EBARA IR Day 2023

Precision Machinery Company Medium and Long-term Business Strategy

December 4, 2023

Masao Hodai
Executive Officer,
Chief Operating Officer,
Precision Machinery Company

Looking ahead,
going beyond expectations
Ahead Beyond

株式会社 荏原製作所

Precision Machinery Company Overview

Our Company's Basic Policies

We apply the world's highest level of technology and support towards providing solutions for the manufacturing processes and sub-fab areas that support semiconductor miniaturization and sophistication to offer new value toward the evolution of industry.

CMP business

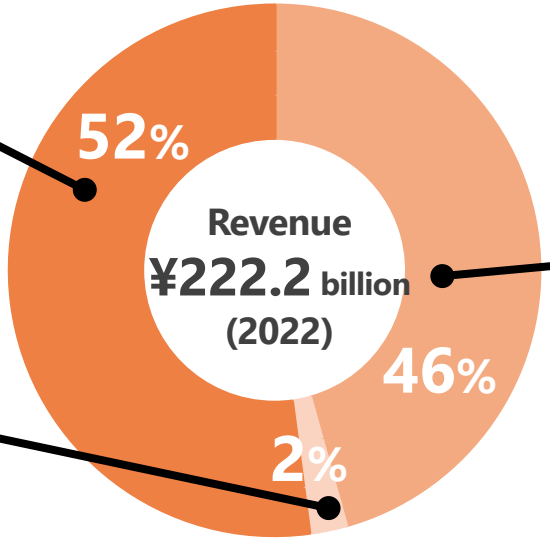
CMP* systems

*CMP: Chemical Mechanical Polisher

Other equipment business

Plating systems

Bevel polishing system



Components business

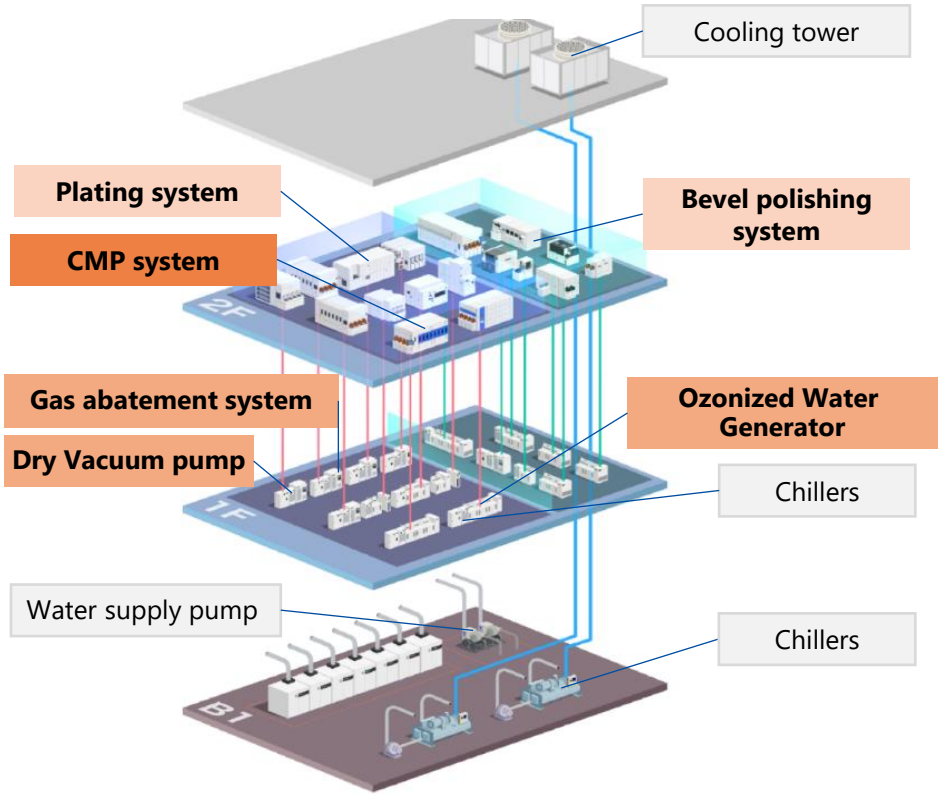
Dry vacuum pumps

Exhaust systems for EUV lithography systems

Gas abatement system

Ozonized Water Generator

Ebara Products Are Widely Used in Semiconductor Factories



2F (clean room)

Devices to manufacture semiconductors

CMP systems

Bevel polishing systems

Plating system

1F (sub-fab)

Devicesto assistmanufacturing equipment

Dry vacuum pumps

Gas abatement system

Ozonized Water Generator

Chillers

Basement (machine room) and Rooftop:

Devices to support plant

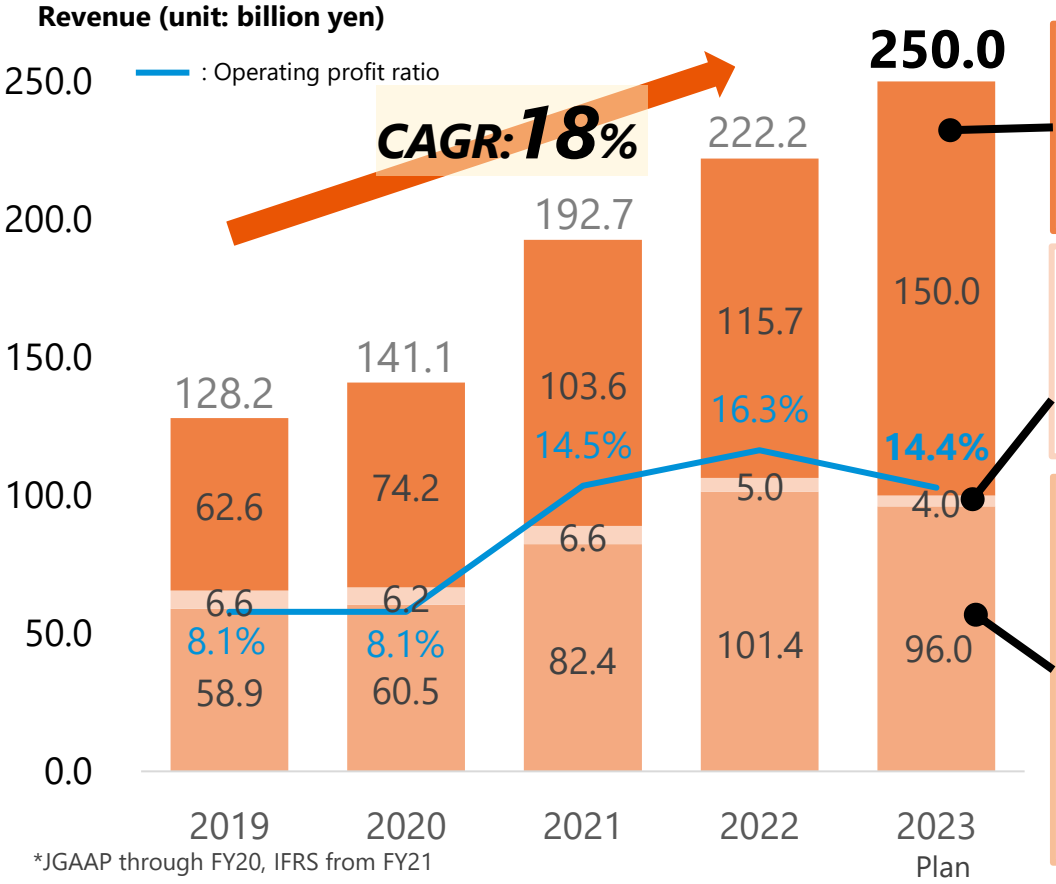
Water supply pumps

Chillers

Cooling towers

✓ **The only manufacturer in the world supplying such a wide range of products for semiconductor plants.**

Precision Machinery Company Results (Consolidated)



*JGAAP through FY20, IFRS from FY21

CMP business

- Global No. 2 share for CMP systems
- Maintaining significant business growth thanks to increasing demand for semiconductor miniaturization and growing market share

Other equipment business

- In addition to developing plating system and bevel polishing systems, we are also developing new businesses and working to maintain business growth by providing multifaceted support for semiconductor manufacturing

Components business

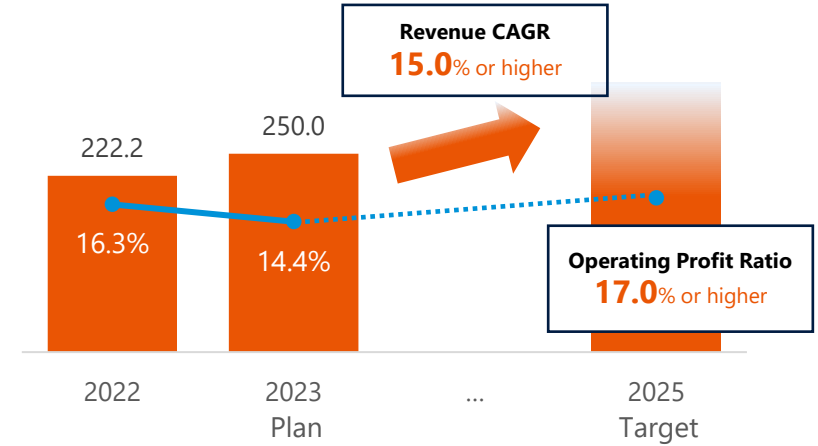
- Driven by a global No. 2 share for our mainstay dry vacuum pumps, we have expanded business to include gas abatement systems, ozonized water generator, exhaust systems for EUV lithography systems, and more

- In recent years, we have also captured the world's No. 2 share for ozonized water generator, which is in increasing demand as a cleaning method for semiconductor manufacturing processes due to its high cleaning effect and reduced environmental impact

Growth Strategy for the Precision Machinery Company

Long-term vision E-Vision 2030	Business Vision	Contribute to the development of society through partnerships and distinctive technologies centered on the semiconductor field while helping create a more enriched world through endeavors in new fields
Medium-Term Management Plan E-Plan 2025	Basic Policies	• Provide unique value not only by providing products and services, but also by offering solutions for customers' process and utility challenges • Shift from a regional strategy to a global account strategy to expand market share through strategic planning and overall global optimization in line with customers' global expansion
	Basic Strategies	• Strengthen product and solution development capabilities • Increase production capacity • Reconstruct global business infrastructure to accommodate expansion of business scale

E-Plan 2025 financial targets



E-Plan2025 non-financial targets

Materiality	KPIs (FY2025 targets)
1 Contribute to the creation of a sustainable society	Reduction of GHG emissions from semiconductor manufacturing processes through gas abatement (20% reduction from 2022)
	Reduction of GHG emissions from dry vacuum pump manufacturing (10% reduction from 2022)
2 Elevate standards of living and support abundant lifestyles for all	Pure water use by CMP equipment (30% reduction from 2022)
	Develop foundational technology for 14Å semiconductor manufacturing

Precision Machinery Company Global Network

Europe

Ebara Precision Machinery Europe GmbH

China

HEFEI EBARA PRECISION MACHINERY CO., LTD.

Xian Ebara Precision Machinery Co., Ltd.

Shanghai Ebara Precision Machinery Co., Ltd.

USA

Ebara Technologies Incorporated

Japan

Fujisawa, Kumamoto
Chubu, Suzuka

- **Kumamoto:**
  New production building scheduled for completion in 2024
- **Fujisawa:**
  New development building scheduled for completion in 2025
- **Tohoku:**
  Planning to complete construction of plant to overhaul dry vacuum pumps in Tohoku in 2024

Southeast Asia

2023.6 - Started operations

Ebara Precision Machinery Malaysia SDN. BHD

Ebara Engineering Singapore Pte. Ltd

East Asia (excluding Japan and China)

EBARA Precision Machinery Taiwan Incorporated

Ebara Precision Machinery Korea Incorporated

Opportunities for Future Business Growth

Growth in IoT, Cloud, AI, Automated Car, 5G (ICAC5), DX, and GX will continue to drive rapid growth in semiconductor demand

Smart phone

Vehicles (autonomous driving)

PCs/tablets

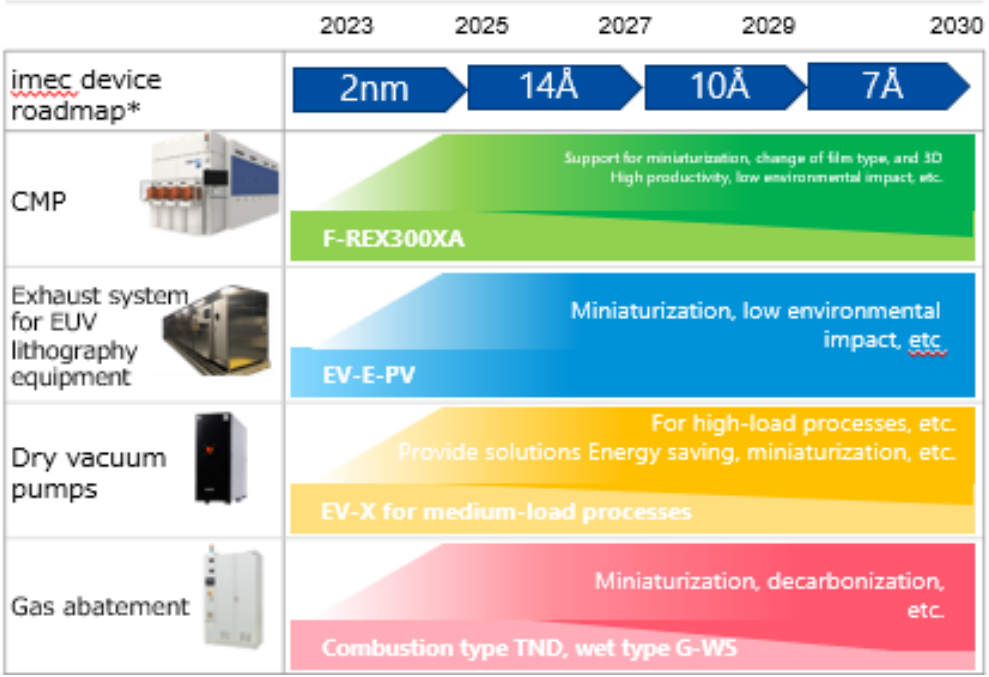
5G

Data centers Servers

AI

IoT

Semiconductor miniaturization shifts from nm to Å



* imec, Belgium's independent nanotech semiconductor research institute, has published a logic device roadmap to 14Å and beyond. (Excerpt from imec Future Summit 2022)
We assume a 7Å generation for development and a 14Å generation for commercial use by 2030

*Refers to the EBARA model number

EBARA IR Day 2023

Evolution of Semiconductor Manufacturing Technology, Trends and Medium- to Long-term Strategies for CMP Processing Technology

December 4, 2023

Isao Nambu
Executive Officer,
Division Executive, Equipment Division,
Precision Machinery Company

Looking ahead,
going beyond expectations
Ahead Beyond

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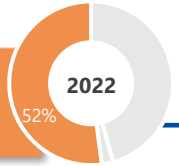
CMP Business Overview



About Chemical Mechanical Polishing (CMP)

- A process for chemically and mechanically polishing wafers (semiconductor substrates) to achieve the nanometer*1-level flatness required in the semiconductor manufacturing process.

*1 1 nanometer is one millionth of a millimeter

- CMP is unique among semiconductor processing, where even the smallest amount of dust can affect performance, due to the large amount of foreign matter utilized.
- Industry's first platform for conducting polishing and cleaning on the same device. Since then, this system has been an indispensable part of the semiconductor process.
- The application of CMP to the wiring process was praised by Dr. Moore, the father of semiconductors, as the biggest surprise.

CMP business product line

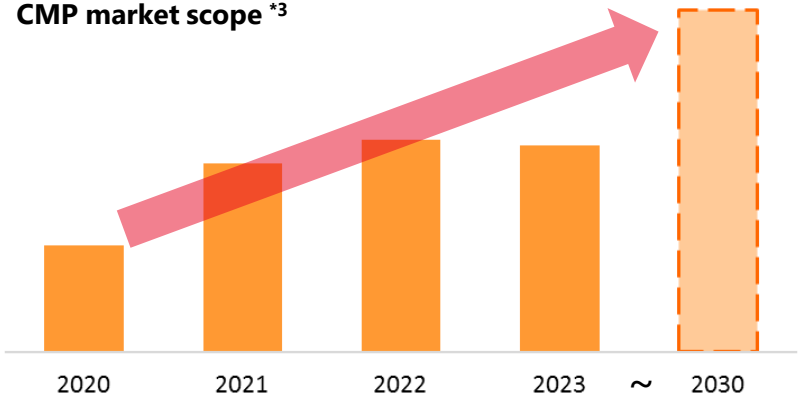
Model F-REX300XA*2

Model F-REX300X*2

Model F-REX200M2*2

*2 Refers to the EBARA model number

CMP market scope *3

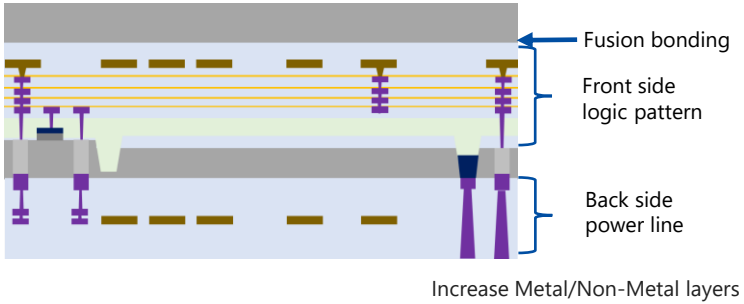
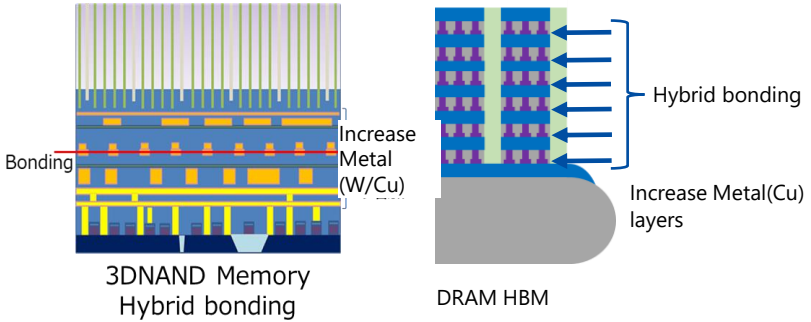


*3. Market scope based on EBARA survey

- CMP demand growing significantly with the increasing high integration of semiconductors
- **Market scope projected to double***4 by 2030 (compared to 2020)
- We have a global **No. 2** share
  Achieving a total of **3,000 units** shipped in 2022
- We possess distinctive technology formed through over 30 years of experience and extensive knowhow/patents

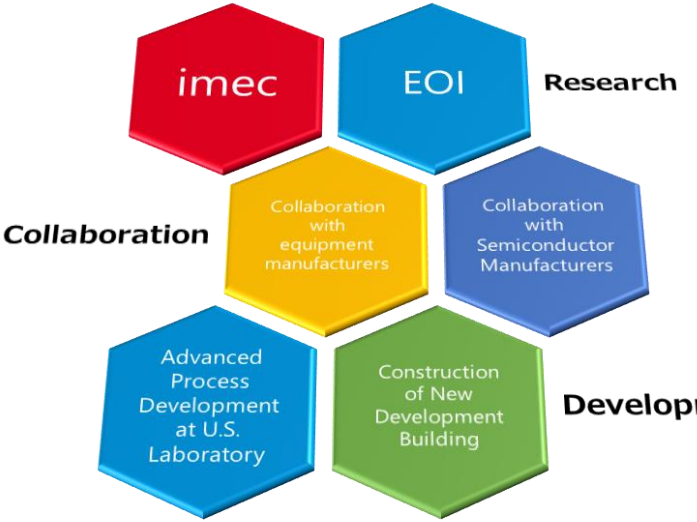
*4 EBARA survey

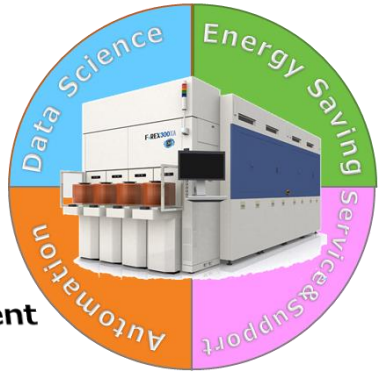
Strategy for Major CMP Processes

	Logic	Memory
Major processes (Layer image diagram)	 (Example: Backside Power Delivery Network (BS-PDN))	 (Example: 3DNAND Memory Hybrid bonding (left diagram) and DRAM High Bandwidth Memory (right diagram))
Market trends	- CMP market growth projected to be on par with or slightly higher than other processes - In addition to miniaturization, the move toward higher integration is advancing with the introduction of bonding technology using three-dimensional layering - Opportunities to utilize CMP have increased compared to conventional integration	
Our position and future strategy	- Metal layers have the most opportunities for both miniaturization and bonding, which are driving growth for these markets. - We will capture market share for the metal layer CMP process, which is one of our strengths ⇒**Achieve growth that outpaces the market by increasing our market share**	

Growth Strategy for the CMP Business
- Strengthen Product and Solution Development Capabilities -

E-Vision2030
Semiconductor Miniaturization - Aim for 14Å





EOI: EBARA Open Innovation, a joint research framework with universities
imec: An international research Institution

E-Plan2025
Strengthen product and solution development capabilities

- Building a market-in solution development system
- Enhancing research and development facilities
- Creating new value through data science utilization

Building a new equipment development building

Construction of a new development building (V8) began at the Fujisawa District. This will strengthen our mainstay CMP systems and the overall equipment business (scheduled for completion in summer 2025).

- Expanding our development areas and accelerating development by establishing an IoT network
- Strengthening process evaluation and proposal capabilities for customers
- Developing next-generation process utilizing the latest development equipment, inspection equipment, and utility environments

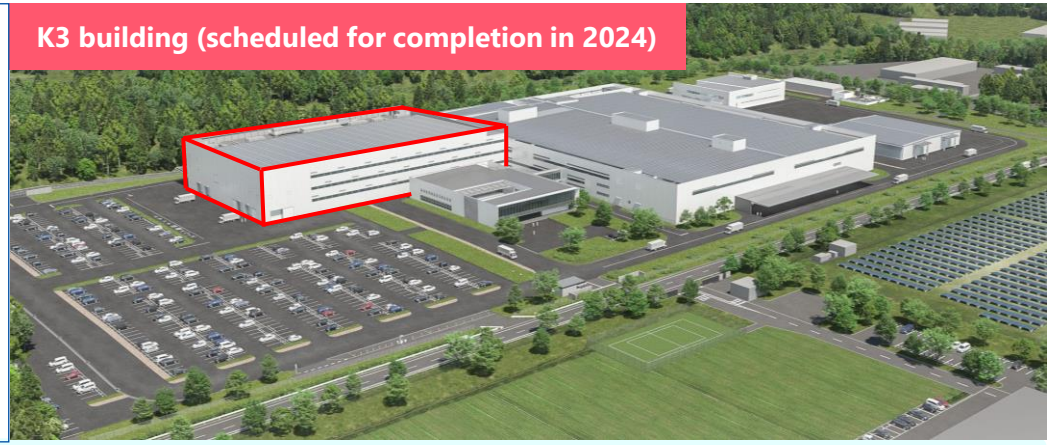
Conceptual image of completion

Growth Strategy for the CMP Business
- Increase Production Capacity -

Construction of a new CMP production building
(scheduled for completion in 2024)

- Started construction of a new production building (K3) in Kumamoto District to respond to medium- to long-term growth in semiconductor demand
- Expanding existing production capacity by more than 1.5x to achieve new business expansion and flexible responses to customer needs
- Proactively promote digitalization and realize the concept of production x digital transformation (DX)
  Aiming to further improve productivity and production capacity

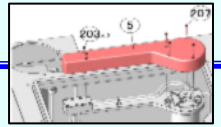
K3 building (scheduled for completion in 2024)




Conveyor
(RFID identified stocking)


Digital picking
(Lamp guided delivery)


MES*1
(Work Instruction/ Management)


AIE*2
(Assembly Procedure Manual)


Paperless
(e-ledgers)


Dashboard
(Area map)


Automated test
(Labor saving)

Production x digital transformation (DX)

*1. Manufacturing Execution System (MES)
*2. Assembly Instruction Evidence (AIE)

EBARA IR Day 2023

Component Products, Sub-fab Solutions, Green Technology

December 4, 2023

Seiichi Tsuyuki
Executive Officer,
Division Executive, Components Division,
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Looking ahead,
going beyond expectations
Ahead Beyond

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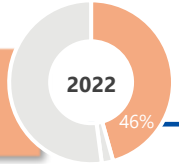
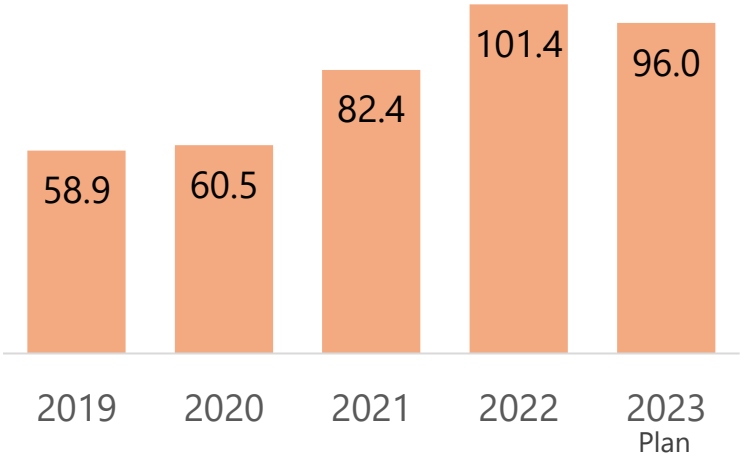
Components Business Overview



- Providing value and solutions to "Sub-fab" areas downstream of clean rooms in semiconductor factories
- Total shipments of dry vacuum pumps reached **200,000 units** in June 2022
- Global **No. 2** share for dry vacuum pumps

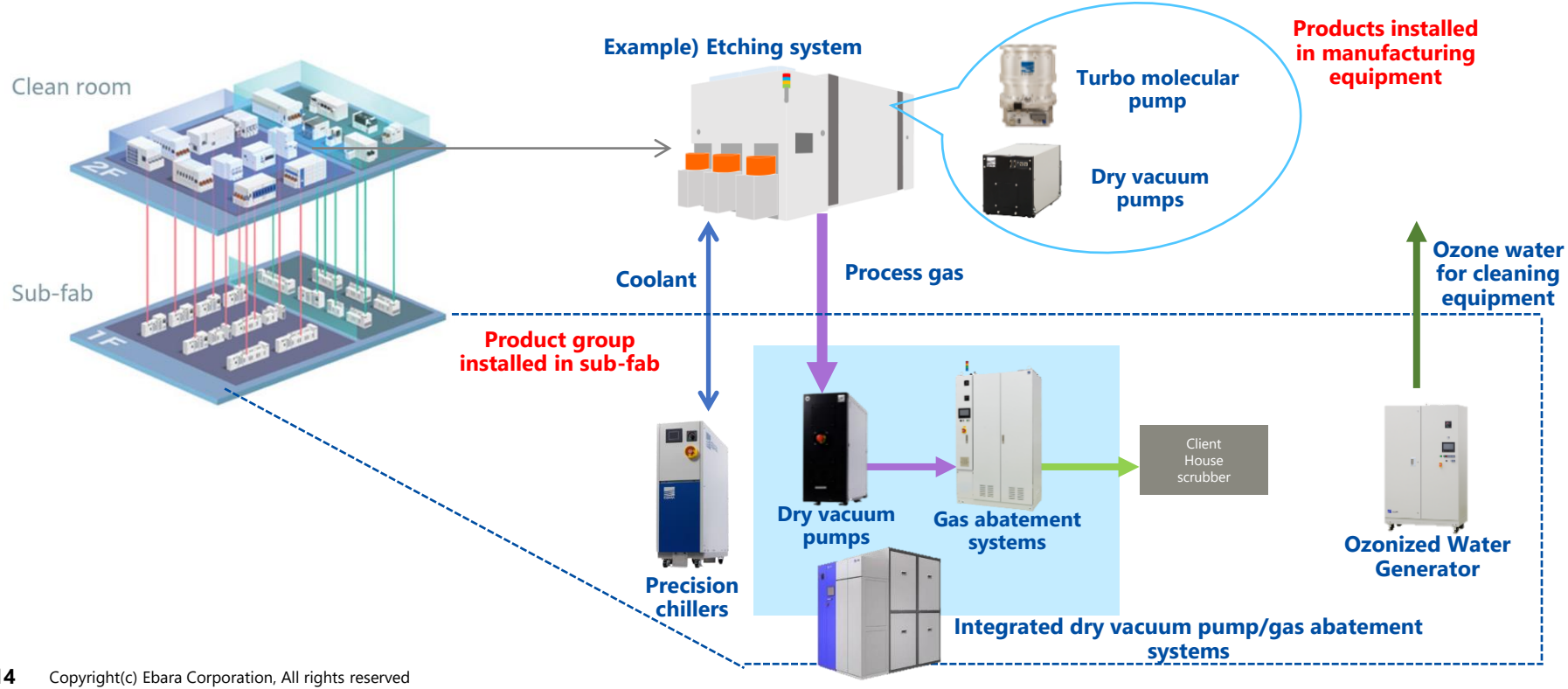
Transitions in Revenue (unit: billion yen)



Components business product line		
Dry vacuum pumps		A non-contact vacuum pump that does not use oil or liquid for sealing. Achieves a clean vacuum without backflow or diffusion of water or oil.
Gas abatement systems		Processing equipment that detoxifies and safely discharges various gases used in manufacturing processes. Used for purposes such as decomposing GHGs, detoxifying toxic gases, safely processing flammable gases, and deodorizing odorous gases.
Ozonized Water Generator		Equipment for producing ozone water. Ozone water is highly oxidizing and is used during cleaning to remove organic substances and metal impurities and form oxide films on material surfaces, as well as applications such as sterilization, bleaching, and deodorization.
Exhaust systems for EUV lithography systems		Vacuum exhaust system connected with an EUV lithography systems. Achieves energy savings and a smaller footprint while maintaining the ability to exhaust the large flow of hydrogen required for the EUV exposure process.
Precision chillers		Device for controlling process temperatures in semiconductor manufacturing equipment. Uses environmentally-friendly coolant. *Building Service & Industrial Company products

Installation Environment for Components Business Products inside Semiconductor Factories

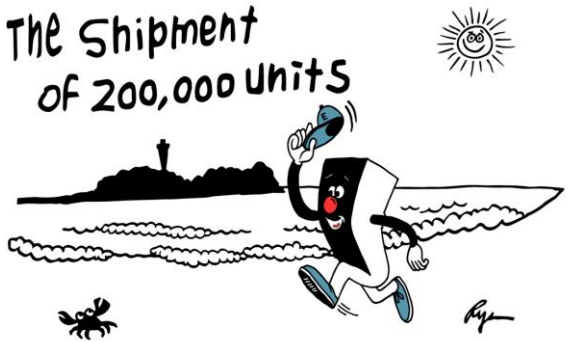
- Vacuum products that create a vacuum environment in semiconductor manufacturing equipment and products that detoxify process gases
- Supplies ozone water for the cooling chillers and wafer cleaning systems of semiconductor manufacturing equipment



Growth Strategy for the Components Business
- Strengthen Product and Solution Development Capabilities -

Using component product integration to transform into an exhaust system solutions provider

1. Value-added solutions for the entire sub-fab area at semiconductor plants
2. Using green technology to reduce customer environmental impact and running costs
3. Responding to technological advances in semiconductor manufacturing processes
4. Expansion into industrial areas beyond semiconductors, LEDs, LCDs, and solar cells



Growth Strategy for the Components Business
- Strengthen Product and Solution Development Capabilities -

1. Value-added solutions for the entire sub-fab area

■ Proposals for packaging multiple products and exhaust systems including piping, valves, and heaters

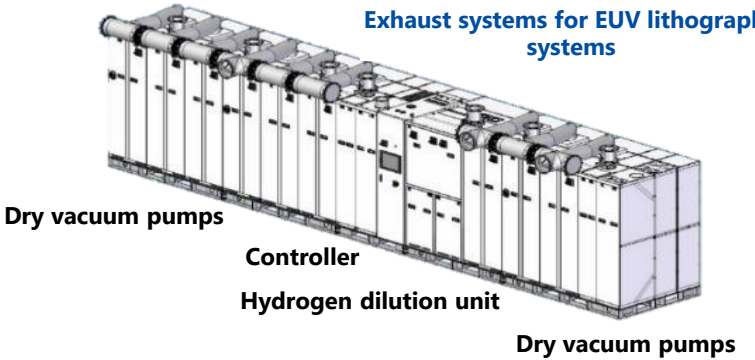
- Eliminates the need for customers to design and arrange construction for piping and valves between each product, significantly shortening construction time
- Safety design that performs overall control including each product and each part, and that accounts for interlocks

■ Providing in-house support and on-call support for sub-fab (for the products of our company and other companies)

- Providing safety and security by supporting customers 24 hours a day through Ebara's global network system

Integrated dry vacuum pump/gas abatement systems

Exhaust systems for EUV lithography systems



Growth Strategy for the Components Business
- Strengthen Product and Solution Development Capabilities -

2. Using green technology to reduce customer environmental impact and running costs

■ Strengthening efforts to reduce the environmental impact of the semiconductor industry as a whole

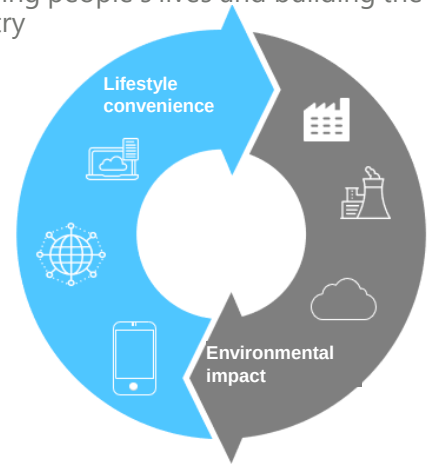
- With increasing importance being placed on whether a product is environmentally friendly when selecting equipment, we are actively providing products and developing technology and products that contribute to the environment.

<Direction of technology/product development>

- ▶ **Dry vacuum pumps: smaller, lighter, and lower power consumption**
- ▶ **Reducing fuel consumption and eliminating fossil fuels for gas abatement systems**
- ▶ **Reducing environmental impact by improving greenhouse gas decomposition performance of gas abatement systems**
- ▶ **Visualizing utility usage and the conversion of utility usage into electricity using an operating status monitoring system**

Semiconductor growth

Semiconductors will continue to grow as a path to enriching people's lives and building the future of industry



Increase in CO_2 emissions

As semiconductors become increasingly miniaturized, CO_2 emissions during manufacturing are also increasing, raising concerns about their impact on the environment

Growth Strategy for the Components Business
- Strengthen Product and Solution Development Capabilities -

3. Responding to technological advances in semiconductor manufacturing processes

Changes in demand due to technological advances	Our Strategy
■ **Adoption of new materials and gases in film deposition processes (CVD/ALD, etc.)** - With the adoption of new materials and gases to improve semiconductor performance, demand for high durability against reaction by-products and corrosion is increasing.	**Increased heavy load endurance for dry vacuum pumps and gas abatement systems**
■ **Increased flow rate of gas used in manufacturing processes (Etching, CVD, ALD, etc.)** - Reducing the manufacturing time required for each semiconductor process Need to respond the requirement of increase in the amount of gas used, for dry vacuum pumps and gas abatement systems	**Increased capacity for dry vacuum pumps and gas abatement systems**
■ **Growing interest in carbon neutrality** - Interest in carbon neutrality has increased in recent years, with increased demand for characteristics such as energy savings, fossil fuel-free, CFC-free, etc. These are points of focus for our company.	**- Reduced power consumption of dry vacuum pumps** **- Reduced fuel consumption of gas abatement systems** **- Development of chillers with new refrigerants**

Growth Strategy for the Components Business
- Strengthen Product and Solution Development Capabilities -

■ New products for the semiconductor market

- Pursuing durability against reaction by-products and corrosion, and energy/footprint savings
- Achieve both improved production efficiency and decarbonization

Process	Product	Solution	Carbon Neutral
Lithography	Exhaust systems for EUV lithography systems 	Large flow hydrogen exhaust	Hydrogen recycling, etc.
CVD/ALD	**New dry vacuum pumps** **New gas abatement systems**	High durability and energy saving Large flow rate processing/small footprint	Energy saving technology using waste heat NOx emission reduction
Etch	**New gas abatement systems** Dry vacuum pumps (Model: EV-X*)	Multi-chamber compatible	Power reduction PFCs gas treatment
TSV (Adv. Packaging)	Dry vacuum pumps (Models: EV-X*, EV-M*) 	Energy saving, reduced footprint	Power reduction
Wafer Bonding (BS-PDN)	Dry vacuum pumps (Model: EV-S*)	Energy saving, reduced footprint	Power reduction
Cleaning	Ozonized Water Generator (Model: OZW*) 	Highly concentrated ozone production	Reducing environmental impact

*Refers to the EBARA model number

Growth Strategy for the Components Business
- Strengthen Product and Solution Development Capabilities -

4. Expansion into industrial areas beyond semiconductors, LEDs, LCDs, and solar cells

- **Oil rotary pumps have been used in liquid chromatograph mass spectrometers (LC-MS) for many years, but in recent years more and more are replacing them with dry vacuum pumps for the following reasons:**
  - Oil contamination inside the mass spectrometer due to oil backflow
  - Oil contamination in the environment near the installation site due to regular oil changes
  - Want to save time and effort needed for oil changes
- **Contributing to various markets with Dry Vacuum Pumps that utilize vacuum technology cultivated in the semiconductor market**
- **Aiming to increase sales by capturing the market where oil pumps are being replaced by dry vacuum pumps**

Market	Process	Product	Solution
Medical/Materials Semiconductor	Mass spectrometry Electronic microscope	Dry Vacuum Pumps (Models: EV-SA*, EV-PA*)	Low noise/low vibration
Smartphone panels Lenses	Vapor deposition equipment	Dry Vacuum Pumps (Models: EV-A*, EV-S*)	Large flow continuous processing
Jewelry	Artificial diamond refining	Dry Vacuum Pumps (Model: EV-A*)	Maintenance reduction

*Refers to the EBARA model number

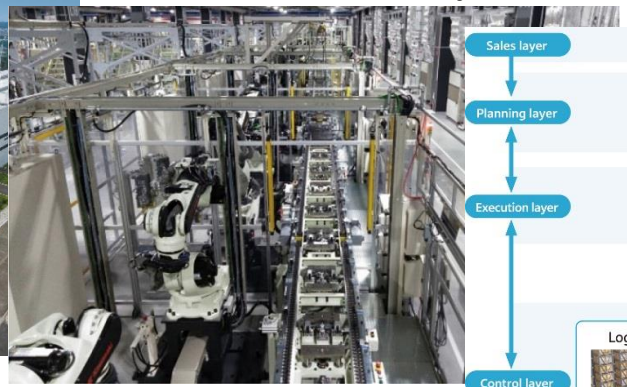
Growth Strategy for the Components Business - Increase Production Capacity -

V7 automated plant - Completed in 2019, production started in 2020

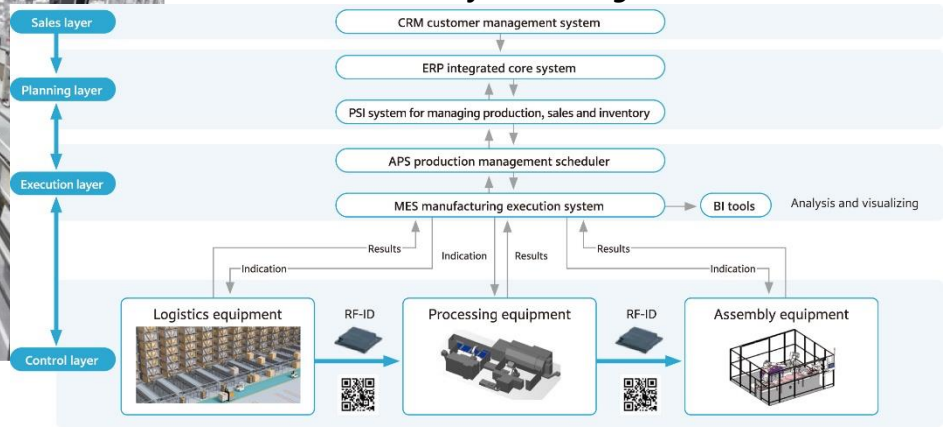
- Early adopter of production automation technology using robots and IoT to strive for the highest quality and address future labor shortages
- Integrated production within the same building with efficient processing, assembly, testing, and logistics processes tailored to demand fluctuations
- Actively using DX to monitor production status in real time and revamped our internal systems, including the creation of an automatic planning system using AI
- Solar panels installed on the roof and power generation began on November 29, 2023

Fujisawa V7 automated plant building exterior

Module automatic assembly line



Internal system configuration



Growth Strategy for the Components Business - Increase Production Capacity -

- Aiming for No. 1 share in dry pump market by 2030, increasing finished product assembly and overhaul capabilities
- Continued investment in automation at V7 automated plant (Fujisawa), which started operations in 2020

Construct a plant to overhaul dry vacuum pumps (Tohoku Region)
Scheduled for completion in July 2024

Automated dry vacuum pump plants
Continue investments in automation
(Fujisawa)

Construct second factory for assembly of finished products of dry vacuum pumps (Taiwan)
Scheduled for completion in June 2026

Construct a plant to overhaul dry vacuum pumps (Malaysia)
Launched operations in June 2023

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