

KOBELCO

KOBELCO Group Environmental Contribution Initiatives in the Machinery Businesses

September 7, 2022

Kobe Steel, Ltd.

Kobelco Eco-Solutions Co., Ltd.

I .

Introduction

II .

Kobelco Eco-Solutions (KES) Environmental Business Initiatives

1. Overview

2. Strengthening of Competitiveness for Existing Business

3. Active Investments in Growth Fields

4. In Conclusion

I . Introduction

Stable Revenue and Market Growth in Machinery Businesses

Engineering

Maximize Profit through Environmental Contribution Offerings

- (1) Expand MIDREX® business
- (2) Demonstrate collective Group strengths through collaboration with the steel and electric power businesses as well as Kobelco Eco-Solutions

Business Covered in Briefing Today

Support of Energy Shift and Growth Markets

Initiatives to help shift to carbon-neutral practices, including hydrogen

[Machinery]
Intermediate Fluid Vaporizer (IVF)
Fuel Gas Compressor for LNG Carriers
[Engineering]
High-purity Hydrogen Oxygen Generator (HHOG)

Machinery

Enhance Environmental Contributions

[Standard Compressors]
Provide a total solutions system to save energy and reduce CO₂ for our customers through a capital and business alliance with Miura Co., Ltd.

→ The capital and business alliance began on January 5, 2022

Construction Machinery

Transform to a Stable Earnings Structure

- (1) Strengthen area strategies and restructure global production system
- (2) Turn a profit in solution businesses
- (3) Commercialize peripheral businesses

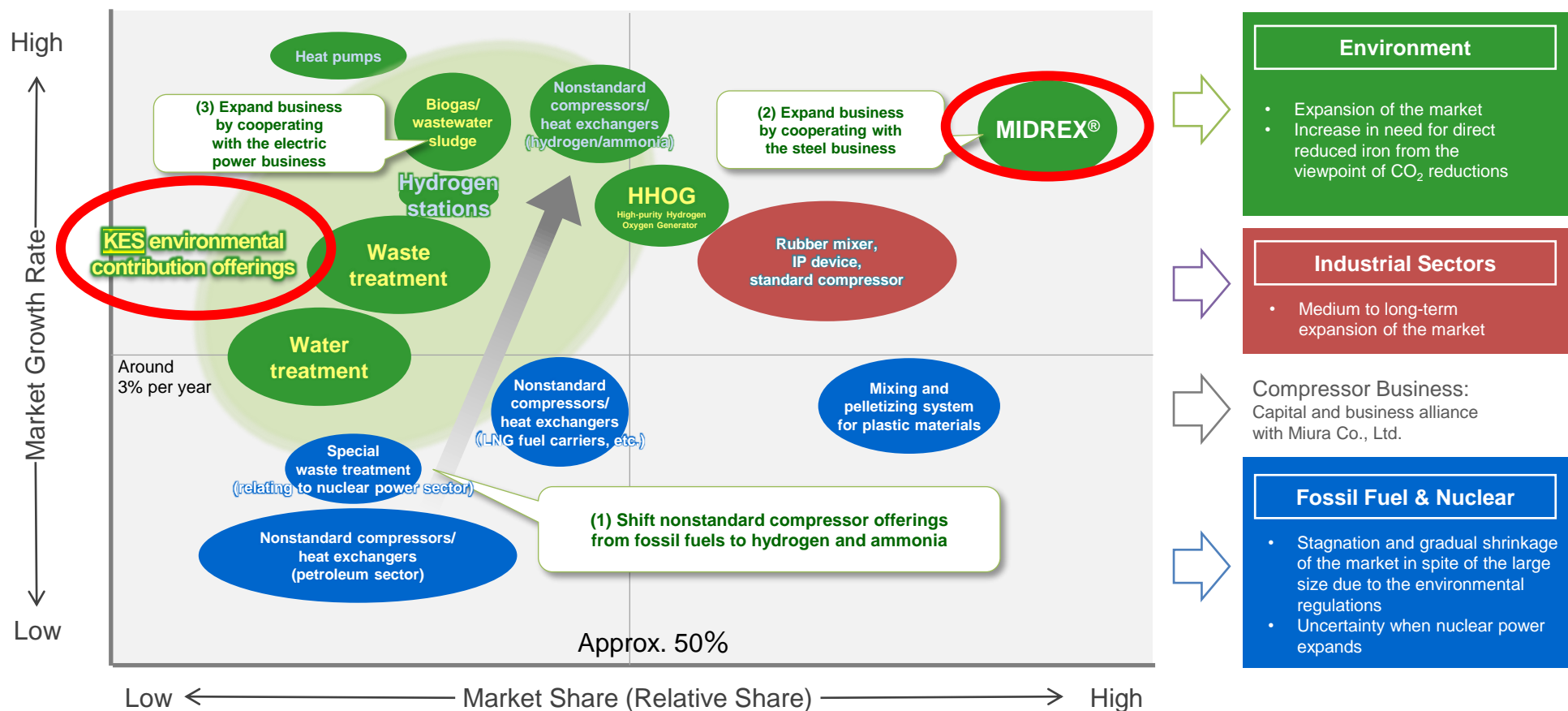
In June 24, 2022 Press Release

https://www.kobelco.co.jp/english/releases/1210520_15581.html

Machinery and Engineering Business Expansion

The Kobelco Group will capitalize on management resources in both the machinery and engineering businesses and cooperate with the steel and electric power businesses as well as Kobelco Eco-Solutions to demonstrate collective strengths and create unique Group value.

*SKS: Kobelco Eco-Solutions Co., Ltd.



Progress Toward KOBELCO Group Profitability [ROIC]

Group Targets in the Medium-Term Management Plan

KOBELCO Vision

Resolve social issues and create economic value through business activities

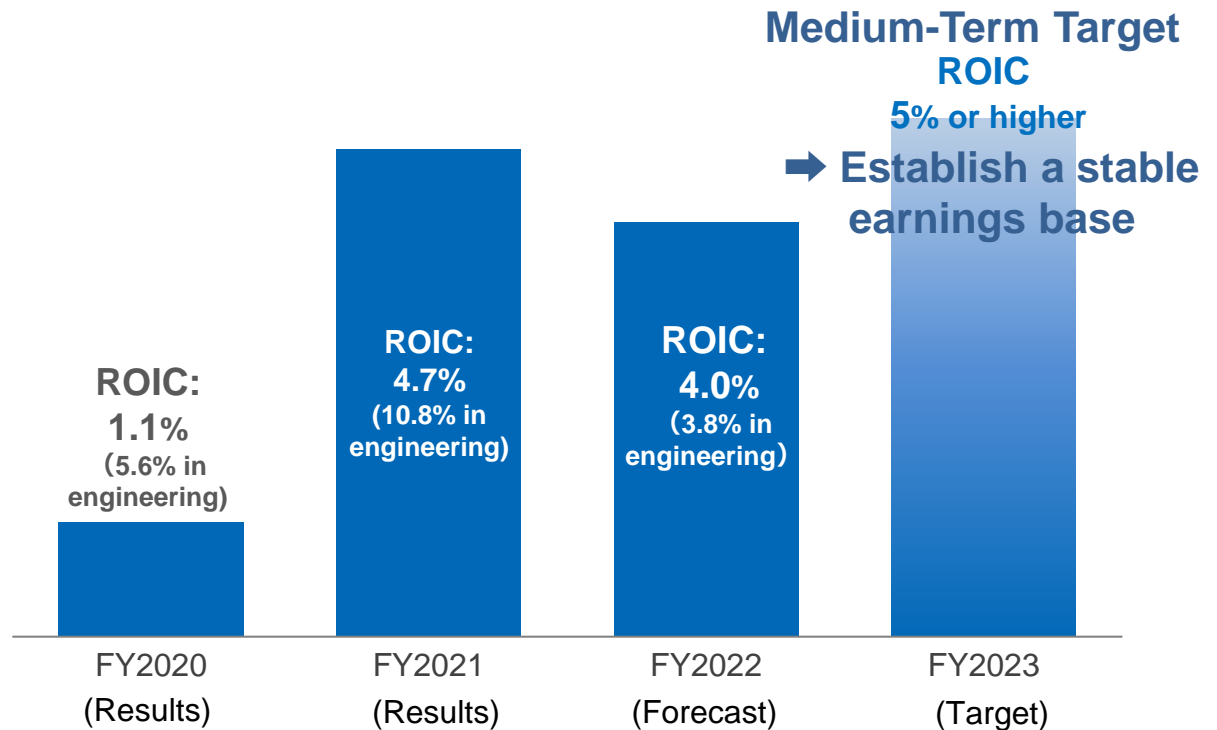


ROIC 8% or higher to achieve stable Kobelco earnings and sustainable growth

- FY2021 results: 4.7% ROIC; 93.2 billion yen in consolidated ordinary income
Engineering business: 10.8% ROIC; 7.7 billion yen
- FY2022 forecast: 4.0% ROIC; 80.0 billion yen in consolidated ordinary income
Engineering business forecast: 3.8% ROIC; 2.5 billion yen

Please see the May 11, 2022 IR release

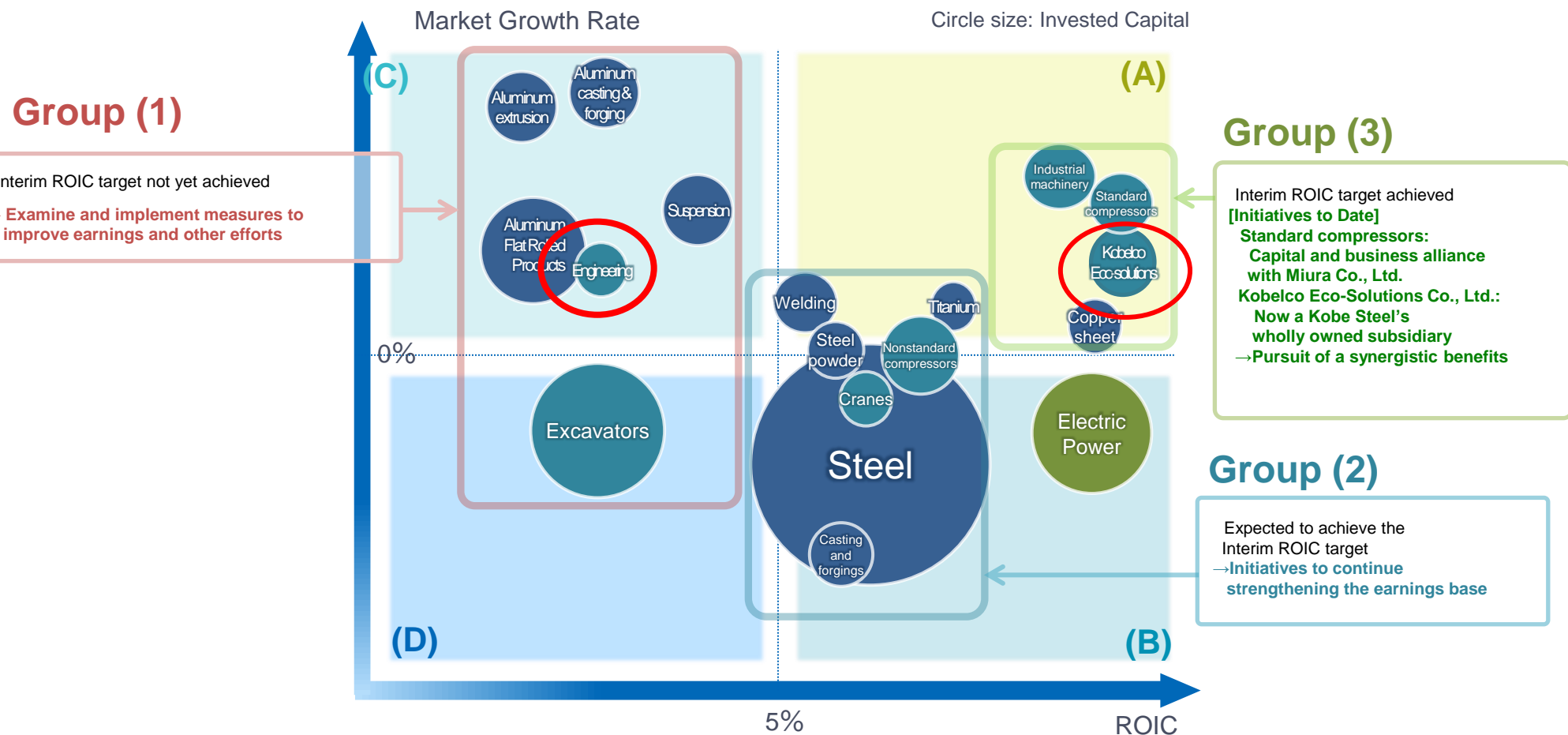
https://www.kobelco.co.jp/english/ir/library/fncf_results/2021/_icsFiles/afieldfile/2022/05/11/220511_ir_meeting.pdf



Engineering Business: Positioning of the Business Portfolio

- Kobelco Group engineering businesses have numerous technologies, products, and services that help reduce CO2 and the environmental impact centered upon Kobelco Eco-Solutions, a wholly owned subsidiary of Kobe Steel, and is positioned as a promising business to ensure environmental and social contributions in the future.

<FY2023 Forecast>



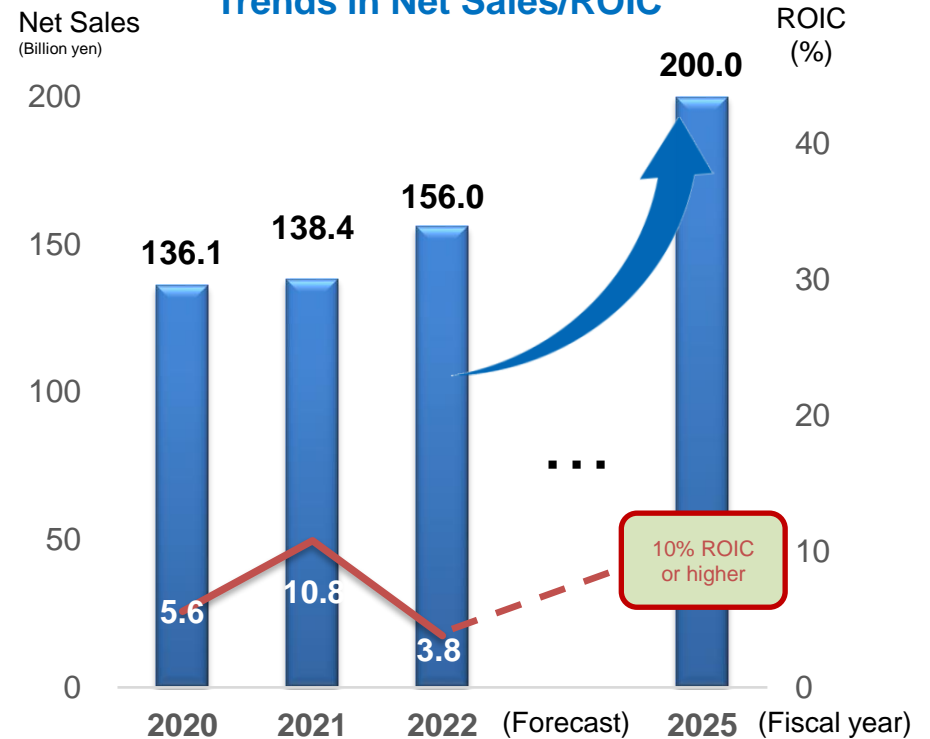
Engineering Segment and Topics

- Kobe Steel made Kobelco Eco-Solutions a wholly owned subsidiary in November 2021
- The Engineering segment expects to foster a greater synergistic effect with the aim of becoming a business boasting 200.0 billion yen in sales and a 10% of more ROIC by fiscal 2025

Purpose of Making Kobelco Eco-Solutions a Wholly Owned Subsidiary

- (1) Kobelco Eco-Solutions and the rest of the Kobelco Group will accelerate the creation of new businesses.
- (2) The Kobelco Group as a whole will ramp up initiatives to realize carbon neutrality.
- (3) The Kobelco Group will use its collective strengths to expand Kobelco Eco-Solutions businesses.
- (4) The Kobelco Group will improve management efficiency and reduce costs related to maintaining the stock listing.
- (5) The The Kobelco Group will expediate business operations and decision-making from a medium to long-term perspective.

Engineering Segment Trends in Net Sales/ROIC



Kobelco Eco-Solutions business has numerous environmental contribution offerings even in the Engineering segment for us to introduce.

Ⅱ . Kobelco Eco-Solutions (KES) Environmental Business Initiatives

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II-1. Overview

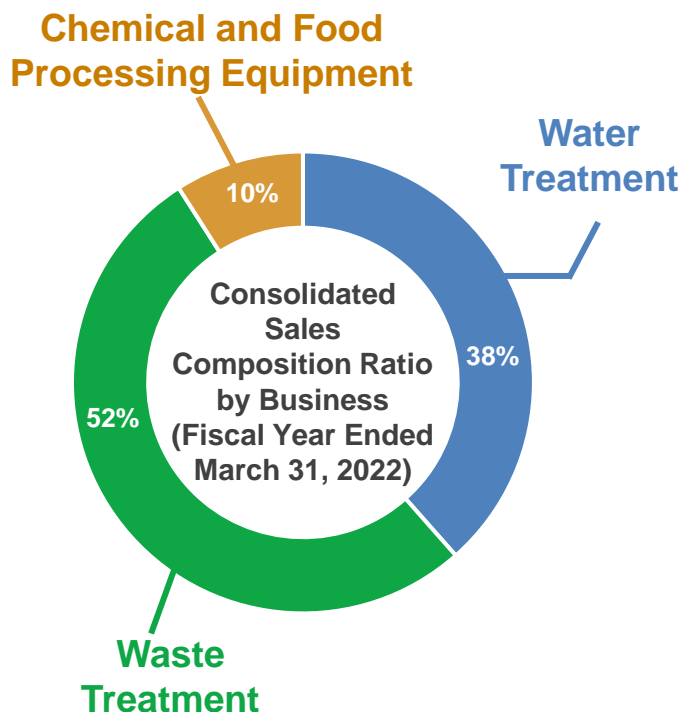
Corporate Philosophy

- Vision: To support a future society that lives in harmony with the Earth.
- Mission: To create a healthy environment and life for future generations through our innovative thinking.

Contribute to Realizing a Sustainable Society
Keep the Earth Sky-blue

Business Structure

- KES has an advantageous business portfolio with both Water Treatment business and Waste (General/Industrial Waste) Treatment business.



Water Treatment Business

- No.1 supplier for wastewater treatment plants in the Kinki regional area
- Capable of catering for a wide range of water treatment needs (including water purification, sewage treatment, and sludge treatment, etc.)

Waste treatment Business

- Over 70 supply track record for waste to energy and waste treatment facilities throughout Japan
- Products that contribute to the environment (stoker-type incinerators, fluidized-bed gasification and combustion/melting furnaces, etc.)
- Leading company for PCB detoxification in Japan

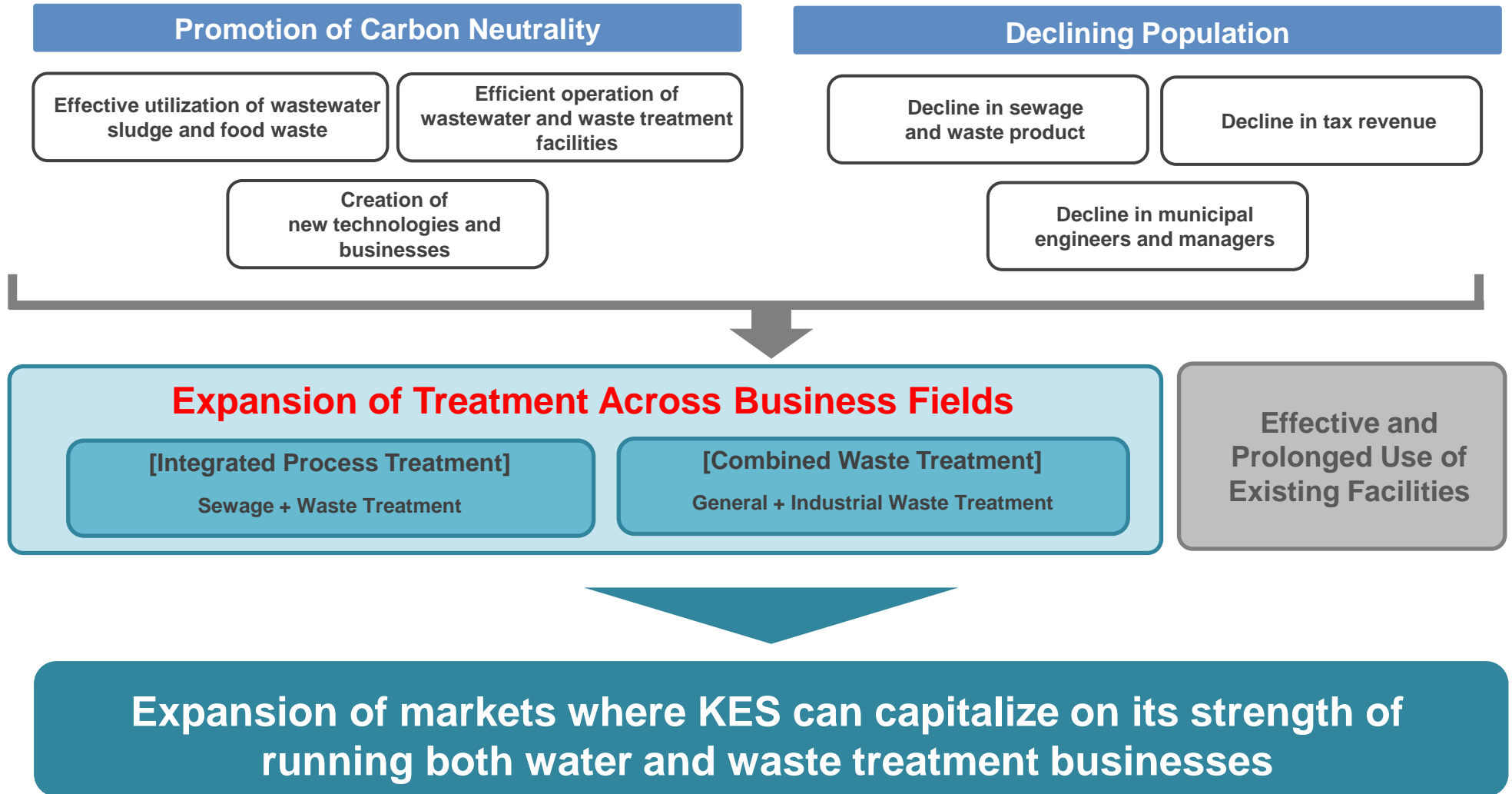
Chemical and Food Processing Equipment Business

- Top manufacturer of glass-lined equipment
- Established competitiveness by our unique technologies also in growth markets, such as medical and electronic materials.

Please see the link below for more product information:

<https://www.kobelco-eco.co.jp/english/solution/>

Wastewater and Waste Treatment Market Changes and Future Business Outlook



II-1. Overview: Outlook of Future Expansion Across Business Fields

Business Climate

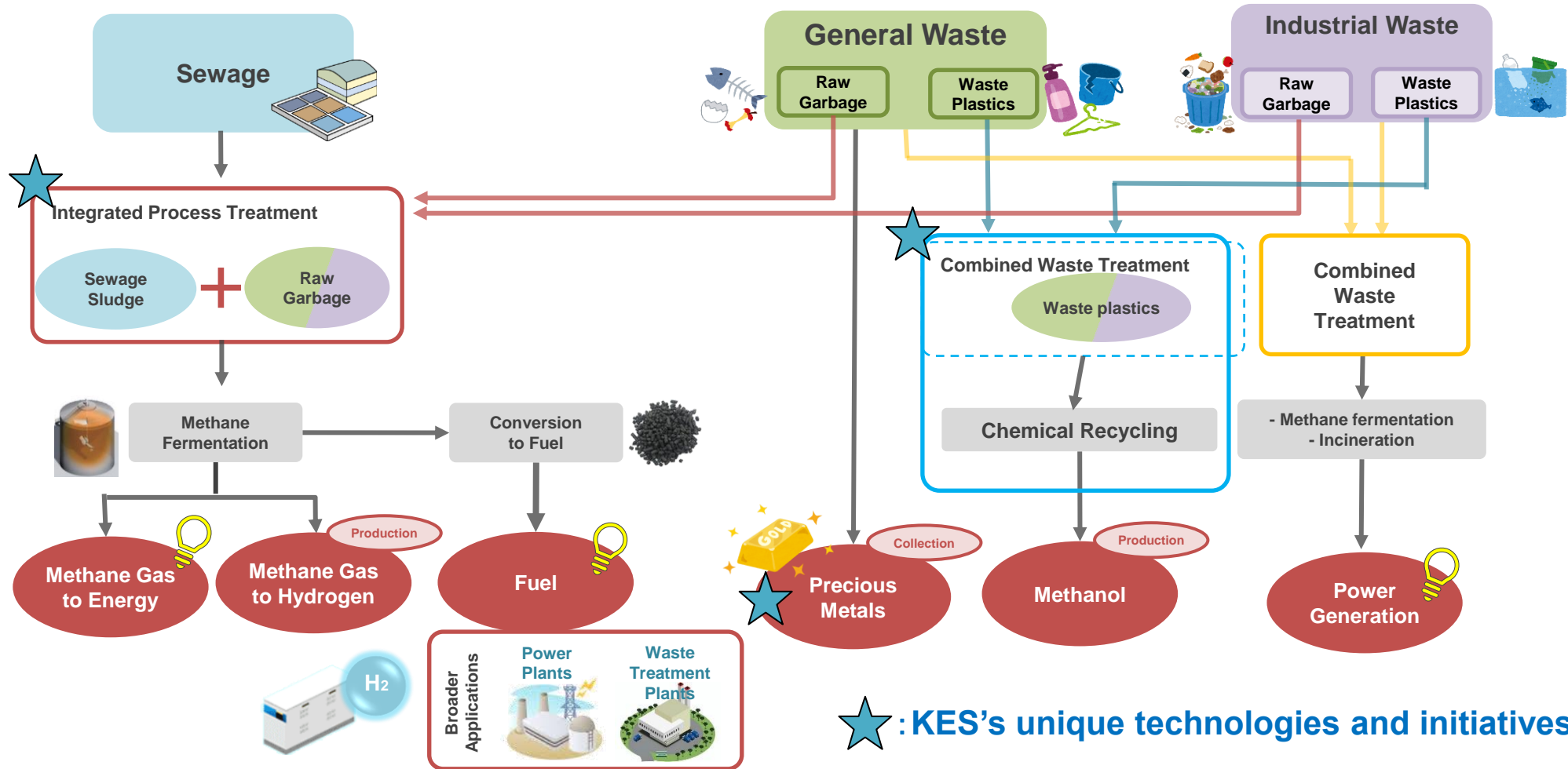
- (1) Promotion of Carbon Neutrality
- (2) Declining Population



**Proposal of Solutions
Optimal to Each Community**

**Treatment across sewage and waste product sectors,
Expansion of product applications and Creation of synergies via innovative technologies**

Domain
Treatment
Process
Product



II-1. Overview: Future Sewage and Waste Market Trends (Forecast)

- The declining population will shrink the respective conventional markets (sewage/general waste) while treatment across sectors (combined treatment of industrial waste, etc.) is expected to grow

Sewage Treatment Market

General Waste Treatment Market

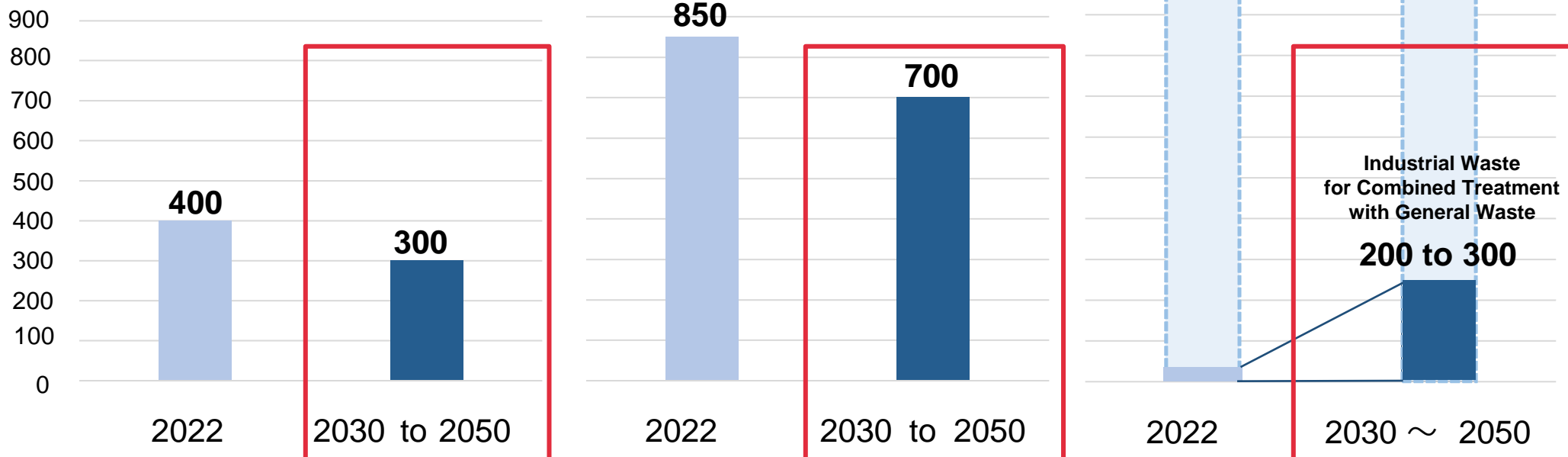
Industrial Waste Treatment Market

(Billion yen)

Intermediate Processing Business
in Total

(2 trillion yen)

(1.6 trillion yen)



Market size: Approx. 1.3 trillion yen

Basic Policy

Ambidextrous Management

Strengthen competitiveness
for Existing Businesses

Actively Invest
in Growth Fields

Ensure a stable earnings base through existing businesses and actively participate in growth sectors to realize sustainable growth.

Aiming to achieve carbon neutrality, we strive to further CO₂ reductions and use of renewable energy, engage in initiatives to realize a hydrogen society, and develop other new businesses.

Strengthening of Competitiveness for Existing Business

<Expand across Domains>

- Broaden clean energy businesses through local production and consumption of sludge and food waste products (sludge to fuel/methane gas to energy)

<Utilize Advantageous Technologies>

- Recover precious metals using fluidized bed gasification technologies

Active Investments in Growth Fields

<Expand across Domains>

- Build waste plastic gasification techniques through fluidized bed gasification technologies

<Initiatives to Realize a Hydrogen Society>

- Be the top provider in Japan of water-electrolysis hydrogen oxygen generators

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(1) Conversion of Sludge to Fuel

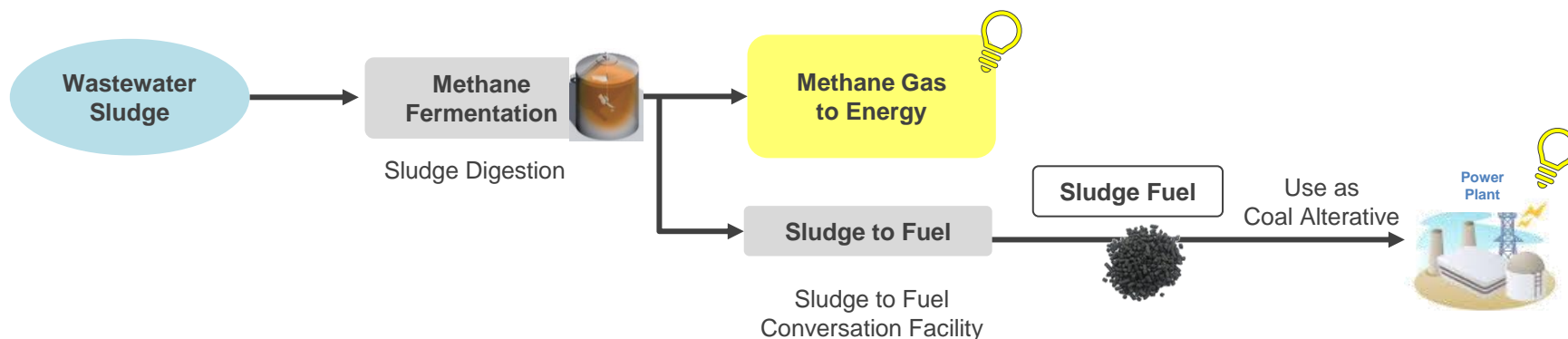
● Renovation Project for the Regional Sludge Treatment Facility at the Hyogo Prefecture's Eastern River Basin

(Contract amount [including tax]: 48,015 million yen) —a group of five companies represented by SKS gained the contract

(Construction contract concluded in October 2021)

- **One of the largest wastewater sludge treatment plants in Japan**

- Production of methane gas and sludge fuel from wastewater sludge, **which can contribute to the reduction of greenhouse gas emission by use of these as power generation fuels.**



● Restructuring Project for Sludge Treatment Plant (Construction of Facility for Effective Use of Sludge) in Fukuchiyama City, Kyoto

(Contract amount [including tax]: 5.5 billion yen)—a group of five companies represented by SKS gained the contract

(Construction contract concluded in January 2022; The project does not include methane gas power generation)

- Production of sludge fuel from wastewater sludge to use as an alternative to coal at the Kobe Power Plant

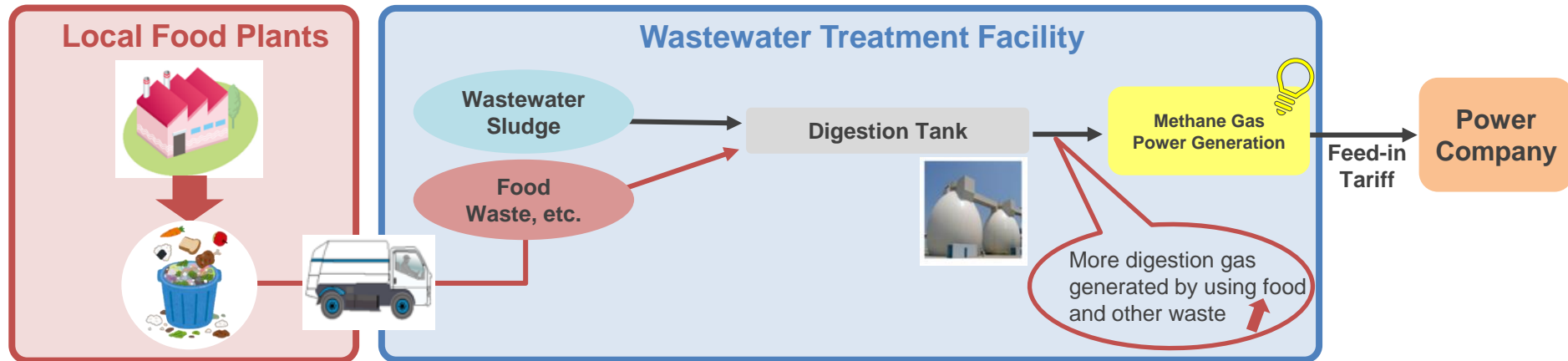
● Has launched the development of new technologies in wastewater sludge digestion and fuel conversion fields, aiming to contribute to realizing carbon neutrality

(2) Gas power generation using wastewater sludge, and food and other waste

- **First company in Japan to acquire a business license to process industrial waste inside a wastewater treatment plant**

Kobe City designated KES as the preferred contract bidder in its **project to rebuild the sludge treatment facilities at the Higashinada Sewage Treatment Plant** (The master agreement is expected to be concluded in November 2022)

- Implement **waste to energy conversion using existing infrastructure**
- **Biomass to energy facility for local production and consumption**
- Wastewater treatment facility renovation for approx. 10 years, and maintenance/management for 20 years



- ***Increase gas production roughly 10%, enhance power generation, and contribute to CO₂ reductions**

using food and other waste to produce around 12,000 m³/day of digestion gas derived from wastewater

- Power generation: 8,500 MWh/year or more (equivalent to power consumption by approx. 2,400 households)
- CO₂ reductions: 3,000 t-CO₂/year or more (Conversion coefficient for power to CO₂ emissions : 0.37 kg-CO₂/kWh)

*Large-scale wastewater treatment facility (100,000 m³/day): CO₂ emissions of 8,864 t-CO₂/year*¹

*1 Manual on Global Warming Countermeasures in Sewage Works published by the Ministry of the Environment and the Ministry of Land, Infrastructure, Transport and Tourism

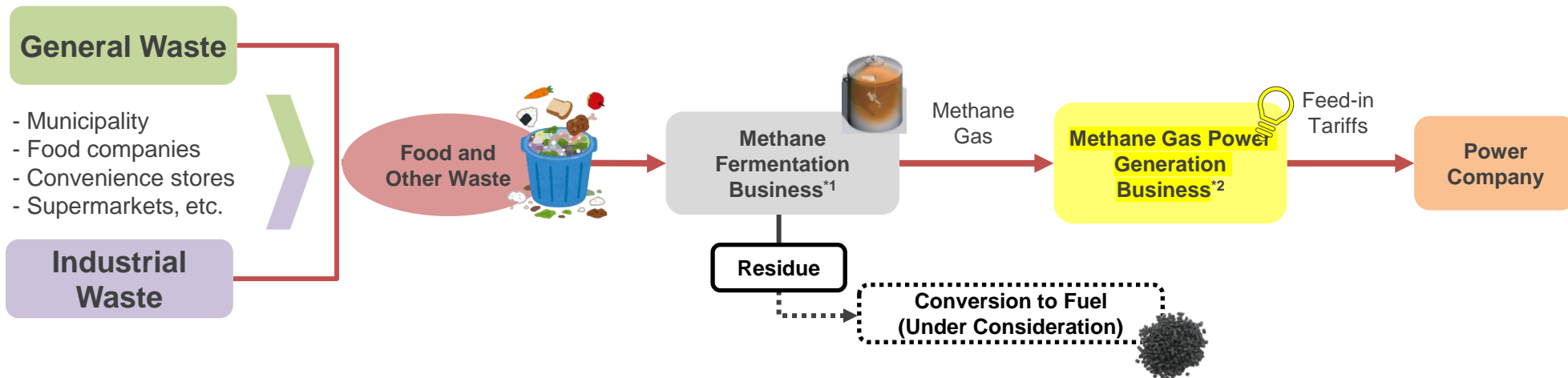
- Establish technologies to efficiently produce hydrogen from methane gas

Breakthrough by Dynamic Approach in Sewage High Technology Project (“B-DASH”) in Fuji City*² demonstrated that hydrogen can be produced from refined gas with highly concentrated methane. The hydrogen was used as fuel for commercially available electric vehicles

*2 Demonstration Project on the Efficient Energy Utilization Technology Using High-solids Anaerobic Digestion and Energy-saving Biogas Purification proposed by a consortium of KES, Japan Sewage Works Agency, and Fuji City and adopted by the Ministry of Land, Infrastructure, Transport and Tourism

(3) Gas power generation using food and other waste

- **Gas power generation using food and other waste across** general and industrial waste sectors and the promotion of **local resource recycling systems** contributing to carbon neutrality



- **Entering the business by establishing SPCs jointly with other companies**

***1: Kobec Co., Ltd.** (Methane gas power generation overseen by Kobe Kankyo Create)

Shareholders: Kobe Kankyo Create 83.7%
Kobelco Eco-Solutions 16.3%

Power capacity: 1,000 kW

Annual generation: Approx. 5,000 MWh/year
(equivalent to about 1,500 households)

Commencement of Operation: June 2024

Business location: Kobe City, Hyogo Prefecture

***2: Re-enermie Co., Ltd.** (Methane fermentation overseen by Daiei Kankyo)

Shareholders: Daiei Kankyo 65%
Kobelco Eco-Solutions 35%

Power capacity: 1,980kW

Annual generation: Approx. 10,000 MWh/year
(equivalent to about 3,000 households)

Commencement of Operation: April 2023

Business location: Iga City, Mie Prefecture

(4) Recovery of precious metals from urban mining (Use of KES's fluidized bed gasification technologies)

- **Resource recovery from urban mining** has been spotlighted as one of the means to promote the effective use of resources

- Confirmed that **high concentrations of valuable metals** can be recovered by using the fluidized bed gasification technologies

Note: Survey results show a gold concentration of tens to thousands of milligrams per kilogram at multiple facilities already using the technologies. The average gold concentration at the Hishikari Mine, the largest mine in Japan currently operating at a commercial scale, is roughly 20 milligrams per kilogram. (Source: Sumitomo Metal Mining website)

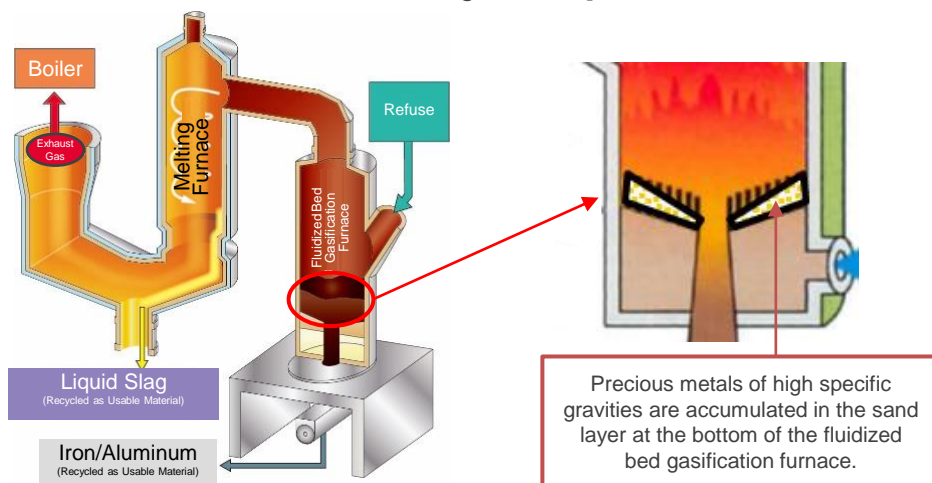
[Urban Mining]

Urban mining refers to the mining of rare metals and other valuable resources found in electronics and other large volumes of urban waste.




- Sagami City and KES jointly recovered precious metals (gold/silver) in the fluidized bed gasification and melting furnace built by KES for Sagami City.

[SKS Fluidized Bed Gasification and Melting Furnace]



FY2021 Sand Analysis Results (Gold/Silver)

	Amount Recovered
Gold (Au)	15,427 g
Silver (Ag)	15,856 g

<Reference: Value of Precious Metals>

Gold: Approx. 100 million yen

Silver: Approx. 1.5 million yen

*Based on the average price in 2021 as estimated by Tanaka Kikinzoku Kogyo

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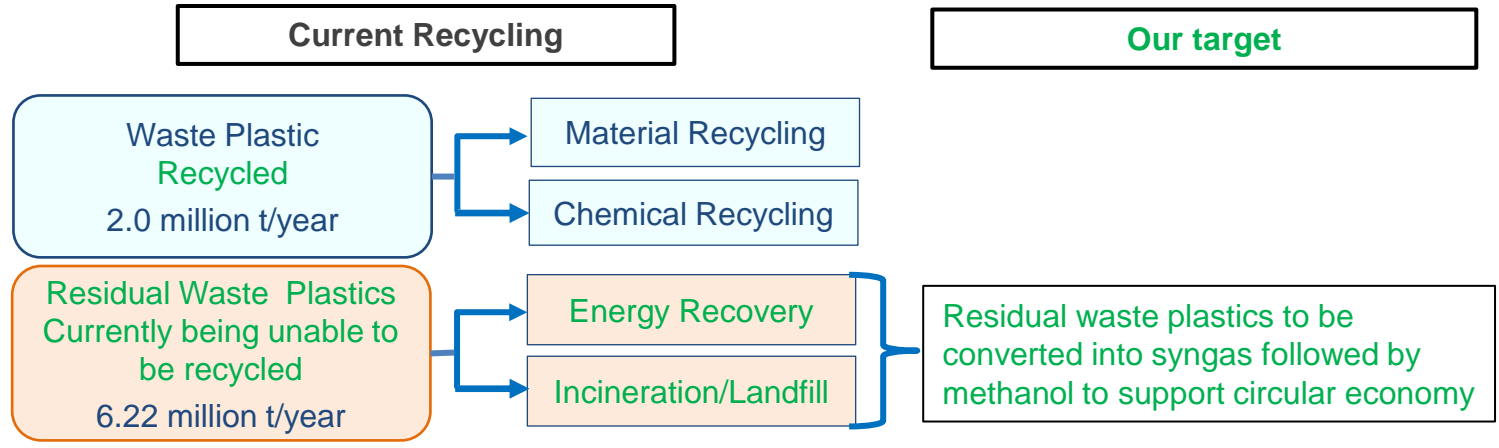
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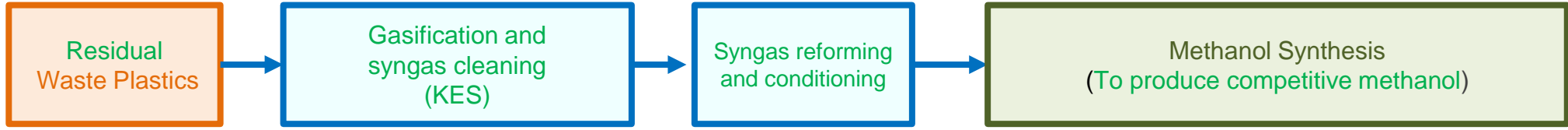
(1) Waste plastics to methanol



[Residual Waste Plastics]

● Our Project

- KES is working on a demonstration project being supported by a program "Demonstration Project for a Plastics Resource Circulation System toward a Decarbonized Society " funded by the Ministry of the Environment of Japan as well as collaborating with local authorities and partners. *1
- Using KES's fluidized bed gasification technology



● CO₂ reductions

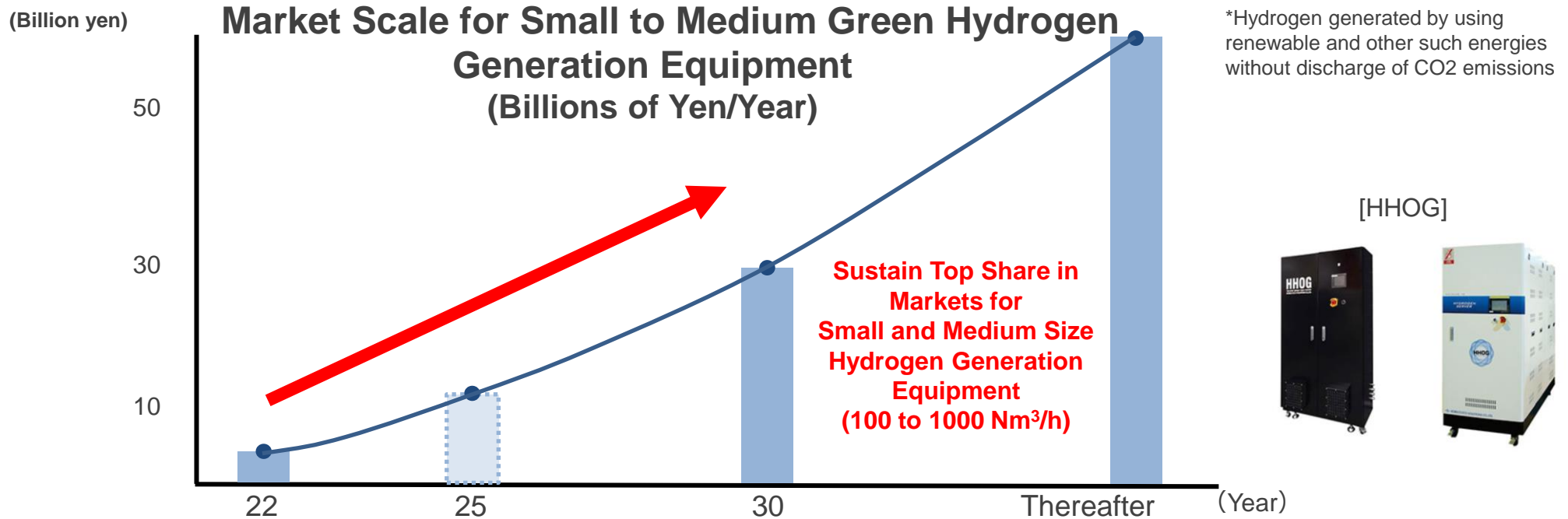
Our technology can reduce ca.100kt-co2 per annum compared with traditional methanol production process in case 60 ktpa residual waste plastics to be converted into 45ktpa methanol *2.

*1 [Lead] Kobelco Eco-Solutions
 [Partner] DINS Kansai Co., Ltd.
 [Affiliates] Daiei Kankyo Co., Ltd.
 Mitsubishi Gas Chemical Company, Inc.
 Mitsubishi Kakoki Kaisha, Ltd.
 [Govt. Partners] Osaka Prefecture and Sakai City

*2 Approx. 2.6% of the 1.7 to 1.8 million ton distribution volume per year Japan; currently produced only from natural gas or imported

(2) High-purity Hydrogen Oxygen Generator: HHOG

- **HHOG (High-purity Hydrogen Oxygen Generator)** can supply green hydrogen* by electrolysis using renewable energy
 - Top supplier for green hydrogen generation units (over 220 units)



- Our customers in FY 2021, including : **Toyota Motors, Oguchi Parts Center No. 2**
 (Used for Fuel-cell Battery Forklifts): 20Nm³/h (April 2021)
ENEOS, Yokohama Asahi Hydrogen Station: 30 Nm³/h (August 2021)
- Accelerate **development of large-capacity HHOG** in response to a growing needs for equipment with a higher hydrogen generation capacity

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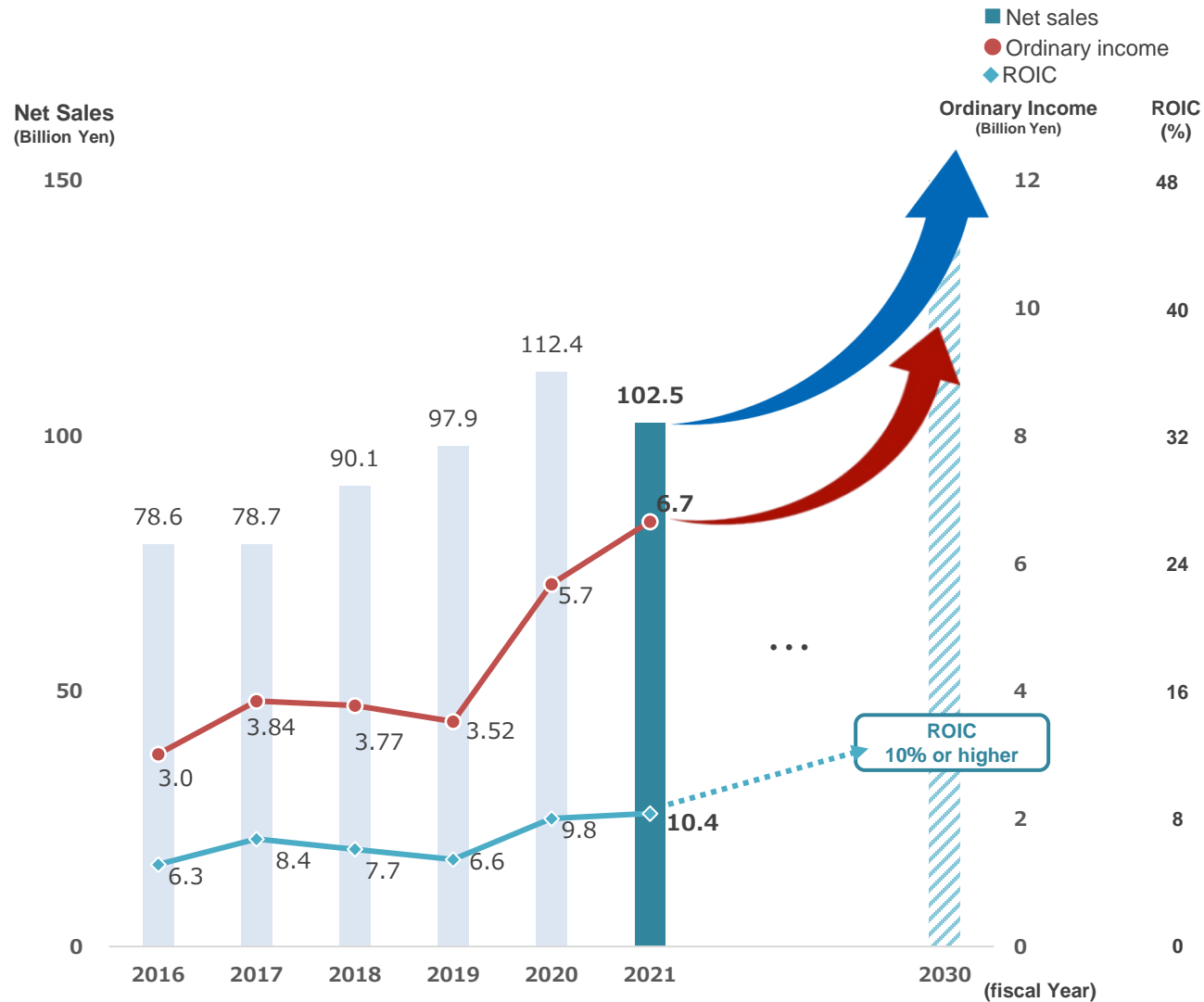
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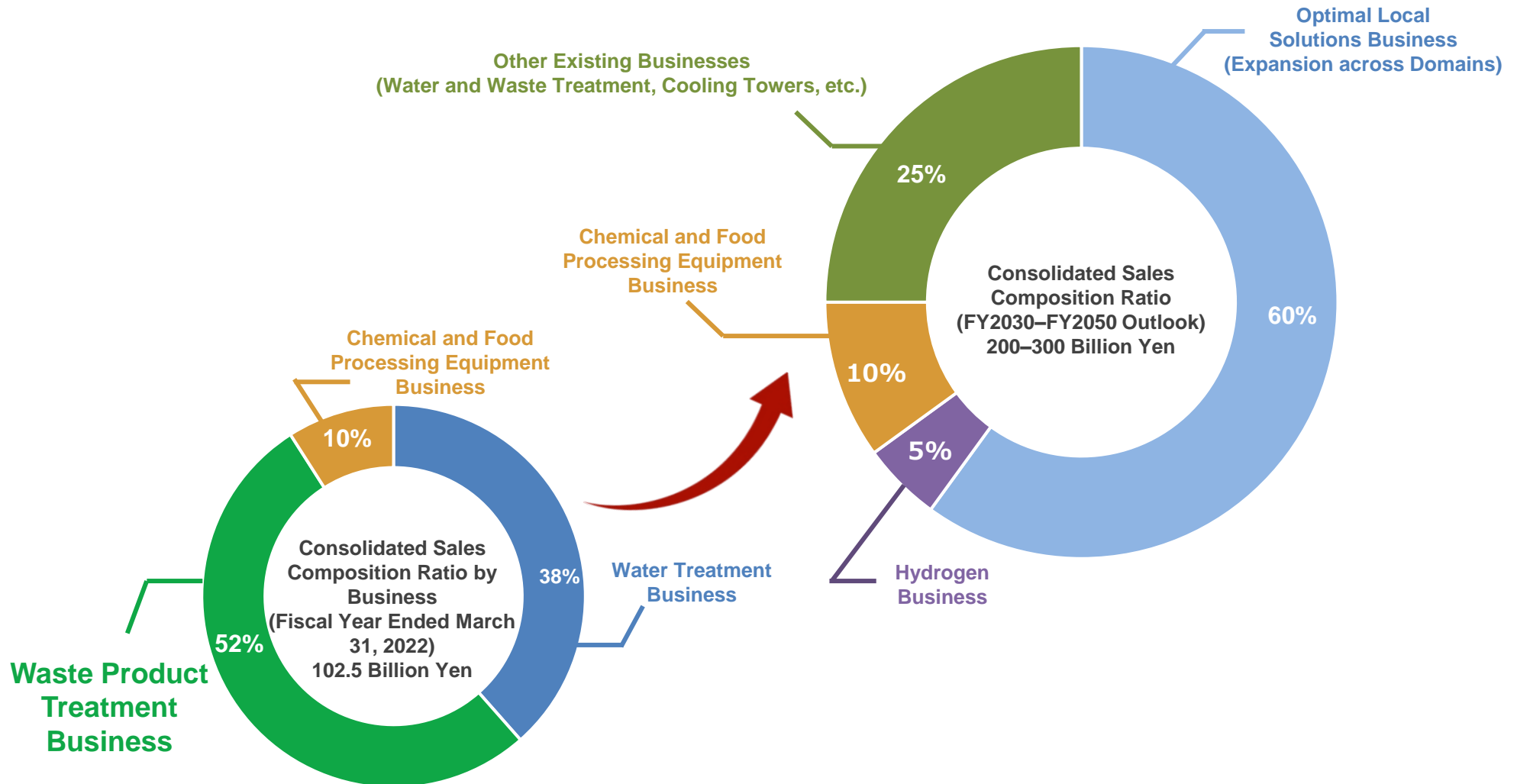
II -4. In Conclusion <KES Future Profitability Forecast>

- The KES Group aims to generate 10 billion yen or more in ordinary profit and an ROIC of at least 10% by fiscal 2030



II-4. In Conclusion <KES Future Profitability Forecast>

- KES aims to acquire a 20% to 30% share of the 1.3-trillion-yen market from 2030 to 2050



Group Corporate Philosophy

<p>KOBELCO's View of the Future</p>	<p>The society and future aimed for through realization of KOBELCO's Mission</p> <p>We envision a world in which people, now and in the future, can fulfill their hopes and dreams while enjoying safe, secure, and prosperous lives.</p>								
<p>KOBELCO's Mission</p>	<p>The KOBELCO Group awareness of its significance to society and mission to be fulfilled</p> <p>Our mission is to provide solutions to the needs of society, by making the best use of the talents of our employees and our technologies.</p>								
<p>Core Values of KOBELCO</p>	<p>The commitment of the KOBELCO GROUP to society and values common to the Group</p> <ol style="list-style-type: none"> 1. Providing trusted products and services 2. Drawing on the individual strengths of each employee while valuing Group harmony 3. Creating new value through continuous innovation 								
<p>Six Pledges of KOBELCO</p>	<p>The Quality Charter as well as the Standards of Conduct to be observed by all employees to meet "KOBELCO's Three Promises"</p> <table border="0"> <tr> <td>1. Uphold the highest sense of ethics and professionalism</td> <td>3. Establish a favorable working environment</td> </tr> <tr> <td>2. Contribute to society by providing superior products and services</td> <td>4. Live in harmony with local communities</td> </tr> <tr> <td></td> <td>5. Contribute to a sustainable environment</td> </tr> <tr> <td></td> <td>6. Respect each stakeholder</td> </tr> </table> <p style="text-align: center;">Quality Charter</p>	1. Uphold the highest sense of ethics and professionalism	3. Establish a favorable working environment	2. Contribute to society by providing superior products and services	4. Live in harmony with local communities		5. Contribute to a sustainable environment		6. Respect each stakeholder
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	6. Respect each stakeholder								

■ Cautionary Statement

- Certain statements in this presentation contain forward-looking statements concerning forecasts, assertions, prospects, intentions and strategies. The decisions and assumptions leading to these statements were based on information currently available to Kobe Steel. Due to possible changes in decisions and assumptions, future business operation, and internal and external conditions, actual results may differ materially from the projected forward-looking statements. Kobe Steel is not obligated to revise the forward-looking contents of this presentation.
- Uncertain and variable factors include, but are not limited to:
 - Changes in economic outlook, demand and market conditions
 - Political situation and trade and other regulations
 - Changes in currency exchange rates
 - Availability and market conditions of raw materials
 - Products and services of competing companies, pricing policy, alliances, and business development including M&As
 - Strategy changes of alliance partners

KOBELCO