

# Business Overview

## Initiatives for Revitalization and the Future

May 9, 2023

Chiyoda Corporation

# Enriching society through engineering value

## Our SDGs Materiality



SPERA Hydrogen  
Shaping the Future of Energy

1. Executive Summary
2. Revitalization Plan Progress
3. 2030 Vision
4. Business Portfolio Transformation
5. The Group Integration Reinforcement
6. Sustainability

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# **1** Executive Summary

# Executive Summary

## Progress of 4 Years in the 5 Year Plan

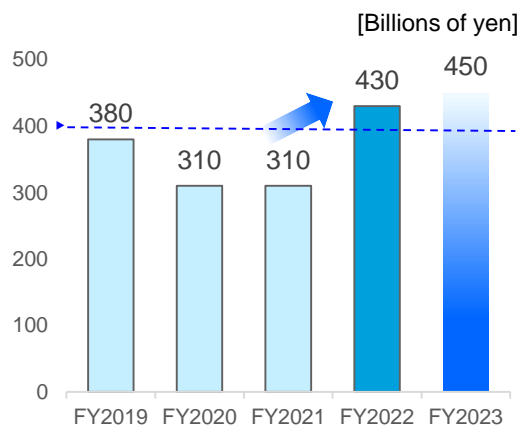
- Stable revenue with improved risk management and EPC execution management
- Order Backlog JPY 1.1 trillion secured
- Steady progress in new business fields, working towards business portfolio transformation

## Priorities for FY2023

- Strengthening financial position through profit earnings in steady execution of JPY 1.1 trillion Project Backlog
- Accelerated business portfolio transformation via continuing growth in new business areas
- Hydrogen business commercialization

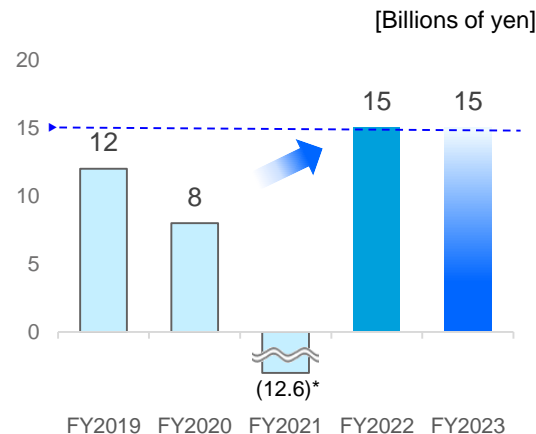
### Revenue

Steadily executes ongoing projects



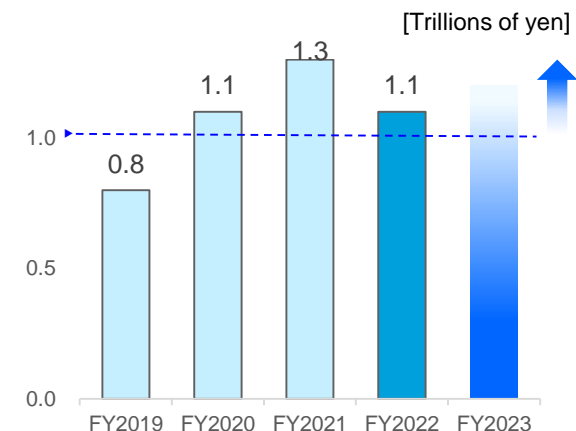
### Profit

High level and stable profit



### Backlog

Sustainably secured 3 year revenue



\* The figure includes Extraordinary Losses of JPY 20.4 billion related to the project losses by settlement of lawsuit with a client.

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## **2** Revitalization Plan Progress

# 1. Key Measures (Qualitative)

Key Measures	Four Year Progress	Assess	FY2023 Measures
① Improved risk management structure	<ul style="list-style-type: none"> <li>➤ Well-established centralized risk management structure</li> <li>➤ Solidly secured earnings on projects awarded following Revitalization Plan</li> </ul>	○*2	➤ Continuously reinforcing risk management
② Improved EPC execution management	<ul style="list-style-type: none"> <li>➤ Optimizing overall EPC by introducing Chiyoda AWP</li> <li>➤ Improved construction execution capability</li> </ul>	○	➤ Project execution as planned
③ Expansion and enhancement of human resources (HR) systems	<ul style="list-style-type: none"> <li>➤ Acquisition of improved HR information and HR career development under a Human Resources Officer (HRO) system</li> </ul>	○	➤ Promoting human capital management
④ Acceleration of digital transformation (DX)	<ul style="list-style-type: none"> <li>➤ Certified DX business operator by METI*1</li> <li>➤ Promoting company-wide DX</li> </ul>	○	➤ Improving business and promoting new business areas through DX
⑤ Business portfolio transformation	<ul style="list-style-type: none"> <li>➤ Steady progress in new business fields</li> </ul>	○	<ul style="list-style-type: none"> <li>➤ Continued growth of new businesses</li> <li>➤ Hydrogen business commercialization</li> </ul>

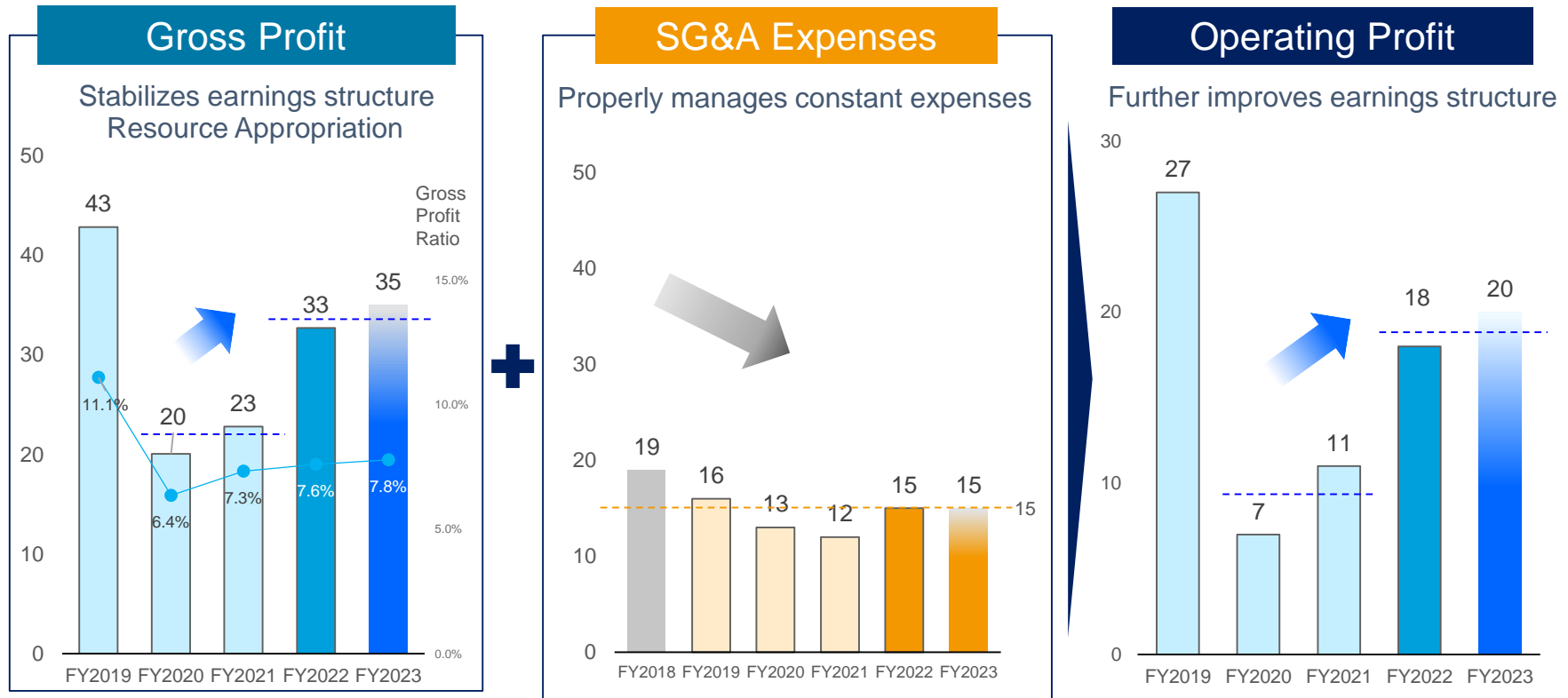
\*1 Ministry of Economy, Trade and Industry

\*2 ○: Achieved

# 2. Steady Profit Structure

- Enlarging stable earnings structure by steadily executing ongoing projects and accumulating new businesses as well as appropriation of resources and properly managing constant expenses

Billions of yen



# 3. Toward Business Portfolio Transformation

- New Orders amounted to JPY 1.65 trillion in the first four years of the Revitalization Plan, with new businesses growing steadily.

## Business Portfolio Transformation

### Existing Business / Medium to Small Size Projects

- Execution of projects change orders
- Front End Engineering and Design projects, etc

### New Business

Order approx. JPY220 billion

- Vaccine Constituent Production Facility
- Biopharmaceutical Manufacturing Plant
- Battery Energy Storage System
- CO<sub>2</sub> Methanation Facility

Feasibility Studies Ongoing, Leading to New Business Projects

EPC in New Business

Recurring Business\*<sup>1</sup>

Hydrogen and Ammonia  
CCS, CCU\*<sup>2</sup>  
Sustainable Aviation Fuel (SAF)  
Life Science  
Advanced Materials

New Orders  
JPY 1.65 trillion

### Existing Business / Large-scale Projects

- NFE LNG, Qatar
- Copper smelting plant, Indonesia

\*<sup>1</sup> Licensing, catalyst, subscription and business investment, Operation and Maintenance solution, etc

\*<sup>2</sup> Carbon dioxide Capture and Storage, and Utilization

#### Business Fields

■ Existing: LNG, Gas, Refinery, Petrochemical and Metal

■ New: Decarbonization, Hydrogen, Energy Management, Life Science and Advanced Materials



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## **3** 2030 Vision

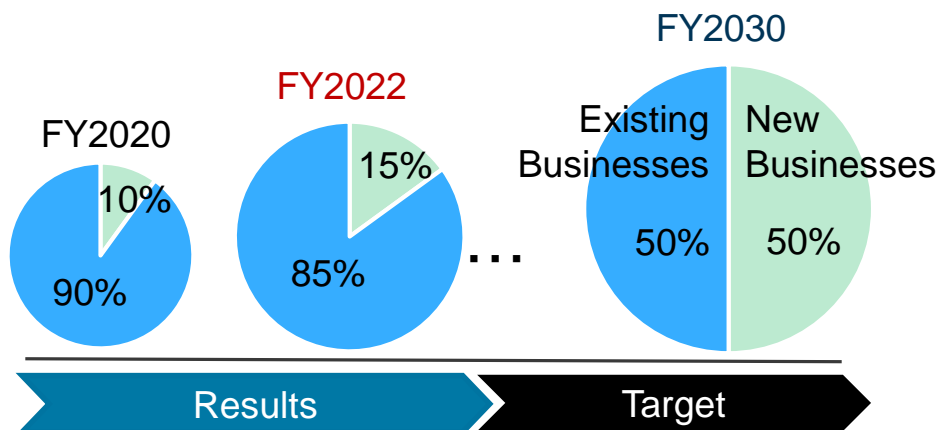
# 2030 Vision

## Steady Progress on Vision for 2030

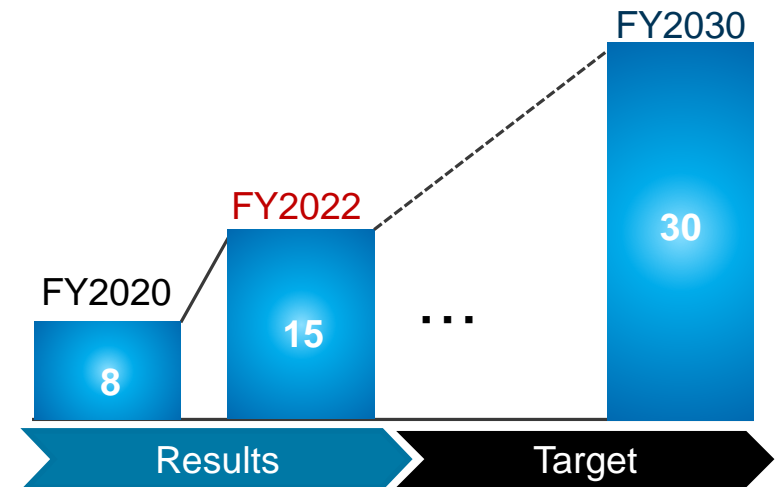
### 2030 Vision

- **Contribution to the goal of carbon neutrality by 2050** by accelerating the transition to a decarbonized society, including our advanced hydrogen technology.
- **Transformation of business portfolio and earnings structure** by reinvigorating existing businesses while accelerating new business initiatives.

### 【Business Portfolio Transformation】 Profit Contribution Ratio



### 【Quantitative Target】 Consolidated Profit [Billions of yen]



#### Business Fields

■ Existing: LNG, Gas, Refinery, Petrochemical and Metal

■ New: Decarbonization, Hydrogen, Energy Management, Life Science and Advanced Materials

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# **4 Business Portfolio Transformation**

# 1. Mirai\* Engineering

Business portfolio transformation by creating  
'New Engineering Value'  
in four business domains and DX.

Stable supply of  
clean energy,  
CO<sub>2</sub> reduction and  
utilization



Early realization  
of a hydrogen  
energy society



Optimizing energy  
utilization, promoting  
renewable energy and  
power storage



High value life  
science solution  
provider



Digital Transformation (DX)

DX Business Promotion & Innovation

\* 'Mirai' means 'future' in Japanese.

# 2. Low Carbon and Carbon Recycling



## Vision

- Focusing on decarbonization supplying LNG as transition energy
- Commitment to a carbon recycling society by applying carbon recycling engineering

## Cleaner LNG



Courtesy of QatarEnergy

- **NFE LNG, Qatar**  
CO<sub>2</sub> emissions reduction of more than 25% compared to existing LNG plants

## Metallic Resources in Decarbonized Society



Courtesy of P.T. Freeport Indonesia

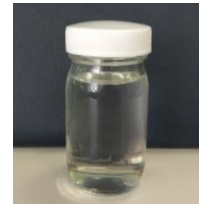
- **Copper Smelting Plant, Indonesia**  
Copper plays a key role in a decarbonized society

## CCS\*1

- Technology development to realize cost reduction of CCS from low concentration CO<sub>2</sub>
- CCS collaboration with UK Pace CCS, Pertamina in Indonesia and Electricity Generation Authority of Thailand

## CCU\*2

- Major ongoing technical development
  - P-Xylene production from CO<sub>2</sub> and hydrogen
  - CO<sub>2</sub> in concrete materials
  - Manufacturing ethylene from CO<sub>2</sub> and water



First purified p-Xylene produced from CO<sub>2</sub>

## Sustainable Fuel

- Constructing e-fuel / Sustainable Aviation Fuel (SAF) projects

\*1 Carbon dioxide Capture and Storage

\*2 Carbon dioxide Capture and Utilization

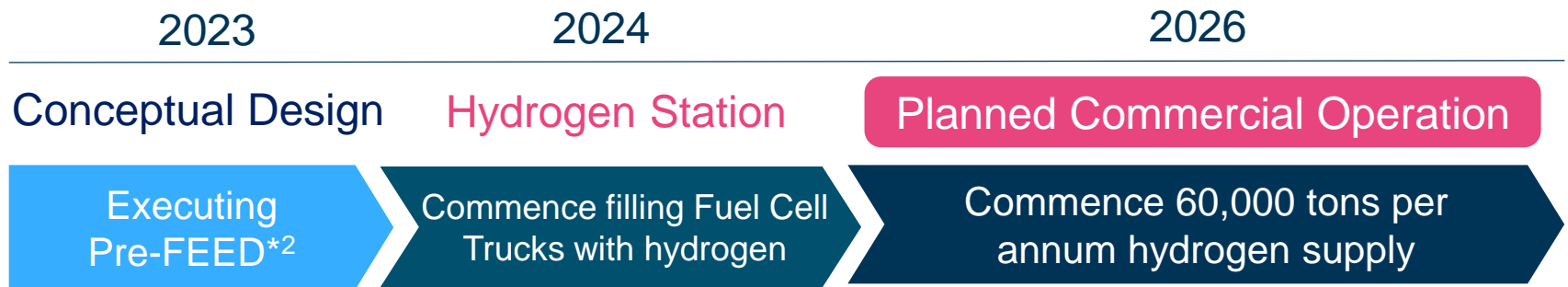
# 3. Hydrogen Business ~SPERA Hydrogen™~



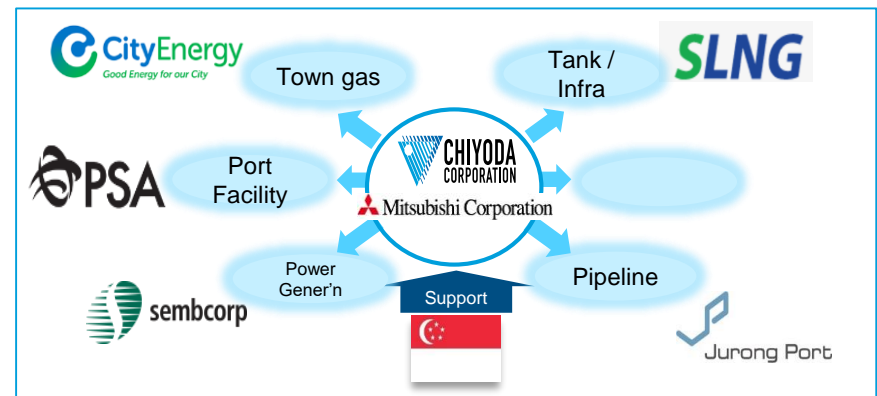
Vision

Contributing to the early realization of a hydrogen energy society based on MCH-LOHC\*<sup>1</sup> supply chain construction, centered on our unique SPERA Hydrogen technology

Constructing a **commercial scale** hydrogen supply chain in Singapore



- Singapore, as well as Japan, relies on energy import, with limited domestic energy source including renewable energy
- **Hydrogen introduction in Singapore serves as a role model for Japan**



\*<sup>1</sup> Methylcyclohexane as a Liquid Organic Hydrogen Carrier

\*<sup>2</sup> Front End Engineering and Design

# 3. Hydrogen Business ~SPERA Hydrogen™~



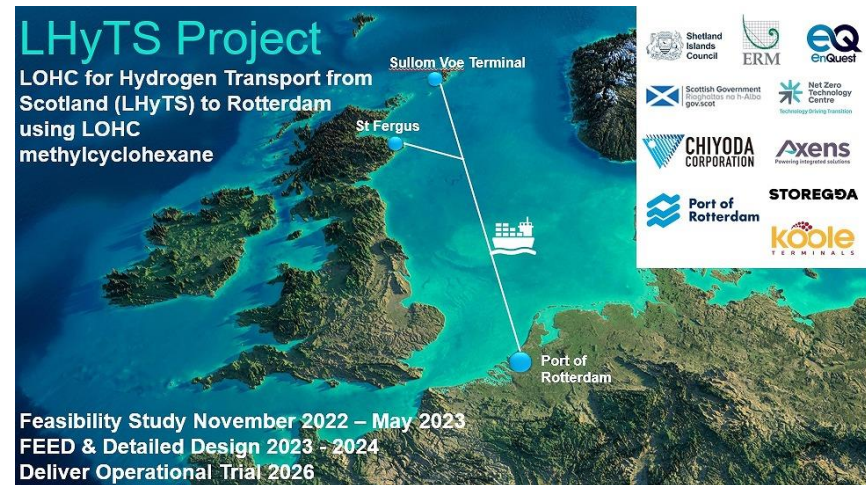
Vision

Contributing to the early realization of a hydrogen energy society based on MCH-LOHC\*1 supply chain construction, centered on our unique SPERA Hydrogen

## Progressing a hydrogen import hub and a hydrogen highway project in Europe\*2

Commercial scale hydrogen import to Rotterdam, The Netherlands

Scotland to Rotterdam hydrogen highway project



\*1 Methylcyclohexane as a Liquid Organic Hydrogen Carrier

\*2 Source: <https://www.portofrotterdam.com/sites/default/files/2021-06/hydrogen-economy-in-rotterdam-handout.pdf>



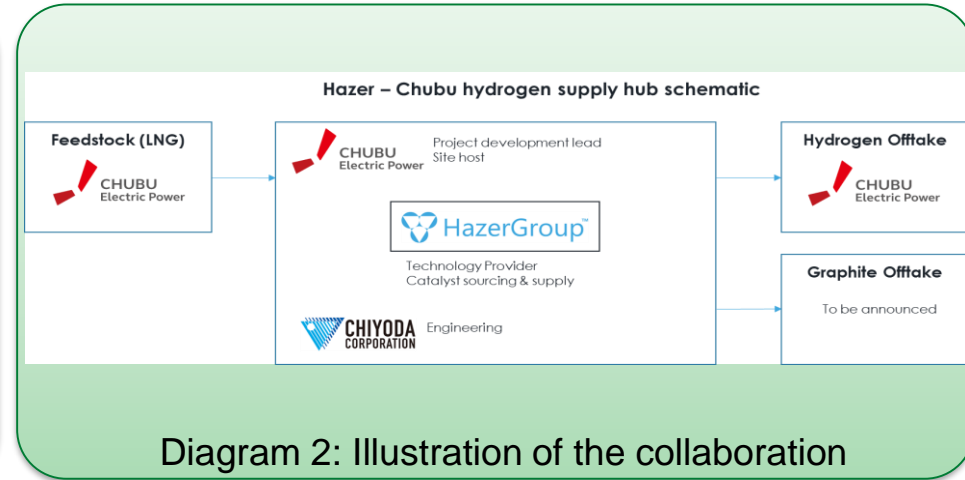
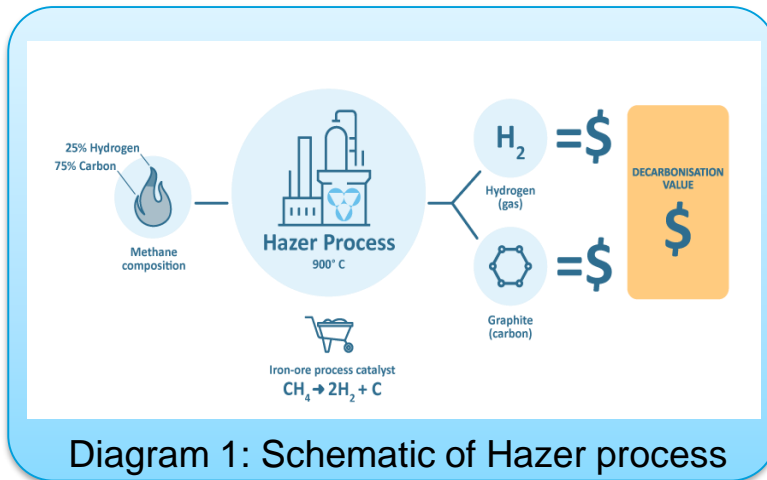
# 3. Hydrogen Business ~SPERA Hydrogen™~



## Vision

Contributing to promote regional hydrogen utilization and realize hydrogen local production and consumption model by introducing new technology

## Carbon free hydrogen production development plan in the Chubu region, Japan ~With Chubu Electric and Hazer, Australia~



- The Hazer Process is a technology to produce hydrogen and high quality graphite from methane / biogas. It promotes methane thermal decomposition in reactors using iron ore as a process catalyst.
- Planned production capacity is between 2,500 and 10,000 tonnes per annum, targeting ultimate production capacity of between 50,000 and 100,000 tonnes per annum.
- Project Development Plan by 2024, aimed at commencing the initial start-up of the facility by the late 2020s.



# 4. Energy Management Business



## Vision

- EPC / O&M in renewable energy, energy storage, and energy management fields
- Creating businesses with EPC facilities expertise and data application

## World's largest battery storage system completed

## Way Forward

Client	North Hokkaido Wind Energy Transmission Corporation
Significance	<ul style="list-style-type: none"><li>• Completion of an energy supply combination project</li><li>• Gains experience and expertise in 20 year maintenance work</li></ul>



Battery Energy Storage System

- Promotes the next battery energy storage system project
- Deploys battery energy storage and renewable energy complex projects
- Deploys to local utility businesses

# 5. Life Science Business



Vision

High value-added biotechnology and life science solution provider

Vaccine constituent production facility completed

Way Forward

Significance

- Domestic vaccine supply facility
- Subsidized by METI\*1 and MHLW\*2



SHIONOGI & CO., Ltd. Vaccine Constituent Production Facility

- Development to next generation pharmaceutical products (cell therapy and regenerative medicine)
- Development to bio-industry

Applying expertise from the oil and petrochemical industry

Expertise deployment

- Participation in contract development and manufacturing business for active pharmaceutical ingredients and intermediates, led by Shionogi Pharma Co., Ltd.
- Applying oil and petrochemical continuous manufacturing (CM) technology expertise in the pharmaceutical industry

- Successfully applied CM technology in the pharmaceutical environment

\*1 Ministry of Economy, Trade and Industry

\*2 Ministry of Health, Labour and Welfare

# 6. Digital Transformation (DX)



Vision

Digital Transformation realization - aiming to be a new leading engineering company

## Company-wide DX acceleration: Four basic strategies

### Project Execution DX

- Optimizing EPC execution management with Chiyoda AWP
- Introducing PlantStream™, an innovative space design system, streamlining engineering work

### Corporate Management DX

- Optimizing HR planning and management
- Introducing RPA\*1 for work efficiency
- Promoting working from home environment

### DX Business

- Deploying clients plant O&M-X\*2 solution business
- Joint provision of a cost-effective 3D digital twin platform with USA company Visionaize, Inc.

### Human Resources DX



Actual plant (left) and 3D digital twin (right). Commenced plant O&M-X\*2 solution service.

\*1 Robotic Process Automation

\*2 Operation and Maintenance Transformation

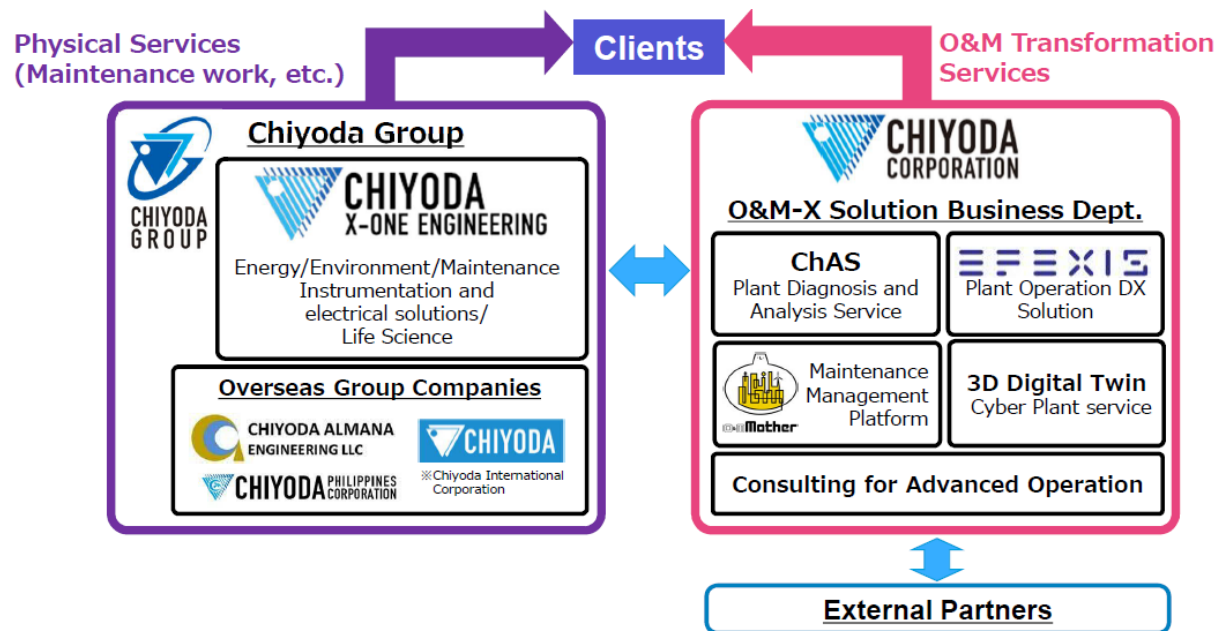
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# **5** The Group Integration Reinforcement

# The Group Empowerment

## CHIYODA X-ONE Engineering Corporation Commenced Operation

- An integrated engineering company 'CHIYODA X-ONE Engineering Corporation' was established in April 2023 from the merger of three group companies.
- The Group deploys 'domestic EPC\*<sup>1</sup> reinforcement' and 'clients' plant O&M-X\*<sup>2</sup> digitalized solution business'.



\*1 Engineering, Procurement and Construction

\*2 Operation and Maintenance Transformation

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# **6** Sustainability

# 1. Reducing Supply Chain CO<sub>2</sub> Emissions

## Carbon Neutral Declaration

Chiyoda is contributing to the realization of carbon neutrality by 2050 via our integrated engineering with digital transformation under the corporate philosophy 'Energy and Environment in Harmony'.

	Scope 1 and 2	Scope 3
FY2030 Mid-term Target	50% reduction in GHG* <sup>1</sup> emissions compared to FY2020	We contribute to carbon-recycling and decarbonized society realization through 'reduction' and 'recirculation'.
FY2050 Long-term Target	Net zero GHG emissions by 2050	



Promoting proposals to clients reducing supply chain CO<sub>2</sub> emission (Scope 3)

### Agreed Proposal, Ongoing

- Energy re-use of redundant steam power generation reducing operation cost
- CCS for LNG AGR\*<sup>2</sup> facility CO<sub>2</sub> emissions
- CO<sub>2</sub> reduction by gas turbine drive exhaust heat steam power generation

### Proposal Under Client Consideration

- Reduces CO<sub>2</sub> emitted from gas turbines, transferring to CCS\*<sup>3</sup> facilities
- Reduces CO<sub>2</sub> from exhaust gas co-firing with hydrogen in LNG gas turbine and boiler

\*<sup>1</sup> Greenhouse gas    \*<sup>2</sup> Acid Gas Removal    \*<sup>3</sup> Carbon dioxide Capture and Storage



# 2. Promoting Human Capital Management

## Vision

- Human resources are the most important asset of an engineering company
- Improvement and enlargement of human resources are the driving force leading to business growth

Objective	Improvement and Enlargement of HR	Fostering Digital HR	Wellness Management / Diversified Organization
Responsible Officer	CHRO*1	CDO*3 & CHRO	Wellness : CWO*4 (CEO) Diversity : Head of Office
Major Policies	<ul style="list-style-type: none"> <li>➤ HRO*2 structure to develop HR by 4 job categories</li> <li>➤ Job assignments to realize mid to long-term business strategies</li> <li>➤ Aggressive junior staff assignments</li> </ul>	<ul style="list-style-type: none"> <li>➤ Accelerates business transformation by HR Transformation x Digital Transformation</li> <li>➤ Fosters digital mindset</li> <li>➤ Skill set acquirement support</li> </ul>	<ul style="list-style-type: none"> <li>➤ Promotes wellness management</li> <li>➤ Promotes diversity                             <ul style="list-style-type: none"> <li>• Women's empowerment quantitative targets</li> <li>• Recognizes diversity &amp; inclusion status and agenda</li> </ul> </li> </ul>
Major Achievement	<ul style="list-style-type: none"> <li>➤ HROs interview 1,319 employees</li> <li>➤ Managers in their 30's / Group company presidents in their 40's</li> <li>➤ Achieved HR Award in 2022</li> </ul>	<ul style="list-style-type: none"> <li>➤ Certified as DX business operator</li> <li>➤ 19 employees qualified in digital certification</li> <li>➤ Digital training for all employees</li> </ul>	<ul style="list-style-type: none"> <li>➤ Certified 3 consecutive years as Health and Productivity Management Organization</li> <li>➤ Female executive ratio doubled (FY2020 3.7%, FY2022 8.3%)</li> <li>➤ Male child care leave ratio 75.0% (Up 30.1pt from FY2021 44.9%)</li> </ul>



\*1 Chief Human Resources Officer

\*2 Human Resources Officer

\*3 Chief Digital Officer

\*4 Chief Wellness Officer



# *Energy and Environment in Harmony*



Chiyoda Corporation Corporate Services Department IR, PR & Sustainability Advanced Section, <https://www.chiyodacorp.com/en/>

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