Carbon Neutral Strategy Briefing

MITSUBISHI GAS CHEMICAL COMPANY, INC.

March 19, 2025

Securities Code
4182

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1. Carbon Neutral Strategy (Overview)

Toward a Sustainable Society -Medium-Term Management Plan: Grow UP 2026

- **We are committed to realizing a sustainable society by promoting sustainability management based on our Mission of creating value to share with society.**
- **Initiatives aimed at carbon neutrality are one of our top strategic priorities.**

Social issues

Changes in international situation

Demographic changes

Advancements in ICT/Mobility

Climate change

Biodiversity crisis

Environmental impact reduction

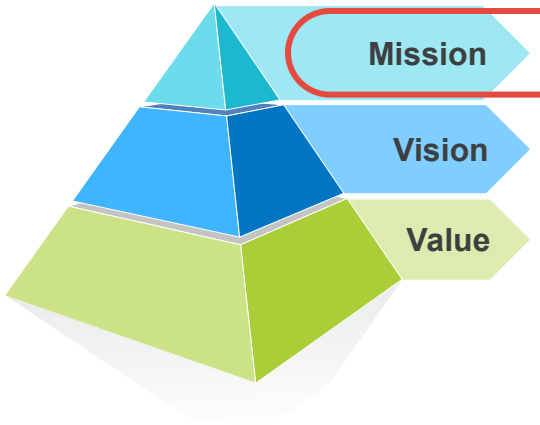
Diversity

Behavioral changes under COVID-19

Objective 1

Strengthen the resiliency of our business portfolio

- Focus on “Uniqueness & Presence”
- Build new value through innovation
- Restructure businesses requiring intensive management



Mission Creating value to share with society

Vision An excellent company with uniqueness and presence built on chemistry

Value Conduct Philosophy

Objective 2

Promoting sustainability management

- Accelerate initiatives for realizing carbon neutrality
- Enhance human capital management
- Promote materiality management

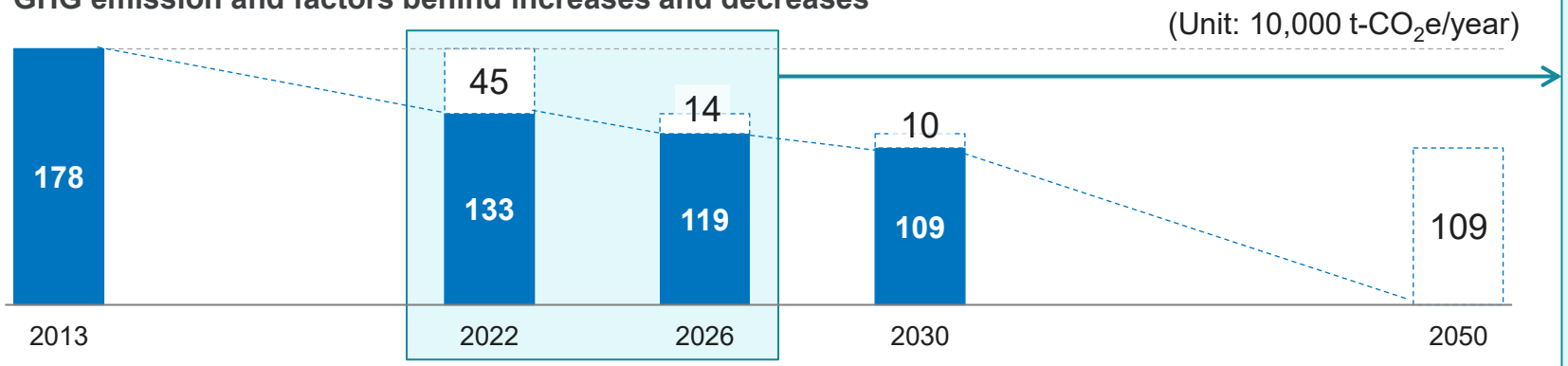
Solving social issues

Achieving sustainable growth

MGC's Roadmap toward Its Ultimate Goal of Carbon Neutrality (Entire MGC Group)

– Aim to achieve reduction of 39% by 2030 in comparison with 2013 and carbon neutrality by 2050

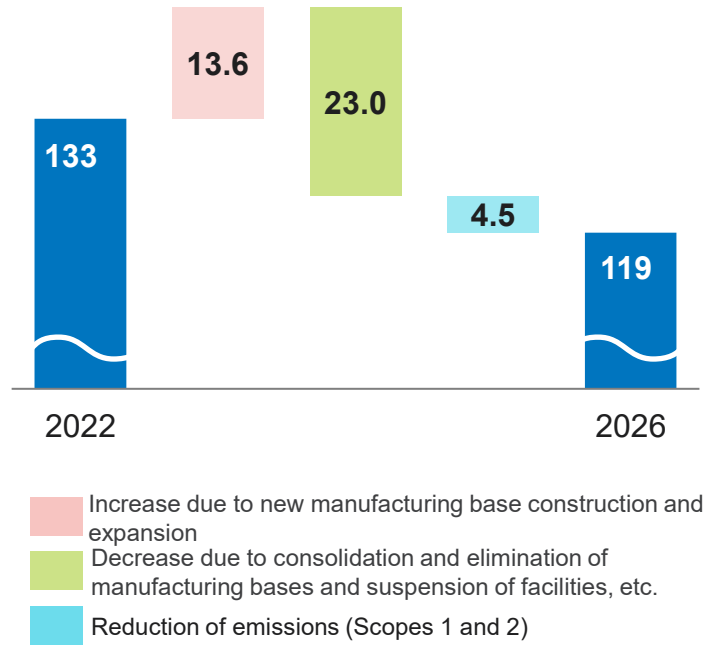
GHG emission and factors behind increases and decreases



Period		2013-2022	2023-2026	2027-2030	2031-2050
Increase due to new manufacturing base construction and expansion		45.0	(13.6)	2.6	46.9
Decrease due to consolidation and elimination of manufacturing bases and suspension of facilities, etc.			23.0		
Reduction in emissions due to R&D collaboration*1					
Reduction of emissions (Scope 1)	Upgrade to highly efficient facilities, energy savings		1.9	2.6	10.0
	Fuel change		1.1	0.2	
Reductions of emissions (Scope 2)	Introduction of renewables and use of transitional energy		1.5	2.3	30.5
	Collaboration with energy supply companies			2.4	21.6

*1 Implementation of new energy systems, CCUS, etc.

Changes in emissions due to business portfolio reforms from 2022 to 2026



Products and Technologies to Contribute to Carbon Neutrality

- Pursue development of products and technologies conducive to carbon neutrality by leveraging distinctive technologies found only at MGC
- Reducing GHG emissions by promoting energy conservation, adopting new energy, implementation of CCUS*, and raw material conversion

*Carbon dioxide Capture, Utilization and Storage

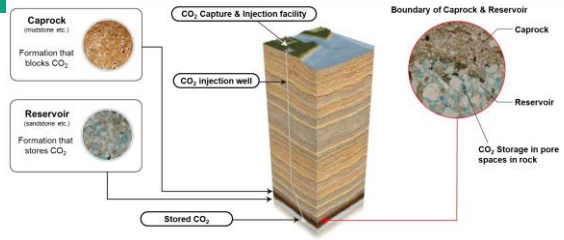
GEC **CarbopathTM circular carbon methanol**

GEC **Procurement of clean ammonia** (fuels, green hydrogen raw materials)

Functions **Polycarbonates using CO_2**

Functions **Research** **Chemical recycling**

GEC **CCS/blue hydrogen**



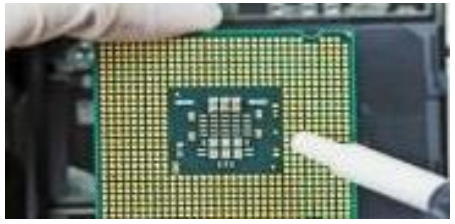
GEC

Methanol: Hydrogen carrier

rDME (dimethyl ether)*: green fuel

* Renewable DME produced from biomass, industrial waste, and other materials

Functions **Energy control systems: Semiconductor materials**



Research **Solid-state batteries** (for EVs) **Fuel cells** (for FCVs)

GEC **High-efficiency LNG (CCGT*) power generation**

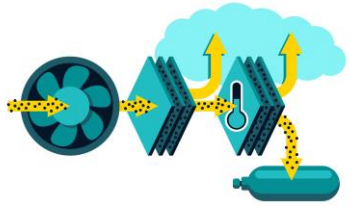
* Combined cycle gas turbine

GEC **Geothermal power generation**

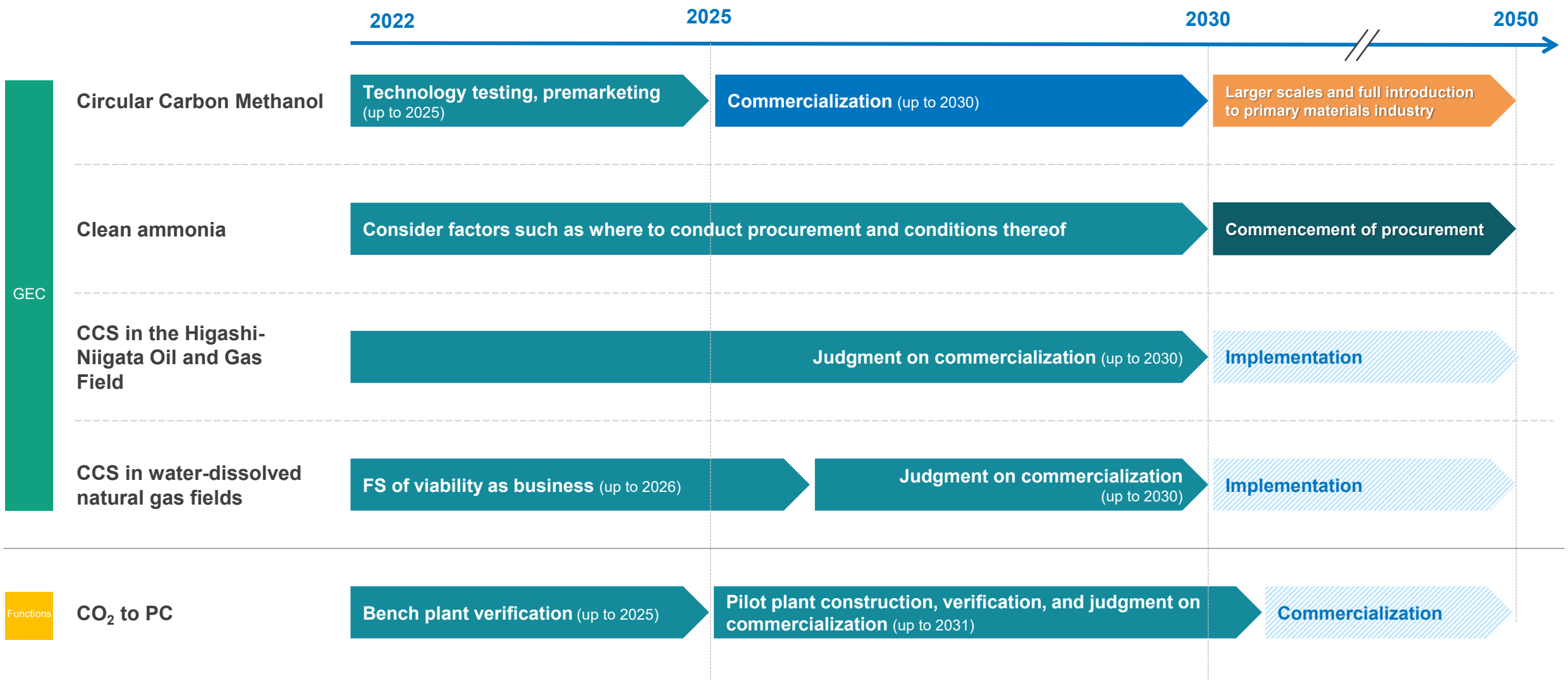
GEC **Functions** **Transition to biomass-based materials**

Functions **Autonomous driving: Optical polymers for sensing cameras for automotive use**

Research **Direct air capture (DAC): Specialty amines**



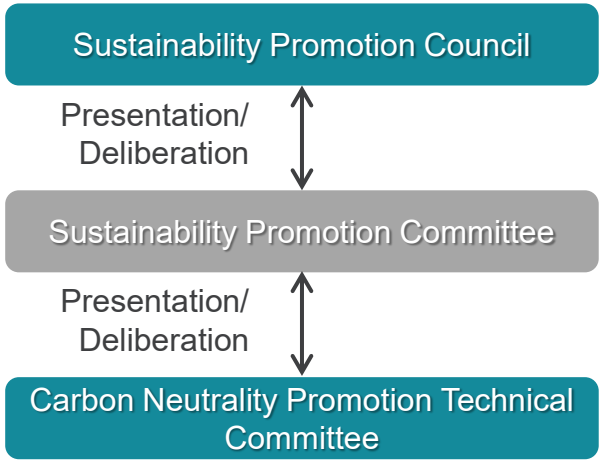
MGC's Implementation Roadmap for Major Carbon-Neutral Items



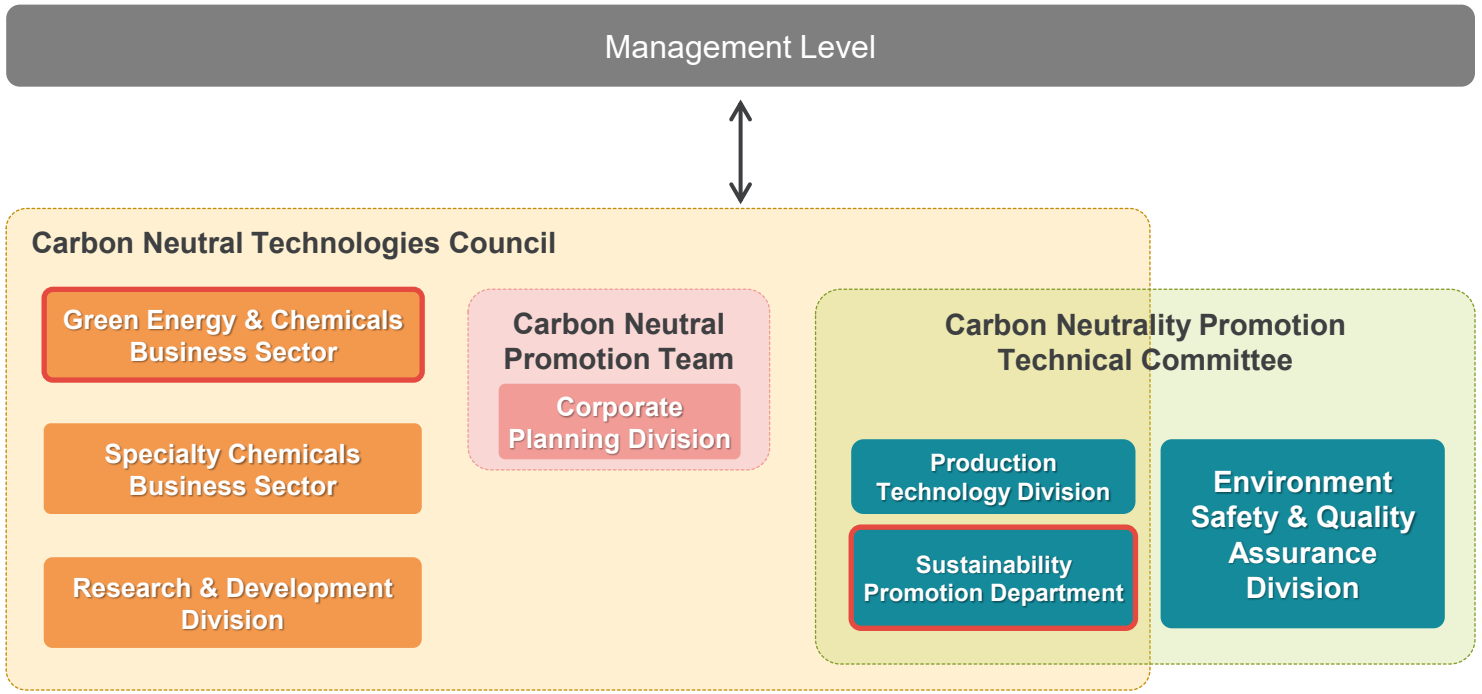
Carbon Neutral Promotion System (Companywide)

- Climate change risk and other sustainability key issues deliberated and decided by the Sustainability Promotion Council, comprised of members of the Board and chaired by the President
- Establishment of Carbon Neutral Technology Liaison Committee, enabling centralized management of MGC Group technology information and promotion of initiatives

Climate Change Governance System



Carbon Neutral Promotion System



Carbon Neutral Promotion System (Green Energy & Chemicals Business Sector)

Green Energy & Chemicals Business Sector

GEC Business Planning Division

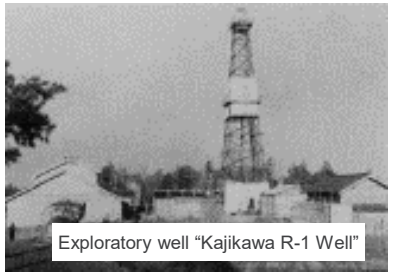
Established as part of April 1, 2024 reorganization

Responsible for timely decision-making on promotion courses and resource allocation, serving as liaison among other sectors for green and carbon-neutral initiatives planned by individual organizations within the sector

		Main products, businesses, etc. (carbon-neutral initiatives indicated in blue)
C1 Chemicals Division	Methanol Department	Methanol, MetaMix, catalysts, MH/MD
	Organic Chemicals Department	Methylamine, DMF, NMF, DME, DMAE, ammonia, MMA chemicals
	Carbon Neutral Project Department	Development and promotion of Carbopath™, green ammonia, and other carbon-neutral businesses
Energy Resources & Environmental Business Division	Energy Resources & CCS Department	Natural gas, crude oil, iodine, CCS studies
	Environmental Business Department	Geothermal, biomass, electric power, LNG, fuel cells
High-performance Products Division		
Life Science Division		
Planning & Development Division		

The GEC Business Sector's Strengths in Carbon-Neutral Technologies (Accumulation of Energy Resources and Environmental Technologies)

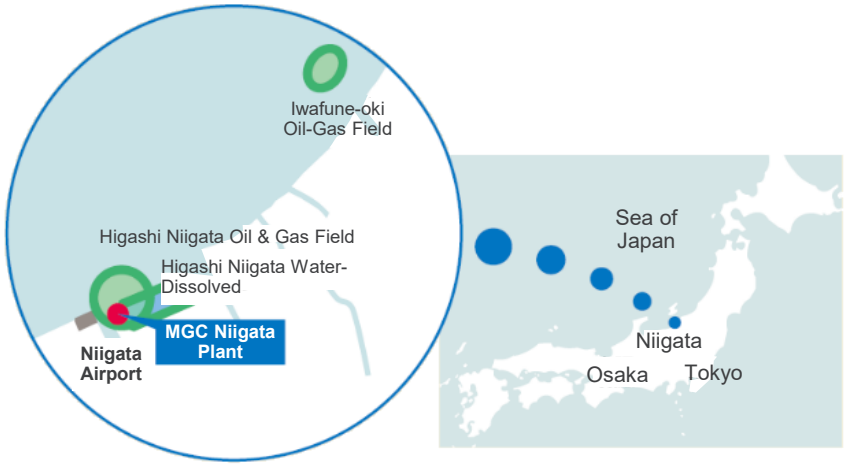
- Over a period of around 70 years, MGC (on a stand-alone basis) deployed a business to develop natural gas. It has exploration and development technologies that are unique among those found at chemical manufacturers.
- Furthermore, MGC has implemented crude oil and natural gas exploration technologies on a joint basis with other resource development companies.
- MGC has also deployed businesses in the compatible areas of geothermal development and LNG-fired power generation.
- Over many years, MGC developed catalysts used in methanol synthesis.


Exploratory well "Kajikawa R-1 Well"


Sumikawa Geothermal Power Plant
Provided by Tohoku Sustainable & Renewable Energy Co., Inc.


Fukushima Natural Gal Power Plant
Provided by Fukushima Gas Power Co., Ltd.


Tomakomai CCS Demonstration Project Center
Provided by Japan CCS Co., Ltd.



1952
Methanol synthesis

1953
Development of water-dissolved natural gas

1957
Ammonia synthesis

1981
Development of geothermal power

2016
LNG power generation *1

2016
CCS *2

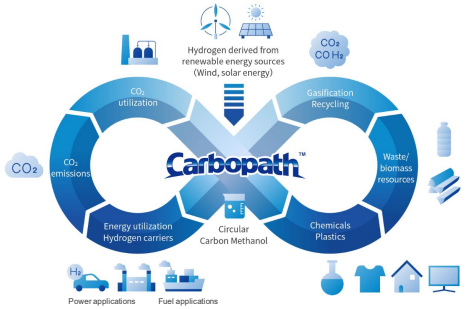
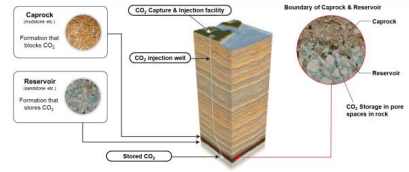
2021
Production of water-dissolved natural gas *3

Accumulated intellectual property and know-how adapted and applied to capturing, storing and recycling CO_2, as well as to building of hydrogen supply chains

*1 Investment in Fukushima Gas Power Co., Ltd.
*2 Commenced press fitting of CO_2 within Carbon dioxide Capture & Storage (CCS) demonstration project conducted in Tomakomai City
*3 New production of water-dissolved gas for first time in 50 years by TOHO EARTHTECH, INC., an MGC subsidiary

Use of the Japanese Government's Green Transformation (GX) Subsidy and Support Programs

- To this point, we have promoted the study of commercial potential and technology testing with GX subsidies centered on support for feasibility studies and surveys (see table below).
- We are currently examining securing support from large-scale GX subsidy and support programs (e.g., support focusing on the price gap, support for the development of hubs, strategic domestic production promotion tax incentive, and support for advanced CCS technologies) intended to realize carbon neutrality projects.
- We plan to draw on these support programs in the initial stages of implementation to enable future business development.

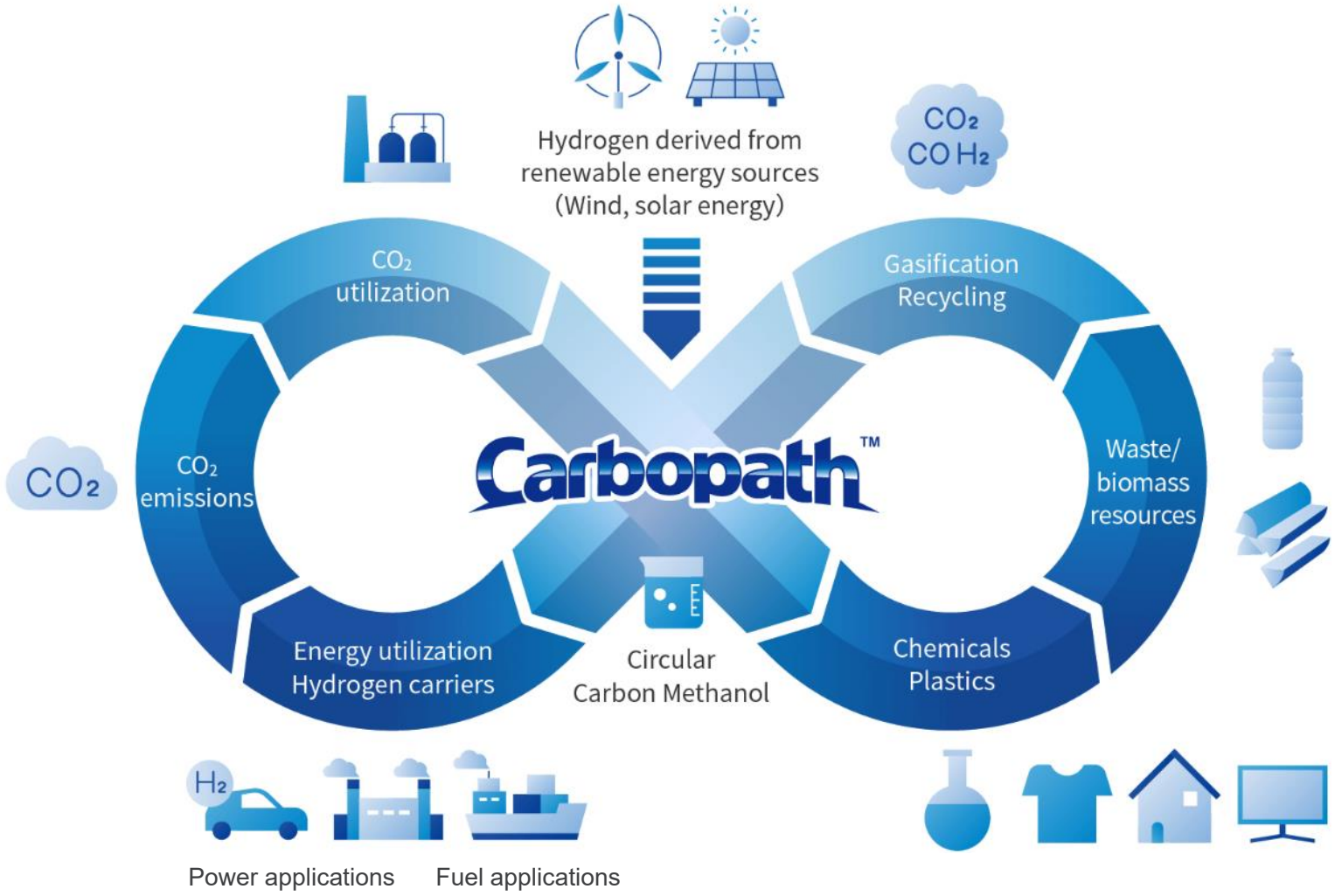
Subsidy	Agency responsible	Projects
FY2024 subsidy for petroleum supply structure improvement projects (program to promote the stable supply of next-generation fuels as part of programs aimed at promoting the transition to a stable supply of next-generation fuels	Ministry of Economy, Trade and Industry Agency for Natural Resources and Energy, Fuel Supply Infrastructure Development Department	CarbopathTM circular carbon methanol project 
FY2024 subsidy for projects that support decarbonization and energy transition technologies in resource-producing nations	Ministry of Economy, Trade and Industry Agency for Natural Resources and Energy, Resource Development Department	
Advanced CCS project design work, etc.	Ministry of Economy, Trade and Industry JOGMEC	Two CCS projects 
FY2024 subsidy for measures to promote the adoption of non-fossil fuel energy (project for development of supply infrastructure for hydrogen and other carbon-zero fuels)	Ministry of Economy, Trade and Industry Agency for Natural Resources and Energy, Fuel Supply Infrastructure Development Department	Green ammonia project 

2. Carbopath™ Promotion

About Carbopath™

– An environmental recycling platform for generating energy and materials using methanol produced from CO_2 and waste

Methanol is a material used to produce a wide range of end products such as plastics, synthetic fibers, and adhesives, and plays essential roles in our lives. Today, most methanol is sourced form fossil resources like natural gas and coal. However, it can also be produced from sources like CO_2, biomass materials, and plastic waste. Carbopath™ aims to realize a carbon-neutral world (a circular economy) by using green methanol in applications like chemicals, raw materials, and fuel.



History of MGC's Methanol Business

– We were the first company in Japan to produce methanol from natural gas. We established an industry presence by advancing swiftly into international markets and growing our businesses.







1934 Start of methanol production utilizing adopted technologies (Tokyo)

1952 Start of methanol production (Niigata) from domestic natural gas utilizing our own technologies (first in Japan)

1955 Start of natural gas development at the Kajikawa R-1 well (Niigata)

1983 Start of methanol production in Saudi Arabia

Start of methanol transport by Japan's first dedicated methanol carrier "KOHZAN Maru"

1994 Start of methanol production in Venezuela

2010 Start of methanol production in Brunei

2020 Start of methanol production in Trinidad and Tobago

2021 Start of demonstration test of methanol derived from CO_2 in a pilot plant at the Niigata Plant

2022 Announcement of Carbopath™, a circular carbon methanol concept, and start of full-fledged activities

2024 Start of bio-methanol production at the Niigata Plant

Strengths of MGC's Methanol Business

– MGC, the world's only integrated methanol producer, is involved in comprehensive methanol value chain from upstream to downstream.

Resource development

HAKURYU-5, owned by Japan Drilling Co., Ltd. (at that time)

By developing our own production of the raw material—natural gas, we were the first in Japan to produce methanol from natural gas.

Catalyst and industrial process development and design

We develop our own catalyst and industrial production processes and provide them to joint-venture plants around the world.

Plant operation (Joint Venture)

We advanced swiftly into international markets to secure stable supplies of affordable raw materials, establishing a leading position in global competition.

Our annual production exceeds 7.5 million tons.

Plant maintenance, technical support

We support plant operations through production expertise accumulated over the years.

We also provide maintenance services for production facilities.

Logistics, marketing

We handle integrated logistics and marketing in-house, achieving logistics efficiency through multiple production sites and sales branches.

Derivatives development and manufacturing

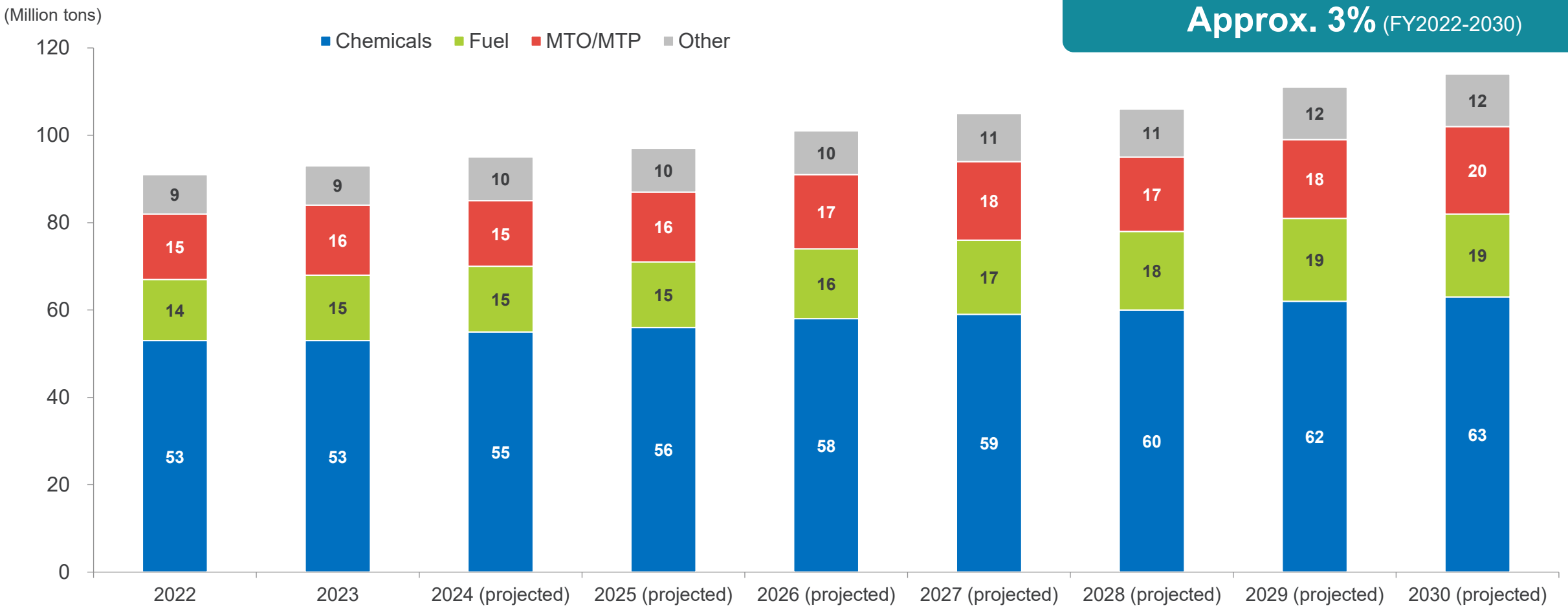
MGC and the MGC Group are also involved in numerous derivatives businesses. We have drawn on our research and development capabilities in areas such as the development of new derivative products to grow the market.

Global Methanol Demand

– Global methanol demand continues to grow steadily as demand for existing applications grows in line with GDP growth. Use of methanol as a sustainable next-generation marine fuel is likewise expected to grow.

Compound annual growth rate (CAGR)

Approx. 3% (FY2022-2030)



Our Advantages for Realization of Carbopath™

A major player with a top three global market share

We have a major industry presence. Operating methanol joint ventures around the world, we have established a reputation as a trustworthy partner, backed by the forms and scale of activities ranging from manufacturing through product sales.

Diverse technologies related to producing methanol from CO_2

We are a world pioneer in producing methanol via new resources and technologies. We continue to improve our technologies in catalyst development, methanol synthesis processes, plant operations, and other areas. These technologies can be applied to produce methanol from new resources like CO_2 and hydrogen suited to current needs.

A wealth of knowledge and experience on comprehensive methanol value chain

We have a wealth of knowledge and technologies for building circular carbon methanol platforms. This reaches beyond production to infrastructure and marketing solutions. We also have relationships with a diverse range of stakeholders.

Having our methanol derivatives business such as DME, formaldehyde, polyacetal, and methylamine, we can promote value-chain development within the MGC Group.

Circular Carbon Methanol: Cross-Industry Cooperation

– We support the production and use of environmentally valuable methanol across the value chain.

CO_2 utilization

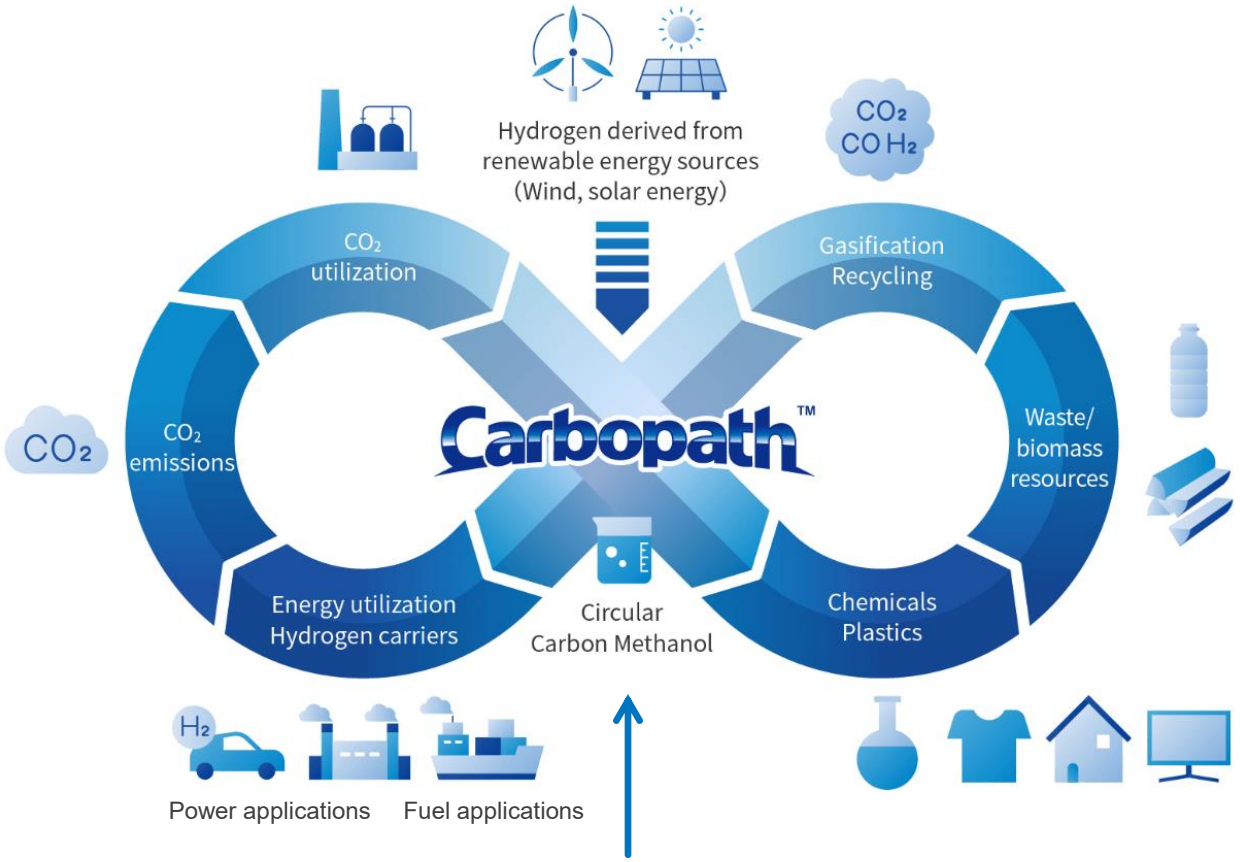
Cooperative efforts with partners

- Raw materials procurement
- Hydrogen production technologies (water electrolysis)
- CO_2 capture technologies

Energy use

Our contributions

- Supply via existing infrastructure
- Regulatory support for usage
- Know-how related to methanol handling
- Use as next-generation fuel
- Technologies for producing hydrogen from methanol



Methanol production using MGC technologies

Plastic waste and biomass recycling

Cooperative efforts with partners

- Collection and utilization of plastic waste and biomass
- Gasification technologies
- Product use
- Market development

Use of chemicals

Our contributions

- Methanol offtake and supply
- Expansion into derivatives
- Market development
- Value creation throughout the value chain

New Methanol Production Technologies (Synthesis Catalysts and Processes)

- Developing technologies optimized for new materials to contribute to carbon neutrality by using accumulated experiences and advanced technological capabilities
- Enhancing cross-industry cooperation to advance social implementation

Overseas plants (four locations)

Improvement →

← Data from existing commercial plants

Pilot plant at Niigata Plant

Development →

← Verification

Methanol synthesis catalysts

Methanol synthesis process

CO_2 methanol catalysts and processes

$$CO_2 + 3H_2 \rightarrow CH_3OH + H_2O$$

Verification completed in 2022

- High durability against the produced water
- High activity, long life

Methanol catalysts and processes suited to diverse gases

$$CO/CO_2/H_2 \rightarrow CH_3OH$$

2023: Verification completed for gas from plastic waste and biomass gasification

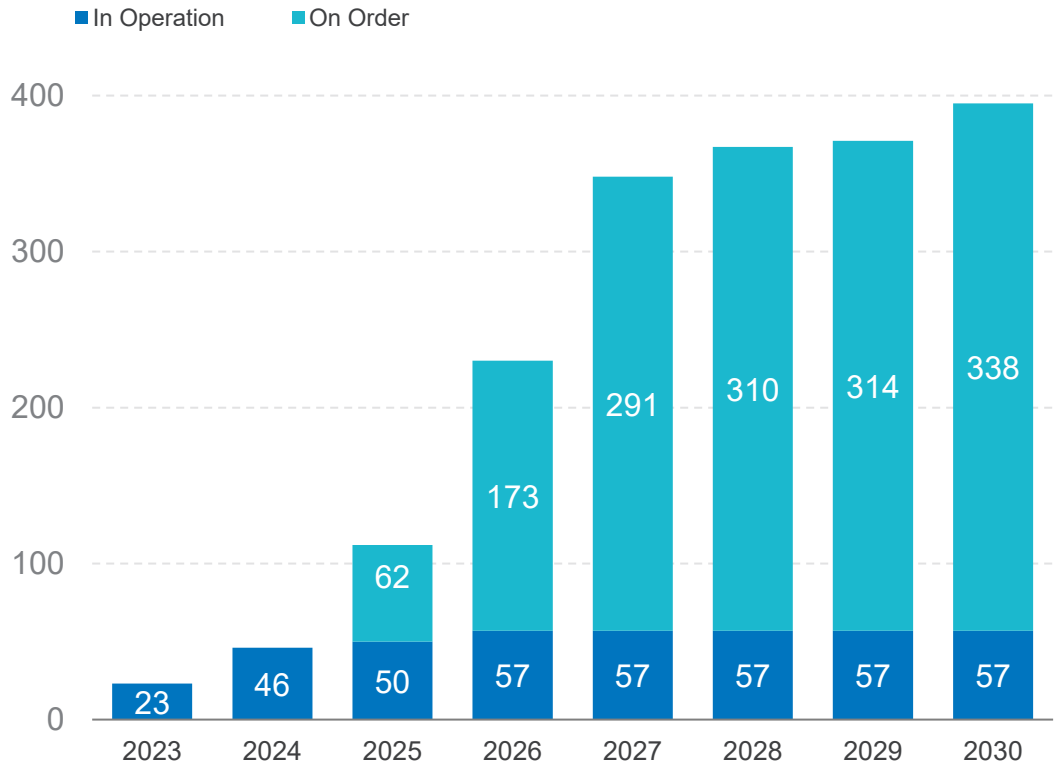
2025: Verification completed for digestive gas (May)

Promotion of Circular Carbon Methanol - Example 1

Dual-fuel methanol carrier

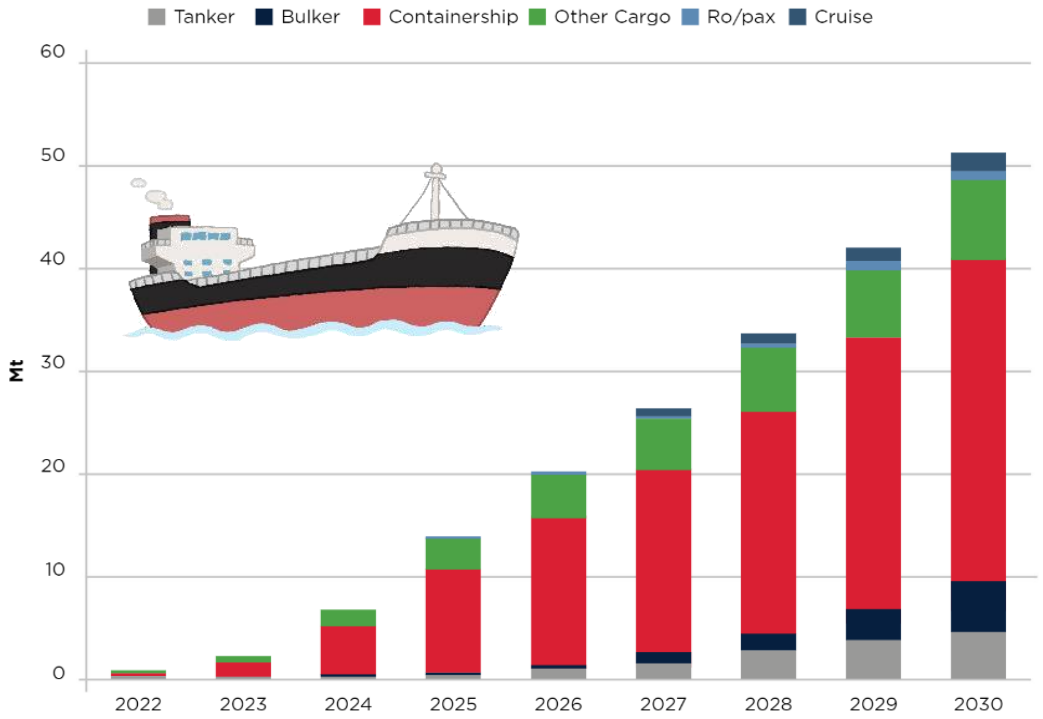
- Compared to burning conventional bunker fuel, methanol fuel significantly reduces SOx, NOx and PM emissions, enabling an up to 15% reduction in CO_2 emissions.
- Use of Carbopath™ methanol as a marine fuel can provide a pathway to carbon neutrality in ship operations.
- Orders for methanol-fuel fleet are set to rise, and the demand for methanol used as marine fuel is also expected to grow.

Methanol Fueled Fleet



Source: DNV

Projected demand for methanol for marine fuel use



Source: ABS https://absinfo.eagle.org/acton/media/16130/outlook2023

Promotion of Circular Carbon Methanol - Example 1

MGC's marine-fuel market development initiatives

– Orders for methanol dual-fuel vessels are growing further. As methanol is being implemented in society as a next-generation fuel with a potential to carbon neutrality in the future, we will continue to build a supply chain system.

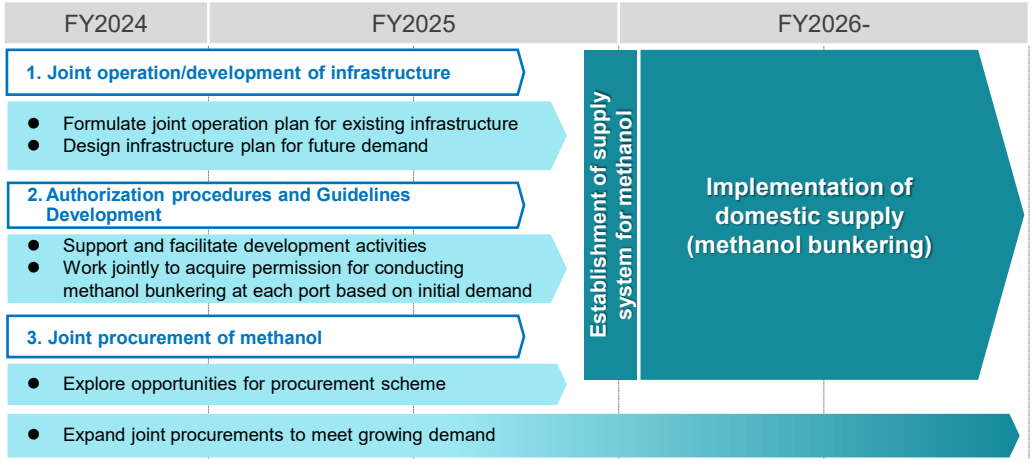
Marketing activity for methanol in marine fuel market

1. In December 2023, we concluded an MOU with the city of Yokohama and Maersk to develop the supply chain system and promote the use of methanol marine fuel in Japan.
2. Progress is being made on the development of bunkering systems using the existing infrastructure. In September 2024, we performed bunkering simulations in our methanol tankers at the Port of Yokohama.
3. Coastal vessels are also beginning to adopt methanol dual-fuel system. (June 18, 2024, "Initial supply planned in Japan of MGC's methanol as fuel for domestic car carrier ships")
4. Collaboration with Idemitsu Kosan Co., Ltd. to establish methanol fuel supply chain system in marine fuel market in Japan by promoting infrastructure development, demand creation (announced October 2024)

September 18, 2024

Bunkering simulations using Maersk's "Alette Maersk" and Kokuka Sangyo's "Eika Maru"

Illustration of cooperative efforts with Idemitsu Kosan Co., Ltd.



Implementation of methanol fuel ship within the MGC group

May 2023

Mitsubishi Gas Chemical reaches Basic Agreement with Mitsui O.S.K. Lines on long-term time charter contract for dual-fuel methanol carrier.

February 2025

Reached a basic agreement on a long-term contract for the chartering of a coastal methanol-transport vessel.

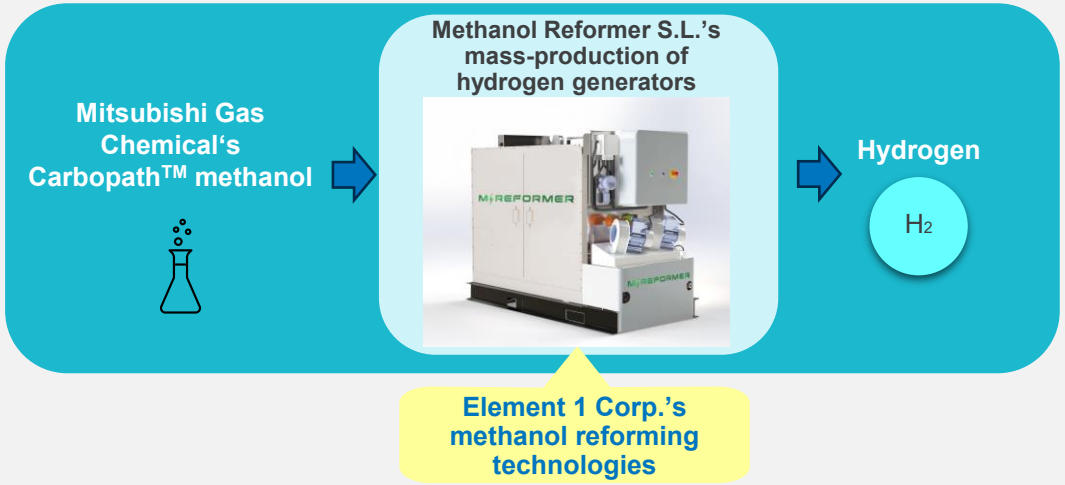
Promotion of Circular Carbon Methanol - Example 2

Cooperative efforts to achieve hydrogen solutions using methanol (announced February 2025)

Mitsubishi Gas Chemical, Methanol Reformer, and Element 1

Hydrogen production through methanol reforming has been well recognized and in place already in several industries. MGC has provided its own technology in more than 100 cases.

To meet wide-ranging demand in the movement toward a hydrogen-based society, MGC is working with two partners that offer innovative hydrogen production technologies to provide hydrogen solutions for carbon neutrality using Carbopath™.



DME promotion under the Seventh Strategic Energy Plan (announced February 2025)

Use of rDME to achieve carbon neutrality for LPG applications

The Seventh Strategic Energy Plan formulated by the Japanese government incorporates the use of renewable DME (rDME) to contribute to LPG decarbonization.

MGC operates a DME production plant at the Niigata Plant. As a producer of DME and methanol, a raw material, we are strengthening cooperative efforts with the Japan LP Gas Association and related companies in aspects ranging from proof of concept testing through social implementation.

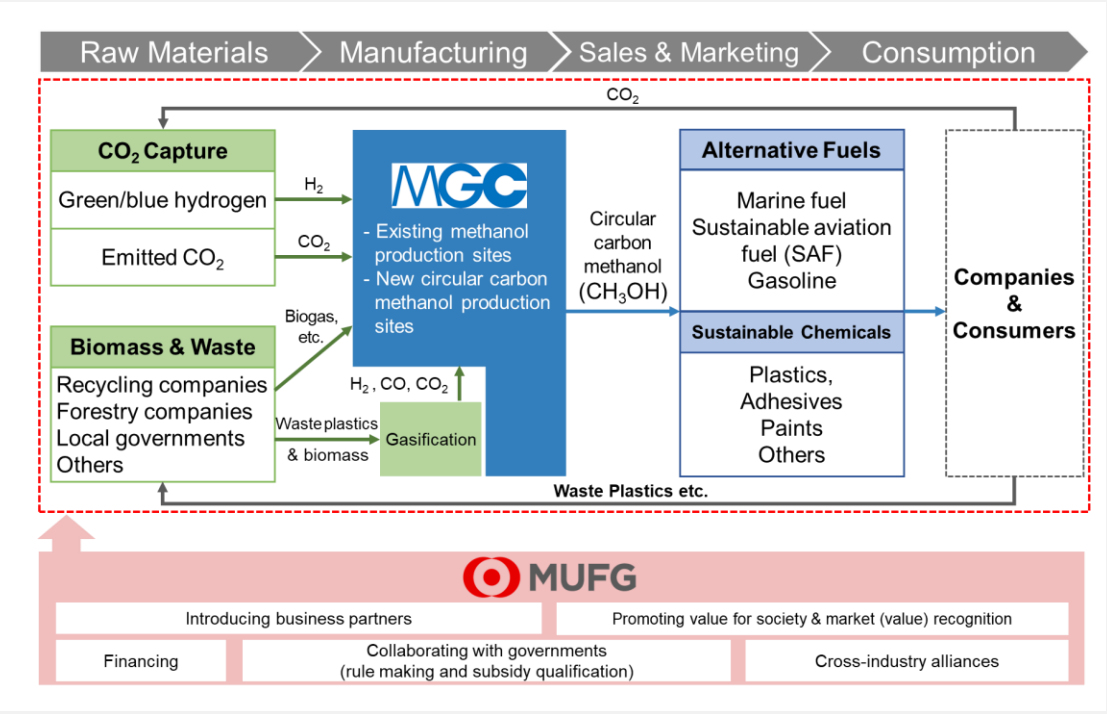
DME plant at the Niigata Plant

Promotion of Circular Carbon Methanol - Example 2

Expansion toward social implementation across multiple industries (announced December 2024)

Mitsubishi Gas Chemical and MUFG Bank

Concluding a memorandum on comprehensive collaboration to realize an environmentally sustainable global society and promoting a circular carbon society through Carbopath™



Cooperative efforts with materials and chemicals markets

In addition to the energy markets, we are promoting initiatives to involve stakeholders at the level of end users of finished products. To achieve this, we will leverage MGC Group derivative products, such as polyacetal and formalin, in the materials and chemicals markets.

Furthermore, by providing finished products derived from CO_2 and waste-based methanol, we aim to stimulate environmental value markets and play a pioneering role.

Carbopath™ site opened

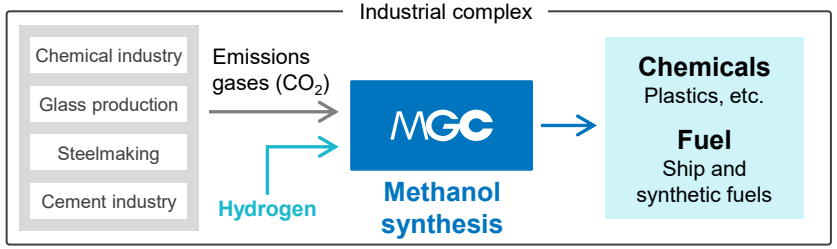
We opened a dedicated website for our Carbopath™ initiative to raise awareness and sympathy.

https://www.carbopath.mgc.co.jp/en/

Promotion of Circular Carbon Methanol - Example 3

– Summary of progress on the projects introduced in the previous report (December 4, 2023) are listed below.

Previous report	Progress (as of March 2025)
Launch of Japan's first pilot project for waste plastic gasification and methanol conversion	Technology development is underway for waste plastic gasification. We plan to continue broadening our partnerships to implement the circular eco-system, including the potential for use of biomass, in addition to plastic waste as raw materials.
Study of bio-methanol production using biogas from a sewage treatment center as raw material	**Production began at the Niigata Plant in 2024.** – International ISCC PLUS certification secured for use of sustainable raw materials; materials will be supplied to the marine fuel market and for use in the development of new sustainable materials. – Also planning expansion of scale through new raw material gases – We won Green Technology Innovation Awards in the Platinum Awards (2024) jointly with Niigata Prefecture.
Start of study on production and sales of the world's first Circular Carbon Methanol made from CO_2 generated from glass production	Studies toward commercialization continue. In addition, other projects under study involve methanol production utilizing emissions gas from chemical and steel industries (i.e. Hard-to-Abate sectors) with hydrogen as feedstocks, as a model for GHG emissions reduction by implementing CCU solutions at industrial complexes.
Studying commercialization of Green methanol production project in Gladstone (Queensland, Australia)	As a result of the feasibility assessments, the study has been put on hold at this stage. Independently of this initiative, we continue to explore Circular Carbon Methanol production projects and are working to establish a robust supply structure, including potential offtake from projects already under development in Mexico and other regions around the world.



For your information: Click on this link for the document used in the previous briefing. https://www.mgc.co.jp/eng/ir/files/231204_1e.pdf

Roadmap toward Carbopath™ Realization

- While promoting new production and offtake projects, we are also taking the initiative ahead of our competitors to achieve methanol decarbonization in existing joint ventures.
- Through activities spanning the methanol value chain, we plan to contribute to a global transformation of the eco-system by providing solutions in the sectors of materials and energy.

2023

- Proof of concept testing of production technologies for circular carbon methanol and progress toward social implementation
- Earning ISCC PLUS certification and building structures for supply of certified methanol

2024

- Beginning production of bio-methanol at the Niigata Plant. Beginning production and supply of ISCC Plus certified products.

2025-2030

- Domestic production plans (up to 50 KT)
- New international plans (100 KT)
- Supply expansion through use of overseas joint ventures etc.
- Securing products to supply to the market through overseas procurement
- Taking the initiative in securing markets for marine fuel
- Contributing to carbon-neutral LPG as an rDME supplier
- Growing the Carbopath™ brand to create and stimulate green markets in collaborations with early movers in various industries

2030 and beyond

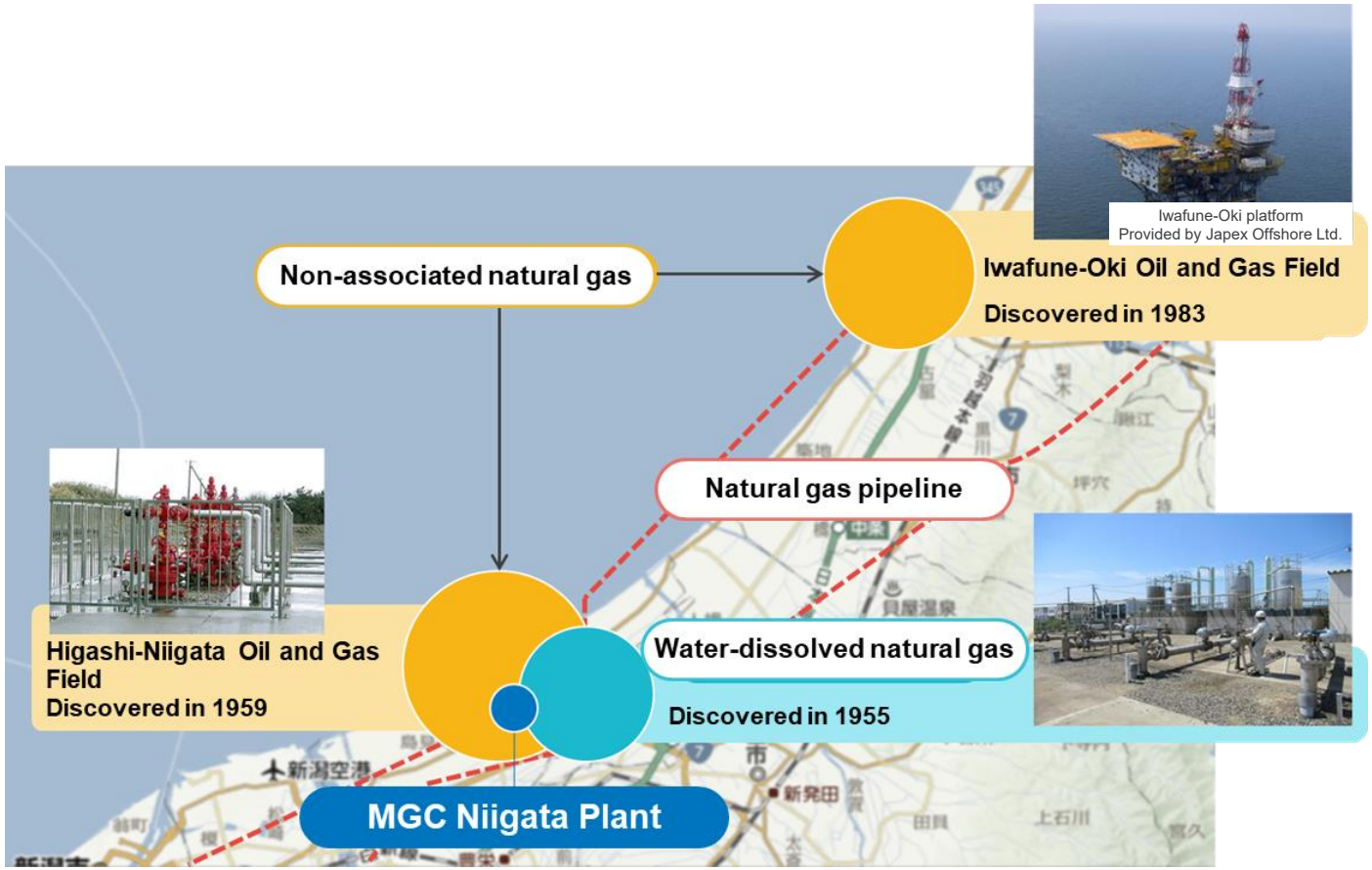
Promoting supply to meet burgeoning demand in fuel and chemicals markets and building plants for output on a scale equivalent to existing methanol production (annual production on the 1 million tons scale)

Striving to further expand green methanol markets as a supplier of carbon neutrality solutions

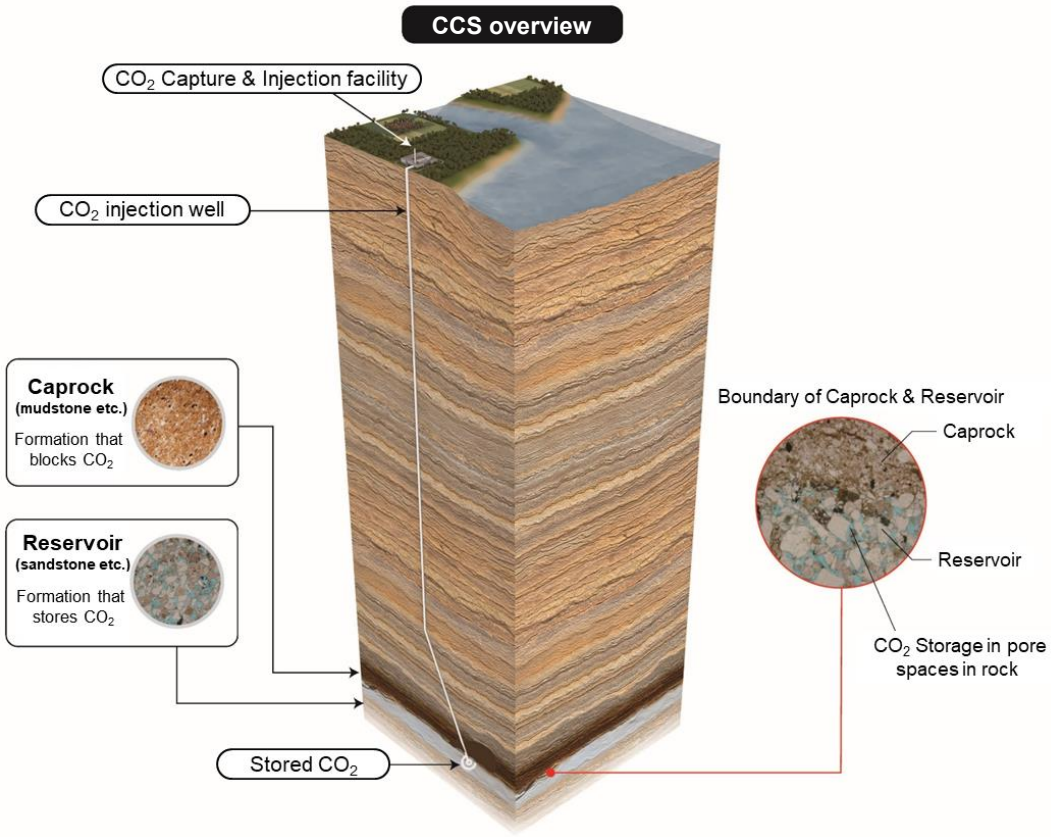
3. Promotion of CCS Utilization

MGC Group Advantages in CCS

- Ownership of non-associated gas and water-dissolved natural gas fields (Higashi-Niigata Oil and Gas Field and Iwafune-Oki Oil and Gas Field)
- Existing natural gas fields as carbon neutral infrastructure enabling development for CO_2 storage and usage



* CCS: Carbon dioxide capture and storage



CCS Initiatives in Japan (Advanced CCS Projects, Act on Carbon Dioxide Storage Business)

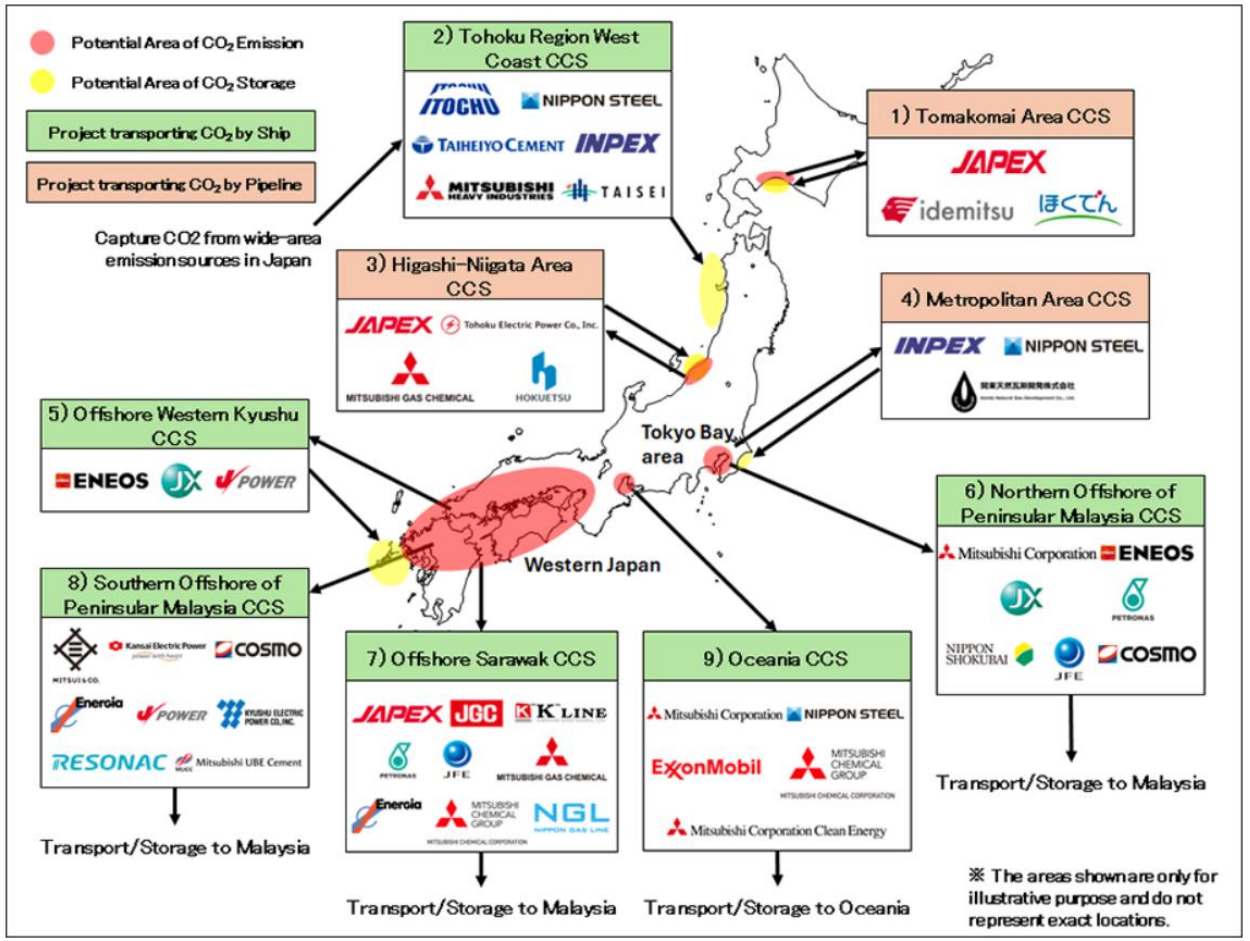
– Through efforts in areas such as surveying storage sites, technology development and testing, and international initiatives, **activities are proceeding to the stage at which development of domestic and international CSS systems and study of business models for the CCS value chain as a whole can begin**.

Advanced CCS projects

Proving advanced CCS projects with integrated support across the entire value chain from CO_2 separation and capture through transport and storage

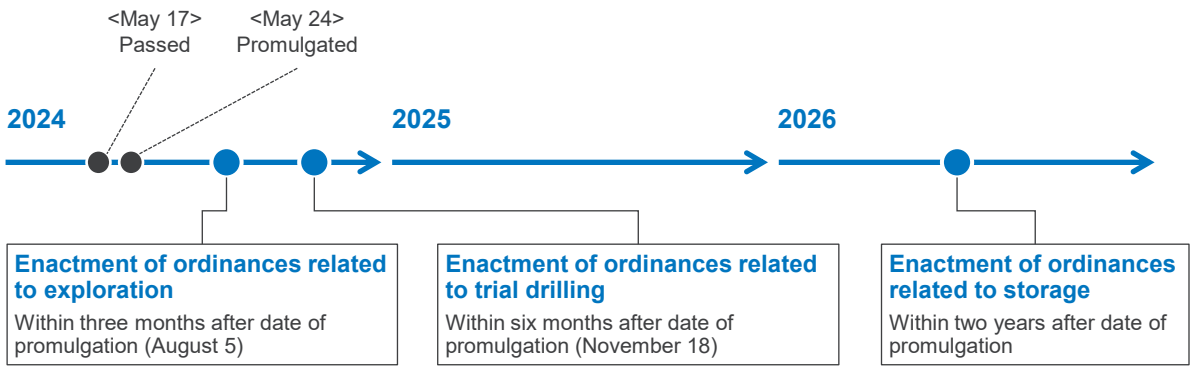
In FY2024, nine CCS projects selected by the Japan Organization for Metals and Energy Security (JOGMEC) to commence operations by FY2030 were chosen as advanced CCS projects.

We are participating in two of these projects: the Higashi-Niigata Area CCS and the Sarawak Offshore CCS.



Act on Carbon Dioxide Storage Business (CCS Business Act)

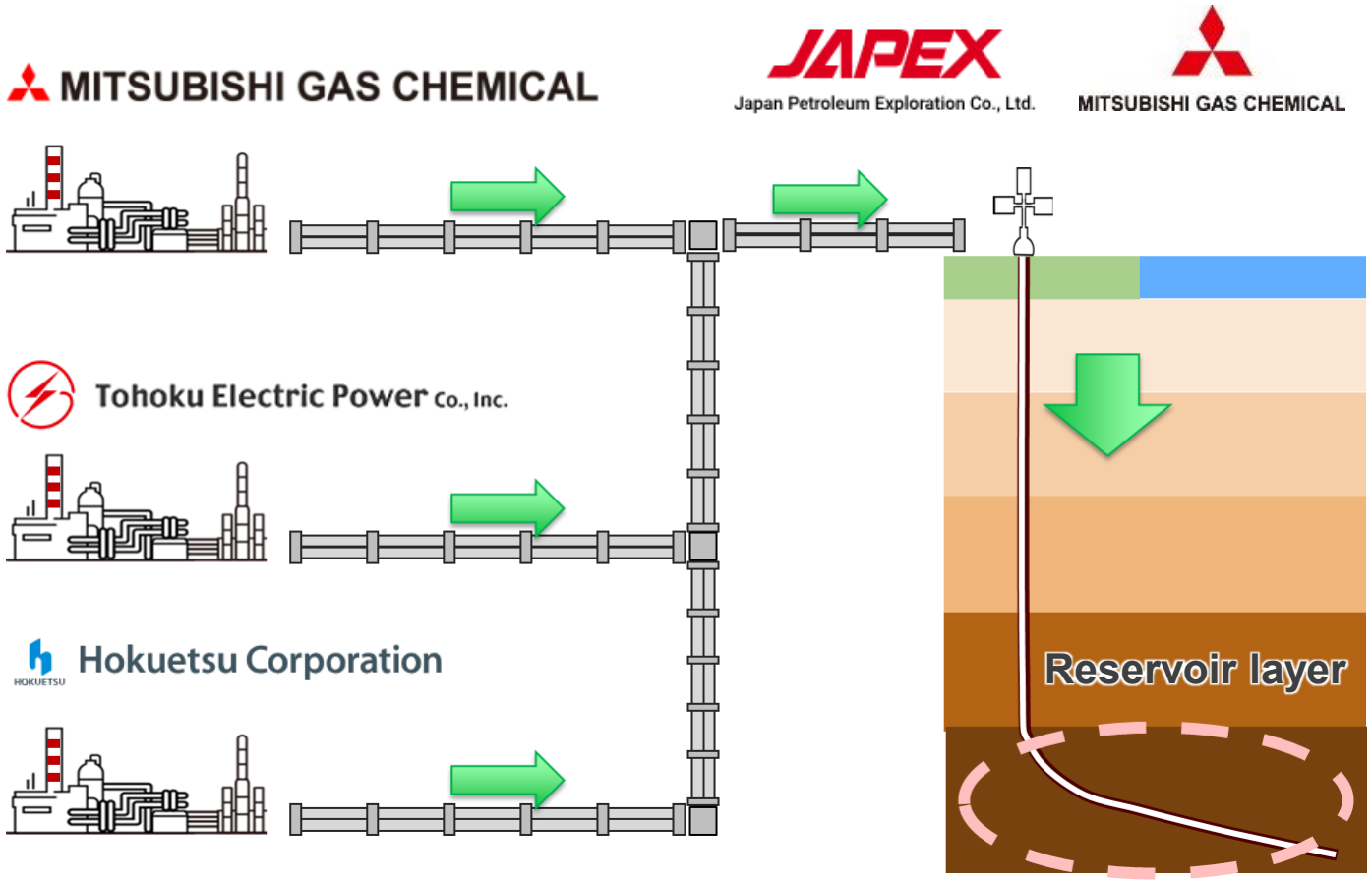
Promulgated May 24, 2024



Source: Ministry of Economy, Trade and Industry, Overview of the Act on Carbon Dioxide Storage Business (CCS Business Act) (August 2024), *METI CCS Policy Trends* (February 2025)

CCS-Related Initiatives at MGC (1): CCS in the Higashi-Niigata Gas Field (Constitutive Gas Layer)

- Injection of CO_2 from the Niigata Plant and blue hydrogen production equipment
- Design and other work are underway following selection as an advanced CCS project (Higashi-Niigata CCS)

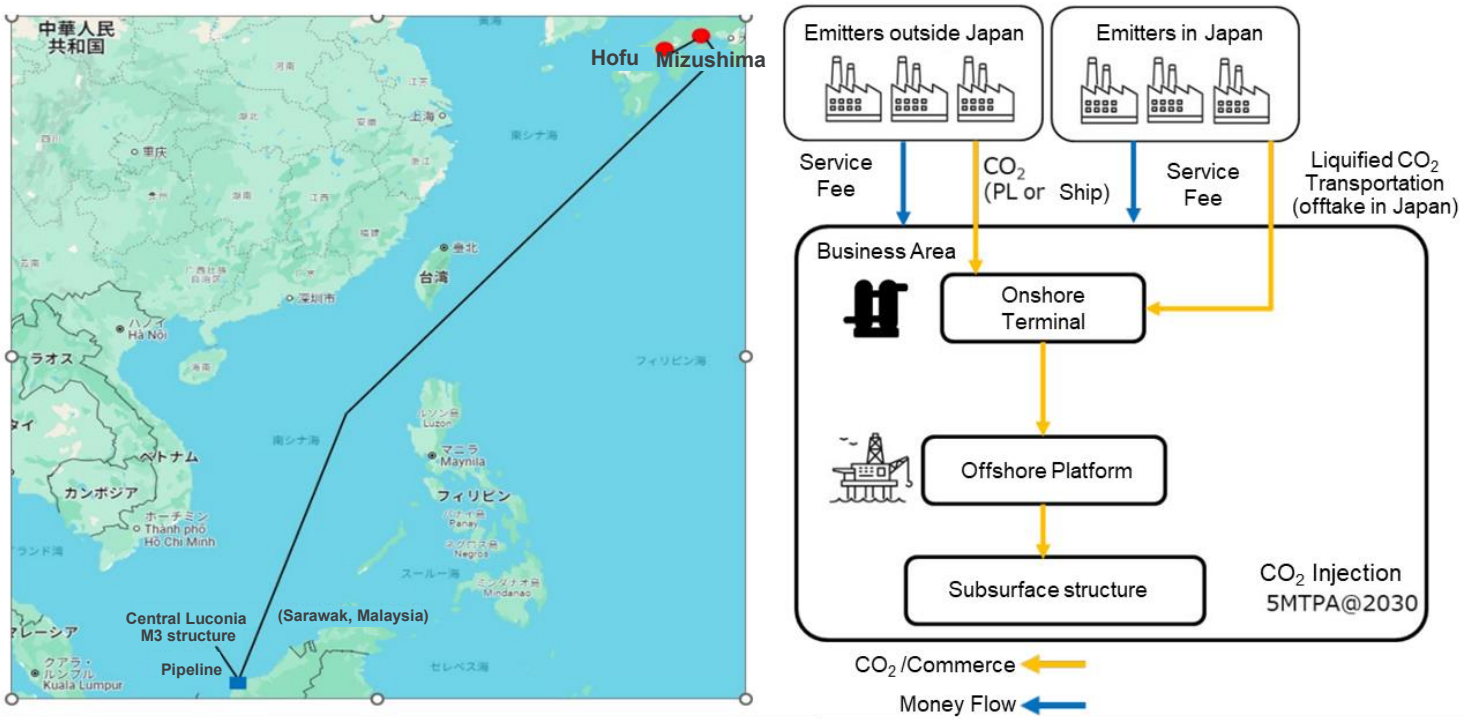


Companies	Japan Petroleum Exploration Co., Ltd. Tohoku Electric Power Co., Inc. Mitsubishi Gas Chemical Company, Inc. Hokuetsu Corporation
Reservoir area	Inside Niigata Prefecture (existing gas fields)
Reservoir volume	Approx. 1.4 million tons/year
Emissions sources	Chemical plants, paper plants, and power plants inside Niigata Prefecture
Method of transportation	Pipeline
Distinguishing features of the project	Promoting a project targeting the creation of added value, such as decarbonized fuels and environmental value, by utilizing existing oil and gas fields, etc., targeting chemicals, paper, electricity, and other industries.

Source: JOGMEC FY2023 CCS Project Results Report Meeting

CCS-Related Initiatives at MGC (2): CCS in Mizushima Plant

- A CCS project to store CO_2 from the Mizushima industrial complex and surrounding areas in the depleted layer in the Sarawak offshore gas field
- Feasibility studies and other efforts are underway after selection as an advanced CCS project (Sarawak Offshore CCS)



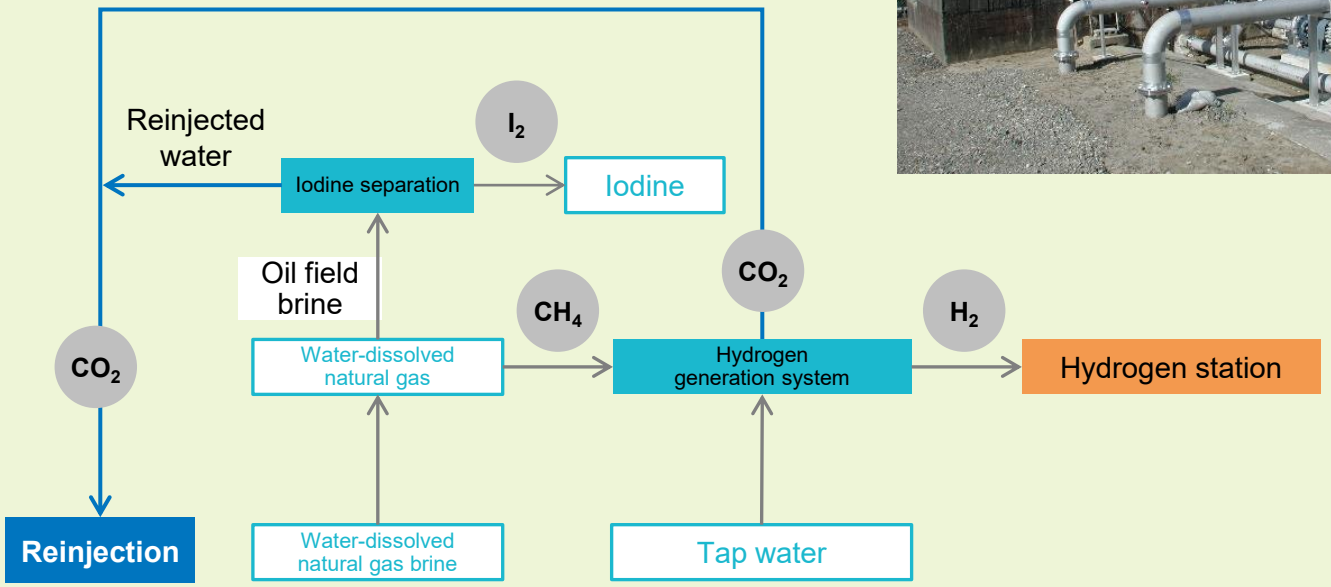
Companies	Japan Petroleum Exploration Co., Ltd., JGC Holdings Corporation, Kawasaki Kisen Kaisha, Ltd., JFE Steel Corporation, Mitsubishi Gas Chemical Company, Inc., Mitsubishi Chemical Corporation, Chugoku Electric Power Company, Inc., Nippon Gas Line Co., Ltd.
Reservoir area	Offshore from Sarawak, Malaysia (depleted gas field)
Reservoir volume	Approx. 1.9-2.9 million tons/year
Emissions sources	Multiple industries in the Setouchi region, including steel mills, power plants, and chemical plants
Method of transportation	Shipping and pipelines
Distinguishing features of the project	Promoting as a joint project with PETRONAS of Malaysia to transport and store CO_2 emissions collected at shipping sites through cooperative efforts among complexes in the Setouchi region of Japan and CO_2 shipped domestically from surrounding areas to the same shipping sites

Source: Document from Carbon Management Subcommittee, Ministry of Economy, Trade and Industry, Japan

CCS-Related Initiatives at MGC (3): Study of CCS in Water-Dissolved Natural Gas Fields

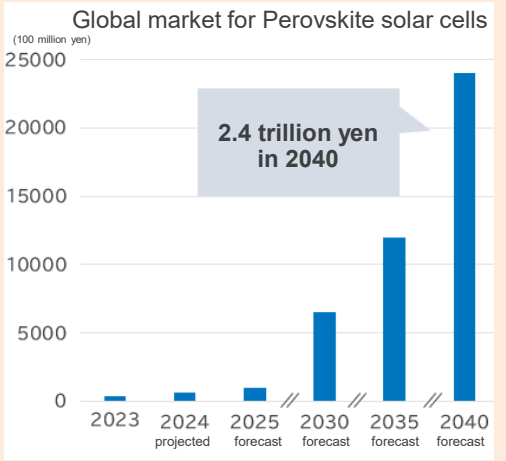
- Promoting initiatives for bringing CCS to water-dissolved gas fields, and for “blue hydrogen” production
- Business feasibility study will be conducted; a decision on commercial operation will be made by 2030.

After extracting natural gas and iodine from water-dissolved natural gas brine, once hydrogen is separated from the natural gas, the resulting CO_2 will be injected underground with the brine, allowing blue hydrogen production to be attempted.



[Iodine]

Perovskite solar cells, which are mainly made of iodine, are expected to play a key role in the expanding use of renewable energy. We plan to further contribute to carbon neutrality by promoting the development and commercialization of Perovskite solar cells using a wide range of the materials we supply, including methylamine, gas barrier materials, and highly heat-resistant resins, in addition to iodine.



Source: Fuji Keizai, *2024 Development Trends and Market Outlook for New/Next-Generation Solar Cells*

Appendix

Reference: Various Methanol Applications: toward Carbon Neutrality

Fossil resources

Natural gas

Coal

Methanol
(CH_3OH)

Renewable resources

Biomass

Captured CO_2

Waste

MMA → PMMA → Auto parts, lenses, aeronautic parts, etc.

Formaldehyde → Polyacetal → Auto parts, home electronics, etc.

Formaldehyde → Resins, adhesive → Plywood etc.

Methylamine → DMF → Solvents, surfactants, etc.

Acetic acid → Acetate resins, fibers, etc. → Synthetic fibers, paints and coatings, etc.

DME → Spray propellant

DME → LPG additive

Marine fuel

MTO → Polyolefin

MTO → MTJ → SAF

Diesel

MTBE

MTG → e-Gasoline

Hydrogen

Basic chemicals

Methanol is beginning to be used as alternative fuels and materials for ethylene, propylene, and other petrochemicals, which already have a wide range of applications.

Energy

Methanol is attracting attention as a new fuel with a pathway to carbon neutrality, offering a wide range of applications as an alternative raw material and energy source to petroleum.

Reference: Global Network of MGC's Methanol Business

- Annual production capacity: at least 7.5 million tons
- Global supply network based on four production plants around the world

Saudi Arabia

Saudi Methanol Company (AR-RAZI)

(Start Year 1983)

Capital JSMC (MGC 47% of Capital) 25%, SABIC 75%

Capacity Total 4,050KMT/Y


Ⅱ 650KPTA (Year 1991)


Ⅲ 850KPTA (Year 1997)


Ⅳ 850KPTA (Year 1999)


Ⅴ 1700KPTA (Year 2008)

Brunei

Brunei Methanol Company（BMC）

(Start Year 2010)

Capital MGC 50%、 Itochu 25%
PB Petrochemical 25%

Capacity 850KMT/Y

Trinidad and Tobago

Caribbean Gas Chemical Ltd. (CGCL)

(Start Year 2020)

Capital MGC 26.25%, Mitsubishi Corp. 26.25%,
Mitsubishi Heavy Industries 17.5%
Natural Gas Company of T/T 20.0%
Massy Holdings 10.0%

Capacity 1,000KMT/Y

Venezuela

Metanol de Oriente, Metor.S.A. (METOR)

(Start Year 1994)

Capital MGC 23.75%, Mitsubishi Corp. 23.75%
Pequiven 47.5%, IFC 1%, Treasury Stock 4%

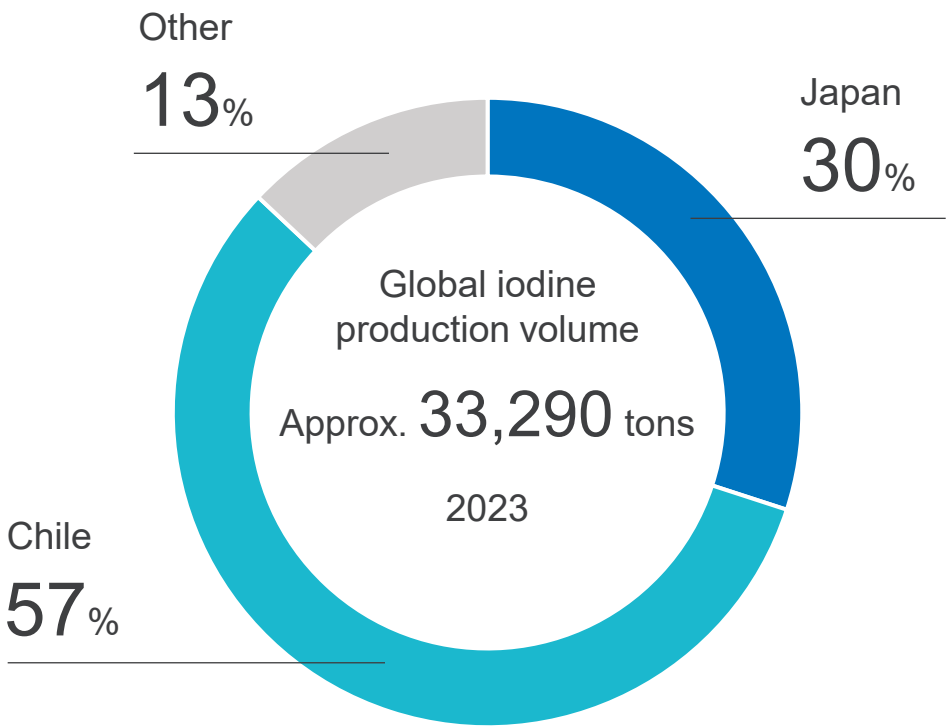
Capacity Total 1,600KMT/Y


METOR Ⅰ: 750KTPA (Year 1994)

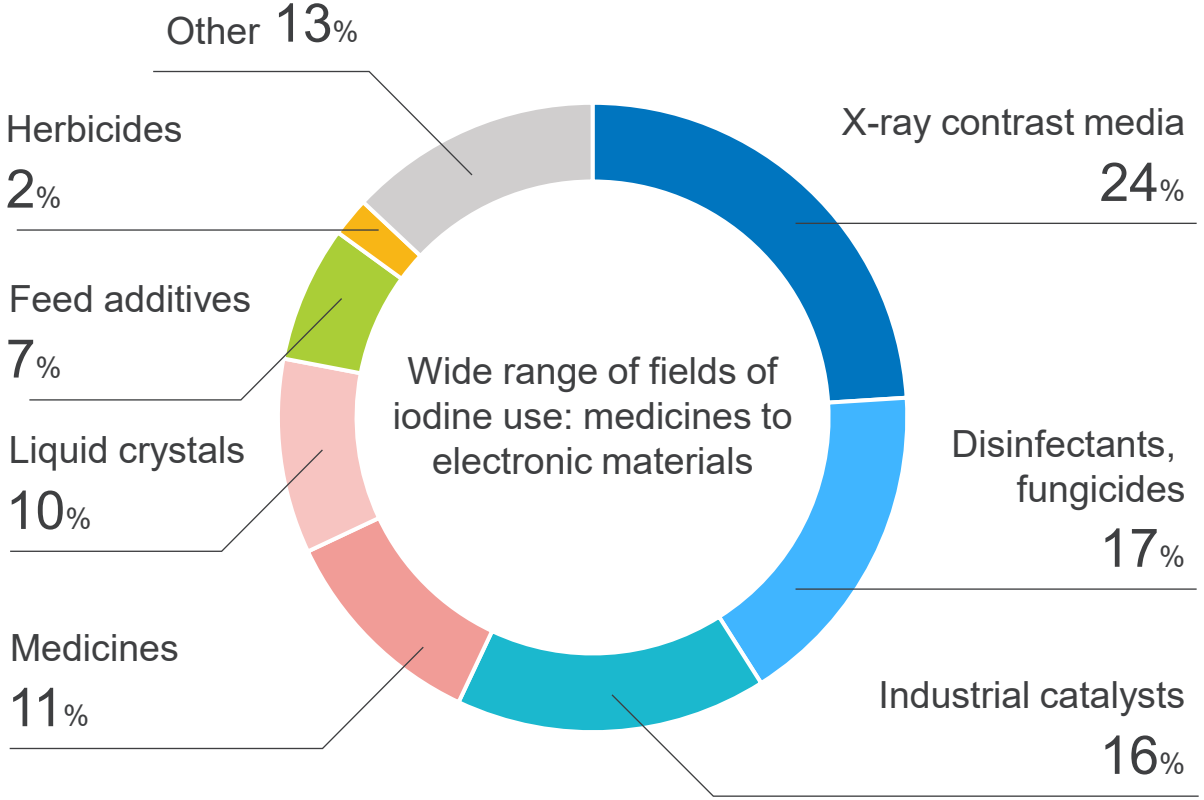

METOR Ⅱ: 850KTPA (Year 2010)

Reference: Iodine Production Volume and Applications

- Japan is the world's second-largest producer of iodine. Chiba Prefecture accounts for some 82% and Niigata Prefecture for some 11% of Japan's total production.
- Use of iodine is advancing across a wide range of fields, from medicines to electronic materials.



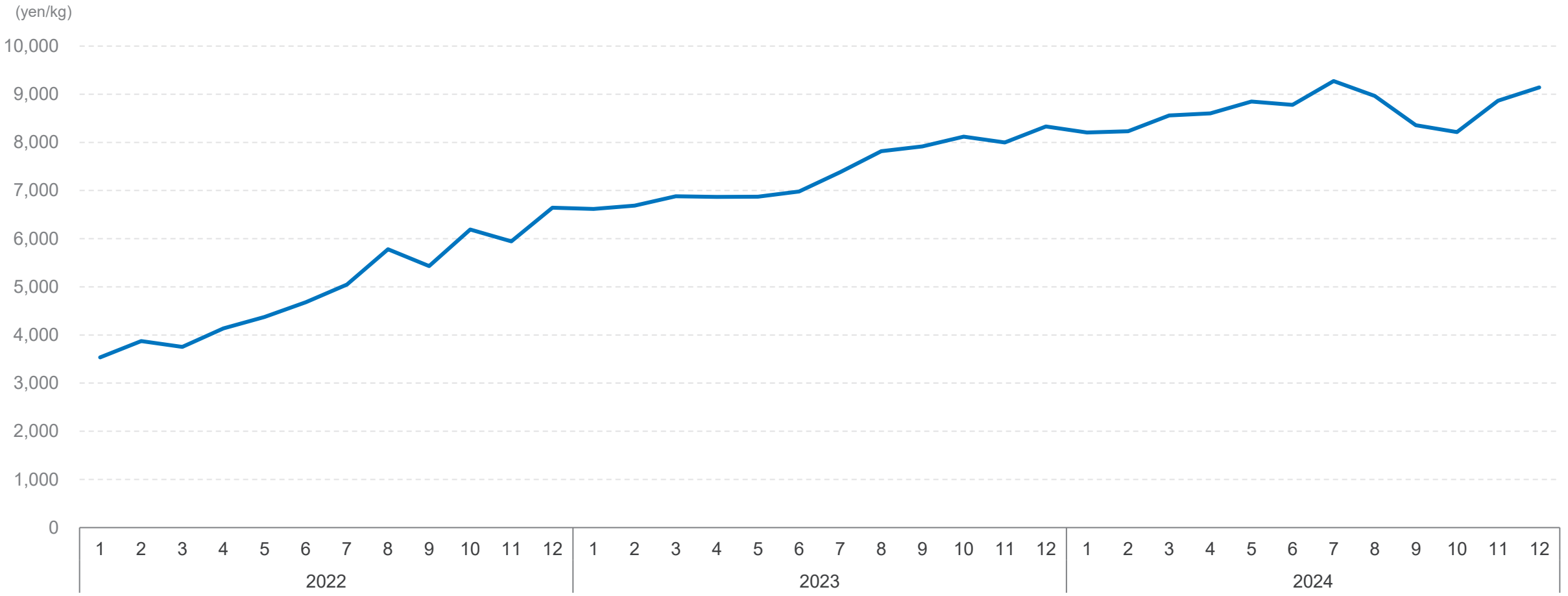
Source: *Japan Oil and Gas Notes January 2025.*1 (Japan Natural Gas Association)



Source: Japan Natural Gas Association website

Reference: Iodine Market Price

– The market price of iodine is rising amid the tight demand and supply balance in recent years.

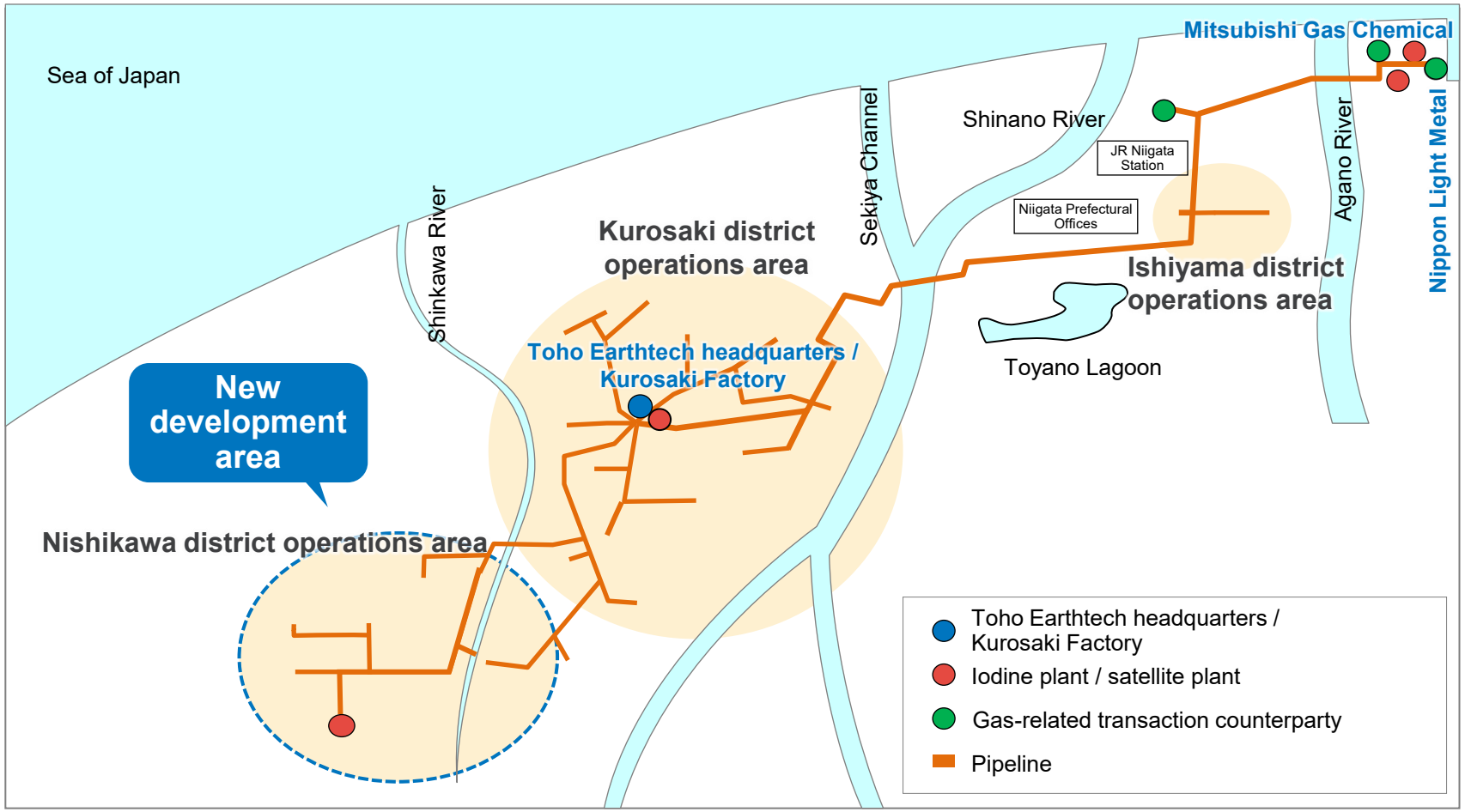


Source: Prepared based on data from the Japan Customs website (https://www.customs.go.jp/toukei/srch/index.htm?M=77&P=1,1,,,,1,,,2,,2022,2024,,,2,280120000,,,,,,,,,1,,,,,,,,,,1,,,,,,,,,,)

Reference: MGC's Iodine Business

- Toho Earthtech, Inc., a subsidiary, separates iodine from the brine released in the extraction of water-dissolved natural gas.
- Toho Earthtech accounts for about 9% of total iodine production in Japan. The expansion project to increase production put online partially in 2024. The project still continues.

Production site (brine pumping) and injection (brine return) site / iodine production plant



Kurosaki Factory

Total site area: approx. 33,000 m^2

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