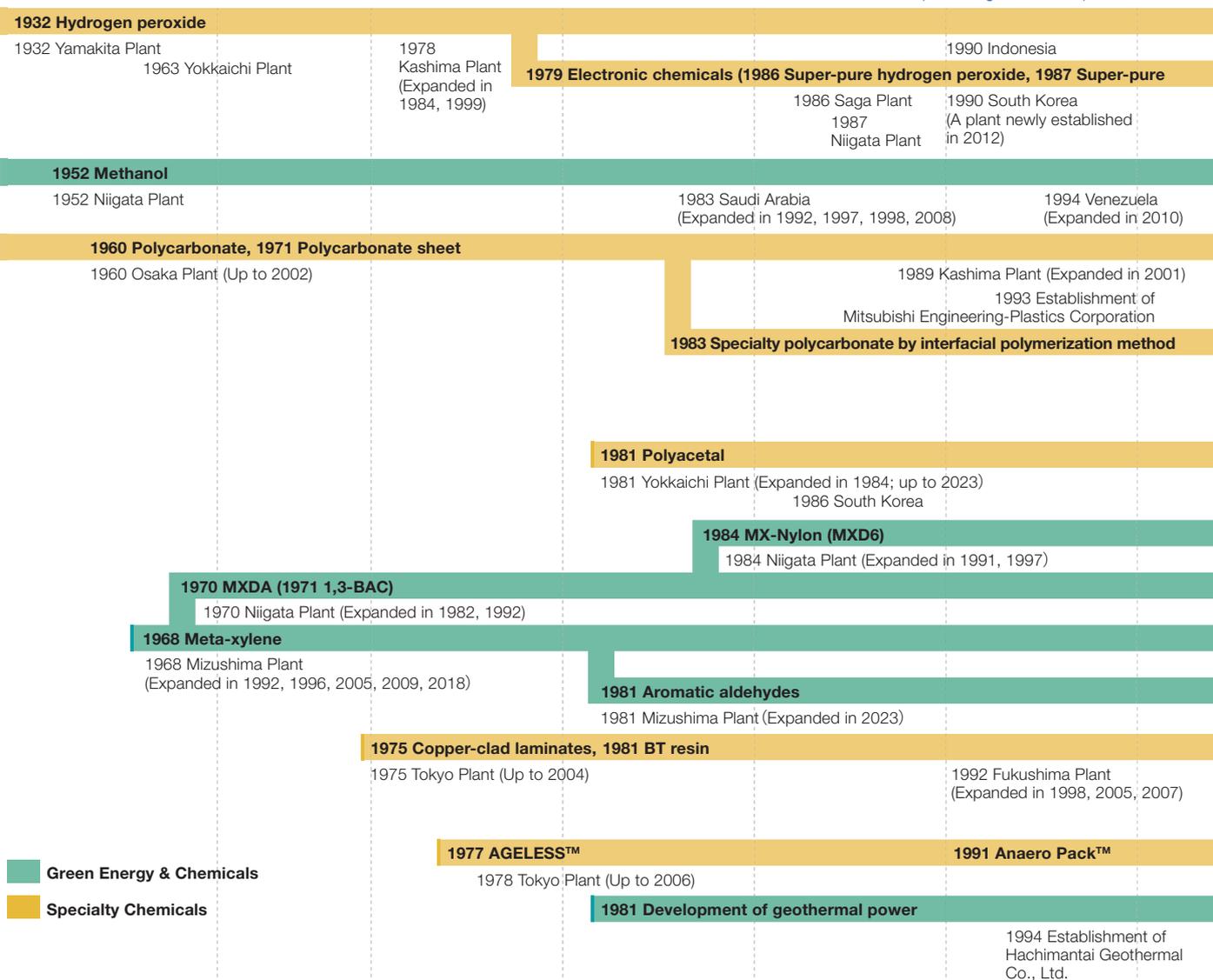
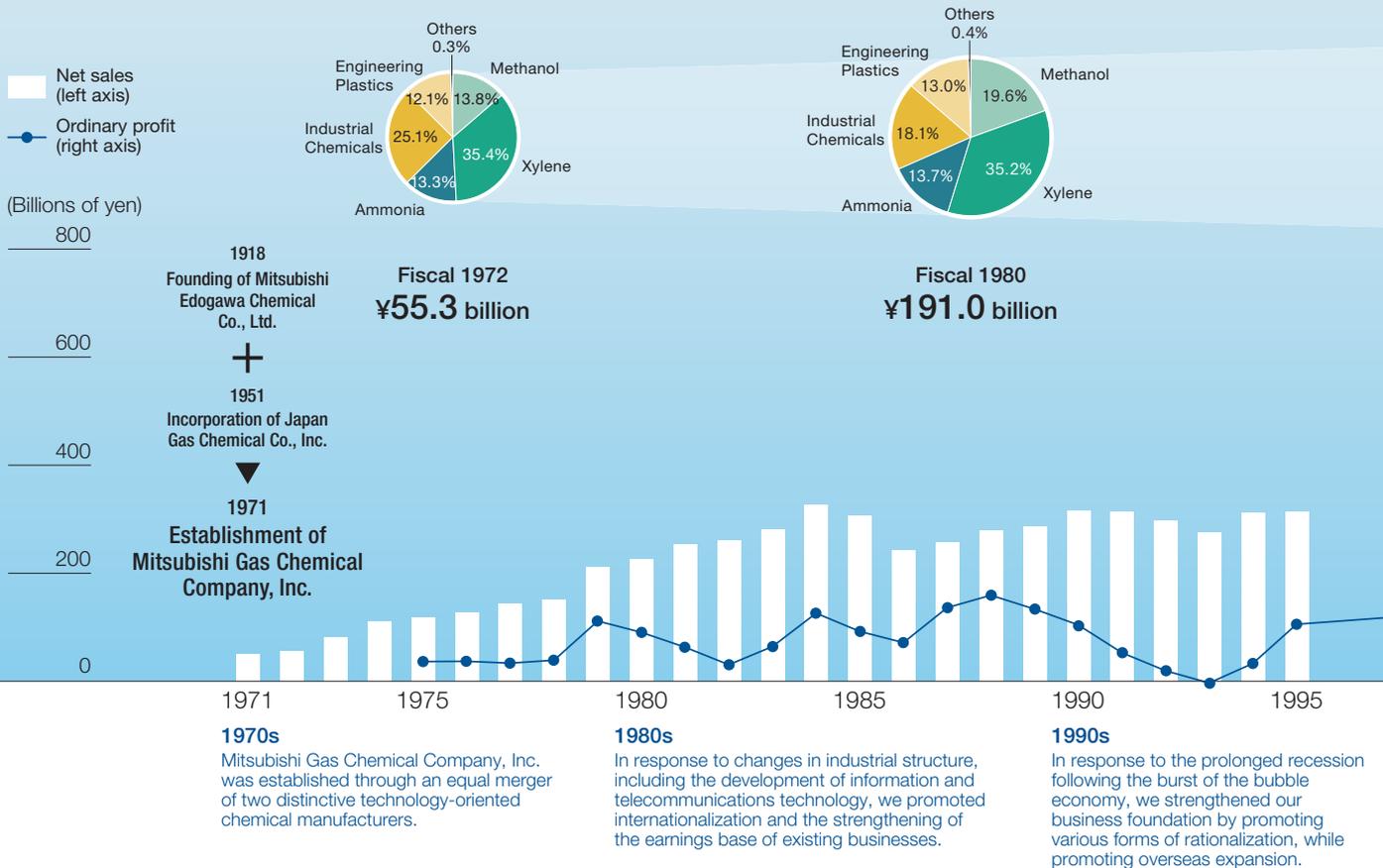
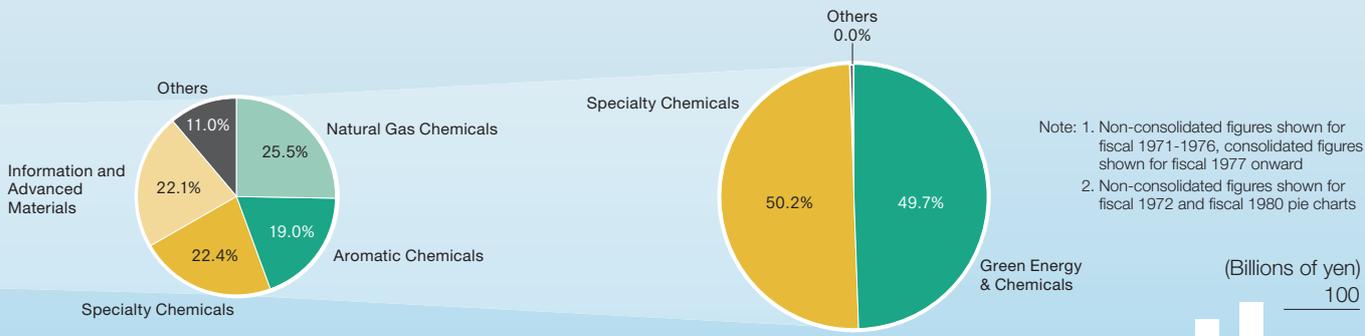
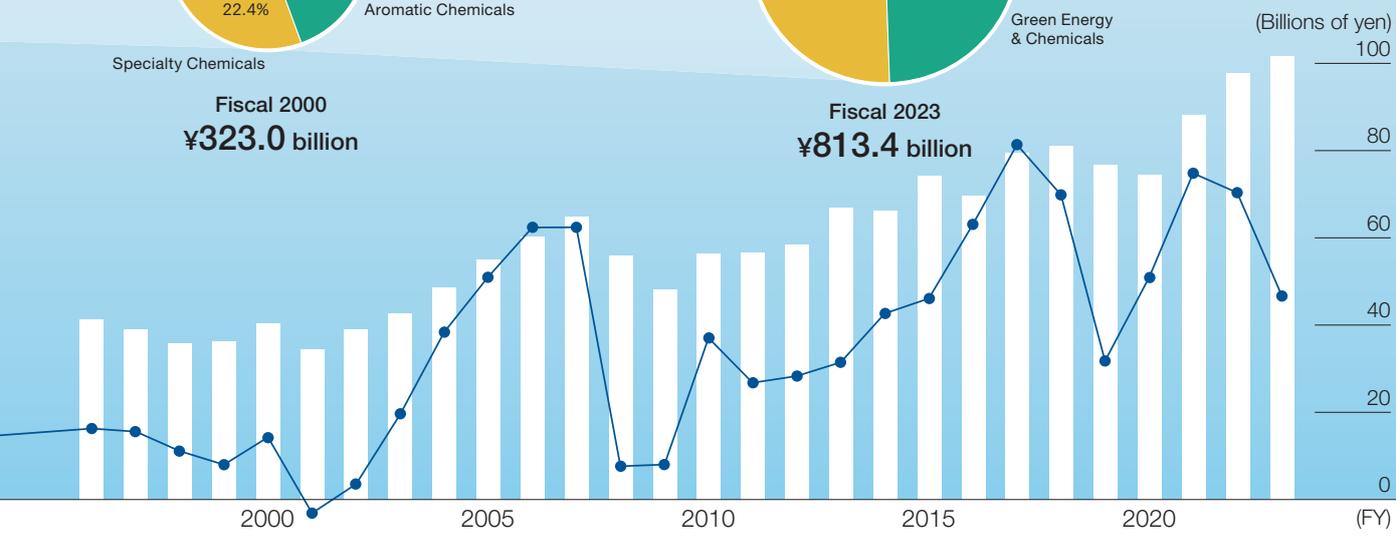


# MGC Group's History





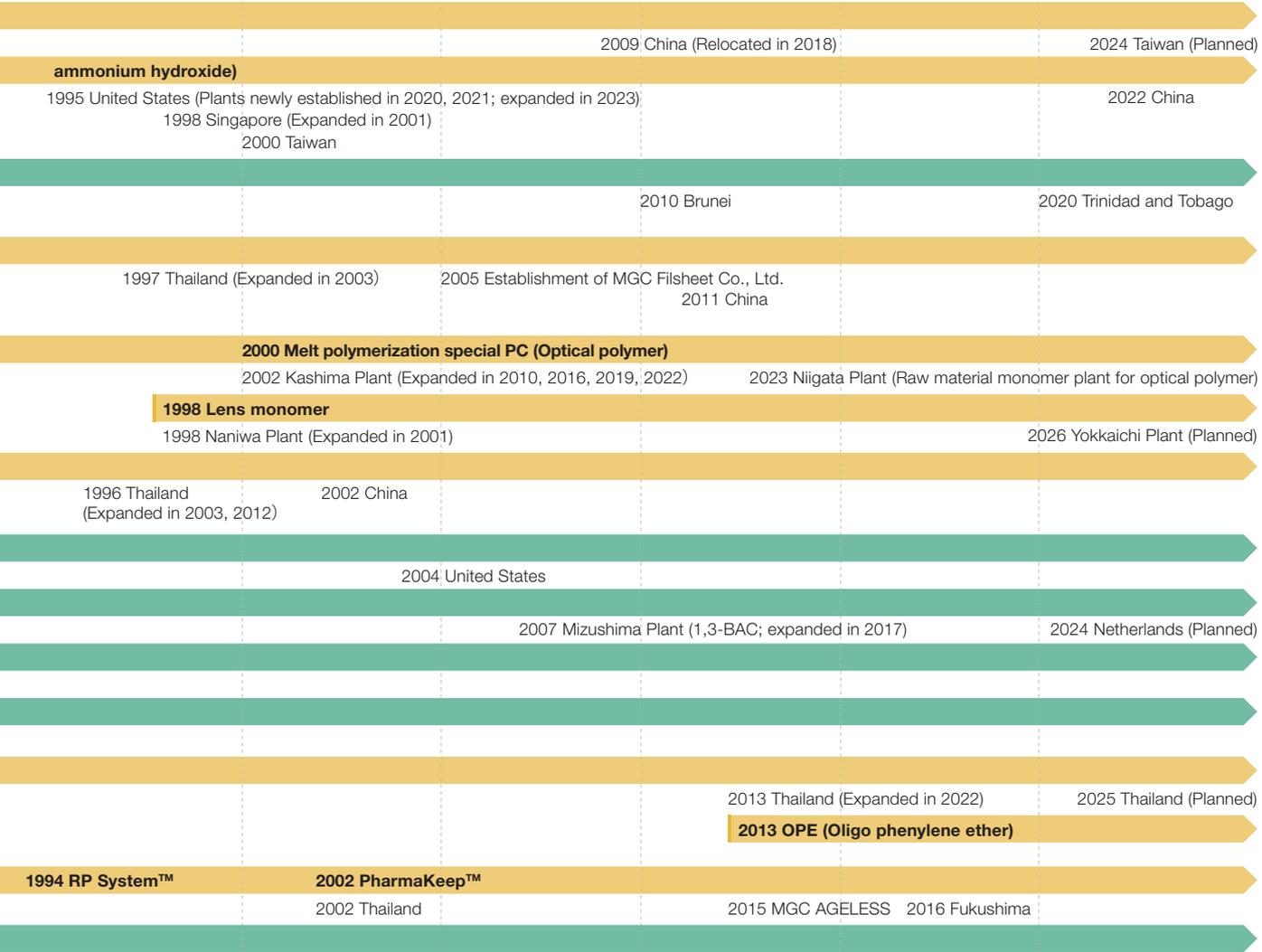
Note: 1. Non-consolidated figures shown for fiscal 1971-1976, consolidated figures shown for fiscal 1977 onward  
 2. Non-consolidated figures shown for fiscal 1972 and fiscal 1980 pie charts



**2000s**  
In light of intensifying global competition, we introduced a company system to improve financial soundness and speed up business expansion.

**2010s**  
In addition to promoting a shift in business structure to businesses with higher added value, we accelerated efforts to create new businesses.

**Fiscal 2020–Fiscal 2023**  
We abolished the company system and revised the organization for overall optimization, with the MGC Group working as one to promote various measures.



(now Hachimantai Green Energy Co., Ltd.)  
 (Started operations in 1994 to supply steam to Sumikawa Geothermal Power Plant)

2010 Establishment of Yuzawa Geothermal Power Corporation  
 (Started operations in 2019 at Wasabizawa Geothermal Power Station)

2015 Establishment of Appi Geothermal Energy Corporation  
 (Started operations in 2023 at Appi Geothermal Power Station)

# Uniqueness



### BT products

Proprietary materials with superior low-warpage and electrical properties, able to keep pace with the evolution of the semiconductor market

Primary applications: IC plastic package substrates (smartphones, computers, IT appliances, etc.)



### Optical polymer

Balances high refractive index with low birefringence, contributing to enhanced camera functionality

Primary applications: Materials for smartphones and other compact camera lenses

\*1 As a highly refractive resin (concave lens)



### MX-Nylon (MXD6)

High gas barrier properties contribute to weight reduction of PET bottles

Primary applications: Food packaging materials, PET bottles, engineering plastics



### Aromatic aldehydes

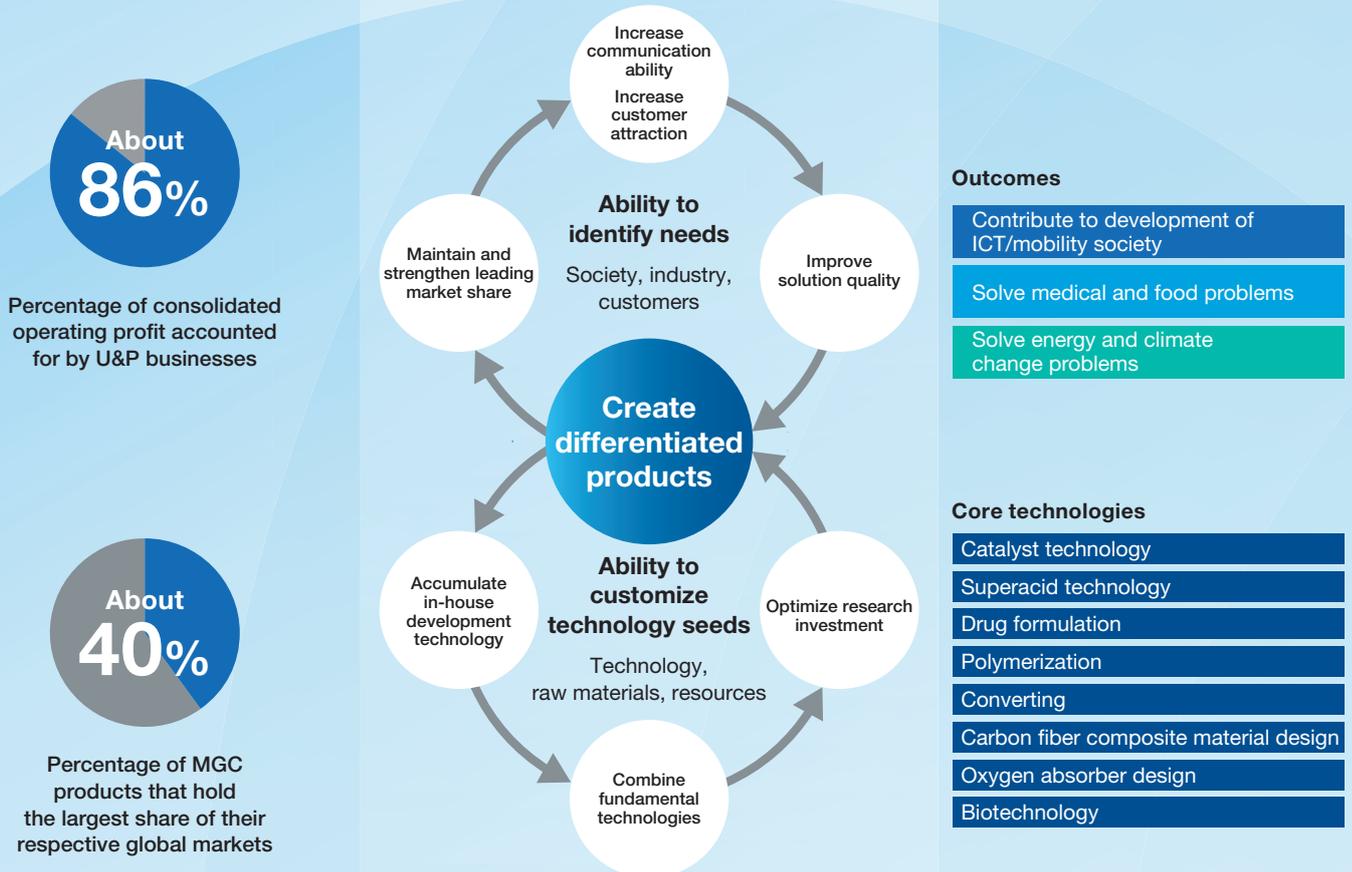
Customized to customers' requirements using proprietary production methods that are efficient and have low environmental impact

Primary applications: Resin additive (agent that renders polypropylene transparent), fragrances

## Creating U&P Businesses through a Beneficial Cycle of Needs and Seeds

The MGC Group is pursuing Uniqueness & Presence (U&P), a business model for creating products that combine unique characteristics that are difficult for other companies to imitate and a presence in the global markets. At the same time, it is also a value creation strategy based on a corporate culture rich in entrepreneurial spirit and originality. It is driven by dialogue with the market conducted by the Company's research personnel using distinctive technologies and resources (seeds). In addition, having grasped customers' needs and information through dialogue, we match these with our seeds to develop products offering higher functionality and qualitatively improve our solutions. Through this beneficial cycle of needs and seeds, the ratio of our products that have captured the top share in their global markets has reached approximately 40%. Moreover, U&P businesses\*<sup>3</sup> now account for approximately 86% of our consolidated operating profit.

\*<sup>3</sup> The Group has defined businesses that can grow sustainably while achieving both economic and social value using KPIs as Uniqueness & Presence businesses. We aim to create product lines that excel from the perspectives of "Growing," "Winning," and "Sustainable."



About  
**86%**

Percentage of consolidated operating profit accounted for by U&P businesses

About  
**40%**

Percentage of MGC products that hold the largest share of their respective global markets

#### Outcomes

- Contribute to development of ICT/mobility society
- Solve medical and food problems
- Solve energy and climate change problems

#### Core technologies

- Catalyst technology
- Superacid technology
- Drug formulation
- Polymerization
- Converting
- Carbon fiber composite material design
- Oxygen absorber design
- Biotechnology

# & Presence

■ Green Energy & Chemicals Business  
■ Specialty Chemicals Business  
 (Global market share, etc. are estimates made by the Company)

  
**Super-pure hydrogen peroxide**  
 Global production capability ensures a stable supply of high-quality products to meet the needs of the most technologically advanced customers  
 Primary applications: Cleaning agents and etching agents for semiconductor wafers

  
**Meta-xylenediamine (MXDA)**  
 Superior rapid curing, anticorrosion and chemical resistance  
 Primary applications: Epoxy resin curing agent (paint for bridges, ships and industrial pipes and ducts), raw material for MX-Nylon

  
**Methanol**  
 World's only comprehensive manufacturer with proprietary catalyst technology and a complete methanol value chain, from natural gas development to manufacture and sales of derivatives  
 Primary applications: Raw and intermediate materials for formalin, acetic acid, etc.  
\*2 Total for all affiliates using MGC technology

  
**Polyacetal resin (POM)**  
 Engineering plastics offering superior wear resistance, low friction and chemical resistance  
 Primary applications: Automotive components, electrical and electronic components, office automation equipment, fasteners

## Location Strategy Based on Customer and Market Characteristics

The ability to maintain and develop U&P businesses is backed by a location strategy that maximizes product value. For example, in super-pure hydrogen peroxide, which is vital for the semiconductor manufacturing process, we have adopted a consumption location strategy, establishing production in the area of consumption in order to meet the different demands of each customer. On the other hand, methanol is well known as a raw material location product. By investing in areas that offer secure access to cheap natural gas, we are expanding production by local companies together with our partners. We have secured our competitive advantage, even in a business environment of increasing uncertainty, by reducing risk and maintaining a diverse market portfolio through geographical distribution. Through such strategies, we aim to increase our market presence and continue being a preferred partner for various cooperating partners.



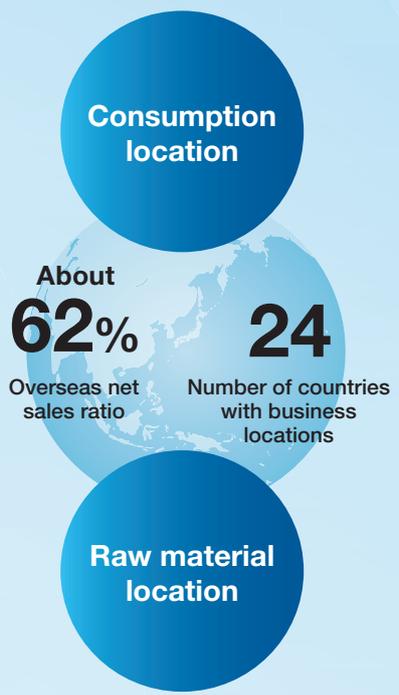
The Netherlands (MXDA/Under construction)



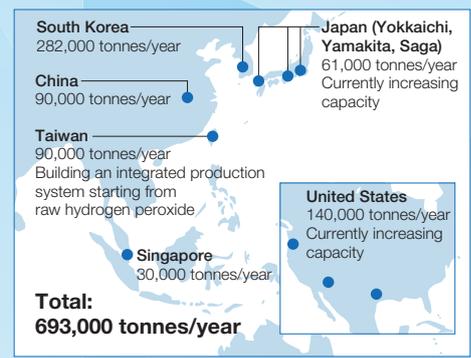
Circular carbon methanol pilot facility (Niigata Plant)



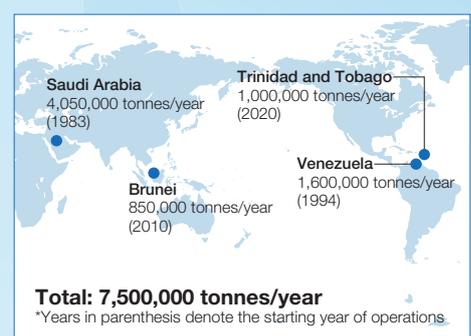
Trinidad and Tobago (methanol)



### Super-Pure Hydrogen Peroxide Production Sites



### Methanol Production Sites



## Examples of U&P Creation by Outcome

**Contribute to development of ICT/mobility society**

In the ICT area, which is one of our target areas, DX is expected to advance in the future through the utilization of AI, IoT, and other technologies. The importance of materials such as chemicals used in manufacturing high-performance semiconductors that form the foundation for these is also continuing to increase. Meanwhile, in the area of mobility, new ingredients and materials that match the needs of computerization and low environmental impact are required. The MGC Group is strengthening proposals for material development and solutions with a view to such next-generation needs.

### Value We Aim to Create



### Foundation of Value

**Function** BT resin is a chemical material developed using our proprietary technology, mainly comprising two types of monomer. It offers thermal resistance and electric insulation properties, with a level of thinness comparable to ceramic. BT materials made from this resin are used as a substrate material for semiconductor components, helping to drive higher performance in electronic devices while making them thinner and more compact.

**Technology** Using BT resin as a starting point, MGC is able to design substrate materials that resolve customer issues and meet needs at the cutting edge of technology. We have various fundamental technologies and advanced R&D expertise that enable us to maintain compatibility with customers' manufacturing processes while also achieving high-level demands for characteristics such as low warpage and low transmission loss.



### Maximization of Value

- Since inventing BT resin in 1976, we have maintained the top share of the global market for half a century as a pioneer in organic IC plastic package substrate materials. Our extensive product lineup ranges from high-end to middle-tier products. Recently, we have been focusing on materials development and proposal activities to meet the demands of the digital infrastructure market.
- We manufacture through Group companies in Japan and Thailand to enable a stable supply globally. At our plant in Thailand, we plan to increase production capacity of mass-produced items in fiscal 2025. We will maintain the efficiency gains of our dual-base structure, and strengthen it even further to ensure a timely response to customer needs.

## BT Materials

Uniqueness

Presence

#### Primary applications

- IC plastic package substrates (smartphones, computers, IT appliances, etc.)



**Tomoyuki Azuma**

Executive Officer  
Division Director,  
Electronics Materials Division,  
Specialty Chemicals  
Business Sector

## Rapid Development of Materials That Offer Unprecedented Performance to the Market

In the information and communications field, the market for automotive and other communication devices that require fault avoidance is set to expand in the future. For this reason, I am confident that demand for BT materials will continue to grow, since we have faithfully maintained our commitment to high quality. To rapidly achieve the characteristics required by our customers, we work with our suppliers to obtain high-performance raw materials and strive to build an ecosystem that will enable practical application. In addition, we are working to quickly develop materials that offer unprecedented performance to the market, and to commercialize them as distinctive and unique substrate materials. While pursuing productivity in our R&D activities through the introduction of DX, we will expand our research themes into multiple areas, taking a wider and longer-term perspective, and contribute to the evolution of diverse electronic components.

## Solve medical and food problems

In light of accelerating global population growth and aging, the MGC Group is expediting development of product groups that will lead directly to the enhancement of preventive and predictive medicine and the improvement of medical productivity. As for addressing food-related challenges, in 1977 we began marketing an oxygen absorber that extends the storage life of foods, and have been improving it for over 40 years. Taking full advantage of the management resources of the Group, we will continue to develop advanced technologies to help extend healthy life expectancy and support sustainable food management.

### Value We Aim to Create



### Foundation of Value

#### Supply chain

MX-Nylon is a polyamide resin made primarily from MXDA, a xylene-chain derivative. Using our product, MXDA, as a raw material, we conduct integrated manufacturing using proprietary methods that we have developed to maintain a stable supply and high quality that is recognized worldwide.

#### Function

MX-Nylon is used for food packaging films and PET bottles due to its excellent gas barrier properties and chemical resistance. It contributes to reducing food loss by extending shelf life and helps to reduce container thickness. With its high strength and rigidity, it enables weight reduction in automotive parts, and is recognized as a material that helps to reduce GHG emissions.

## MX-Nylon

### Uniqueness

### Presence

#### Primary applications

- Food packaging materials
- PET bottles
- Engineering plastics

### Maximization of Value

- In 2022, we began manufacturing and selling ISCC PLUS-certified\*<sup>4</sup> MX-Nylon with sustainable raw materials, including plant-derived raw materials, allocated using a mass balance approach. We are currently appealing to the food and beverage markets with MX-Nylon as a product that can contribute to further GHG emissions reductions while maintaining product performance.

\*<sup>4</sup> An international certification system for companies and organizations that manufacture products using sustainable raw materials such as biomass and recycled materials.

- Personnel responsible for R&D, manufacturing, and sales come together to exchange opinions and share information in our regular collaboration meetings. Through these meetings, we share our awareness of market changes, legal and regulatory trends, potential risks, and future forecasts in each country and region, aiming to develop new applications and new markets.



**Kenichi Nakaura**

Division Director,  
High-performance  
Products Division,  
Green Energy &  
Chemicals Business Sector

## Promptly Communicating Product Value to Maintain and Strengthen Competitive Advantage

To make full use of the value of MX-Nylon, it is essential to grasp trends related to the active response to environmental issues in the food packaging and automotive industries, which are our main customers. Going forward, we must respond to the revision of GHG emissions reduction targets and laws in each country by properly addressing product design and other aspects, while promptly communicating the value of our products to the relevant customers in order to maintain and strengthen our competitive advantage. One effective means of doing this is to proactively set up opportunities where our engineers can talk directly with customers and to provide technical support for product design and prototype inspections. In this way, we are promoting initiatives to quickly stimulate actual demand. We are currently focusing on expanding sales and applied research of products that respond to social demand, such as products that use plant-based materials.

## Examples of U&P Creation by Outcome

**Solve energy and climate change problems**

Taking advantage of our many years of experience developing natural gas and producing methanol, we are working to commercialize our carbon-neutral technology. We are concentrating our efforts on R&D related to methanol synthesis from CO<sub>2</sub> as well as on CO<sub>2</sub> capture, utilization and storage. We also endeavor to contribute to addressing issues related to energy and climate change in a way that is unique to the MGC Group as a chemical company, such as the use of methanol and ammonia as hydrogen carriers, geothermal power generation, which no other company in the chemical industry is doing, and materials development to help extend the life of wind power generation equipment.

### Value We Aim to Create



### Foundation of Value

**Technology** As Japan's first manufacturer of methanol using natural gas as a raw material, we have accumulated experience and know-how in our own catalyst technologies and plant operation and manufacturing over many years since our foundation in 1951. In 2021, we tested the production of methanol from CO<sub>2</sub> and hydrogen as circular carbon methanol (CCM). In 2024, we started a biomethanol manufacturing business.

**Supply chain** We have led the world in expanding our production sites overseas, and we currently achieve stable production with a structure comprising four locations in the Middle East, South America, and Southeast Asia. We are a unique, comprehensive methanol manufacturer with a global value chain that spans from raw materials upstream to derivative products made using our proprietary technologies downstream, giving us a world-leading competitive advantage.

### Maximization of Value

- For over 70 years, we have built a seamless value chain, from resource development to proprietary catalysts, synthesis processes, manufacturing, transport, sales, and derivatives. It is our status as a unique global presence that enables us to maximize the value of methanol.
- The CCM concept Carbopath™ is a powerful platform that can contribute to the realization of a circular carbon society by manufacturing methanol from materials such as atmospheric CO<sub>2</sub> emissions, waste plastic, and biomass, and producing energy and materials.

## Methanol

Uniqueness

Presence

### Primary applications

- Raw materials and intermediate materials for formalin, acetic acid, etc.



**Masahiko Naito**

Division Director,  
C1 Chemicals Division,  
Green Energy & Chemicals  
Business Sector

## Aiming to Create a Circular Carbon Platform with Participation from All Entities that Make Up Society

Carbopath™ is a circular carbon platform that aims to create energy and materials through CCM produced from CO<sub>2</sub> and waste products. It is a new business model that utilizes the technologies and intellectual property accumulated by the Group over its long history, as well as the Company's entire methanol value chain. To realize Carbopath™, we are promoting alliances with diverse collaboration partners in Japan and overseas, including shipping companies, energy companies, customers who require GX materials, and firms and governments aiming to realize GHG reduction, recycling, renewable energy and hydrogen usage, and a sustainable society. In the future, we aim to contribute to the realization of a carbon-neutral society by growing into a platform with participation from all stakeholders that make up society.

# Circular Carbon Methanol Carbopath™



The Group is working to promote the construction of Carbopath™<sup>5</sup>, a circular carbon platform that aims to generate energy and materials through CCM produced using CO<sub>2</sub> and waste, and to build cross-industry alliances. The name Carbopath™ expresses MGC's commitment to being a pioneer in promoting the CCM concept and playing a key role in realizing carbon neutrality and a circular carbon society by promoting its environmentally advanced methanol business.

Under this concept, MGC will invest in the CCM production business; issue technology licenses; provide automated operation, remote monitoring, and maintenance services; and conduct product transportation and sales.

In 2024, we are aiming to achieve social implementation of CCM, while working to accelerate cross-industry collaboration between companies and local governments that have essential sources of renewable energy-based hydrogen, biomass, waste, and CO<sub>2</sub> emissions which are needed for methanol production, as well as talks and consultations with methanol users.

Looking ahead, we will build up demonstrations of small-scale plants aiming for fiscal 2025, with a target of starting commercial production at a 100,000-tonne capacity plant by fiscal 2030. From fiscal 2030, we will increase the manufacturing scale up to the 1 million-tonne level.

<sup>5</sup> Carbopath™ is derived from "carbon" and "pathfinder."

## Roadmap to Large-Scale Commercialization



## Turning Environmental Value Creation into a Strategy

Under the current Medium-Term Management Plan, which started in April 2024, MGC has revised its definition of differentiating businesses, renaming them as U&P businesses, which excel at being sustainable, while also delivering both social and economic value. We have identified the businesses that should receive priority allocation of management resources by evaluating them economically with ROIC\*7 and EBITDA\*8 as indicators, evaluating aspects such as their market share and market growth potential, and evaluating their potential as a sustainable business over the medium to long term. Using this new business classification, we aim to build a resilient business portfolio that can cope with changes in the business environment.

Over the three years of the Medium-Term Management Plan, with the objective of promoting sustainability management, MGC will accelerate its initiatives for realizing carbon neutrality, while demonstrating resilience in its ability to adapt to various changes in the social environment. As one approach to this, we have set a target of ¥500.0 billion in net sales of eco-friendly products in the non-financial

targets of our vision for MGC in 2030. We have backcasted from this target value to reflect it in our plans for each business under the Medium-Term Management Plan. The Group's eco-friendly products have been newly designated as "Sharebeing," which are defined as products that have a reduced environmental impact over the product life cycle and help to create a healthy environment. In February 2024, we redesignated our products, including products designated already, under certain internal standards. The designations were deliberated by the Environment Safety & Quality Assurance Division, the Production Technology Division, and the Corporate Planning Division, before being approved by the Sustainability Promotion Committee. Growing net sales of eco-friendly products is expected to contribute to resolving energy and climate change issues, and also to lead to the creation of U&P products and technologies that have competitive advantages in the market.

\*7 ROIC = (operating profit - income taxes + equity in earnings of affiliates)/invested capital

\*8 EBITDA = ordinary profit + interest paid + depreciation and amortization

### Establishment of "Sharebeing" Eco-Friendly Products and Setting of Materiality KPIs

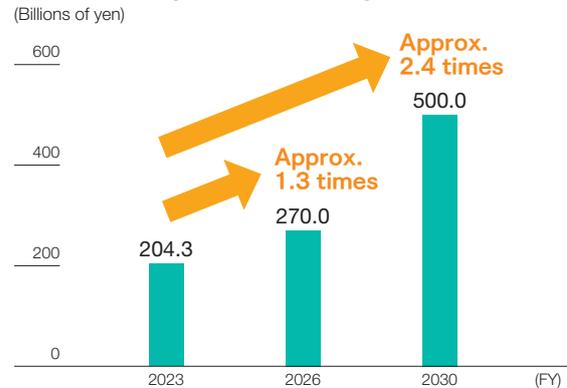


"Sharebeing" is derived from the words "share" and "being."

Under our Mission of "creating value to share with society," we are dedicated to providing "Sharebeing: products that can be shared with society" to reduce the environmental impact of society by leveraging our unique and distinctive technologies to create valuable products that meet society's demands.

We will accelerate our efforts to realize carbon neutrality, having set "Sharebeing" (eco-friendly product) sales as a KPI for our materiality issue: "Contribution to solving social issues through business."

#### Quantitative Targets for "Sharebeing" Sales



### MGC Group Eco-Friendly Product Certification Criteria

#### Certification Criteria

Products and technologies demonstrating any of the effects below on some aspect of the product life cycle (raw material production, manufacture, distribution, usage, disposal and recycling)

#### 1. Renewable energy

- Renewable energy development
- Products or technologies that contribute to renewable energy production
- Products or technologies that encourage renewable energy use

#### 2. Energy conservation

- Products or technologies able to reduce consumption of energy (fuel, heat, electricity)
- Products or technologies that significantly reduce energy use during manufacturing

#### 3. Resource conservation

- Products or technologies able to reduce consumption of resources (raw materials)
- Products or technologies using recycled raw materials

#### 4. Resource recycling

- Products or technologies able to reduce waste
- Products or technologies able to enhance post-use material recycling rates

#### 5. Air quality control

- Products or technologies able to reduce the amount or hazard of hazardous substances released into the atmosphere

#### 6. Water quality control

- Products or technologies able to reduce the amount or hazard of hazardous substances released into bodies of water, soil or groundwater
- Products or technologies able to reduce water usage or wastewater

#### 7. Global warming prevention and adaptation

- Products or technologies able to reduce GHG emissions
- Products or technologies able to promote GHG fixation
- Products or technologies that adapt to global warming

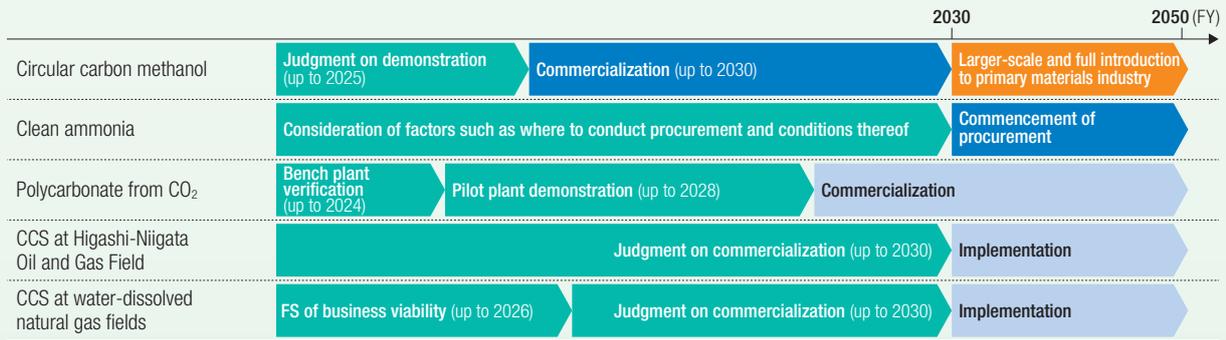
#### 8. Biodiversity conservation and sustainability

- Products or technologies that contribute to maintaining a favorable ecosystem balance
- Products or technologies that reduce negative impacts on the ecosystem balance
- Products or technologies that purify the environment or create and maintain a favorable environment
- Products or technologies that contribute to sustainable use of resources and the environment

#### 9. Certification

- Products that received an environmental label or other certification

## Development of Eco-Friendly Products and Technologies



The MGC Group is the only chemical manufacturer that is carrying out natural gas exploration and development, operating businesses that are generating energy from geothermal, biomass, and LNG resources, all of which are highly compatible with our proprietary mining technologies. In March 2024, we started operation of the Appi Geothermal Power Plant, a joint venture with Electric Power Development Co., Ltd. (J-POWER) and Mitsubishi Materials Corporation. This is the first time in 28 years that a geothermal power plant with an output of over 10,000 kW has operated in Iwate Prefecture. All the electricity generated is being supplied to society under the feed-in tariff (FIT) system for renewable energy.

Furthermore, using methanol manufacturing technologies cultivated over many years, we have started work with multiple cooperating partners towards commercialization and social implementation of our circular carbon platform Carbopath™, which converts CO<sub>2</sub>, waste plastic, and other materials into methanol as a way of recycling them as chemicals and for fuel or electricity generation.

Furthermore, we have been discussing the CO<sub>2</sub> capture-and-storage (CCS) projects in the Group's natural gas fields. The required geological formations for CCS are a highly porous storage reservoir with a sealing of caprock to prevent CO<sub>2</sub> from escaping. Since these requirements match the geological characteristics that form natural gas reservoirs, there are rising expectations that the fields may form an infrastructure for carbon neutrality.

MGC participated in a large-scale CCS demonstration test by NEDO\*<sup>9</sup> in Tomakomai City, Hokkaido Prefecture. We started high-pressure underground injection of CO<sub>2</sub> in 2016, and in 2019 the cumulative amount of CO<sub>2</sub> injected reached 300,000 tonnes. In other areas, we are also participating in advanced CCS projects led by the government, and we are also examining the option of injecting CO<sub>2</sub> emitted from the Group's plants, such as the Niigata Plant injecting its CO<sub>2</sub> into the Higashi-Niigata Oil and Gas Field.

Currently we have about 30 research projects for realizing carbon neutrality in progress domestically. Two of those have been selected as Green Innovation Fund Projects by NEDO. One of these is a project to develop technologies for manufacturing polycarbonates from CO<sub>2</sub>. Having successfully developed a process that reduces CO<sub>2</sub> emissions compared with the conventional manufacturing process, in fiscal 2023 we started verifying it at a bench plant. Subsequently, we aim to complete pilot plant demonstrations at a 2,000-tonne diphenyl carbonate (DPC) plant\*<sup>10</sup> and a 400-tonne polycarbonate plant in 2029. Leveraging our strengths in terms of basic technologies holding the key to achieving a decarbonized society and specialists in chemical industrial processes, we will continue to elevate these research results to a level with potential for social implementation.

\*<sup>9</sup> New Energy and Industrial Technology Development Organization  
 \*<sup>10</sup> A raw material for polycarbonate resin, manufactured through the reaction of dialkyl carbonate with phenol

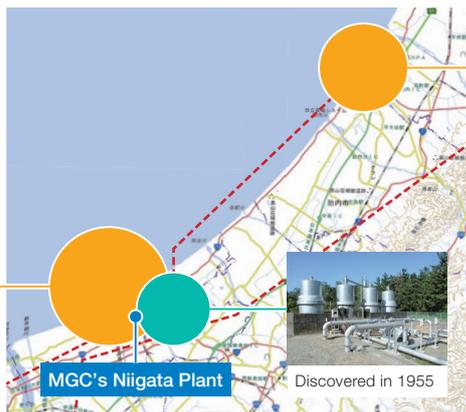
### The MGC Group's Strengths in CCS

- Ownership of natural 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<sub>2</sub> storage and usage

- Non-associated natural gas
- Water-dissolved natural gas
- Natural gas pipeline



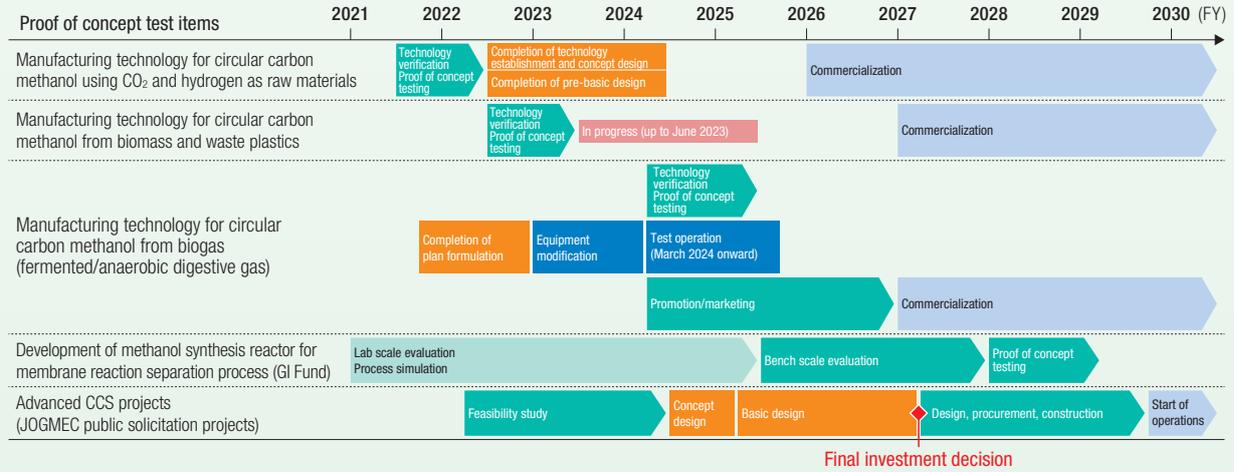
**Higashi-Niigata Oil and Gas Field**  
Discovered in 1959



**Iwafune-Oki Oil and Gas Field**  
Discovered in 1983

Source: Geospatial Information Authority of Japan  
 (https://maps.gsi.go.jp/development/ichiran.html)

### Status of Technology Demonstration in the Niigata Area



MGC is currently discussing the potential for CCS at the reservoir of its Higashi-Niigata Oil and Gas Field.

In fiscal 2022, together with Tohoku Electric Power Co., Inc. and Nomura Research Institute, Ltd., MGC was entrusted with the “Study on CO<sub>2</sub> Capture and Transport in Specified Areas in Japan,” a public solicitation project by Japan Organization for Metals and Energy Security (JOGMEC). The following year, in fiscal 2023, the Company and Japan Petroleum Exploration Co., Ltd., Tohoku Electric Power, Hokuetsu Corporation, and Nomura Research Institute were jointly entrusted with the “Business Feasibility Study on Japanese Advanced CCS Project,” and conducted a feasibility study in the Higashi-Niigata area. This business concept envisages multiple CO<sub>2</sub> emission sources (the Company’s Niigata Plant and the plants of Tohoku Electric Power and Hokuetsu Corporation), transporting the CO<sub>2</sub> by pipeline to the Higashi-Niigata Oil and Gas Field, where it would be stored in deep non-associated gas reservoirs in which the Company holds a

joint interest with Japan Petroleum Exploration. We plan to continue exploring these possibilities with support from the government.

In shallow formations in which MGC is the sole interest holder, there are two types of reservoirs: water-dissolved gas and non-associated gas, and we are currently examining technologies for the water-dissolved gas type, having joined the Geological Carbon Dioxide Storage Technology Research Association. For the non-associated gas type, we are examining the potential for repurposing existing wells with an on-site operation support subsidy from JOGMEC. Furthermore, we are working together with JOGMEC and INPEX CORPORATION to acquire seismic survey<sup>\*11</sup> data to evaluate the future regional potential. We will evaluate the volume of underground CO<sub>2</sub> storage in oil and gas formations in Niigata Prefecture, looking at those that have a proven track record.

<sup>\*11</sup> A survey method for examining underground structures and physical characteristics using seismic waves generated on the surface.

### Progress of Green Innovation Fund Projects

#### Synthesis of Methanol from CO<sub>2</sub>

We are jointly developing a methanol synthesis process utilizing a separation membrane with Mitsubishi Chemical Corporation, and MGC is handling catalyst optimization (independently) and the development of a reactor and process (jointly with Mitsubishi Chemical). In fiscal 2023, we conducted acquisition of basic data using compact testing equipment, process evaluation and cost estimation based on simulations, and designed equipment for bench testing planned for fiscal 2025.

#### Manufacturing of Polycarbonates from CO<sub>2</sub>

We are researching an innovative polycarbonate manufacturing process using a melt polymerization method that has high environmental compatibility and is highly effective for reducing carbon by using cerium

oxide as a catalyst and 2-cyanopyridine (2-CP) as a dehydrating agent to synthesize dialkyl carbonate (DRC) from carbon dioxide and alcohol, and using this as an intermediate for DPC synthesis. In fiscal 2023, we conducted a component study to examine the reduction of energy consumption in the DRC synthesis process and the dehydrating agent recycling process, and found the potential to significantly reduce energy consumption through a technological breakthrough, achieving the GHG emissions reduction target in the Green Innovation Fund Project in the laboratory research phase. We proceeded with work to install bench plant equipment to verify laboratory test results on a larger scale. In early November 2023, we completed construction at MGC’s Tokyo Research Laboratory. We are currently carrying out test operations.