

Kanadevia IR Day

Carbon Neutral Solution Business Headquarters

19 December, 2024

Kanadevia Corporation

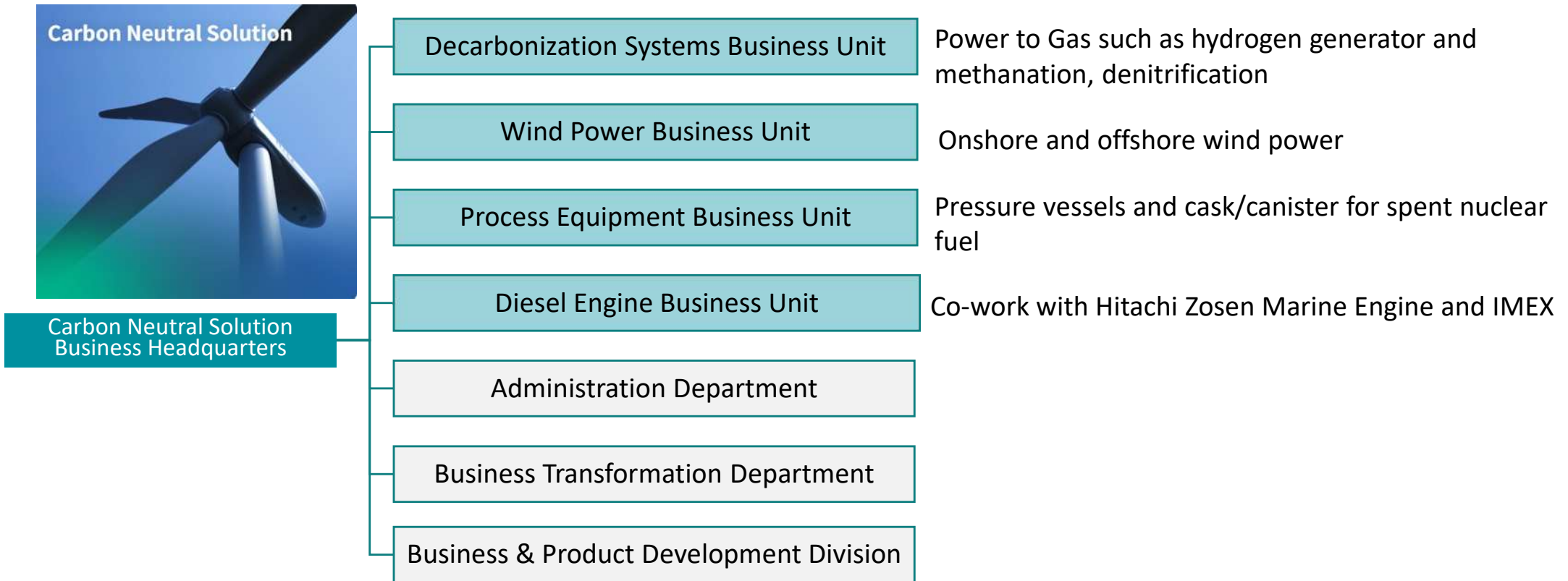
Background

Junichi Yamamoto

- 1995 Joined the Company, Environment Business HQ
- 2006 Plant Planning Dept./Chemical Group
- 2013 Kanadevia Inova (Project Execution Dept.)
- 2017 Environment Business HQ/Overseas Environmental Business
of the Company
- 2018 Kanadevia Inova (Project Office)
- 2021 General Manager, Project Management Department
- OCT.2022 General Manager, Overseas Environmental Business Unit
of the Company
- 2024 General Manager, Carbon Neutral Solution Business HQ

Business Overview

Business Overview - Organisation



Major group companies

Japan

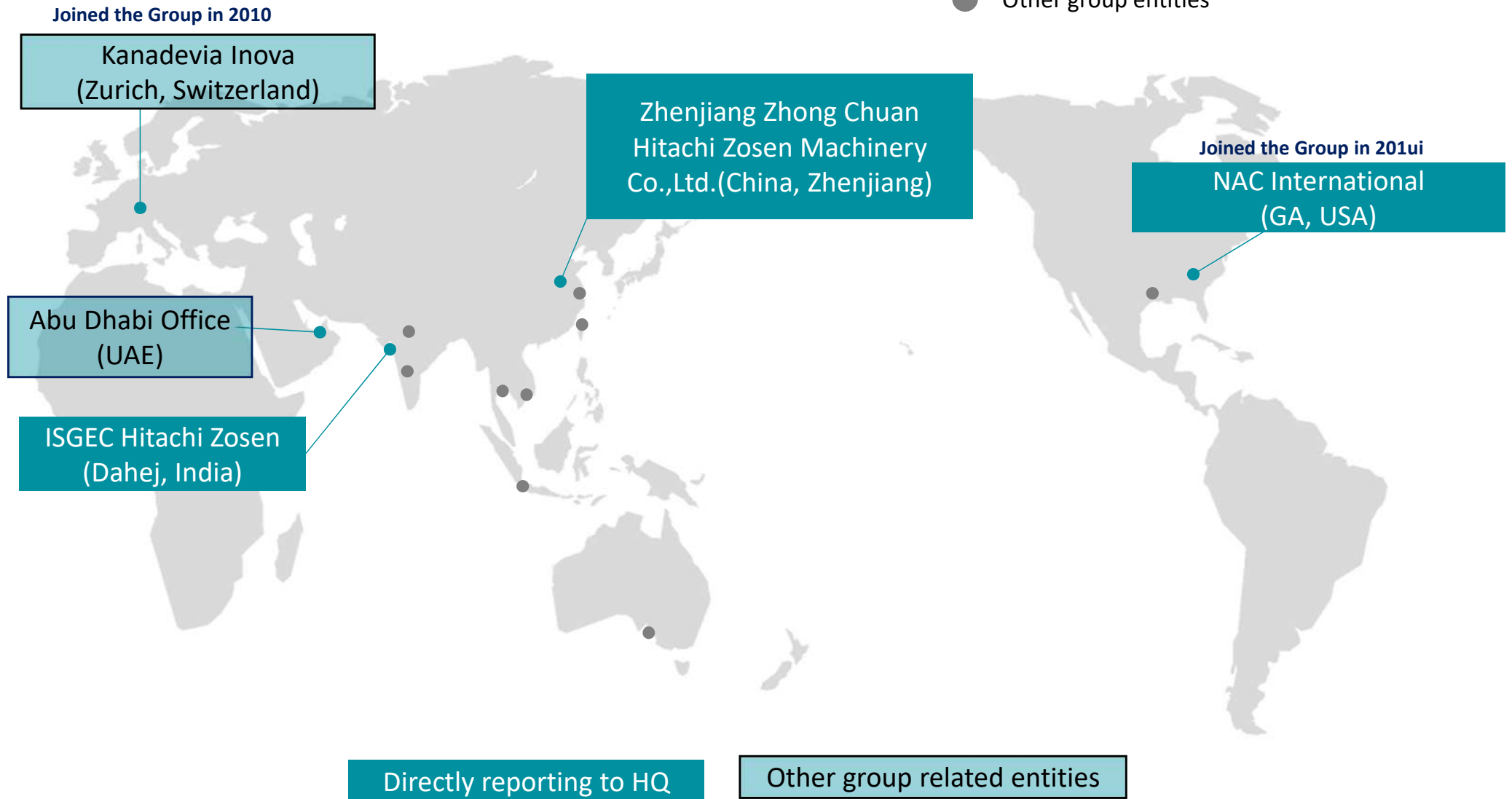
- 【Diesel engine】 IMEX
- 【Diesel engine】 Hitachi Zosen Marine Engine
- 【Nuclear】 Toso Mirai Manufacturing
- 【Wind power】 Mutsu Ogawara Wind Power

Overseas

- 【Nuclear】 NAC International Inc. (USA)
- 【Process】 ISGEC-Hitachi Zosen (India)
- 【Diesel engine】 Zhenjiang Zhong Chuan (China)

Business Overview – Global Network

- Overseas offices and affiliates related to Carbon Neutral Solution Business
- Other group entities



Business Overview - Products

Decarbonization Systems

Water electrolysis



Methanation



Denitrification catalyst



Wind Power

Offshore wind power



Onshore wind power

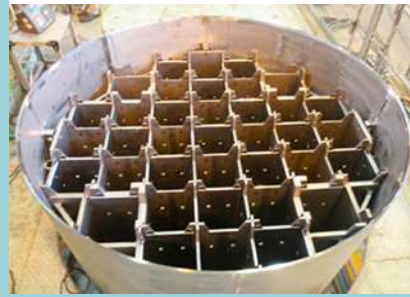


Process Equipment

Pressure vessels



Cask & Canister



Diesel Engine

Marine diesel engine



Marine SCR system



Divisional Policy

- In April 2022, organizations with technology contributing to carbon neutrality were integrated to establish the "Decarbonization Business Department".
- By collaborating within the group based on technology related to carbon neutrality, we provide value to customers and contribute to society.

Sustainable growth
of existing businesses

- Reduction of NOx emissions from marine engines and thermal power plants, etc.
- NOx & GHG (methane, N2O) control catalysts
- Adapting to equipment needed for fuel conversion e.g. pressure vessels and tanks

Sustainable growth
of existing businesses

- Production and solution technologies for Power-to-Gas (hydrogen, synthetic methane).
- Base structure of offshore wind power generation, and the dry storage and transportation of spent nuclear fuel.

Promoting sustainable
management

- Onshore wind power generation business
- Entry into hydrogen and methanation business through Power-to-Gas technology

Medium-term management plan 'Forward 25'

Forward 25 Financial Goal

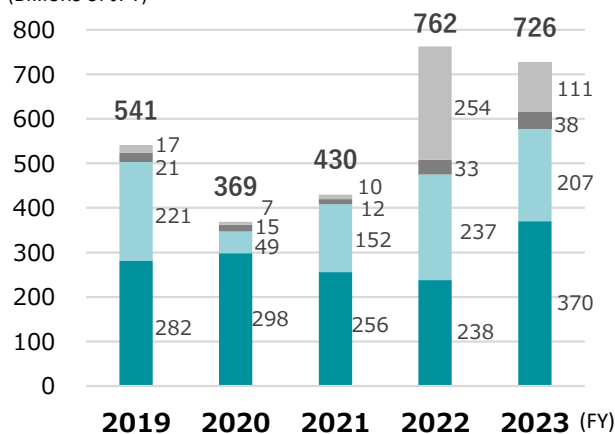
(Billions of JPY)

	FY2023 Results	FY2024 Forecast	FY2025 Goal(※)
Order received	72.6	53.5	
Sales	55.2	75.0	Sales 70.0
Operating income (OI margin)	1.8 (3.3%)	0.8 (1.1%)	

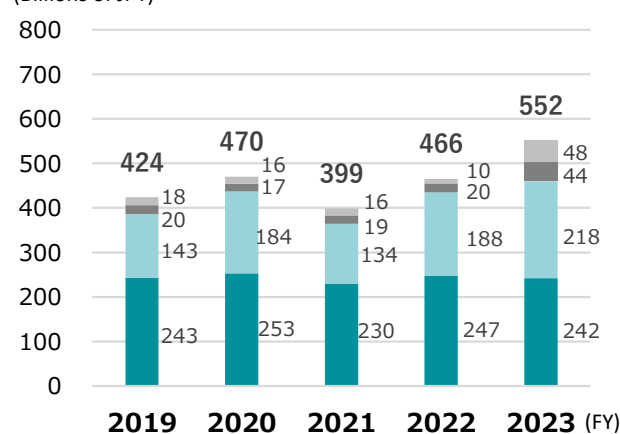
※Initial plan

■ Diesel engine ■ Process equipment ■ Decarbonization Systems ■ Wind Power —●— OI margin (Right axis)

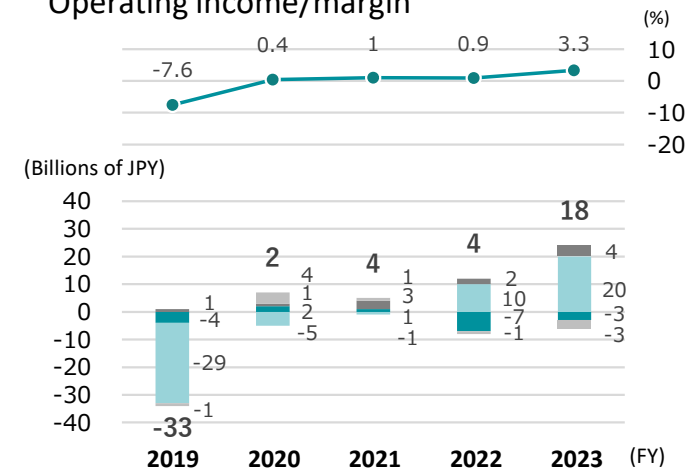
Order received
(Billions of JPY)



Sales
(Billions of JPY)



Operating income/margin



Business Strategy, Initiatives, etc.

(1) Decarbonization Systems - Business Environment

Main services and products: : hydrogen generator, methanation, denitrification, catalyst

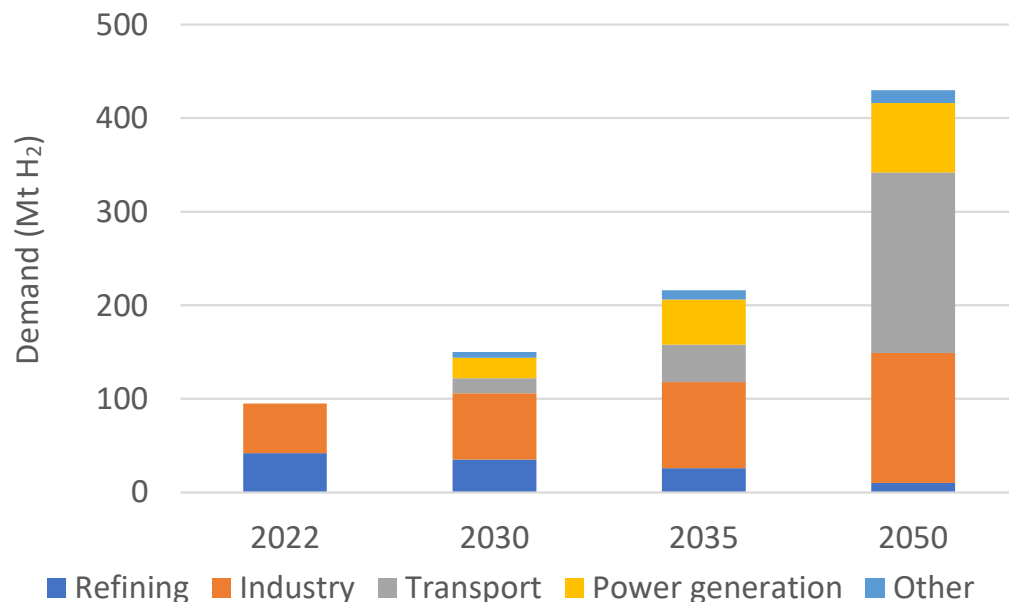
Market

Japan :
Japanese government announces basic hydrogen strategy and target of 90% synthetic methane injection into existing infrastructure by 2050.

Overseas :
Many countries have developed hydrogen strategies to promote hydrogen adoption.

Our strength

- Highly efficient catalysts developed in-house (methanation, denitration)
- Know-how accumulated through demonstration projects
- Package proposal capability through collaboration with Inova



Global hydrogen demand
(Created by our company from the IEA's 'NET Zero Roadmap)

Cabinet Decision on the Sixth Strategic Energy Plan/
Target for Green Growth Strategy

Annual Introduction Volume

2030:Injecting 1% synthetic methane into existing infrastructure
Achieving carbon neutrality for 5% of the gas, along with other measures*

2050:Injecting 90% synthetic methane (25 m tons) into existing infrastructure
Achieving carbon neutrality for gas, along with other measures*

*Direct use of hydrogen, biogas, LNG offset through credits, CCUS, and others

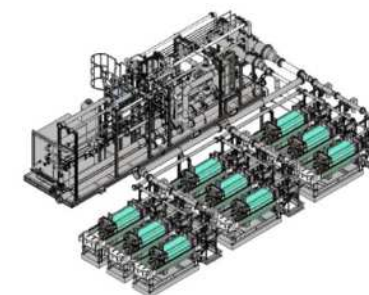
Targets for the introduction of synthetic methane.
(Source: Agency for Natural Resources and Energy)

(1) Initiatives - Water Electrolyser

Water electrolyser

Establishment of projects for the realisation of a hydrogen society

1. Performance improvement through utilization of GI fund
2. GX supply chain building support project
3. Local production for local consumption business in Japan
4. Collaborate with our partners, both in Japan and abroad



Large-scale water electrolyzer under development (6MW)



Image of mass production plant (Tsuru City, Yamanashi Prefecture)

Methanation

Strengthen product and engineering capabilities for early commercialization

1. Development of large systems (jointly developed with Inova)
2. Development and mass production of high-performance catalysts
3. Demonstration project in Oman* in collaboration with Inova

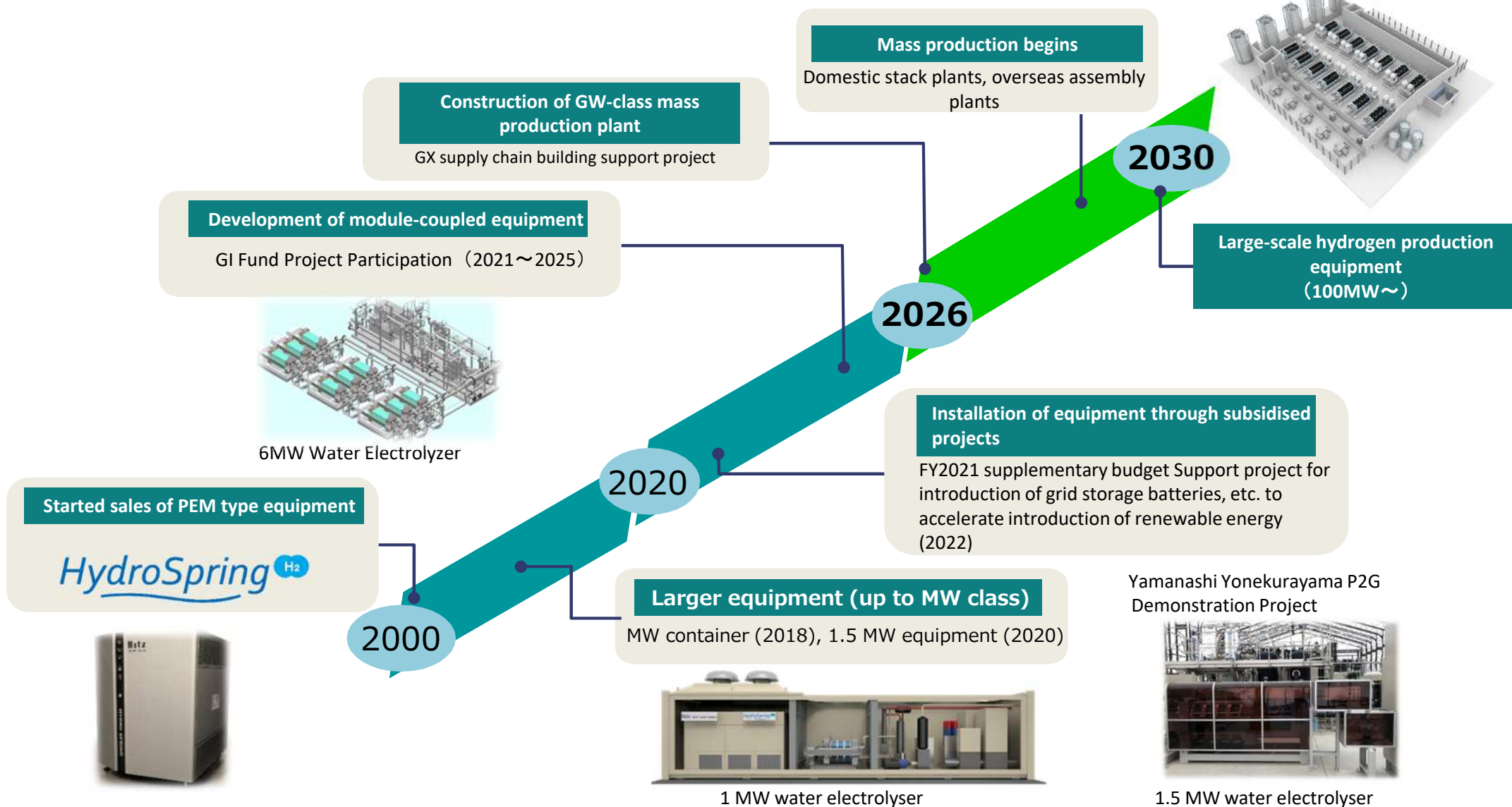
※Methanation demonstration project for Oman LNG with a synthetic methane production capacity of 1,200 Nm³/h



Image of Methanation facility
(Synthetic methane production: 1,200 Nm³/h)

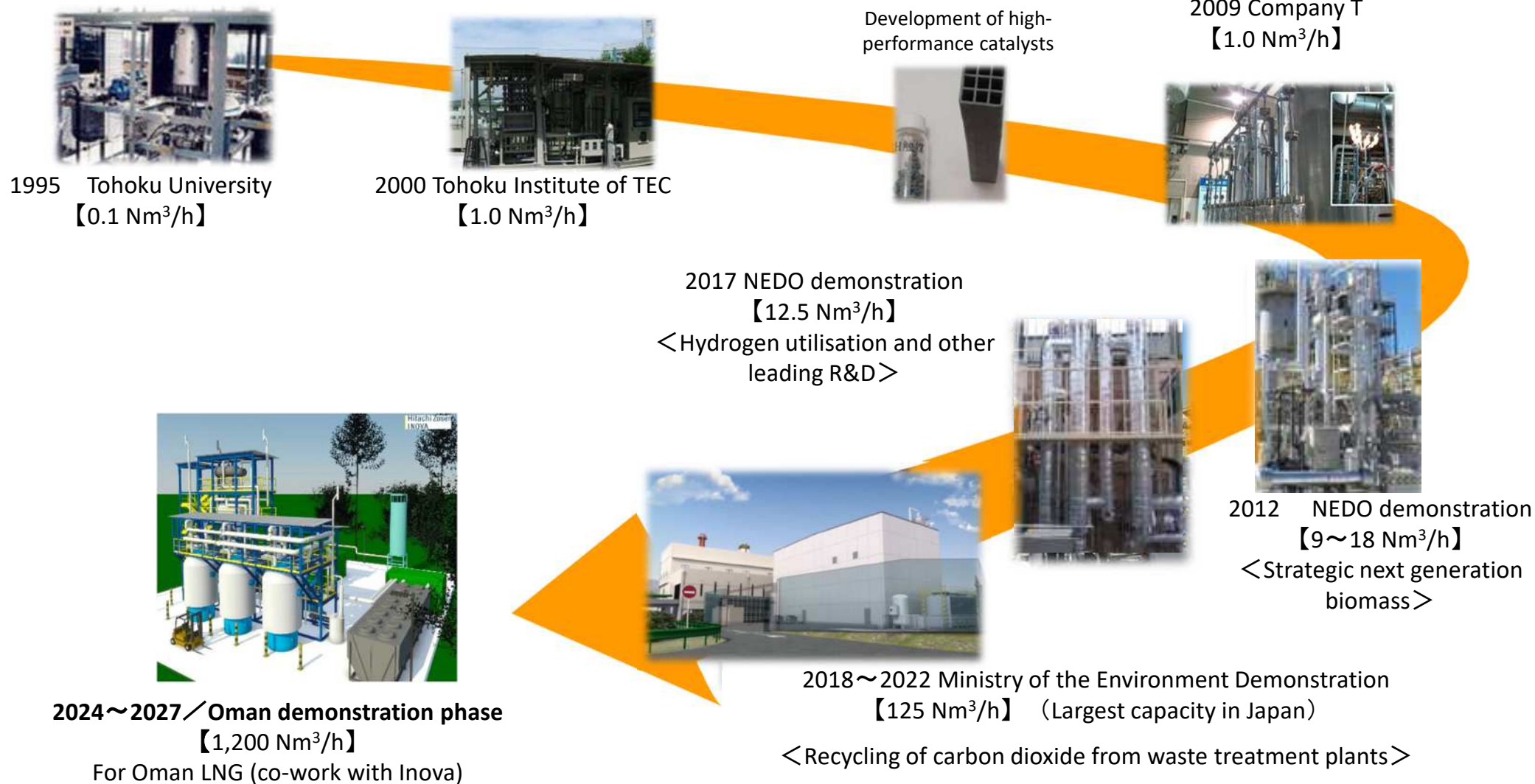
(1) Initiatives - Water Electrolyser

Roadmap for equipment enlargement and business expansion (PEM-type water electrolyzers)



(1) Initiatives - Methanation

Development of methanation technology



※ 【 】 Synthetic methane production volume

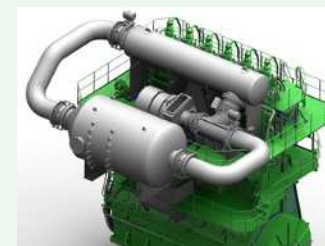
(1) Initiatives - Catalyst

Ship fuel emission control and clean energy conversion initiatives

Marine SCR systems + catalysts

Compliance with emission regulations

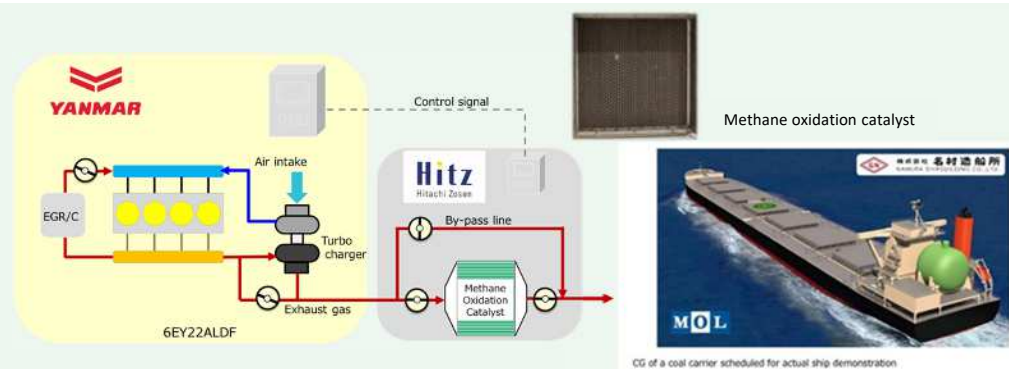
- Demonstration vessel trials conducted and marketed in 2011
- Orders received (as of January 2024)
 - Total 192 units, of which 136 are in service
- Supply and renewal of in-house catalysts



Marine SCR systems

Methane slip reduction technology (GI Fund project)

Reducing unburned methane emissions from LNG-fuelled ships
(Development of in-house catalysts)



N2O removal technology (GI Fund project)

Development of N2O removal equipment and catalysts for ammonia-fuelled ships



	Existing technology		Current development
Operating temperature range	400-600°C	460°C	300°C-
Main applications	Chemical plant	Marine engine	Marine engine
Applicability to marine engines	×	○	○
Operating environment	Low in sulfur and moisture	High in sulfur and moisture	High in sulfur and moisture

(2) Wind Power - Business Environment

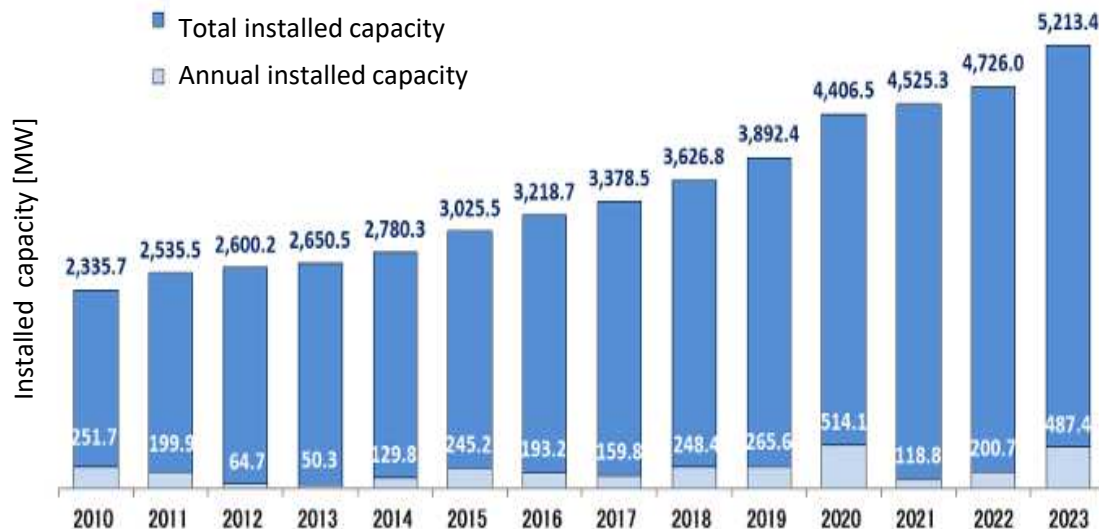
Main services and products: onshore wind power, offshore wind power

Market

- Offshore wind power is expected to expand rapidly in Japan, and floating type to increase after 2030.
- Our offshore Aichi Project selected for Phase 2 of the GI fund project, along with the offshore Southern Akita Project.

Our strength

- Utilization of shipbuilding technology and facility
- Know-how accumulated through demonstration projects, etc.
- Advancing the floating foundation demonstration in GI Fund Phase 2



Japan's wind power introduction
(Source: Japan Wind Power Association)

Domestic introduction goals

	2030	2040	2050
Onshore (incl semi-offshore)	18~26 GW	35GW	40GW
Offshore (More than 2km offshore)	10GW	30~45 GW	90GW
Total	28~36 GW	65~80 GW	130GW

Source: Statistical data from the Japan Wind Power Association and the approach to the introduction of wind power generation in 2030 for achieving carbon neutrality by 2050

(2) Wind Power - Business Strategy

Onshore wind power




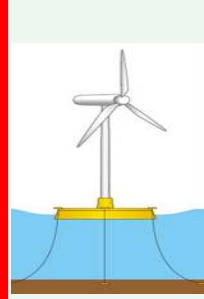
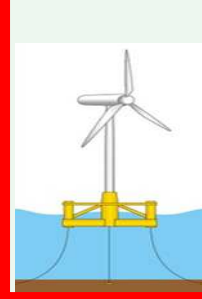
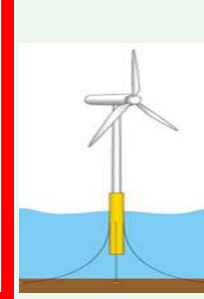
- Completion of large-scale construction work (Mutsu Ogawara Project) 【Interconnection capacity 57MW (max. power output 64.5MW)】
- Development of new projects: Partnership with other companies, developing businesses closely tied to the local community

Offshore wind power

- Commercialization of the production of foundation structures for both fixed-bottom and floating types
 - ① Fixed-bottom: Expanding suction bucket foundations
 - ② Floating type: Demonstrated the semi-submersible type in GI Fund Phase 2, moving towards social implementation



Omagari Wind Power Station currently in operation (Akita city)

	Fixed-bottom type			Floating type		
Applicable	50m or less			50m ~ 100m ~ 200m		
Type	monopile	jacket	suction bucket	barge	semi-submersible	spar
Schematic drawing						

Our main foundation structures



Image of a semi-submersible floating body

(2) Initiatives – Onshore Wind Power

- Integrated project development, construction and operation
- 57 MW (interconnected capacity) wind farm is under construction in Aomori Prefecture

Delivered 12 units, 1 under construction (15 units)

Completion	Power	Location
2001	640kW×1	Shizuoka
2006	1.5MW×1	Wakayama
2007	2.0MW×6	Aomori
2015	2.0MW×1	Akita
2016	2.0MW×1	Akita
2017	2.0MW×1	Akita
2018	2.0MW×1	Akita
(2026)	4.3MW×15 (interconnection capacity 57MW)	Aomori

In operation 4 units (8 MW in total)



Omonogawa Wind Power Plant

Location Akita, Akita city
Output 2,000 kW×1 terminal
Operation March, 2015

Second Omonogawa Wind Power Plant

Location Akita, Akita city
Output 2,000 kW×1 terminal
Operation March, 2016

Iwaki Katte Wind Power Plant

Location Akita, Yurihonjo City
Output 2,000 kW×1 terminal
Operation March, 2017

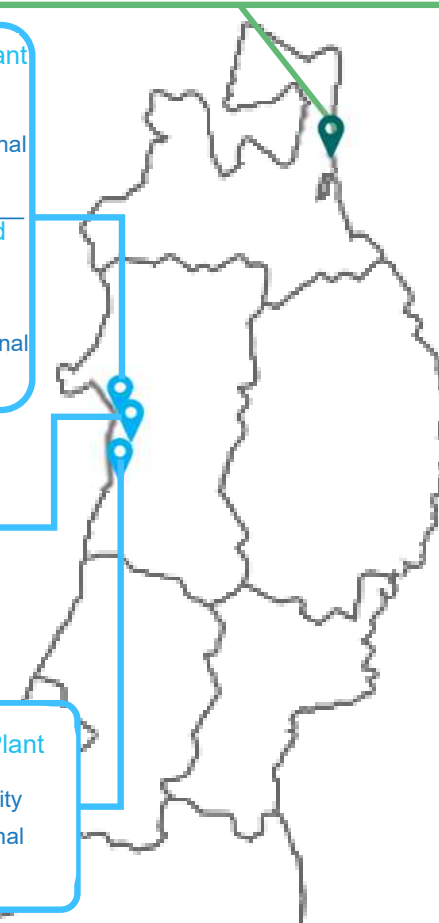
Matsugasaki Wind Power Plant

Location Akita, Yurihonjo City
Output 2,000 kW×1 terminal
Operation March, 2018

Under construction (57 MW)



Operator : Mutsu Ogawara Wind Power LLC
(Kanadevia 40%, Itochu 40%, Tokyo Century 20%)

Location Aomori, Rokkasho mura
Output Interconnection capacity 57MW
Operation April 2026 (tentative)



(2) Initiatives – Offshore Wind Power

Commercialization of the production of foundation structures for both fixed-bottom and floating types

	Fixed-bottom suction bucket	Semi-submersible (demonstrated in GI Fund Phase 2)
Feature	<ul style="list-style-type: none"> Minimal noise and vibration during construction Complete removal of the foundation is possible 	<ul style="list-style-type: none"> Simple structure that is easy to mass produce Can be divided into large blocks, and can be stably towed even in block state
Image		 <p>Wind Farm Image</p> <p>Demonstration sea area off Aichi Prefecture</p>

(3) Process Equipment - Business Environment

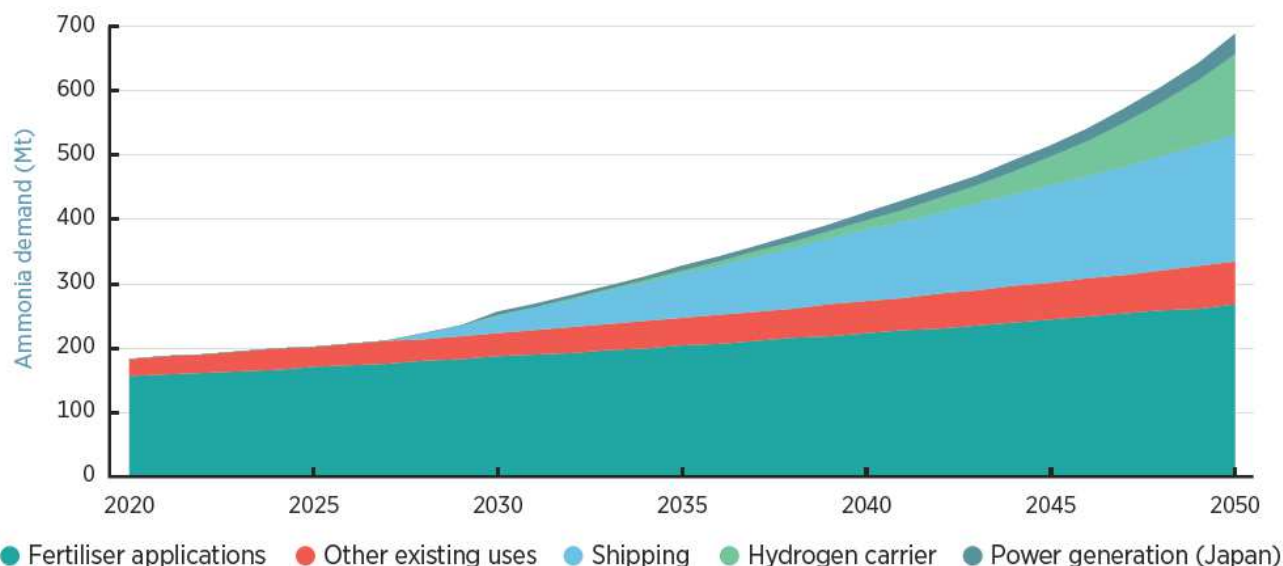
Main services and products: Pressure vessel, cask & canister

Market

- Demand for pressure equipment and fuel tanks (LNG, ammonia, liquefied CO2, etc.) is increasing due to the shift away from fossil fuels
- Nuclear power plants do not emit CO2 and can be used sustainably, provided that safety is ensured.

Our strength

- Welding technology for heavy plates
- Extensive track record of delivery
- Cooperation with NAC (wholly owned subsidiary) in U.S.
- Established a cask manufacturing joint venture with Tokyo Electric Power



Ammonia Demand Forecast (Source : IRENA 1.5 degree scenario)

2020 power generation and energy mix in Japan
(Source: Agency for Natural Resources and Energy, Oct.2021)

[100 million kWh]	Electricity generation volume	Power generation mix
Oil and others	190	2%
Coal	1,780	19%
LNG	1,870	20%
Nuclear power	1,880~2,060	20~22%
Renewable energy	3,360~3,530	36~38%
Hydrogen and ammonia	90	1%
Totals	9,340	100%

*The figures are approximate, and the total may not match due to rounding.

(3) Process Equipment - Business Strategy

Pressure Vessel

- Conversion to CN fuels: conversion to decarbonised applications and production of alternative fuel tanks (e.g. ammonia, LNG, CO2)

Cask and Canister

- Japan : Commercialization of new casks, establishment of joint venture with TEPCO (Toso Mirai Manufacturing)
- North America : NAC, based in U.S. acquired Niagara Energy Products (NEP) and entered the Canadian market.



 **東双みらい製造株式会社**

Hamadori Works



NAC (GA, U.S.)

 **NAC
INTERNATIONAL**






NAC acquired NEP in Canada

 **NIAGARA
ENERGY PRODUCTS**

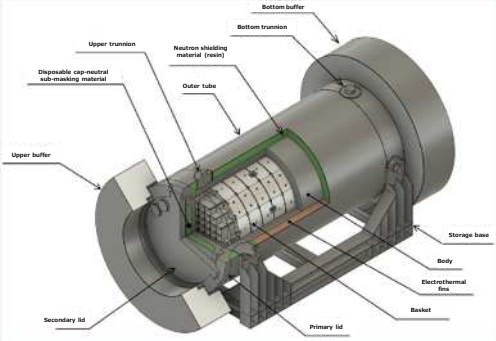

(3) Initiatives – Pressure Vessel

- Conversion to decarbonised applications and production of alternative fuel tanks.

Process equipment for decarbonisation	CO2 and other transport and storage containers	Large tanks related to decarbonisation use
 <p>methanol converter</p>	 <p>production of storage containers</p>	 <p>Image of large tank for land use</p>

(3) Initiatives – Cask and Canister

- Commercialization of new type of casks, development of concrete casks in Japan

Metal Cask	concrete cask
<ul style="list-style-type: none"> ➤ Applicable: PWR, BWR ➤ Technology: Development of containers to meet the evolution of fuels 	<ul style="list-style-type: none"> ➤ Storage type: dry storage ➤ Technology: NAC's technology, proven in the US, is deployed in Japan
	

- North America: US NAC acquires NEP and enters the Canadian market.



Consistent group response possible.

(4) Diesel Engine - Business Environment

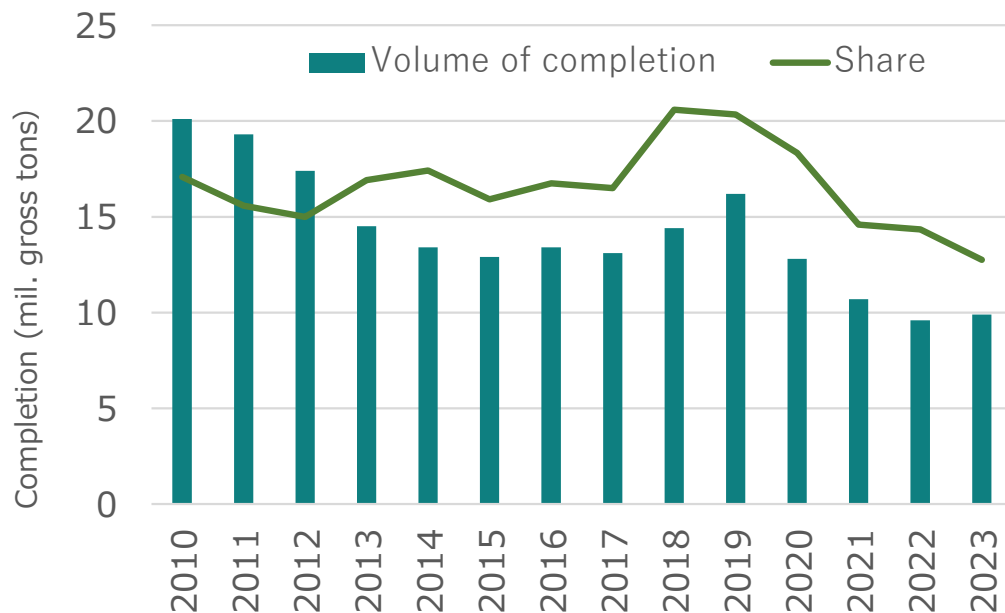
Main services and products: Marine engines, exhaust gas regulation compliant equipment

Market

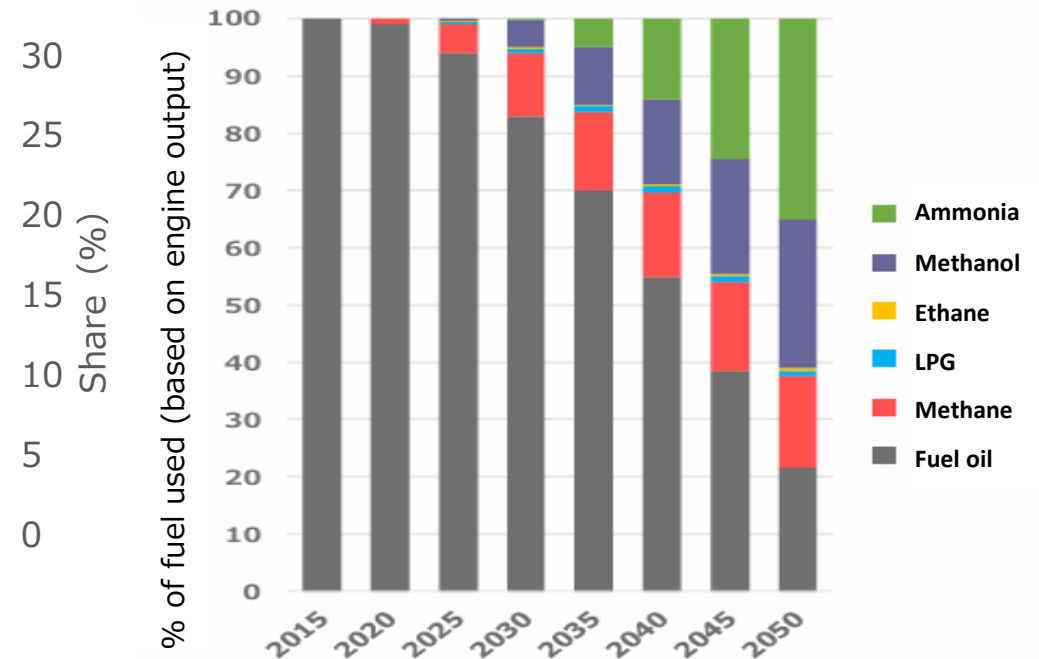
- Although Japan's production volume has been on a downward trend, it is expected to increase under favorable economic conditions
- New demands are emerging, such as emission controls for ships and fuel conversion

Our strength

- Alliance with Imabari Shipbuilding
- Development of new fuel-compatible engines (collaboration with MAN)
- Development of GHG reduction technologies for fuel switching



Japanese merchant shipbuilding and market share
(Source: by our Company from materials provided by the Japan Shipbuilders' Association)



Fuel conversion forecasts for marine two-stroke engines
(Source: by our Company based on MAN ES data, Sep. 2023)

(4) Diesel Engine - Business Strategy and Initiatives

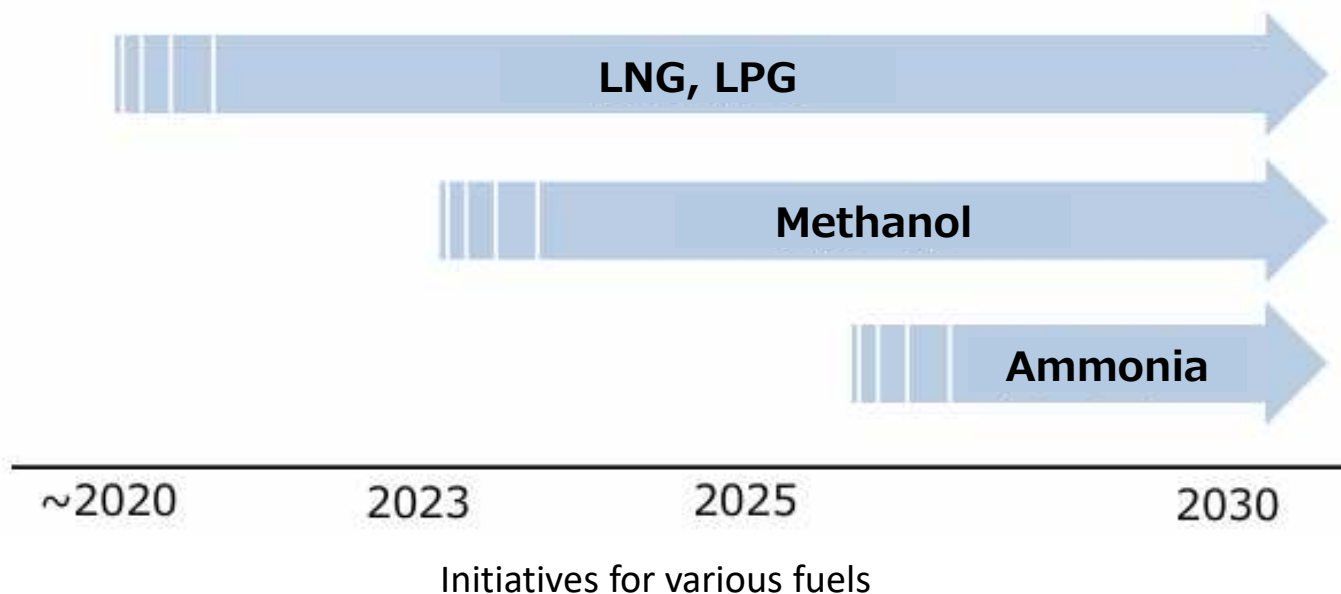
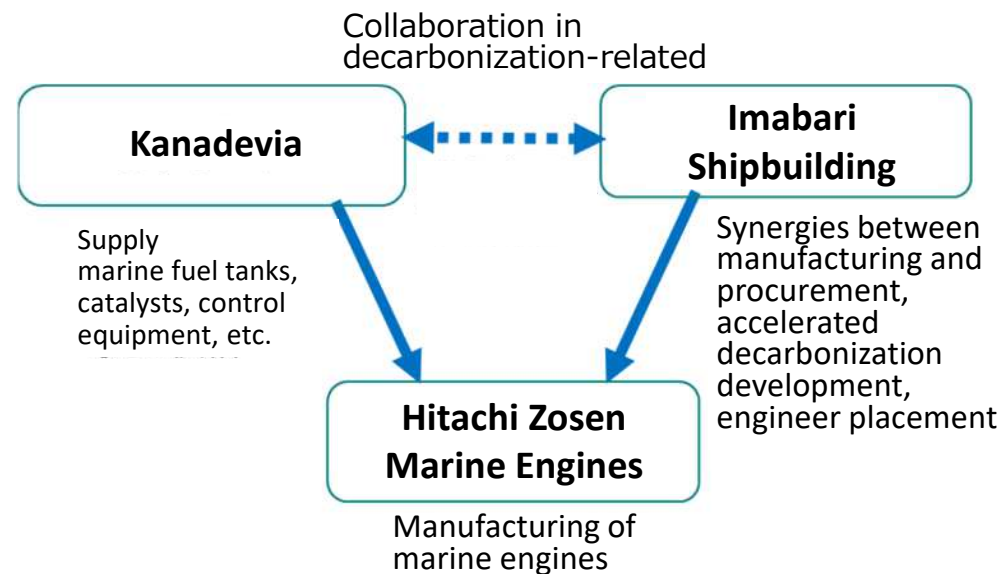
Marine engines (Hitachi Zosen Marine Engines)

Strengthening business competitiveness and adapting to fuel conversion

1. Strengthening global competitiveness through alliance with Imabari Shipbuilding, leading company in Japan
2. Development of engines compatible with new fuels (methanol, ammonia)
3. Catalyst technology of our Decarbonisation Systems BU supports to comply with emission regulations



Marine engine

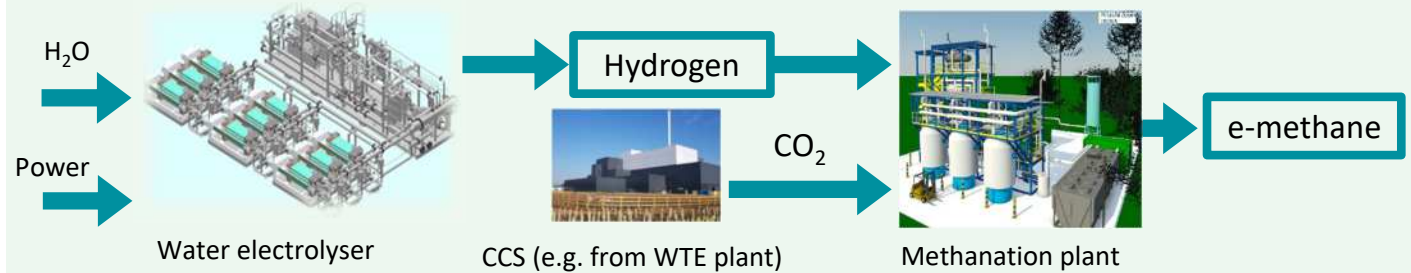


The Vision for 2030

Sales : JPY70bn (2025) → 140bn (2030)

(1) Decarbonization Systems

- Hydrogen production system
- Methanation system
- Catalyst



(2) Wind Power

- Onshore wind power
- Base structure for offshore wind power



Onshore wind power



Offshore wind power



Floating foundation

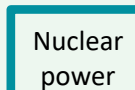
(3) Process Equipment

- Pressure vessels for CN related applications
- cask, canisters



Green Methanol
Ammonia/urea

CN related pressure vessels



Nuclear power



Cask

(4) Diesel Engine

- Marine engines
- Equipment compliant with emission regulations



Marine engine

- New fuel compatible
- Compliance with emission regulations



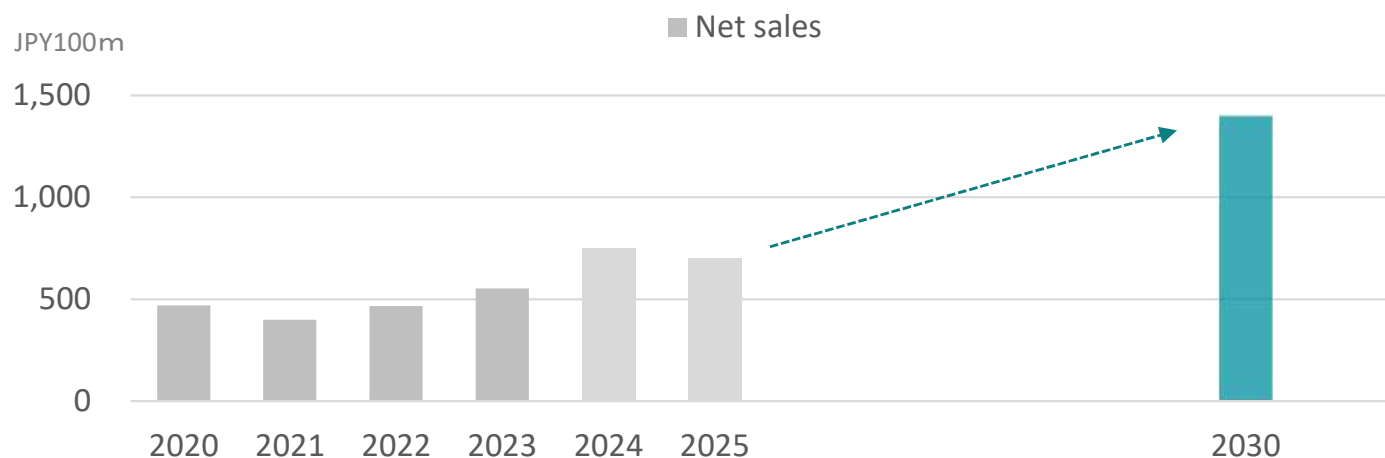
Ammonia-powered ammonia carrier

N₂O Reactor

2-stroke engine

Source: Kanadevia, NYK Line

Growth View



	Forward 25 (FY2023 – 2025)	2030 Vision (- FY2030)
Decarbonization Systems	<ul style="list-style-type: none"> Respond to demonstration projects and participate in GI Fund projects Promote overseas expansion in cooperation with group companies 	<ul style="list-style-type: none"> Larger and more efficient equipment to meet growing demand Mass production of water electrolyzers through construction of a plant for mass production
Wind Power	<ul style="list-style-type: none"> Onshore: Strengthening project execution capacity, including O&M Offshore: Low-cost foundation structures (GI Fund project) 	<ul style="list-style-type: none"> Offshore wind: Commercialising the manufacture of foundation structures, both fixed bottom and floating
Process Equipment	<ul style="list-style-type: none"> Process equipment: Growth in after-sales service Nuclear power-related: Strengthening systems for global expansion 	<ul style="list-style-type: none"> Process equipment: Business expansion through entry into decarbonisation-related products Nuclear power-related: Meeting domestic and international nuclear power-related demand
Diesel Engine	<ul style="list-style-type: none"> Strengthen competitiveness through collaboration with Imabari Shipbuilding Development and production system for fuel conversion 	<ul style="list-style-type: none"> Market launch of various new fuel-compatible engines at the right time



Cautionary Statement

Forward-looking statements are based on information currently available to Kanadevia Corporation. Therefore, those forward looking statements include unknown risks and uncertainties. Accordingly, you should note that the actual results could differ materially from those forward-looking statements. Risks and uncertainties that could influence the ultimate outcome include, but are not limited to, the economic conditions surrounding Kanadevia Corporation and/or exchange rate fluctuation.