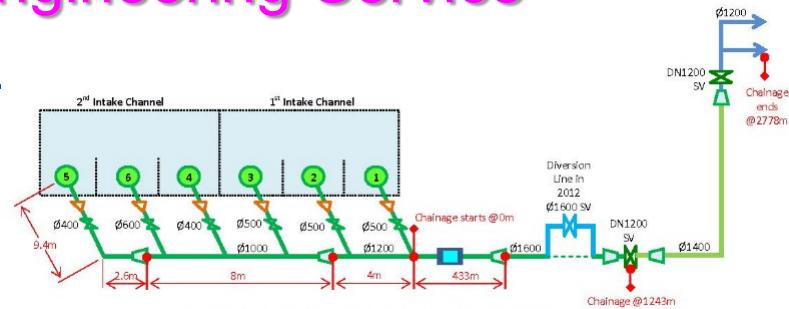
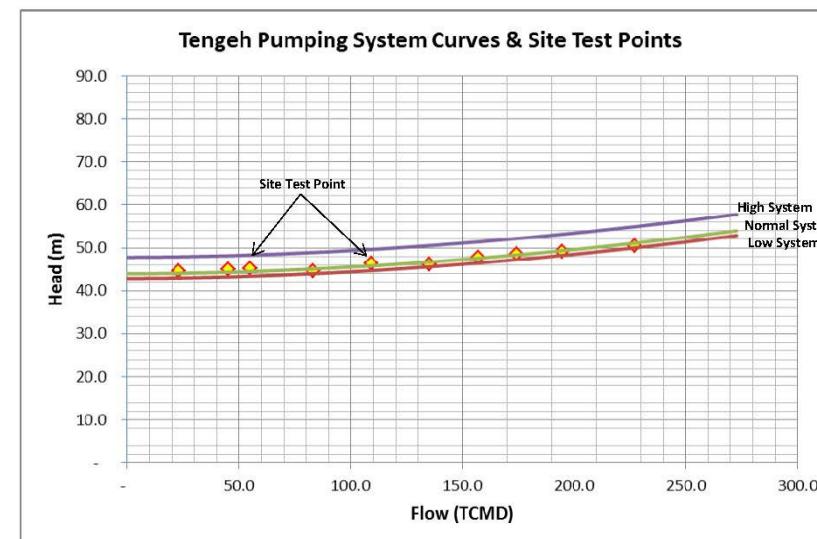
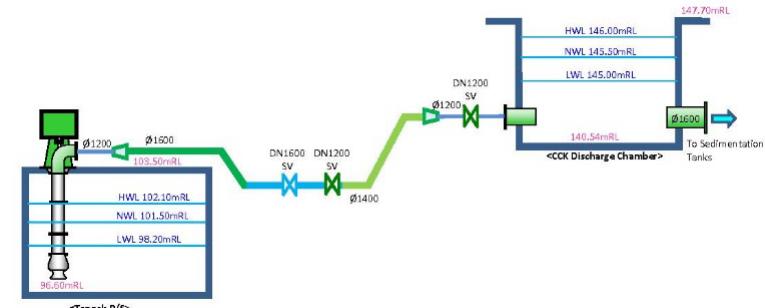


Figure 1 Schematic diagram for Existing Tengeh Pumping System



System Curves : Site test result VS Calculation

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Other products



EBARA PUMPS TOWARDS EXCELLENCE



Standard products

Production from various factories in the world

1. Ebara Italy
2. Ebara Machinery China/ Ebara Kunshan
3. PT Ebara Indonesia
4. Ebara Pump Philippines Incorporated
5. Ebara Japan
6. Ebara Thebe Brazil
7. Ebara Thailand Ltd
8. Sumoto Italy
9. Vansan Turkey
10. etc

Fluid Machinery products

Standard products



13. What Ebara can Offer.





Thank You.

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