



**Idemitsu Kosan Co.,Ltd.**

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**Idemitsu  
Integrated Report  
2023**

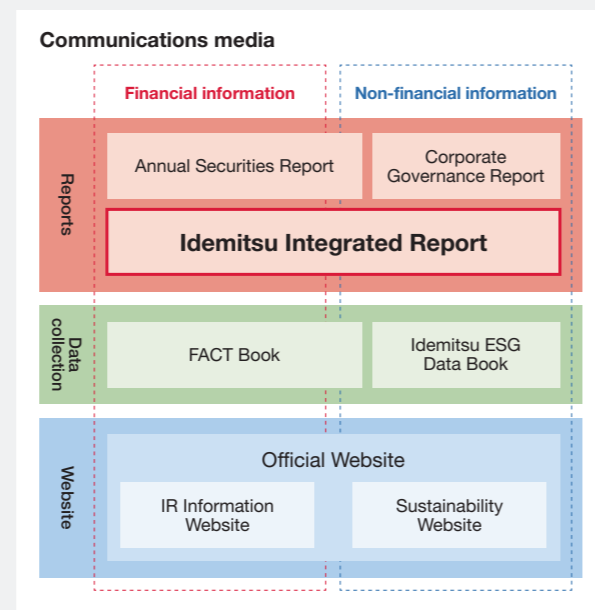


## Editorial Policy

To demonstrate the Idemitsu Group's growth strategy that will lead to sustainable improvement of our corporate value, this report presents related financial and non-financial information, along with specific initiatives for FY2022.

This year's report was produced in accordance with the following editorial policy.

- The CEO, officers, and general managers in charge explain the progress of the Medium-term Management Plan (FY2023-FY2025) announced in November 2022, as well as future challenges.
- The report describes specific initiatives in ESG areas that the Company is actively pursuing, such as responding to climate change, expanding diversity, equity & inclusion (DE&I), and supporting employees to build their life-careers.
- Outside Directors discuss their expectations, challenges, and suggestions for the Company through conversations with the Company's officer and through messages.



### Scope of the Reporting

As a general rule, this report covers Idemitsu Kosan Co.,Ltd. and our 251 Group companies as of the end of June 2023. When the scope differs, this fact is noted.

### Reporting Period

Results for FY2022 (April 1, 2022-March 31, 2023) are included in this report. When the applicable period differs, this fact is noted. Activities since April 2023 are also included.

### Publication Information

Japanese version: Published annually since 2001, and the previous edition was published in January 2023.

English version: Published annually since 2003, and the previous edition was published in March 2023.

### Reference Guidelines

We refer to the international integrated reporting framework recommended by IIRC, TCFD (Task Force on Climate-related Financial Disclosures), the Ministry of Economy, Trade and Industry's Guidance for Collaborative Value Creation, GRI Sustainability Reporting Standards, and ISO 26000.

### Disclaimer on Forward-looking Statements

Any plans, projections, or targets contained in this report that are not historical facts are based on decisions and assumptions made by the Company using information currently available. Actual results may differ substantially from forecasts due to various factors. Factors that may affect the results of operations include economic conditions, crude oil prices, petroleum product supply and demand, market conditions, and currency exchange rates, but are not limited to these factors.

### IR Information Website

Provides reference information for shareholders and when considering the Company as a potential investment destination.

<https://www.idemitsu.com/en/ir/index.html>



### Sustainability Website

We disclose information on a wide range of topics from the environmental, social, and governance perspectives. We also provide information on the results of our efforts in a timely manner.

<https://sustainability.idemitsu.com/en>



### Official Website

Extensive information about the Company's products and services, press releases, etc.

<https://www.idemitsu.com/en/index.html>



### Contact point for inquiries about Idemitsu Integrated Report

Idemitsu Kosan Co.,Ltd.

Contact form on the official website:

<https://www.idemitsu.com/en/contact/fllow/>



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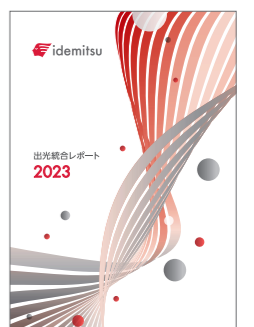
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### Thoughts embodied in the cover design

This design is inspired by the Vision for 2050, "Shaping Change." It incorporates our desire to flexibly embrace change and create new value even in the midst of various environmental changes.



# The Origin of Management and Management Philosophy

For Idemitsu, our Management Philosophy is a statement of “what is the meaning of our existence?” Our Management Philosophy is also a universal, unshakeable coordinate, like the North Star, and for employees, it is a guide when they are unsure of their judgments, and it represents a vision to which they should aspire at all times. Our Vision changes with the times and the environment, and represents our initiatives to realize a sustainable society that we must connect to the future. Our Action Mindset exists to achieve our Management Philosophy, and we believe that we can come closer to our “Management Philosophy” by following our Action Mindset and moving forward toward our Vision.



Ningen-Soncho (Having respect for human beings)  
Written by Sazo Idemitsu

### The Origin of Management

These are the words of the founder, Sazo Idemitsu, in his own handwriting. We intend to communicate to the world the importance of “Ningen-Soncho (Having respect for human beings),” a key tenet of our history for over a century, and unassailable ideals we continue to pass down.

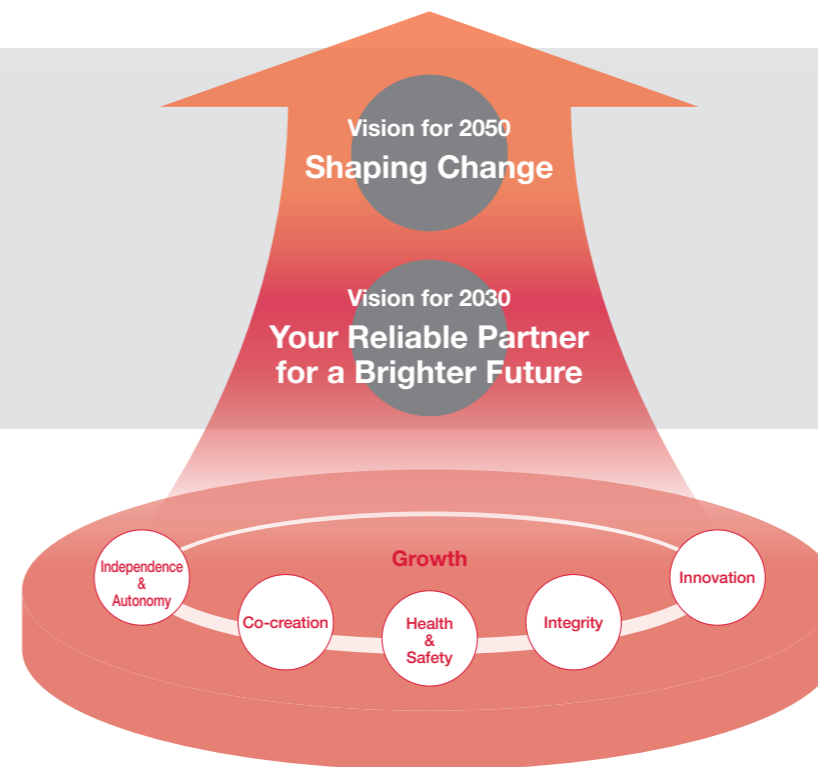
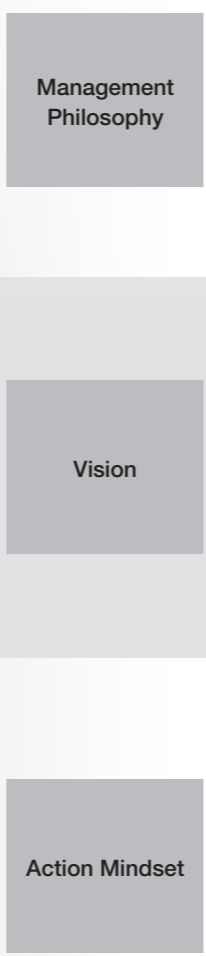
# Truly inspired

How often do we consider the countries and communities we touch, and how much empathy do we have for the people living there?  
Are we contemplating what's best for them and then doing our utmost to act in their interests?  
Each day, we must reflect on our actions;  
we must strive to do better not only for ourselves, but also for others.  
When we come together and our efforts are united, we make the impossible possible.  
With integrity, solidarity, and determination, we will overcome any challenge we face.

The reaffirmation of “people-centered management” beliefs and ideals, which we have carefully maintained since our founding. It is the guidance to “keep focused on what matters” and “stay committed to providing value to society” for all Group members.

This signifies the realization of the Management Philosophy at some point in the future. It is an image of the targets to be achieved through the business, and is also the “vision” for the Company. In many cases, this will be linked to a medium to long-term business plan. It can be said that a Management Philosophy is something which remains unchanged over time, while a Vision is that which should change with the changing times.

The Idemitsu Group has established the Action Mindset, which is the basis for all employees' attitudes and actions to be taken. Believing in the limitless possibilities of human beings, we strive to grow by constantly increasing each other's potential and abide by the following five pillars: “Independence & Autonomy,” “Co-creation,” “Health & Safety,” “Integrity,” and “Innovation.” All employees shall strive to deepen their understanding of our Management Philosophy, Vision, and Action Mindset and various policies, take pride in being a member of the Group, be aware of their responsibilities, and conduct fair and transparent corporate activities.



## Idemitsu's History

-1900	1910	1920	1930	1940	1950	1960	1970	1980	1990	2000	2010	2020-
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### ■ Founding Period

In 1892, Tsunekichi Niitsu established Niitsu Sekiyu in Amaze (Niigata Prefecture) and started an oil refinery. In 1899, Yosaburo Hayama, founder of Hayama Sekiyu, started an oil refinery business. Both companies, which later became Showa Shell Sekiyu, survived the early days of the petroleum industry. Later, under the wartime regimen, the integration of the petroleum industry progressed, and in 1942, the three companies Niitsu Sekiyu, Hayama Sekiyu, and Asahi Sekiyu merged to form Showa Sekiyu. In 1911, Idemitsu Shokai, the predecessor of Idemitsu Kosan (hereinafter called Idemitsu), took its first steps into the petroleum sales business in Moji, Kitakyushu (Fukuoka Prefecture). Sazo Idemitsu, the founder of Idemitsu, followed a policy of “From producers to consumers.” Since our inception, the Company has focused on the sale of lubricants (machine oil) and petroleum for fishing boats in Japan, and later expanded its sales channels to Manchuria, Korea, China, and Taiwan.



Headquarters' first shipment at the time of Idemitsu Shokai's founding

### ■ Postwar Recovery

Idemitsu lost almost all of its businesses and overseas assets due to Japan's defeat in the war in 1945, but the Company made a fresh start after the war with “people as its capital.” When Iran, whose interests had been taken over by the major oil companies, declared nationalization of its oil industry, Idemitsu dispatched the Nissho Maru in 1953 to import it. This resulted in a legal dispute with the major oil companies, which it won. This gave the Japanese people, who had lost confidence following the war's defeat, a great deal of energy (Nissho Maru Incident).



Nissho Maru Incident

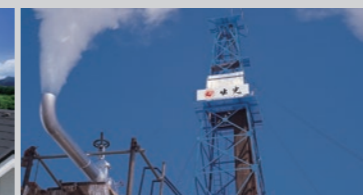
### ■ After Oil Crisis

Using the oil crisis as an opportunity to evolve into a comprehensive energy company, Idemitsu conducted studies on renewable energy as an alternative to petroleum for the development of new energy sources.

Solar research commenced at Showa Sekiyu in 1978, and geothermal exploration commenced at Idemitsu in 1979. These subsequently led to the power and renewable energy business, including Showa Shell Sekiyu's solar cell technology and Idemitsu's commercial operation of geothermal power plant in Takigami (Oita Prefecture).



Solar cell research



Geothermal power

### ■ Management Integration and the Future

In 2019, Idemitsu Kosan and Showa Shell Sekiyu integrated their management with the aim of building a strong management foundation and growing from a global perspective. In 2021, Idemitsu Kosan celebrated its 110th anniversary.

We will continue to fulfill our mission of providing a stable supply of energy and materials, and “Shaping Change” to become a main player in energy and carbon neutral (CN) solutions in the carbon neutral and circular society of 2050.



apollostation



Click here for the Company history:  
<https://www.idemitsu.com/en/company/history/>



# Message from the President and CEO



## Building a Carbon-Neutral Future

### Challenges of Business Structure Innovations and Human Resource Development

Representative Director,  
President and Chief  
Executive Officer

**Shunichi Kito**

### Initiatives for Business Structure Reforms -Promoting Carbon Neutrality Through Co-creation and Collaboration-

In November 2022, the Group announced its Medium-term Management Plan starting from FY2023, with the aim of drastically transforming its business structure toward the realization of a carbon neutral and circular society, based on its Vision for 2050 “Shaping Change.”

I consider this Medium-term Management Plan not just a three-year revenue and expenditure plan, but an “execution plan” as a touchstone for breaking away from dependence on fossil fuel and becoming a main player in new energy and materials, and I consider it a critical juncture that will determine the future of our company.

Amid the shift in energy policy in many countries from a focus on decarbonization to a more realistic discussion of transitions triggered by Russia’s military invasion of Ukraine, our goal of steadily promoting social implementation toward carbon neutrality while fulfilling our responsibility to provide a stable supply of energy and materials will not change.

We will make efforts to identify future energy and materials that simultaneously satisfy the “3E+S” (economic efficiency, energy security, environmental compatibility, and safety), the axis for energy policy decisions, without misjudging the time frame for reaching this goal.

We will present our recent efforts to shift our business portfolio from five existing businesses to three business domains (“Energy one step ahead,” “Diverse resource conservation / circulation solutions,” and “Smart Yorozyuya”).

We have decided to construct a 20,000-ton oil chemical recycling facility at our Chiba Complex that will use used plastics as raw material. At present, only about 20% of the 8.2 million tons of used plastics are used for recycled products in Japan. Through this facility, used plastic is converted back to its raw material, oil, literally establishing a recycling chain. We believe that this initiative is an example of how refineries and complexes can become carbon neu-

### Vision for 2050 Shaping Change

We will fulfill our

- **Responsibility to support people and their daily lives**
- **Responsibility to protect the global environment now and in the future**

through the implementation of:

- Energy one step ahead
- Diverse resource conservation / circulation solutions
- Smart Yorozyuya\*

\*Smart Yorozyuya: Smart one-stop shop

tral social infrastructure, and we will continue to expand the scale of this initiative through various verifications toward the start of commercial operation in 2025.

Next, we will develop solid electrolytes for all-solid-state batteries, which are expected to surpass the performance of current mainstream liquid-type lithium-ion batteries. We are advancing the practical application and mass production of solid electrolytes by leveraging our manufacturing and other technologies we have cultivated over the past 30 years.

While collaborating to realize mass production of all-solid-state batteries for EVs, we are engaged in further technological development to deliver even superior materials to the world at large for the transition to EVs that contribute to a carbon neutral society.



### Business Portfolio



\*1 CCUS (Carbon dioxide Capture, Utilization and Storage)  
\*2 ICT (Information and Communication Technology)

## Message from the President and CEO

I have discussed two examples this time, but as I have already mentioned, we are beginning to look into various options for early social implementation, including sustainable aviation fuel (SAF), blue ammonia, carbon dioxide capture, utilization, and storage (CCUS) facilities, and synthetic fuels, and we will continue to update you as appropriate.

Through these initiatives, we once again realized our business structure reforms toward a carbon neutral society cannot be carried out by our Company on its own. Collaboration is essential not only with various companies in the energy industry but also with global companies that transcend industry boundaries, and even joint research with academia. It is our employees who play a central role in co-creation and collaboration with our diverse stakeholders, and further enhancement of human capital is key to this.



### Initiatives to Enhance the Value of Human Capital -Fostering Human Resources that Take on Challenges-

Next, I will speak about our “human capital strategy (investments in human capital),” which is a dual effort that goes hand in hand with “investments in business structure reforms.”

Looking back on the 20th century, humankind encountered fossil fuels, a highly energy-dense, inexpensive, and convenient source of energy, and has reaped the maximum benefits of this energy as a cornerstone of industrial development. However, before we usher in a decarbonized society, we are faced with many social challenges that make it difficult to predict the future.

In order to overcome this challenging situation with no clear future, we believe that unearthing and fostering human resources who are inclusive of diverse opinions and viewpoints and who can co-create and collaborate with various players is an extremely important management issue that cannot be avoided.

Since our establishment, we have placed importance on the approach to “people are capital” and “People-Centered Management.” Once again, we have placed human capital strategy at the core of our management strategy. I, as President, recognize that it is my responsibility to make our human resources strategy the cornerstone of our management strategy, and to create a group of flexible,

resilient, and future-oriented human resources, no matter what the future may bring.

As a specific initiative, the expanding of DE&I has progressed over the past year, including the advancement of women, male childcare leave, understanding of LGBTQ, and the expansion of employment for people with disabilities. We have also been establishing an environment where employees can take on the challenge of creating new value through an in-house side job system, cross-departmental workshops, and external exchanges with educational institutions such as Japanese and overseas graduate schools, environmental education institutions, and local governments. This fiscal year, we will further enhance life and career plans and review our personnel and evaluation systems so that all employees can bring out each of their full potential and individuality. By promoting the Enhance productivity by 30% project, which is being developed throughout the Company to ensure that employees have more mental and time availability to take on new challenges, we will encourage human resources to take on various challenges without fear of failure, leading to the sustainable growth of the Company.

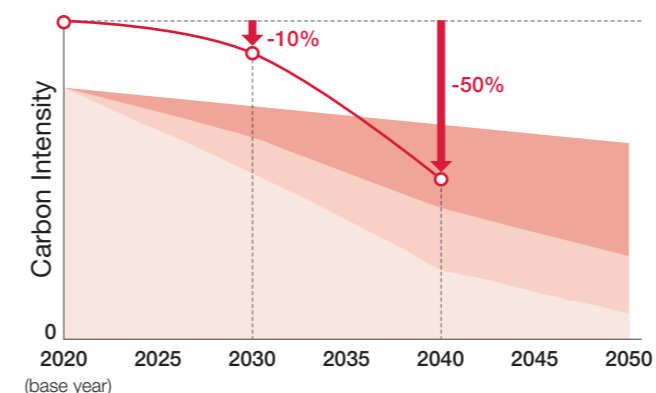
### Promotion of Sustainability Management -Aiming to Improve Non-financial Value-

Because we are mainly engaged in the energy business, focusing on fossil fuels, which have a large environmental impact, we position environmental and social issues as management issues and take the initiative to contribute to solving them. While pursuing business

structure reforms and human capital value enhancement as an offensive strategy, we will also push forward with sustainability management as a defensive strategy in order to improve our corporate value.

Here are two examples of recent initiatives. The first is to set targets for Scope 3. In order to further clarify our initiative to achieve a carbon neutral society by 2050, we have set a new target for Scope 3, which is the CO<sub>2</sub> emissions of the entire supply chain, in addition to the target for Scope 1+2, which is the CO<sub>2</sub> emissions from Idemitsu’s operations. Idemitsu has introduced Carbon Intensity\* as an indicator of CO<sub>2</sub> emissions per unit of energy supplied, and aims to reduce Carbon Intensity by 10% from the FY2020 level by FY2030, and by half from the FY2020 level by FY2040.

The second is the enhancement of the Board of Directors,



which is at the core of corporate governance. In order to create a forum for discussion that guarantees even greater transparency, we have put in place a mechanism to ensure that even if Internal Directors are convinced, the brakes are applied by Outside Directors to prevent the discussion from becoming closed and homogeneous. In addition to the Board of Directors meetings, we have enhanced opportunities to present and communicate to Outside Directors, and have had a series of open discussions regarding measures to increase financial value, business structure reforms investment policy, and measures to increase non-financial value such as human capital. In addition, we have revised the executive compensation system for directors and others and raised performance-linked compensation, including non-financial indicators, to 50%. These actions further reinforce our commitment to the sustained improvement of our corporate value.

Idemitsu does not expect only our company to adapt to an uncertain and chaotic world, and survive. With a strong sense of mission to contribute to the sustainable growth of the country and local communities, even if only in a small way, we are committed to sustainability management.

\* An indicator of how effectively energy supplied to society is being converted to low-carbon energy sources. (Details are on pp. 55-56)

## Message to Stakeholders

We understand that, among our stakeholders, there are those who feel that the future of our company’s business is uncertain. I have personally felt that our ability to manage to improve our corporate value is being questioned, not only from a financial perspective but also from a non-financial perspective, through dialog with institutional investors and other capital market players. I became aware that there were questions as to whether the management of the Company was being conducted properly.

In response to the announcement from the Tokyo Stock Exchange in March 2023 on “Action to Implement Management That is Conscious of Cost of Capital and Stock Price,” we explained our awareness of market valuation at our financial results briefing in May. The Board of Directors has continuously held discussions to improve our corporate value. In the second quarter financial results, we revised upward our FY2025 ROE target and announced that we would aim to achieve a PBR of over 1.0x as soon as possible by partially revising our shareholder return policy and working to reduce our cost of capital.

In the spring of 2024, we will substantially renew our corporate website to provide more concrete and real-time information about the Group’s initiatives so that a wider range of stakeholders can better understand our company moving forward. Please look forward to this.

### Management Philosophy

## Truly inspired

How often do we consider the countries and communities we touch,  
and how much empathy do we have for the people living there?  
Are we contemplating what’s best for them and then doing our utmost to act in their interests?

Each day, we must reflect on our actions;  
we must strive to do better not only for ourselves, but also for others.  
When we come together and our efforts are united, we make the impossible possible.

With integrity, solidarity, and determination, we will overcome any challenge we face.

To achieve “Innovation” to accomplish the Vision for 2030 and 2050, many challenges are necessary, and people grow by thinking through and working through challenges. This is our very management objective. In this sense, we are convinced that the current environment is an excellent opportunity to “nurture people” and a unique chance to embody our Management Philosophy of “Truly inspired” to society at large. This is truly a time to test Idemitsu’s capabilities. We would like to thank all of our stakeholders and investors for their continued understanding and support.

# Value Creation Process

Foundation supporting value creation  
pp.3-4▶

Management Philosophy  
The Origin of Management

Truly inspired

人間尊重

Ningen-Soncho (Having respect for human beings)  
Written by Sazo Idemitsu

## Vision for 2050 Shaping Change

We will fulfill our

- Responsibility to support people and their daily lives
- Responsibility to protect the global environment now and in the future

through the implementation of:

- Energy one step ahead
- Diverse resource conservation / circulation solutions
- Smart Yorozyua

pp.6▶

# 2023

### External Business Environment

- Low-carbon and decarbonized society
- Digital and technological advancements
- Rapidly aging society
- Lifestyle changes
- Increased energy and geopolitical risk

### List of Materiality (Key Challenges) pp.45-46▶

- Contribute to carbon neutral and circular society
- Contribute to regional society (energy and mobility)
- Maximize employee growth and engagement
- Expanding DE&I
- Acceleration of digital innovations
- Progress in governance
- Ensure the health, safety, compliance and human rights

# 2030

## Vision for 2030 Your Reliable Partner for a Brighter Future

pp.45▶

### GHG Targets pp.55-56▶

Scope1+2: Amount of CO<sub>2</sub> emissions 46% lower than 2013  
Scope1+2+3: CI\*1 10% lower than 2020 (2040 CI 50% lower than 2020)

# 2050

### GHG Targets pp.55-56▶

Scope1+2: Realization of CN\*2 (Net zero CO<sub>2</sub> emissions)  
Scope 3: Aim for carbon neutrality

### Business Domains in 2050

## Energy one step ahead

Carbon-free ammonia  
Carbon-free hydrogen  
SAF\*3  
Synthetic fuel / chemicals  
CCUS\*4

pp.15-16, 27-30▶

## Diverse resource conservation / circulation solutions

Electrification solutions  
Bio / life solutions  
ICT \*5 solutions

pp.17-18, 29-38▶

## Smart Yorozyua

Diverse energy & mobility services

pp.27-28, 39-40▶



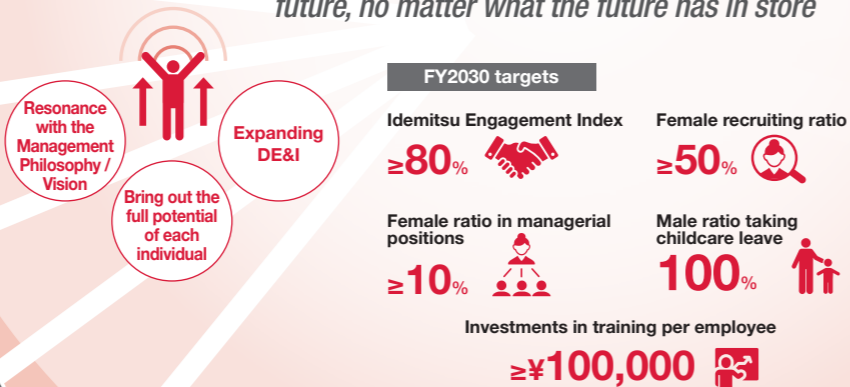
Careful selection of investments based on social value and investment efficiency

## Investment in Business Structure Reforms pp.11-18▶

Organically Combined and Reorganized.

## Investments in Human Capital pp.19-22, 87-98▶

A strong and flexible team that can shape the future, no matter what the future has in store



## Evolve the Business Platform pp.23-24, 63-74▶

### Business Domains

#### Source of Competitiveness

- Human capital**
  - People-centered management
- Intellectual capital**
  - Technological capabilities to meet diverse customer needs
- Manufactured capital**
  - Global business development
  - Manufacturing site assets and supply chain
- Social and relationship capital**
  - Customer base developed over many years of business development
  - Business partners linked by solid trust
- Natural capital**
  - Various types of renewable energy
- Financial capital**
  - Strong financial foundation

Petroleum

Basic chemicals

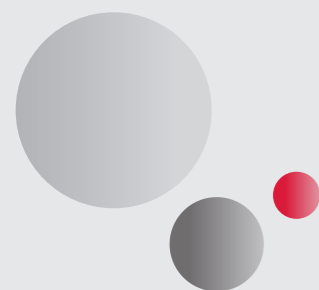
Functional materials

Power and renewable energy

Resources

\*1 CI(Carbon Intensity)  
\*2 CN(Carbon Neutrality)  
\*3 SAF(Sustainable Aviation Fuel)  
\*4 CCUS(Carbon dioxide Capture, Utilization and Storage)  
\*5 ICT(Information and Communication Technology)

# Message from the CFO



Representative Director,  
Executive Vice President  
CFO  
**Noriaki Sakai**



## Summary of Business Environment and Performance

FY2023 is the first year of the Medium-term Management Plan announced in November 2022, and we consider it an important year for achieving our management goals. Looking at our business environment, the impact of the COVID-19 pandemic on demand for petroleum products has subsided. However, we feel that we are entering an era of greater uncertainty and environmental change, as evidenced by the global inflationary trend and the emergence of geopolitical risks.

The results for FY2022 were as follows: due to the downward trend in crude oil prices, the inventory impact decreased by 177.5 billion yen compared to FY2021, resulting in segment income (operating income + equity in earnings) of 308.4 billion yen, and net income of 253.6 billion yen. Segment income, excluding inventory

impact, was 252.7 billion yen, a record high, mainly due to an increase in earnings from the resources business reflecting soaring Australian thermal coal prices.

As we enter FY2023, we forecast a significant year-on-year decline in earnings in the resources business as coal prices begin to fall. Crude oil prices are expected to be around \$80-\$90 per barrel, and the Petroleum Segment is expected to absorb some of the impact of lower coal prices, resulting in segment income of 265.0 billion yen and a net income of 180.0 billion yen for the year. Segment income, excluding inventory impact, is forecast to exceed the plan and total 220.0 billion yen, and we believe that the first year of the Medium-term Management Plan will get off to a smooth start.

### ■ Status of consolidated statements of income

(Unit: Billions of yen)

	FY2022 result	FY2023 forecast	Difference	
Net sales	9456.3	8650.0	-8,06.3	-8.5%
Operating + equity income (excluding inventory impact)	308.4 (252.7)	265.0 (220.0)	-43.4 (-32.7)	-14.1% (-12.9%)
Net income (excluding inventory impact)	253.6 (215.0)	180.0 (150.0)	73.6 (-65.0)	-29.0% (-30.2%)

## Initiatives to Improve Our Corporate Value

### Analysis and evaluation of the current status of the Company's return on capital, market valuation, cost of capital, etc.

In March 2023, the Tokyo Stock Exchange published "Action to Implement Management That is Conscious of Cost of Capital and Stock Prices." Reflecting on the previous Medium-term Management Plan period from 2020 to 2022, despite the fact that we have

exceeded our original plans in terms of profit level, ROE, and ROIC, and have made steady efforts to revamp our refinery structure, our PBR has remained weak at around 0.6x.

In light of this current situation, we have engaged in dialog with

many investors in Japan and overseas regarding the factors behind the stagnant PBR, and have had ongoing discussions with management on what is needed to increase our corporate value. After these discussions, we announced our initiatives to improve our corporate value and stock value, etc. at the time of the release of our FY2023 Q2 financial results, and here I would like to talk about the background of these initiatives and my feelings as CFO.

One of the factors contributing to a PBR below 1x is the low return on equity (ROE) of the existing business. The cost of share-

holders' equity recognized by the market is assumed to be over 10%, and we recognize that the 8% FY2025 ROE target we set in our Medium-term Management Plan was not a sufficient target owing to the negative equity spread.

In addition to this, amidst the growing carbon neutral momentum, Idemitsu has not yet fully developed expectations for future profit growth, and the high volatility of the business has been recognized as an issue, and we believe that this is not connected to the stock valuation.

### Policies and Specific Targets for Improving PBR

In our Medium-term Management Plan, we have set a goal of achieving 7% ROIC and 10% ROE in FY2030 by increasing return on capital through business portfolio evolution. This direction we are aiming for is also in line with the requirements of the Tokyo Stock Exchange, and we share a common understanding within our management. However, to improve our corporate value, we believe that we can further improve our return on capital, especially in our existing businesses, and we have concluded that a higher target is necessary and have reviewed our ROE target for FY2025 and our shareholder return policy during the Medium-term Management Plan period.

We will raise our FY2025 ROE target from 8% to 10% or more and, in order to achieve this target, we will take on the challenge of improving the profitability of existing businesses such as petroleum and functional materials businesses. In addition, the Vietnam Nghi Son Refinery and power and renewable energy are positioned as challenge businesses, with the aim of achieving a stable turnaround as soon as possible.

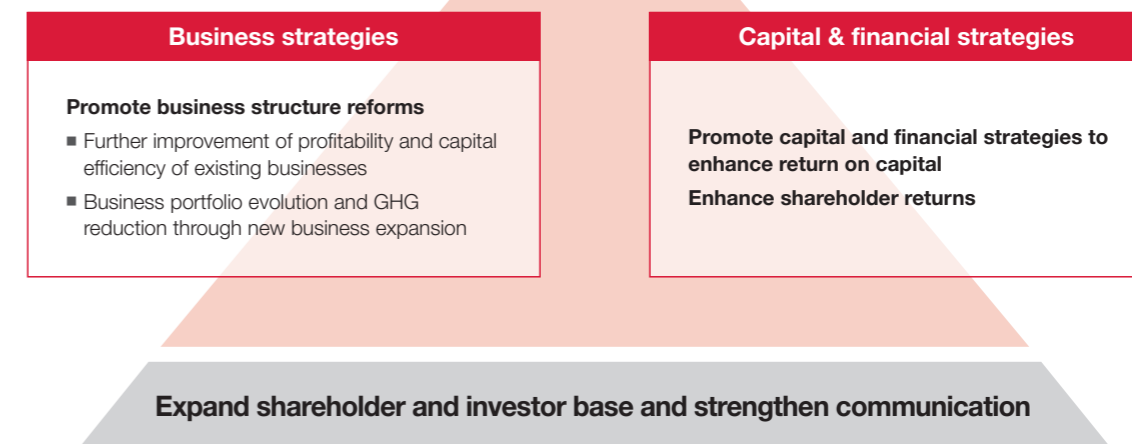
Shareholders' equity, the denominator of ROE, has been built up to a certain level due to the highest profit from soaring resources prices in FY2021 and FY2022, but we will pursue an optimal financial balance in light of capital profitability, business risk, and credit ratings.

### ■ To improve our corporate value and stock value

Upward revision to "FY2025 ROE target of 10% or more"

Through initiatives combined with capital cost reductions, promptly move to a PBR of over 1.0x

## Further Accelerate Initiatives of Medium-term Management Plan



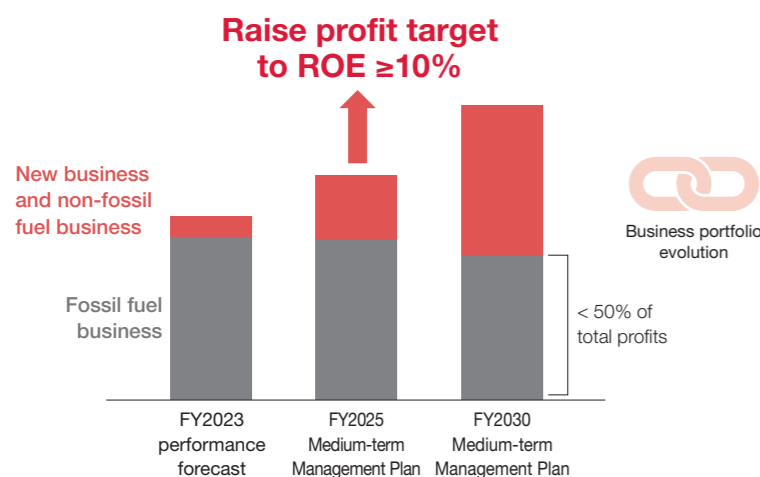
## Message from the CFO

To improve equity spreads, we must tackle not only ROE but also reduce the cost of capital. We believe that we need to shift our existing businesses to decarbonized businesses and to growth businesses through business portfolio evolution and to transform our earnings structure. We are planning to invest 1 trillion yen in business structure reforms by 2030, and are currently having intensive discussions through investment screening to determine which areas we should focus our investments. Our current financial sound-

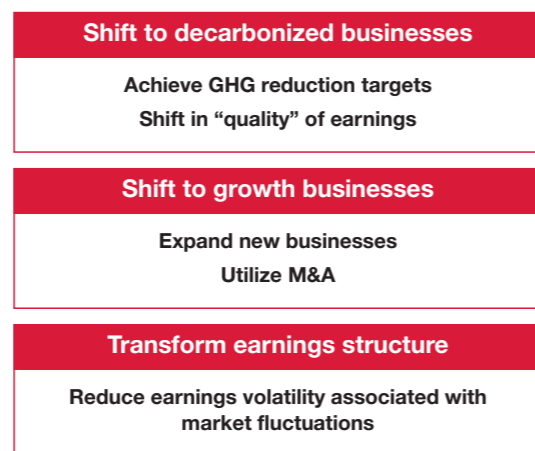
ness has increased due to synergies from management integration and the soaring prices of resources over the past few years. However, since this is an extremely important management decision that will greatly affect the future of the Company, we intend to hold thorough discussions while maintaining a sense of urgency.

While this is a long-term initiative, we plan to make steady progress and keep the market informed of our progress on an ongoing basis.

### ■ Reducing the cost of capital through business portfolio evolution



Achieve carbon neutrality, profit growth, and a stable earning structure through business portfolio evolution, and pursue lower cost of capital

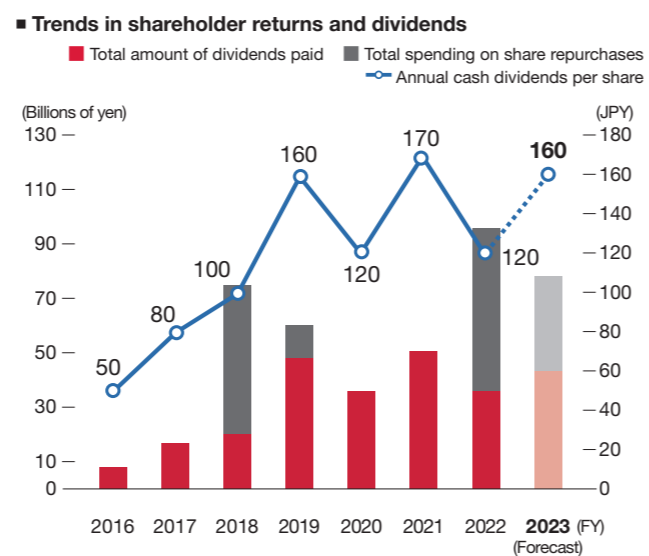


## Returns to Shareholders

The basic policy for returns to shareholders for FY2023-FY2025 remains unchanged, with a total return ratio of at least 50%. However, we increased a stable dividend of 120 yen per share to 160 yen per share and set this level as the lower limit, and also decided to flexibly repurchase the Company's stock in consideration of the stock price level.

In addition, in order to encourage a greater number of people to hold our shares, we have decided to carry out a 5-for-1 stock split (5 for 1 common stock), effective January 1, 2024.

In light of this action, the Company has decided to pay an interim dividend of 80 yen (before the stock split) and a projected year-end dividend of 16 yen (after the stock split) as returns to shareholders for FY2023, along with repurchasing 35.0 billion yen of the Company's stock. Through these initiatives, we aim to expand our investor base among a wide range of generations who sympathize with the Group's business activities and management strategies.



\* The dividend forecast for FY2023 is the numeric value before the stock split on January 1, FY2024.

## Dialog with Various Stakeholders

We recognize the importance of enhancing opportunities for dialog in order to increase the number of stakeholders who understand and sympathize with our business activities and medium- to long-term strategies. From the perspective of shareholder composition, we have a low ratio of individual shareholders, and as CFO, I am aware of this as a major issue and am making special efforts to expand the individual shareholder/investor base. Specifically, in addition to the stock split, we launched "Idemitsu Connect," a website exclusively for shareholders, and established new lottery benefits. We further expanded opportunities for interactive communication with our individual shareholders and we want to communicate our strategies and specific initiatives in a simple and easy-to-understand manner to them.

We have been receiving a variety of opinions from institutional

investors through financial results briefings, individual meetings, and the ESG Top Management Seminar, and we would like to further enhance opportunities to communicate with them. Through these initiatives, we believe that increasing the number of investors who sympathize with our Management Philosophy and business structure reforms is essential to improving our corporate value.

In FY2023, as a result of the positive assessment of our information disclosure based on dialog with our stakeholders, we were awarded first place in the energy industry among companies selected for Excellence in Corporate Disclosure by the Securities Analysts Association of Japan. We would like to sincerely request that our stakeholders, including investors and shareholders, continue to give us their honest opinions and guidance to improve our corporate value.

### Launching of "Idemitsu Connect," a Website Exclusively for Shareholders.

TOPICS

In June 2023, we launched "Idemitsu Connect," an exclusive website as a platform for disseminating information to shareholders. We seek to enhance two-way communication with shareholders through such things as the provision of shareholder-oriented content, information on events, and feedback from shareholders. In addition, Idemitsu Connect Plus, a booklet that supports access to the website, will be delivered to shareholders once a year.

We plan to establish "Idemitsu Connect" as a platform to offer plans and enhance information dissemination to further deepen understanding of our business activities, medium- and long-term policies, and strategies. At the same time, we will expand opportunities to receive feedback directly from our shareholders through online surveys, and promote the strengthening of two-way communication.

#### Functions and services provided by Idemitsu Connect

- The "Shareholder Post" function for up-to-date news and content information
- Viewing of live online briefings by the President & Representative Director
- Application for lottery benefits system
- Participation in shareholder-only and experiential events, such as tours of our business sites
- View a live streaming the General Meeting of Shareholders



### Selected for Excellence in Corporate Disclosure (FY2023)

In FY2023, Idemitsu was selected for the first time as the No. 1 excellent company in the energy sector (from among 22 companies) of the Securities Analysts Association of Japan's "Securities Analysts' Selection of Excellence in Corporate Disclosure." The quality, quantity, and timing of the Company's disclosure were assessed under five evaluation criteria, including management's IR stance, IR department functions, disclosure of explanatory and other materials, fair disclosure, and disclosure of ESG-related information.





# Initiatives for Business Structure Reforms (CNX Centers)

## Executive Message

Director,  
Managing Executive Officer  
**Masahiko Sawa**



Based on the forecast that oil demand in FY2030 will be about 20% lower than in FY2022, we have decided to cease the refining functions of Seibu Oil Co., Ltd. in March 2024. Looking ahead, we will continue to review our refineries and complexes and strengthen competitiveness (cost reduction and efficiency improvement) while keeping an eye on future changes in the environment to ensure a stable supply of petroleum products and petrochemicals, which are important energy and materials.

The Group's refineries and complexes have been working together with the support of local communities over many years. Our accumulated knowledge, experience, technological capabilities, and existing infrastructure will be a valuable asset in our efforts toward carbon neutrality by 2050. On the other hand, we have built longstanding relationships of trust with our partners, including governments in many

countries and regions in the Middle East and the Pacific Rim, through various businesses, including the import of fossil energy sources. Based on these important assets and relationships of trust, we will promote business innovation to CNX\* Centers that are suited to the characteristics of each refinery and business site from a menu of hydrogen, ammonia, biomass, resource recycling, carbon dioxide fixation, and synthetic fuel, in cooperation with various governmental agencies, local governments, and related companies in Japan and overseas.

While continuing to provide a stable supply of petroleum products and petrochemicals, we will steadily and swiftly advance the establishment of CNX Centers and continue to support the mobility, energy, and livelihood of the people of the region, both now and into the future.

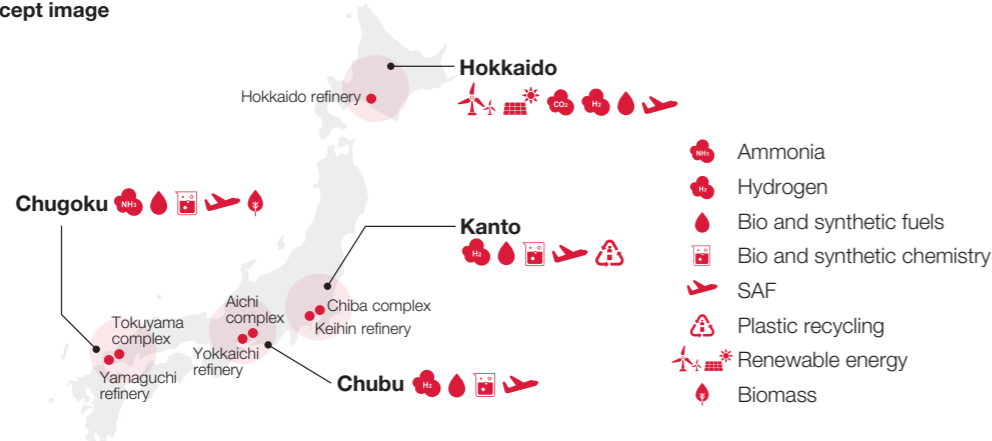
\* CNX (Carbon Neutral Transformation)

## “CNX Center” Concept

Our CNX Center concept that we are pursuing is to transform our refineries and complexes, which have been operating for many years as fossil energy sources production bases, into new carbon neutral fuel and product supply bases while taking advantage of

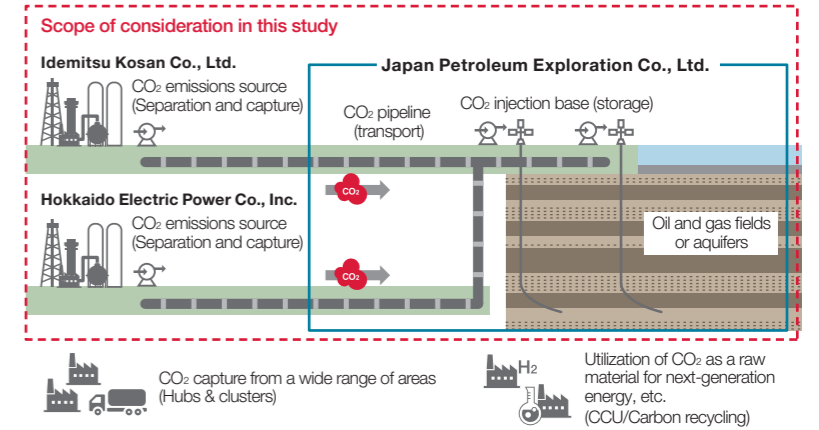
their characteristics and strengths. In doing so, we will construct new supply chains tailored to the characteristics and demands of each complex where each base is located, contributing to the “carbon neutrality” of the entire complex.

### ■ “CNX Center” concept image



## Joint Study for CCUS Implementation in the Tomakomai Area of Hokkaido

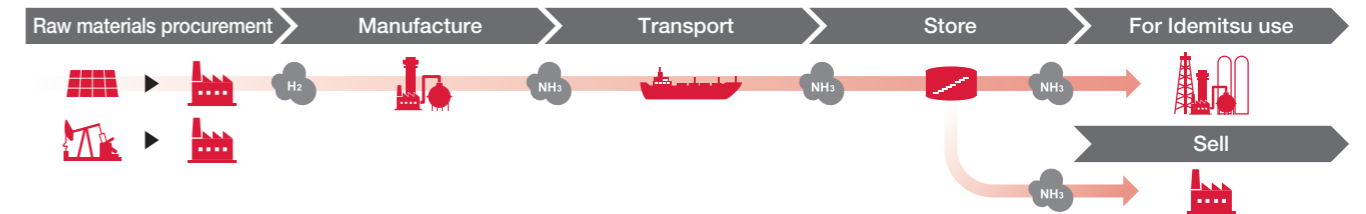
Idemitsu, Hokkaido Electric Power Co., Inc., and Japan Petroleum Exploration Co., Ltd. have begun a joint study to realize Carbon dioxide Capture, Utilization, and Storage (CCUS) in the Tomakomai area of Hokkaido, Japan, utilizing the business bases and strengths of the three companies. Keeping in mind the launch of the CCUS business to connect multiple points in the Tomakomai area by FY2030, feasibility study will be conducted, focusing on CO<sub>2</sub> emission points and CO<sub>2</sub> capture facilities, technical studies related to CO<sub>2</sub> transport pipelines, and studies of suitable locations for CO<sub>2</sub> storage sites. In addition, we will not only store CO<sub>2</sub> but also try to utilize it as a resource to produce synthetic fuels.



## Construction of an Ammonia Supply Chain at Tokuyama Complex and Shunan District

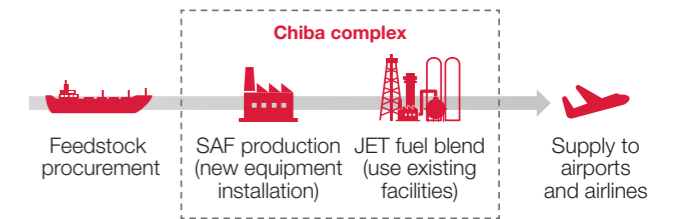
Idemitsu, Tosoh Corporation, Tokuyama Corporation, and Zeon Corporation have launched a joint study with the aim of establishing a supply system for over 1 million tons of carbon-free fuel ammonia per year at the Shunan Complex by 2030. A jetty and storage facilities at Tokuyama Complex will be developed as a common supply hub for ammonia in the

Shunan Complex, and ammonia supply infrastructure will be studied for each company in the Shunan Complex (demand side). The four companies will also promote the establishment of Japan's first ammonia supply chain in the Shunan area through various initiatives, including an ammonia combustion pilot test using actual equipment, based on this business.



## SAF Production Using ATJ Process Technology at Chiba Complex

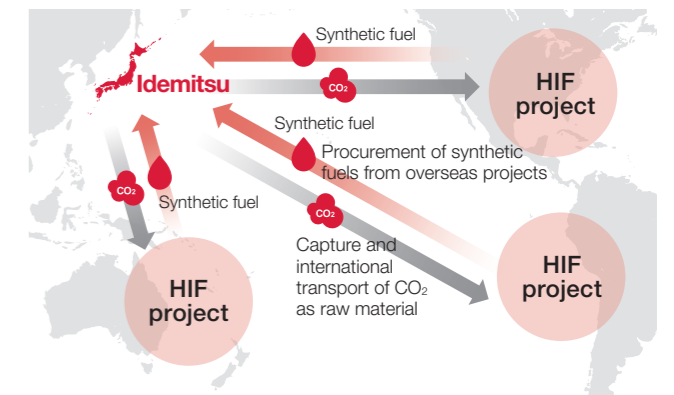
We are developing the world's first 100,000kL-class ATJ\* pilot test facilities and will construct a SAF production facility based on ATJ technology at our Chiba Complex in FY2025 and start supplying SAF in FY2026. For bioethanol, which will be used as feedstock, we will diversify procurement from Japan and overseas to establish Japan's first large-scale supply chain, with the aim of early social implementation of SAF. By 2030, we will establish an annual production system of 500,000kL.



\* ATJ: Alcohol To Jet  
The technology and process for producing SAF from ethanol, certified as ASTM D7566 Annex 5, the international SAF standard.

## Initiatives to Promote the Use of Synthetic Fuels in Japan

Idemitsu has concluded an MOU with HIF Global (HIF), a manufacturer of synthetic fuels (CN achievable energy produced by synthesizing hydrogen from renewable energy sources and atmospheric CO<sub>2</sub>) in South America, North America, Australia, and other countries, for a strategic partnership to accelerate the production of synthetic fuels and their commercialization and diffusion in Japan. We are studying the international transportation and utilization (conversion into raw materials) of CO<sub>2</sub> captured in Japan, the procurement of synthetic fuels from overseas projects and their domestic supply, and the production of synthetic fuels at our refineries and complexes, aiming to establish a domestic synthetic fuel production and supply system by the late 2020's.



# Initiatives for Business Structure Reforms (Advanced Materials)

## Executive Message

Senior Managing Executive Officer  
and President,  
Advanced Materials Company  
**Hajime Nakamoto**



In July 2022, we established the Advanced Materials Company to be prepared to the changing business environment and to conduct strategic planning and management of all related businesses.

Currently, we are working to materialize the three focus areas\* of our functional materials business for social implementation of "Diverse resource conservation / circulation solutions," which was set forth in our Medium-term Management Plan as our business domains for the year 2050. In the three focus areas, we will both integrate the technologies we have thus far accumulated in "organic/inorganic synthesis," "photo/electrochemistry," and "bioconversion technologies," as well as vigorously promote various external collaborations that generate

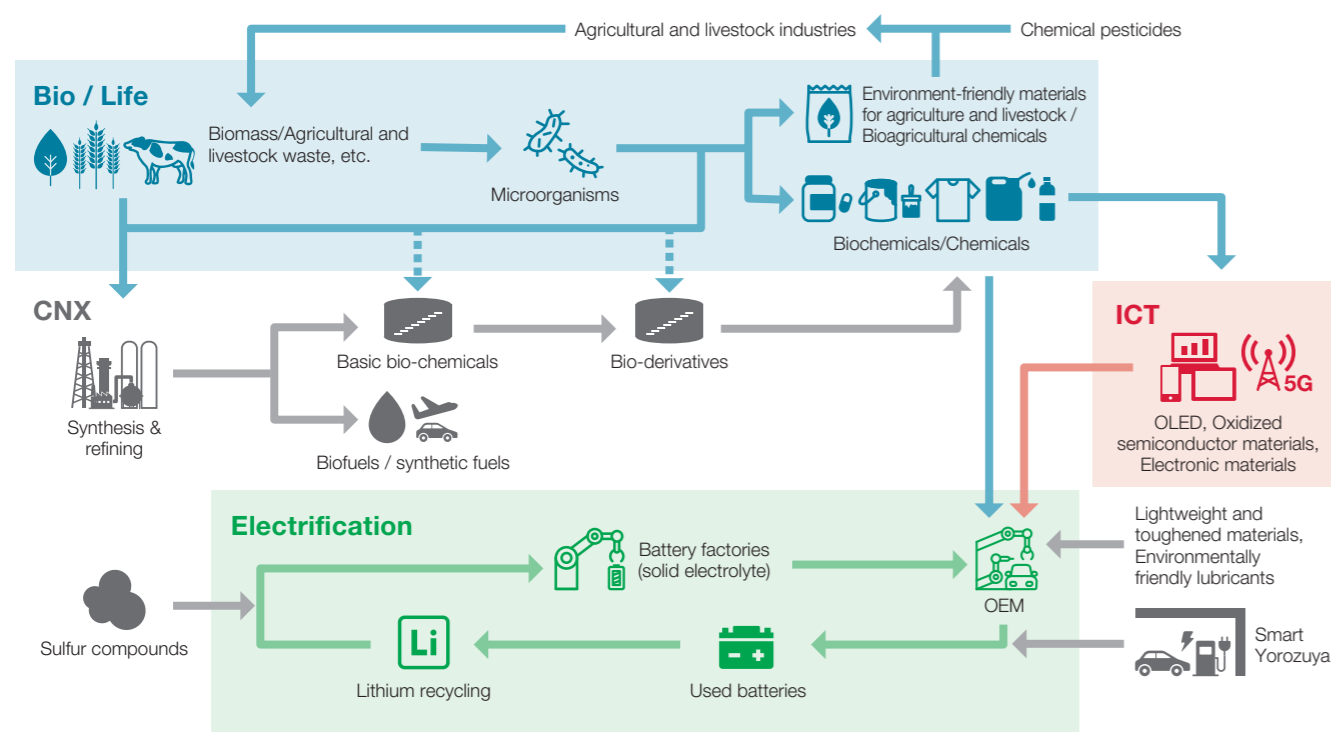
technological innovation, such as comprehensive initiatives with academia and investment in start-ups.

In current businesses, we reviewed unprofitable businesses and consolidated production in order to secure steady earnings and cash flow, and we built the foundation for promotion of new business development.

Going forward, we will further accelerate the materialization of portfolio innovation, with new businesses, and work to become a stronger business entity that can maintain and expand earnings even in a rapidly changing business environment.

\* Electrification Solutions, Bio / Life Solutions, ICT Solutions

### Three focus areas for growth in the functional materials business



### Three Focus Areas for Growth in the Functional Materials Business

The three focus areas for growth of the functional materials business are highly related to the petroleum and petrochemicals business that the Group has been operating for many years. This allows for not only the conversion of final petroleum products to bio-based products, but also the procurement of common raw materials and the utilization of existing assets. For example, the lithium battery materials business utilizes sulfur compounds, a byproduct of refineries, as

a raw material.

We leverage our core technologies, such as luminescent material design technology cultivated in the electronic materials business and biotechnology that utilizes microorganisms, as well as our own global value chain and other strengths. At the same time, we are also strengthening and expanding each of our focus areas by proactively combining external R&D functions and new technologies.

### Bio / Life Solutions

#### Manufacturing using microorganisms

We position "bio-manufacturing" as a new chain in parallel with the decarbonized/carbon-neutral chain from crude oil refining to the conventional petrochemical and we are engaging in initiatives based on our biotechnology toward social implementation.

Idemitsu has been promoting technological innovation in collaboration with academia and start-ups, based on the microorganism-related technologies, having been accumulated since the 1970s in the fields of agrochemicals and feed additives.

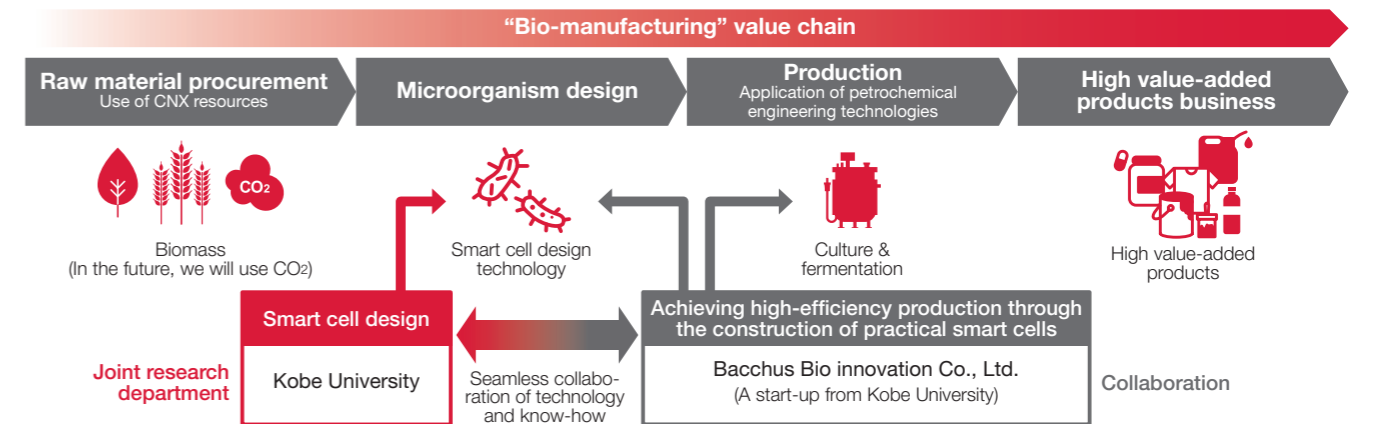
We have made an investment in Bacchus Bio Innovation Co.,

Ltd. and established the Idemitsu Bio Manufacturing Joint Research Department with Kobe University, which owns microorganism development technologies of the leading level in the world.

We will accelerate technological development in the area of bio-manufacturing, and in the future, we aim to establish an integrated bio-manufacturing chain from securing raw materials to manufacturing useful substances using smart cells\*.

\* Smart cells: Organisms and cells that maximize the production of target products by combining genetic modification technology and information analysis.

#### Establishing a value chain for social implementation



### Electrification Solutions

#### Commercialization of lithium battery materials

All-solid-state lithium-ion secondary batteries (all-solid-state batteries) are expected to see early commercialization and widespread use as a technology that contributes to improvement of safety, charging speed, and cruising range, mainly in electric vehicles (EVs).

With the aim of commercializing solid electrolytes, a key material for all-solid-state batteries, Idemitsu is accelerating the development of performance improvements in materials and mass production technologies based on our raw material production technology using sulfur compounds byproducts generated from our refineries.

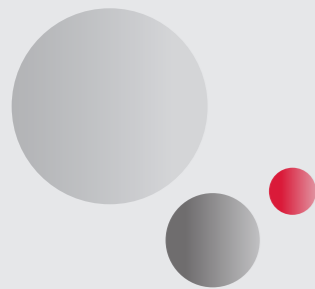
In October 2023, we launched a collaborative project with Toyota Motor Corporation to realize the mass production of all-solid-state lithium batteries.

We will also utilize our bases in Switzerland, Korea, and the U.S. to strengthen joint initiatives with global automotive and battery material manufacturers.

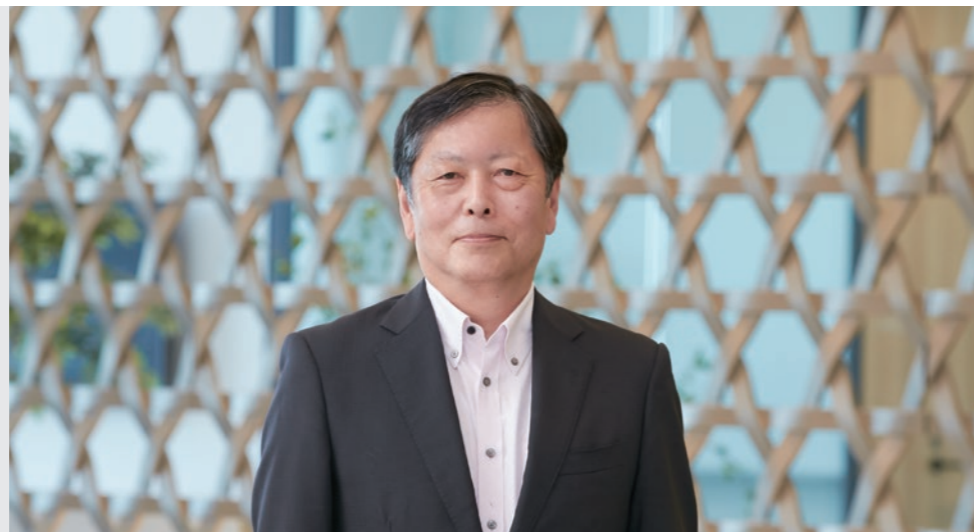


Joint press conference with Toyota Motor Corporation

# Message from the COO (Initiatives to Increase the Value of Human Capital)



Representative Director  
Executive Vice President  
and Chief Operating Officer  
**Susumu Nibuya**



The key to the innovation of our business structure in preparation for the era of carbon neutrality is the discovery and cultivation of human resources capable of promoting projects and social implementation in cooperation with a diverse range of stakeholders in Japan and overseas. Based on this awareness of these issues, in our Medium-term Management Plan announced last year, we stated that we would strongly promote our human capital strategy from the three perspectives of “Resonance with the Management Philosophy / Vision,” “Expanding D&I,” and “Bringing out the full potential of each individual.”

## ■ Human Capital Strategy (announced November 2022)



### Resonance with the Management Philosophy / Vision

As we embark on the long voyage of business structure reforms, our Management Philosophy, “Truly inspired” plays an important role as a compass. Firmly sharing this Management Philosophy with employees, including our Vision for 2030 and 2050, is the starting point for structural reform.

Idemitsu holds semi-annual online townhall meetings as a forum for direct dialog between the President & Representative Director and other members of management and employees. Now an established annual event, each meeting is attended by approximately 3,000 employees, who engage in lively discussions. The more management emphasizes the need for business structure reforms, the more employees often feel more anxiety than anticipation. It is impossible to convey thoughts and

true intentions merely by providing information in text or one-way communication. In order to help our employees wholeheartedly understand and feel a sense of empathy, we intend to provide a steady stream of direct, two-way communication with them going forward.

The President & Representative Director and the Vice President also spent six months visiting complexes across the country to exchange opinions on the subject of the Medium-term Management Plan announced last November. In this way, seizing every opportunity, we will create opportunities to contemplate and engage in dialog with our employees about “why we exist” and “where we are headed.” As a result of these initiatives, the degree of awareness of the Management Philosophy has reached 99.6%, while the level of empathy has reached 77%.

### From “Expanding D&I” to “Expanding DE&I”

In order to create new value, we must bring together individuals with different backgrounds, knowledge, and experiences. To achieve this, we need to establish an environment where everyone, including women, LGBTQ+, foreign national employees, and people with disabilities, can demonstrate their abilities to the fullest without feeling disadvantaged by their minority status.

Over the past year, we have made intensive efforts to promote the advancement of women in our company. We have set the female recruiting ratio, the female ratio in managerial positions, and the male ratio taking childcare leave as KPIs, which was linked to executive and

director compensation starting in 2023. The male ratio taking childcare leave, which widely sought understanding of employees through public commentary in the previous year, increased to 84% from 59% in the previous year. In addition, from the perspective of equity, we have begun in-house mentoring of female employees by Executive and General Managers of departments to see if we are providing enough support to women. The mentoring deals with such issues as whether women, who are minorities in their respective workplaces, can speak out without fear and demonstrate their abilities to the fullest and whether there is sufficient support for women who are facing life events such as marriage,

pregnancy, childbirth, and childcare, and who are struggling with building lives and careers. At the same time, we have also engaged in a cross-company cross-mentoring program with Tokio Marine & Nichido Fire Insurance Co., Ltd. The D&I Promotion Committee, an advisory committee to the President & Representative Director, which I chair, again this year made suggestions to all employees on “From D&I to DE&I,” “Let’s re-inspect existing workplace environments,” “Let’s think about the

image of future managers,” etc., and collected opinions widely through a public commentary method. More than 80% of the employees agree with the Committee’s suggestions, but the Committee is talking about listening to minority opinions and carefully engaging in dialog.

In March of this year, we were selected for the first time as a Nadeshiko Brand in recognition of our series of initiatives.

### Bringing out the Full Potential of Each Individual

In order to bring out the full potential of each individual, it is first necessary to ask employees to consider “what kind of lives and careers they want to pursue” and “what kind of experience and skills are needed to achieve it.”

In September of this year, a questionnaire study was conducted among our senior employees aged 50 and over (1,674 respondents). The study also confirmed that those who have a clear picture of their one’s life and career plan are more engaged in their work than those who do not, and, as a result, are more loyal to the Company. In order to help employees think about their own lives and career paths, to date, we have held “My Career,” where you can

view on the web how our executives, general managers, deputy general managers, and section managers have progressed. We have held “Job Festivals” and other events that allow employees to ask directly to the person in charge of the relevant department what each of our departments and complexes are doing. For employees struggling with their career plans, we have provided approximately 300 career consultations over the past year.

However, in this study, only 15% of seniors, even those with extensive life experience, have a clear life and career plan. We recognize that significant challenges remain here.

### Future Initiative (1): Resonance with the Management Philosophy / Vision to Embodiment

While raising the level of resonance with the Management Philosophy to a higher level, we would like to transition to a higher stage of “Embodying Management Philosophy / Vision,” that is, whether the employees are practicing the Management Philosophy as a guideline in their daily business activities. We are now, as a company, actually taking on the challenge of simultaneous equations, the solution to which is currently impossible to solve, of balancing the stable supply of energy and materials that support our daily lives today with the preservation of the global environment in the future. If we break down business activities into the tasks of each employee, there should be a myriad of simultaneous equations. We would like to produce as many employees as possible who will take on challenges without fear of failure and who transcend

conventional frameworks and departments to which they belong when they believe there is value and significance for the Company and society. For this reason, we are currently engaged in:

- (a) Promoting the Enhance productivity by 30% project to create the mental and temporal availability to take on challenges in new fields
- (b) Developing a full-fledged in-house sideline system to promote activities extending beyond departments
- (c) Revising HR systems to encourage employees to take on challenges

The results of the activities are measured by the Idemitsu Engagement Index, which is explained in detail on the next page. We will discuss HR systems in the next section, including other perspectives.

### Future Initiative (2): Evolution of HR systems

The HR systems project was launched in April of this year. This project is looking into the three policies of: (1) to value and encourage employees to take on challenges without fear of failure, (2) to make DE&I feel more real, especially Equity, and (3) to enable employees to draw up their lives and career plans on their own by providing them with options. HR systems cover a wide range of areas, including recruitment, transfers, education and training, evaluation, and welfare, and because of the need for consistency with existing systems, HR systems have traditionally been carefully examined in a closed setting by specialized Human Resources Departments. We have positioned HR systems as an infrastructure that supports the human capital strategy to promote business structure reforms, and we have recruited members from several departments other than HR to form a project team and operate under a policy of openness regarding the content and process of the study. To start with, at the end of May of this year, we compiled the framework of the review, and solicited the opinions of all employees widely through a public commentary format. In response to Policy (1), we are (a) creating mechanisms to evaluate new challenges as contributions to the Company, (b) linking multifaceted feedback and personnel evaluations when employees perform their duties across departments. In response to Policies (2) and (3), we are diligently considering and preparing to (c) clearly stating the various managerial positions in the Company, (d) transferring and assigning employees with respect for

their lives and career paths, and (e) establishing a department dedicated to supporting employees’ own career development.

Based on the evolution of HR systems and the Enhance productivity by 30% project based on the keywords “challenge,” “DE&I,” and “life and career,” the Company will promote our human capital strategy from the three perspectives of “Embodying Management Philosophy / Vision,” “Expanding DE&I,” and “Bringing out the full potential of each individual.”

### ■ Future Human Capital Strategy



# Message from the COO (Initiatives to Increase the Value of Human Capital)

## Idemitsu Engagement Index

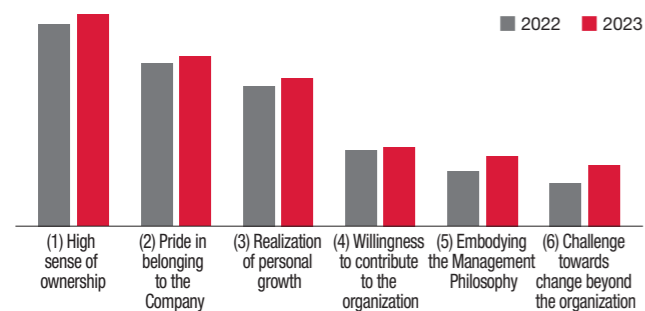
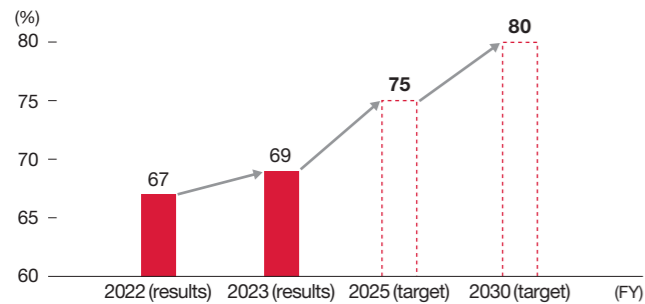
The tangible assets we own in Japan, such as refineries, complexes, and service station networks, have potential as social infrastructure that supports carbon neutrality. The soft skills to manifest these values and to bring new technologies and new applications to social implementation are critical, and in particular, strengthening human resources to promote the project has become an issue. Co-creation and collaboration with diverse stakeholders in Japan and overseas are indispensable in order to confront carbon neutrality, for which the optimal approach is not readily apparent. To achieve this, we need to identify and nurture as many human resources as possible who have the ability to assemble and promote businesses that are inclusive of diverse values. Based on the realization of these issues, the Idemitsu Engagement Index (Idemitsu EI) was newly established in the last fiscal year.

Idemitsu EI is composed of six elements: (1) High sense of ownership, (2) Pride in belonging to the Company, (3) Realization of personal growth, (4) Willingness to contribute to the organization, (5) Embodying the Management Philosophy, and (6) Challenge towards change beyond the organization.

(1) through (3) measures whether employees take pride in belonging to the Company while growing autonomously and independently in the Company's field. On the other hand, (4) through (6) measure whether or not they are challenging themselves in new areas beyond the organization in addition to the work they are currently engaged in. (1) through (3) serve as the source of the Group's centripetal force, and as described below, they have reached a level where they can be considered our traditional strengths. However, we recognize that improving (4) through (6) is an urgent issue in nurturing human resources that will promote co-creation and collaboration with diverse stakeholders. In particular, with respect to Management Philosophy, which forms the basis of these activities, Idemitsu EI demands an extremely high standard of whether or not it is put into practice as a guideline in the conduct of daily business operations.

### Trends in Idemitsu EI in FY2022 and FY2023

Idemitsu EI improved by 2 pt from 67% in FY2022 to 69% in FY2023.



"(1) High sense of ownership, "(2) Pride in belonging to the Company," and "(3) Realization of personal growth" continue to be the Company's strengths, which have been further improved since last year. We believe that this is the result of our efforts to provide employees with opportunities to think about their careers and to strengthen dialog between management and employees, including a nationwide caravan on the subject of the Medium-term Management Plan.

On the other hand, there was only modest improvement in "(4) Willingness to contribute to the organization," "(5) Embodying the Management Philosophy," and "(6) Taking on the challenge towards change beyond the organization."

While the number of overtime and holiday work hours has remained at a consistent level, there has been a significant increase in the time taken off for annual paid leave and male ratio taking childcare leave. DTK activities\* and decluttering initiatives in each department have resulted in approximately a 13% improvement in productivity since the integration. However, this is not necessarily directed toward high value-added operations or new business concepts, and there is little incentive to do so. We also believe that this may be due to the fact that they are facing a situation where they are unable to secure the mental and temporal availability to take on new challenges.

Human capital strategy is the key to steadily nurturing human resources who can review existing operations to improve our productivity, while co-creating and collaborating with companies with diverse values and ideas in new areas, and promoting business structure reforms.

To achieve the Idemitsu EI score, which we have set as a KPI, to a target level of 75%, which can be considered a strength, will require bold initiatives and promotions, and this is linked to the compensation system as a commitment by top management. We believe that by creating a foundation on which employee engines can propel our business structure reforms, we will accelerate the creation of new business areas and our initiatives toward carbon neutrality.

\* DTK activities: Project activities in which all employees participated for the purpose of transformation of workflow and work style. The period of activity: 2019-2021.

### Transform to a business structure that is not subject to market fluctuations + Growth strategy for the era of carbon neutrality



By achieving a human capital strategy to resolve these issues, we will work to further increase the value of our human capital.

For the purpose of quantitatively and continuously analyzing employees' engagement, mutual trust, and unity and understanding the state of the organization, the Employee Engagement Survey has been conducted annually since 2019, the first year of the integration, and Idemitsu EI is also calculated through the results of this survey.

## Employee Engagement Survey

Placing emphasis on maximizing the growth and engagement of people, we conduct an employee engagement survey once a year to quantitatively and continuously analyze employees' engagement, mutual trust, and unity, and to grasp the state of our organization. The results of the survey are fed back to man-

agement and all employees. Then they are analyzed in detail, and specific action plans are formulated and implemented based on it. The results of these analyses and plans are then confirmed in the next year's survey. This is the PDCA cycle.

### Overview of FY2023 employee engagement survey

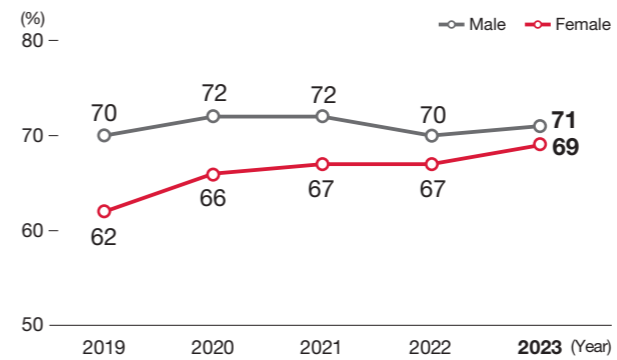
**Survey period:** Late July–early August 2023

**Scope:** A total of 11,522 people at Idemitsu and 29 affiliates and subsidiaries in Japan and overseas

**Response rate:** 96.1%

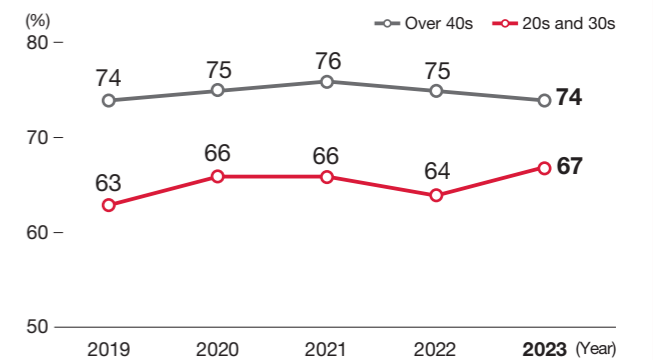
**Features of the FY2023 survey:** We can see an improvement in the "Engagement Score" we use as an indicator. The gap in the scores between those with different attributes (especially gender and age group), which has been issue, has shrunk overall.

#### Engagement score (gender)



We believe that we have been successful in deploying detailed measures for those with each type of attribute. In particular, the scores of young employees (those in their 20s and 30s), many of whom work at refineries and complexes, have improved significantly. We believe this is a result of the DE&I Committee's initiatives and taking career-related measures to support the growth of individuals. We will continue to identify the essential issues through dialogue between management and employees to lead to appropriate actions in the future.

#### Engagement score (age group)

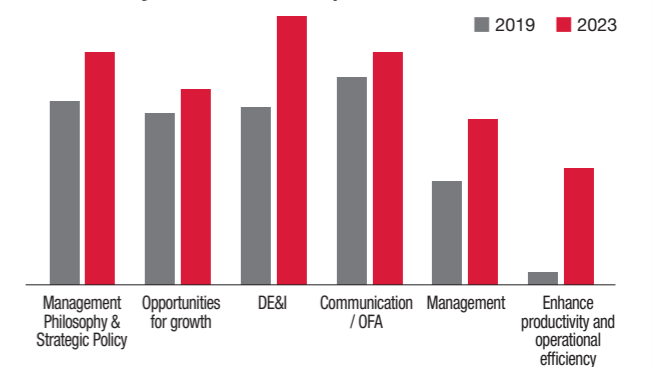


### Toward maximizing employee engagement

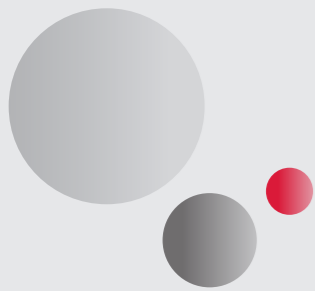
The chart on the right shows the trend of scores for the six issue items that we place particular emphasis on over the five-year period beginning in FY2019. FY2019 is the year when Idemitsu Kosan and Showa Shell Sekiyu integrated their businesses and made a new start. All items improved overall, but the breadth of improvement in "DE&I" was particularly strong.

"Employee Engagement Score" is highly correlated with "Management Philosophy/Strategic Policy," "Opportunities for growth," and "DE&I." We believe that a concentrated approach to the issue items that are less satisfactory than those in general industry, based on the correlation with the "Employee Engagement Score," will lead to further improvement of employee engagement.

### Our six key issue areas of emphasis



# Message from the CDO (DX Strategy)



Managing Executive Officer  
Chief Digital Officer  
**Soichi Kobayashi**



Challenge and change are necessary for sustainable corporate growth, and DX has become the natural environment for this. There are various targets and methodologies for DX. However, the critical thing is that our customers, business partners, and employees are able to realize the benefits of digitization, and then we will be able to move forward with innovation.

To ensure that customers can conveniently use our services, we plan to expand the functionality of DriveOn, which is currently available at service stations, and make the interface more engaging.

We are also engaged in the Enhance productivity by 30% project, which aims to improve productivity by inspecting supply chain and indirect operations, including points of contacts with business partners, and innovating them into digitally-integrated operations. We have launched dozens of projects, including those under consideration. For example, in the lubricants business, which is

characterized by a high variety of products in small quantities, we are leveraging data analysis tools to complete manufacturing and sales planning and profit management analysis in a short period of time. We are also moving forward to establish an environment in which all employees can utilize the generative AI and simple use of the database.

Since it is people who support these activities, we are working on skills training to promote DX. We have divided the process of nurturing digital human resources into three stages and are enhancing the educational programs at each stage. Approximately 2,000 employees have already been trained in the basic stage, which is aimed at acquiring basic knowledge of digital literacy.

We will continue to create an environment where the knowledge gained from this education can be put into practice, leading to enhanced productivity and the creation of new value.

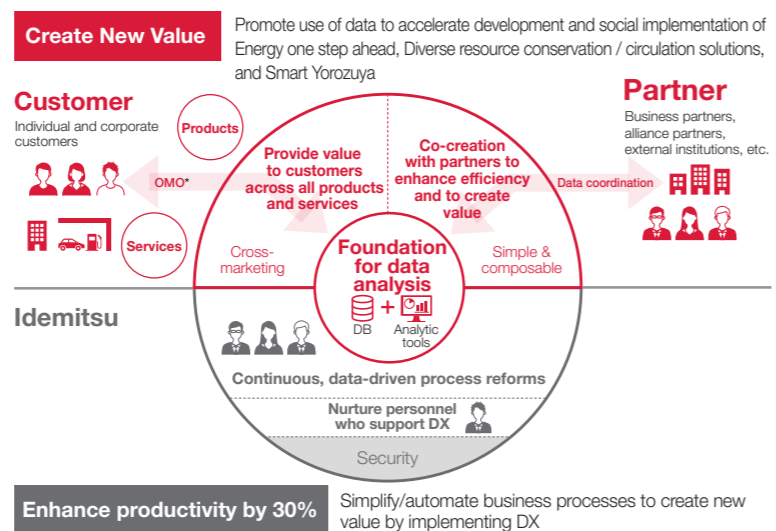
## Strategic Framework

We are working on DX with the dual focus of (1) creating new value for our customers and (2) enhancing in-house productivity.

In creating new value, we will organize and integrate information from each of our businesses into an information utilization platform, aiming to provide information-based services and evolve the customer experience, while realizing cross-marketing and providing new value.

In addition, under the Smart Yorozuya concept, in cooperation with partners, we will prepare a menu of services to provide localized services in a timely manner and build a customer interface that allows customers to contact these services centrally.

In order to secure the resources needed to create this value, we have positioned the enhance productivity as a priority issue and, since FY2022, have been strengthening our initiatives using digital technology.



## Enhanced Productivity

Initiatives to improve productivity can be broadly classified into two categories: a. Evolution of a digital work style common to all employees, and b. Initiatives to realize each department's strategy.

We believe that the use of generative AI is essential as part of the evolution of digital workstyles. We are currently building an Idemitsu version of the ChatGPT environment that allows secure use of ChatGPT and are encouraging all employees to use it. In the future, Idemitsu will promote coordination with our own databases and increase the use of generative AI to improve the efficiency of our own operations. By providing an environment that enables the development of no-code\* and low-code\* apps and a forum for education, we will work to expand the number of citizen developers and to activate information cooperation by strengthening the community of such developers.

On the other hand, to improve productivity in order to realize the strategies of each business department, a co-creation-type project team has been formed by the business departments and the in-house digital department to address this issue. For target processes that are the subject of issues, we are developing a method of visualizing workflows and information flows, identifying bottlenecks and duplication, and then adding digital countermeasures. In addition, we are building an environment that enables us to centrally manage data from Japan and overseas, and we are looking into the optimization of operations on a global basis. We also aim to speed up decision-making by visualizing data across businesses. These initiatives for each department are disclosed on an intranet, and information is shared so that it can be applied to the activities of other departments.

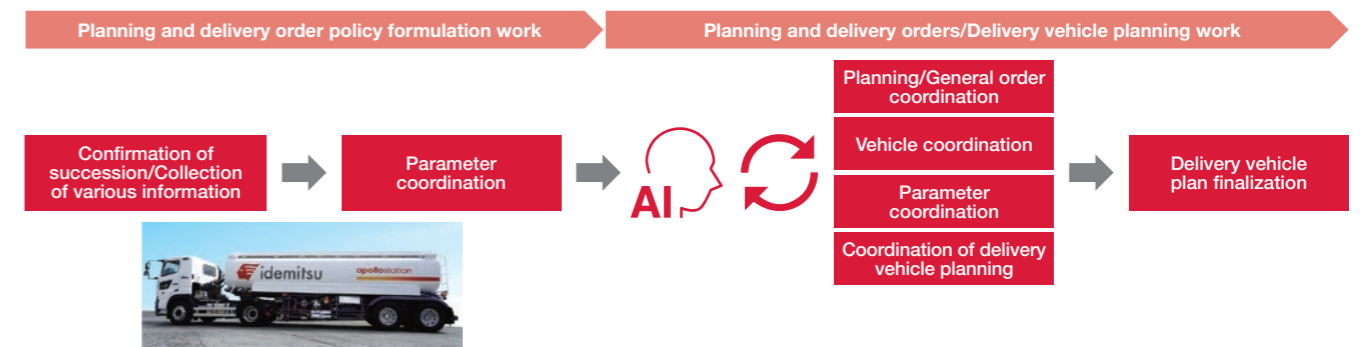
\* No-code/low-code: Refers to development with (as little) programming as possible.

### Example of activity: Improving the efficiency of vehicle delivery operations by upgrading the system

We are planning to introduce a system that utilizes AI technology to streamline the operational tasks of fuel oil order and delivery, and we are currently driving the project towards its implementation within the fiscal year 2023.

We are building and systematizing a tank inventory forecasting and order creation model and a delivery planning optimization model

for service stations that conduct planned deliveries. We are aiming to (1) reduce work hours by 25% while maintaining quality in demand forecasting, order creation, and delivery planning, which are highly dependent on human resources, and (2) create benefits such as preventing stock-outs at planned delivery destinations through demand forecasting at service stations.



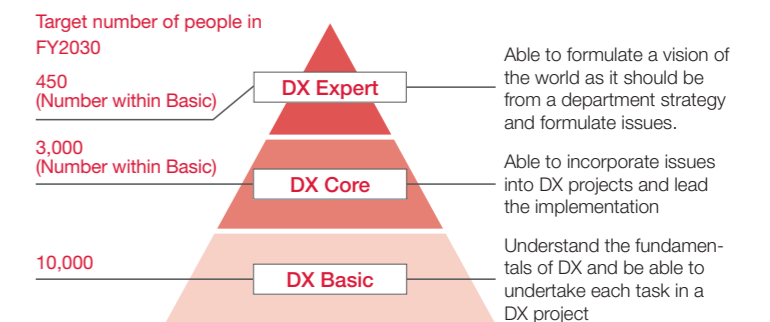
## Nurture Personnel Who Support DX

Idemitsu has positioned "Nurturing personnel who support DX" as a priority issue, and is systematizing the knowledge and skills required for all employees to independently utilize digital technology, and is developing nurture programs in line with this system.

Currently, we are in the process of reinforcing the "Basic" level, which is a level that enables employees to understand fundamental knowledge related to DX and thinking methods.

In addition, to nurture individuals who can lead implementations at the "Core" and "Expert" levels, we have a plan to develop training programs through hands-on training and actual projects using e-learning that is optimized for each individual according to their level of proficiency and the skills they want to acquire.

As of June 30, 2023, more than 2,000 employees had taken the "Basic" e-learning course. We aim to nurture more than 10,000 "Basic," 3,000 "Core," and 450 "Expert" qualified employees by FY2030.



Idemitsu Kosan aims for three proficiency levels of "personnel who support DX"

# FY2022 Review of Operations

Idemitsu Kosan is developing five businesses in the domains of energy and materials. We will contribute to the realization of a sustainable society while fulfilling our social mission of providing a stable supply of energy, and will continue to strengthen the competitiveness of existing businesses and transform our business portfolio.

### Composition of Net Sales

9,456.3 billion yen (FY2022)

- Petroleum 78%
- Resources, Others 7%
- Basic chemicals 7%
- Functional materials 5%
- Power and renewable energy 2%

### Composition of Operating + Equity Income (excluding inventory impact)

252.7 billion yen (FY2022)

- Resources 91%
- Others, adjustments -9%
- Petroleum 7%
- Functional materials 7%
- Basic chemicals 4%
- Power and renewable energy 0%

### Trends in Net Sales and Operating + Equity Income (consolidated)

(FY)	Net sales (Billions of yen)	Operating + equity income (Billions of yen)
2020	4,556.6	100.3
2021	6,686.8	216.2
2022	9,456.3	308.4

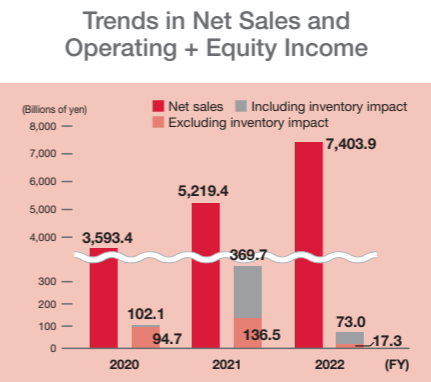
### Composition of Net Sales by Region

FY2022

- Japan 71%
- Asia and Oceania 18%
- North America 8%
- Others 2%

## Petroleum Segment

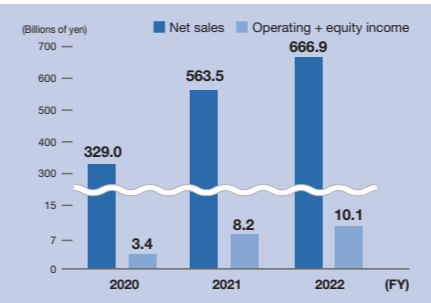
pp.27-28

- ### Main Businesses
- Procurement of crude oil and refining of petroleum products
  - Sale of gasoline, diesel oil, kerosene, and automotive lubricants to service stations
  - Sale of industrial kerosene, diesel oil, and heavy oil
  - Sale of aviation and marine fuel
  - Operation of hydrogen stations

## Basic Chemicals Segment

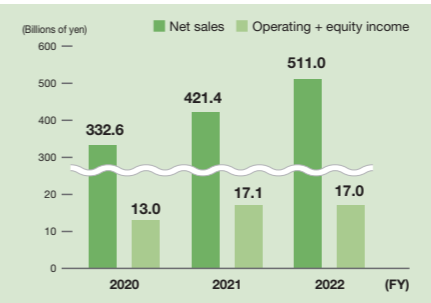
pp.29-30

- Manufacture and sale of ethylene, propylene, butadiene and other synthetic resin materials
- Manufacture and sale of benzene, styrene monomers, mixed xylene, paraxylene, and other chemical products

## Functional Materials Segment

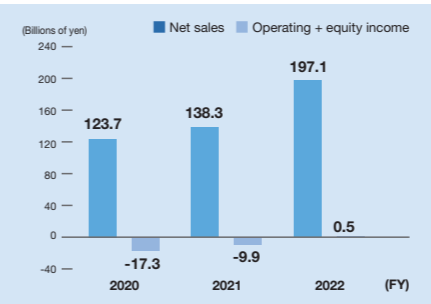
pp.31-34

- R&D, manufacture, and sale of automotive lubricants, industrial lubricants, marine lubricants, and grease
- R&D, manufacture, and sale of engineering plastics, adhesive materials, derivative products, and solvents
- R&D, manufacture, and sale of OLED and other electronic materials
- R&D, manufacture, and sale of high-performance asphalt (bitumen)
- R&D, manufacture, and sale of chemical pesticides, plant-derived pesticides, and functional feeds
- R&D of all-solid-state batteries materials

## Power and Renewable Energy Segment

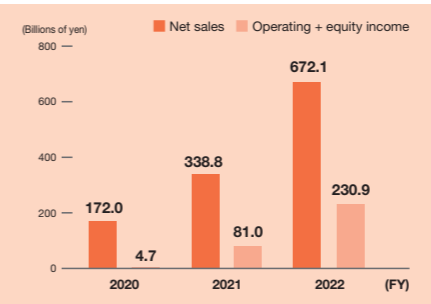
pp.35-36

- Supply, wholesale, and retail of electric power
- Operation of highly efficient thermal power plants
- Development and operation of renewable energy sources, including solar, wind, and biomass power plants
- Providing solutions throughout the entire life cycle of a solar power plant

## Resources Segment

pp.37-38

- Exploration, development, and production of petroleum and natural gas
- Production, procurement, and sale of coal
- Operation of geothermal power plants, supply and sale of electric power and steam



# Petroleum Segment

## Strengths

- Group refineries (six sites) / network of oil terminals (34 sites) positioned in key areas around Japan
- Sales measures at our approximately 6,000 service stations, which boast the second largest market share in Japan
- Cooperative framework with dealers whose businesses are community-based
- Accumulation of experience and technologies cultivated since Idemitsu's founding and the overseas expansion of our value chain

## Manufactured Capital (as of March 31, 2023)

### Group refineries

Domestic	Location	Crude oil processing capacity (10 thousand barrels per day)	Overseas	Location	Crude oil processing capacity (10 thousand barrels per day)
Hokkaido Refinery	Tomakomai City, Hokkaido	15.0	Nghi Son Refinery (Nghi Son Refinery and Petrochemical LLC)	Thanh Hóa, Vietnam	20.0
Chiba Complex	Ichihara City, Chiba Prefecture	19.0	<b>Total</b>		<b>20.0</b>
Aichi Complex	Chita City, Aichi Prefecture	16.0			
Yokkaichi Refinery (Showa Yokkaichi Sekiyu Co., Ltd.)	Yokkaichi City, Mie Prefecture	25.5			
Keihin Refinery (TOA Oil Co., Ltd.)	Kawasaki City, Kanagawa Prefecture	7.0			
Yamaguchi Refinery (Seibu Oil Co., Ltd.)	Sanyo-Onoda City, Yamaguchi Prefecture	12.0			
<b>Total</b>		<b>94.5*</b>			

\* The total processing capacity when adding the capacity of Fuji Oil Company, Ltd., with which Idemitsu has concluded a petroleum products trading agreement, is 1.09 million barrels per day (bpd).

## FY2023 Initiatives

FY2023 represents the first year of the current Medium-term Management Plan. We will continue to fulfill our responsibility to provide a stable energy supply and steadily implement measures to achieve business structure reforms in 2030 as outlined in the Medium-term Management Plan.

The current business environment remains uncertain, with concerns of a slowdown in the global economy due to monetary tightening in various countries, in addition to ongoing global inflation. Crude oil prices have slowed from the downward trend of the previous year and are hovering around \$80 in the beginning of 2023.

Domestic demand for petroleum products is expected to be around the same level as the previous year due to a recovery from behavioral restrictions imposed by the COVID-19 pandemic, despite a structural demand decline. The overseas petroleum products market has continued to be favorable since the summer.

As for the Petroleum Segment's initiatives this fiscal year, we recog-

nize that the response to Seibu Oil Co., Ltd.'s ceasing of refining functions is a key issue. While steadily reducing refining capacity in response to declining domestic demand for petroleum products, we will strive to enhance competitiveness by reducing costs through the consolidation and decommissioning of oil terminals, maintaining stable refinery operations, and pursuing profit-earning opportunities through exports.

On the sales front, we have also launched new initiatives such as an environmentally friendly fueling station (TypeGreen) that utilizes CLT\* with domestic wood specifications as part of our Smart Yorozuya service.

As part of our efforts toward carbon neutrality by 2050, we have also started sales of Idemitsu Carbon Offset fuel to industrial customers. By using carbon credits, customers can contribute to offsetting CO<sub>2</sub> emissions while continuing to use petroleum without having to make changes to their existing facilities.

\* CLT (Cross Laminated Timber) is a laminated timber panel that is lightweight, insulates well, and allows for a shorter construction period compared to conventional concrete.

## Executive Message

Managing Executive Officer  
**Kenichi Morishita**



In an effort to achieve a carbon neutral society by 2050, we will promote the shifting of our business portfolio through social implementation in our "Three business domains." In the Petroleum Segment, we are particularly committed to the social implementation of "Energy one step ahead" and "Smart Yorozuya."

In "Energy one step ahead," we will fulfill our responsibility to protect the earth's environment and lifestyles by providing a stable supply of energy one step ahead of the times. Currently, we are working to establish a stable supply chain for "SAF" and "biodiesel/bio-fuel oil" from raw material procurement, production, distribution, and product supply. Also, as we approach the year 2030, we will proceed with pilot tests to add synthetic fuels in addition to hydrogen and ammonia to our "Energy one step ahead" lineup.

At Smart Yorozuya, our apollostation brand aims to evolve into a lifestyle support hub that supports the people of each town and their comfortable daily lives. Under the new slogan "Various a! in this town," apollostation will continue to evolve in line with the needs of each town in a YOROZU (infinitely diverse) manner, and will work to become a presence that supports energy and mobility.

"apollostation", which began its rollout in April 2021, will have completed brand integration of all of its approximately 1,300 tanker trucks and logistics systems and 6,000 service stations by the end of 2023. Together with our dealers and transport companies, who are important partners of our Company, we aim to create an apollostation brand that will continue to be supported by our customers in the future.



"Various a! in this town"

The "a!" is the "a" of apollostation, which has expanded nationwide and evolved into a "Smart Yorozuya." By extending a variety of services, we hope to provide our customers with a surprise and peace of mind and for them to say "I am glad it is there" in their daily lives.

## Initiatives at Nghi Son Refinery

The Nghi Son Refinery, operated by Company's equity method affiliate in Vietnam, Nghi Son Refinery and Petrochemical LLC (NSRP), performs an important role as an energy supply base for approximately 35% of Vietnam's petroleum demand. In FY2023, we implemented measures to improve equipment reliability and

productivity, among others, during the first periodic repair work called Turnaround, which began at the end of August. We will pursue initiatives to contribute to profitability by continuing to ensure stable operations and further improving the utilization ratio and enhancing facility reliability.



Periodic repair work called Turnaround



## TOPICS



Executive Officer  
**Jun Miki**

# Basic Chemicals Segment

## Strengths

- Integrated oil refining and petrochemical manufacturing
- Top-level ethylene production capacity in Japan and a supply network serving customers located in petrochemical complexes
- Initiatives for low-carbon and resource-recycling solutions by leveraging our own value chain

## Manufactured Capital (as of March 31, 2023)

### Mainstay chemicals production capacities\*1

Domestic	Chemical product	Production capacity (tons/year)
Olefins	Ethylene	997,000
	Paraxylene	836,000
	Mixed xylene	764,000
Aromatics	Benzene	1,020,000
	Styrene monomer	550,000
	Cyclohexane	240,000
Overseas	Chemical product	Production capacity (tons/year)
Aromatics	Paraxylene*2	245,700
	Benzene*2	87,750
	Styrene monomer	240,000

\*1 Including products manufactured at Group refineries  
\*2 Production capacity in proportion to shareholding ratio

### Group petrochemical bases

Domestic	Location
Chiba Complex	Ichihara City, Chiba Prefecture
Tokuyama Complex	Shunan City, Yamaguchi Prefecture
Aichi Complex	Chita City, Aichi Prefecture
Hokkaido Refinery	Tomakomai City, Hokkaido
Showa Yokkaichi Sekiyu Co., Ltd.	Yokkaichi City, Mie Prefecture
Seibu Oil Co., Ltd.	Sanyo-Onoda City, Yamaguchi Prefecture
TOA Oil Co., Ltd.	Kawasaki City, Kanagawa Prefecture
Overseas	Location
Idemitsu SM (Malaysia) Sdn. Bhd.	Johor, Malaysia
Petrochemicals (Malaysia) Sdn. Bhd.	Johor, Malaysia
Idemitsu Chemicals (M) Sdn. Bhd.	Johor, Malaysia
Nghi Son Refinery (Nghi Son Refinery and Petrochemical LLC)	Thanh Hóa, Vietnam

## FY2023 Initiatives

The business environment surrounding the Basic Chemicals Segment continues to be extremely challenging, with the increased construction of petrochemical facilities in the Asian region resulting in the utilization rate of ethylene production plants in Japan falling below 80% for three consecutive months since June. In addition to oversupply due to new and expanded facilities, demand for synthetic resins such as polyethylene and polypropylene, for which the raw materials are made from Basic Chemicals, has deteriorated in Japan and overseas due to the current slowdown in the global economy.

Although demand for basic chemicals in Asia is forecast to grow over the long term, a major issue in the Basic Chemicals Segment's Medium-term Management Plan is to further strengthen competitiveness to ensure profitability even in the current difficult business environment.

As key measures taken this fiscal year, we are working on cost

reductions, including maintenance costs and maintenance and renewal investments, as well as optimizing logistics. In addition, we will continue our chemical shift by converting surplus gasoline base materials to high-value-added chemicals through the paraxylene production equipment (production capacity of 400,000 tons/year) at the Aichi Complex, which launched production in the previous fiscal year. We will aim to achieve the profit targets of the Medium-term Management Plan by strengthening the competitiveness of existing businesses through steady progress by taking measures such as diversifying sales destinations.

To realize the 2050 CN transition, we are working on establishing CNX centers integrated with the oil refining business. We will steadily move to take action on business structure reforms by creating new added value in existing businesses through initiatives such as the conversion of conventional petroleum-derived raw materials to bio-based materials and the recycling of used plastics using refining equipment.

## Message from a General Manager

As demand for petroleum continues to decline, there is an ongoing shift toward chemicals with higher added value, making the role of the Basic Chemicals business even more critical.

While steadily working to improve the competitiveness of existing businesses, it is necessary to shift from conventional fossil energy sources to green raw materials and to conserve resources in order to ensure the sustainability of our business.

We believe that the most significant issue is to continue to fulfill our responsibility to supply basic chemical raw materials into the future by strongly promoting each of the projects we are currently working on to establish a bio-feeding and recycling system, and evolving toward a

more sustainable business.

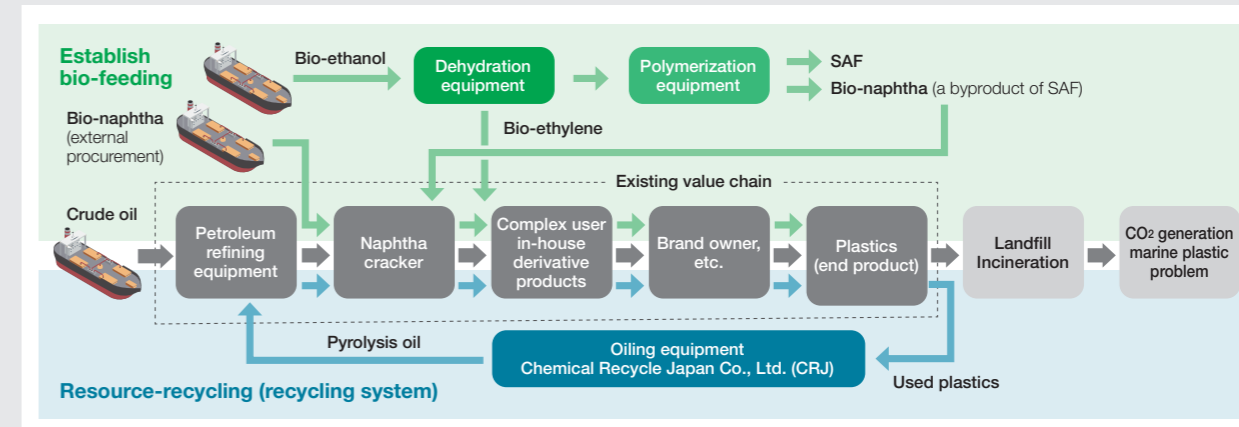
Our major strength is that we are able to innovate the entire value chain from petroleum refining to chemicals, not only because we have integrated petroleum refining and petrochemicals, but also because we have downstream joint ventures, Prime Polymer Co., Ltd. and PS Japan Corporation that manufactures synthetic resins, the raw material for plastics.

While leveraging these strengths to the maximum extent possible, we will accelerate various initiatives related to the current Medium-term Management Plan as an important period for early social implementation.



Basic Chemicals Department General Manager  
**Nobuhiro Miyagishi**

### Image of initiatives towards CN in 2050



## Bio-chemicals

Through collaboration with the SAF business (refer to p. 16), we aim to produce bio-naphtha and bio-ethylene in-house and expand into downstream derivatives. Bio-naphtha is produced from renewable biomass-derived raw materials, which enables it to reduce GHG emissions compared to petroleum-derived naphtha.

So far, Tokuyama Complex and Chiba Complex have acquired ISCC Plus, an international certification system necessary for the promotion of bio-chemicals business. In April 2023, the Pasir Gudang Complex in Malaysia also obtained the same certification, and we are working to establish a supply chain for biomass plastic not only in Japan but also in Southeast Asia.

Currently, we have started supplying bio-styrene monomer (SM) made from bio-naphtha procured from overseas as raw materials to CHIMEI Corporation in Taiwan. Other joint initiatives are being promoted with companies such as Toray, DIC, and Kumho Petrochemical. Idemitsu forecasts that the need for bio-chemicals will further increase in the future, and we will continue to promote marketing to capture demand, leading to the full-scale development of bio-chemicals.

## Resource-recycling (Recycling System)

In April 2023, we decided to invest in an oil chemical recycling facility that will use used plastics as raw materials. Environment Energy Co., Ltd., which has been working jointly to establish oiling equipment technology, and Chemical Recycle Japan Co., Ltd. ("CRJ"), a joint venture to produce pyrolysis oil from used plastic raw materials, are aiming to start commercial operation in FY2025.

CRJ produces pyrolysis oil from recovered used plastics using its own technology and Idemitsu produces "renewable chemicals" as a substitute material for crude oil. The production of plastic products using these "renewable chemicals" as raw materials will achieve resource-recycling. After establishing a business model in the area adjacent to Chiba Complex, we plan to install oiling equipment at other Group refineries and complexes to expand the business on a large scale, targeting used plastics nationwide.





## Functional Materials Segment

### Lubricants

**Strengths**

- A global manufacturing, sales, and R&D network spanning 28 countries
- A lubricants product development capabilities that addresses customers' frontline issues and needs

#### FY2023 Initiatives

The lubricants business handles lubricants such as automotive oil and greases, hydraulic and gear oil for industrial machinery, and other industrial oils. As for automotive lubricants, the Company's "apollostation oil series" of branded engine oils are sold at service stations nationwide. With advancements in carbon neutral initiatives, further demand is expected for products that conform to the growing demand for EVs, and for products that are environmentally friendly and contribute to energy and resources conservation. In FY2022, we brought to market "idemitsu AshFree," the industry's first phosphorus-free and ash-free diesel engine oil. Leveraging advanced tribology, we develop OEM (Original Equipment Manufacturing) products for automakers and other customers doing business globally via our production and sales bases in Japan and overseas.

As a major initiative during the Medium-term Management Plan period, we aim to further expand our revenue by strengthening the strategy of the Idemitsu brand through the expansion of the "IBMO Series\*" of Idemitsu brand motor oil sold overseas.

In addition, we are determined to achieve greater competitiveness in our business by steadily advancing efforts to reduce manufacturing costs.

\* Idemitsu Brand Motor Oil: Idemitsu brand engine oil sold overseas

#### idemitsu AshFree

The industry's first ZeroAsh diesel engine oil that provides DPF (Diesel Particulate Filter) with super longevity\*. An ash-free oil that does not emit ash, a factor in DPF clogging in diesel trucks and buses, and reduces maintenance costs by extending DPF life and reduces labor time and fuel consumption by shortening DPF regeneration time.



\* Super longevity: a term coined to mean exceeding longevity

### Electronic Materials

**Strengths**

- Technical capabilities and patents centered on blue-light emitting materials, a subset of OLED materials of special technical difficulty
- Global supply network for display manufacturers, our major customers

#### FY2023 Initiatives

The electronic materials business mainly develops and produces light-emitting materials for OLED displays. Leveraging our particular strengths in blue light-emitting material-related technologies, we are working on the development of high-performance materials that enable power saving and a wider color gamut for displays. In terms of production systems, we have plants in Japan, as well as in Korea and China, which are near the demand centers, and we supply materials to display manufacturers, who are our customers.

In March 2023, we established Idemitsu Advanced Materials Korea Co., Ltd. to strengthen our R&D and marketing structure in the advanced materials field in Korea. Going forward, we will further strengthen collaboration with Korean global companies and engage in R&D of materials that accurately meet customer needs.

In the electronic materials business, we will continue to grow our existing businesses and aim to contribute to the realization of a circular society through the provision of materials that lead to various resource-saving and resource-recycling measures and social implementation, as indicated in the Medium-term Management Plan.



### Advanced Materials & Performance Chemicals

**Strengths**

- Materials development capabilities to meet the requirements of the market (Catalyst, synthesis and polymerization technologies, material design for chemicals and composites)
- Extensively developed overseas manufacturing, development, and sales network

#### FY2023 Initiatives

The advanced materials & performance chemicals business handles an extensive range of functional products such as polycarbonate resin (product name: Tarflon™), SPS resin (product name: XAREC™), and other engineering plastics featuring high transparency, high durability, and high heat resistance, as well as adhesive materials used for disposable diapers (product name: I-MARV®) and plastic zipper tapes (product name: PLALOC™) used for food preservation.

We have established a supply system that is cost-competitive and are engaged in global development and sales. At our overseas bases, we have established a polycarbonate resin joint venture with a Taiwan-based plastics group's Formosa Chemicals & Fibre Corporation (FCFC) and a hydrogenated petroleum resin joint venture with Formosa Petrochemical Corporation (FPCC). We are building our second SPS resin plant in Malaysia (scheduled to come on line in the latter half of FY2023) and we have a resin compounding plant in China and a PLALOC plant in Thailand, which are both operating stably.

During the period of the Medium-term Management Plan, we will promote structural reforms and enhance the development of

materials for mobility in the field of electrification and the development of functional products that anticipate the requirements for high-speed communications in the field of ICT. As part of the CNX Center Concept, we will also focus on the development of bio-chemicals and other activities to contribute to the realization of a carbon neutral and circular society.

#### XAREC™ (SPS/syndiotactic polystyrene resin)

A high-performance resin that is lightweight and offers excellent heat resistance, electrical properties, chemical resistance, and hydrolysis resistance.



They are used in automotive electronic parts and kitchen appliances, such as microwave ovens and rice cookers, etc.

## Bitumen (High Performance Asphalt)

### Strengths

- Diverse product lineup of road paving materials, waterproofing materials, industrial materials, etc., and comprehensive asphalt-related technical capabilities
- Leveraging the our Group's chemical expertise to develop products and technologies to achieve longer-lasting roads

### FY2023 Initiatives

In Japan, we are the only comprehensive asphalt manufacturer supplying asphalt for a wide range of applications, from road paving materials to waterproofing materials for housing and industrial materials. In particular, demand for our high-performance asphalt products for roads with characteristics such as high durability and long life is expected to grow in Japan in terms of reducing CO2 emissions and road life-cycle costs, as well as overseas in line with the growth of infrastructure demand.

We recognize that this is an area in which we can leverage our technological superiority while at the same time anticipating growth potential. In addition to this, our efforts to improve profitability by streamlining the supply chain and other measures will contribute to the business growth of the Functional Materials Segment and to the achievement of our profit plan.

In terms of research and development, we will work on the development of products and technologies to further improve the durability and longevity of roads and enhance the quality of pavement recycling.

We will continue to promote the establishment of business foundations overseas by leveraging our technological capabilities cultivated in Japan, a country with advanced infrastructure.

### Grandphalt ART

Highly functional asphalt for roads formulated with rubber and resin. Used on highways and other roadways as a product that prevents rut digging and improves safety while extending the life of the road.



Example of Grandphalt ART use / New Tomei Expressway

## Pesticides and Functional Feed

### Strengths

- Proposal capabilities in accordance with the requirements of manufacturing sites, both chemical and biological
- Technology development capabilities that enable new agent development from diverse perspectives

### FY2023 Initiatives

With "food safety and security" and "addressing the increasing demand for food" as keywords, the business is engaged in the development, manufacture, and sale of chemical pesticides, biological pesticides, functional feeds, and other products that contribute to improved productivity and stable supply of agricultural products based on research and development. SDS Biotech K.K., a wholly owned subsidiary of the Company, is a manufacturer of agrochemical ingredients and animal husbandry material additives, and aims to contribute to "food" production sites through the provision of products, whether chemical or biological, and is engaged in the creation of new active ingredients and the promotion and expansion of applications of existing agents.

In the field of pesticides, the outbreak of pesticide-resistant pests and weeds that lead to lower crop yields has become a problem in recent years. To address this issue, we aim to contribute to stable crop production in Japan and overseas by promoting the spread of the fungicide Daconil, for which there have been no cases of outbreaks of resistant bacteria, by continuously expanding its application in Japan, and by promoting the overseas expansion of the rice paddy herbicide Benzobicyclon, which is highly regarded for its excellent effects against

hard-to-control weeds. In 2023, the Yokohama Plant, which manufactures a portion of the Daconil formulation and active component (active ingredient), achieved a cumulative production volume of 200,000 tons of active components since 1969, when it began production. In addition, we are continuing our efforts to develop our Benzobicyclon business, particularly in Europe and the U.S.

In the field of animal husbandry, we are promoting the sale in Japan and overseas of functional animal feed containing cashew nut shell liquid (CNSL), which is expected to be effective in reducing methane gas emissions, a type of greenhouse gas contained in burps, in addition to improving cattle productivity, and are promoting its widespread use to help achieve low carbon and sustainable animal husbandry material production. In 2023, we began selling functional feed containing CNSL in the U.S. and are continuing to work with partners on pilot tests of methane gas emission reductions in live cattle.



Products using cashew nutshell liquid

## Lithium-ion Battery Materials

### Strengths

- Our extensive patent portfolio and our integrated manufacturing technology from sulfide raw materials to solid electrolytes, which we have cultivated through petroleum refining and established through many years of R&D

### FY2023 Initiatives

All-solid-state batteries are being sought for early commercialization for EVs, etc., and the demand for solid electrolytes, a key material for these batteries, is increasing. By changing from conventional liquids to solid electrolytes, improvements in safety, recharging speed, and cruising range can be expected.

We have decided to increase the manufacturing capacity of the Plant 1, a small pilot facility, with the aim of commercializing solid electrolytes (scheduled for completion in FY2024). The Plant 2 also newly began operation in July. In order to evaluate materials from the customer's perspective and accelerate the development of high-performance solid electrolytes, we established a new battery prototyping and evaluation facility.

Applying validation in small pilot facilities as a foothold, we will

establish mass production technology in large pilot facilities, which is the next stage of the project, and lead to commercialization beyond that. The joint development with Umicore, which began in FY2022, also includes the development of new high-performance materials.

Furthermore, in October, we launched a collaboration with Toyota Motor Corporation to realize mass production of all-solid-state batteries. The two companies will work together to develop mass production technology for solid electrolytes, improve productivity, and establish a supply chain to further ensure the commercialization of all-solid-state batteries in 2027-28.

By integrating the technologies of both companies, we aim to realize mass production of solid electrolytes and all-solid-state batteries that can be widely used throughout the world.

### Message from a General Manager

Toward the practical application of all-solid-state batteries, which are the next generation of batteries, Idemitsu is working on the development and commercialization of battery materials such as solid electrolytes.

Safe and high-performance energy storage technology, as exemplified by EV, not only supports the replacement of fossil fuels but also makes a significant contribution to solving a variety of social issues.

We aim to realize the commercialization of solid-state electrolytes in collaboration both internally and externally, and, thus, play a role in contributing to society.



Small pilot test facilities for solid electrolytes  
Exterior view of the Plant 1 (at our Chiba Complex)



Executive Officer  
General Manager of Lithium  
Battery Material Department,  
Advanced Materials Company  
Jotaro Kobayashi

### Our Strengths

Our strength lies in our integrated manufacturing technology from sulfur compounds obtained in oil refining to solid electrolytes, and in our numerous patents on all-solid-state batteries, solid electrolytes, and lithium sulfide.

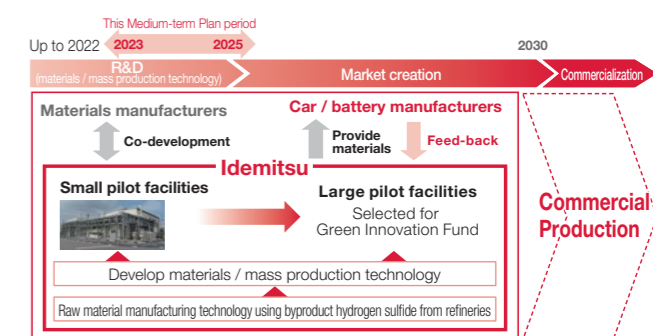
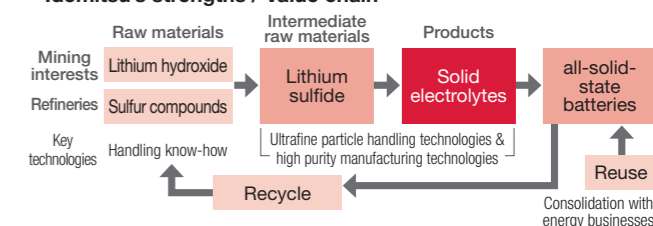
As a result of many years of research on technologies to add value and effectively utilize petroleum, we have discovered a high-purity production technology for lithium sulfide, which is used as an intermediate material for solid electrolytes, using sulfur compounds. Furthermore, we can manufacture high-performance solid electrolytes with our design, synthesis, and evaluation capabilities cultivated through our research and development.

### Initiatives Aimed at Expanding Our Business Domains

With a view to expanding our business domains in the future, we will continue to explore technologies not only for solid electrolytes, but also for the development of sulfur-based cathodes and the recycling of all-solid-state batteries.

We will accelerate the performance improvement of solid-state electrolytes and the development of mass production technologies to meet customer needs in terms of both quality and quantity, thereby contributing to the spread of all-solid-state batteries.

### Idemitsu's strengths / Value chain





# Power and Renewable Energy Segment

## Strengths

- A track record of developing and possessing competitive thermal power sources and diverse renewable energy sources both domestically and internationally
- Integrated business structure spanning from power generation to retail
- Knowledge and network in the photovoltaic power generation business cultivated by Solar Frontier

## Manufactured Capital (as of March 31, 2023)

### Capacity of the group power generation facility portfolio\*1

Type of power generation	Unit: 10,000 kW
Domestic solar power	18.7
Overseas solar power	52.1
Solar power (subtotal)	70.8
Biomass power	10.3
Wind power	2.0
Geothermal power*2	0.5
Renewable energy (subtotal)	83.6
Domestic thermal power generation	83.4
Overseas thermal power generation	27.1
Thermal power generation (subtotal)	110.5
<b>Domestic power generation capacity (total)</b>	<b>114.9</b>
<b>Overseas power generation capacity (total)</b>	<b>79.2</b>
<b>Power generation capacity (total)</b>	<b>194.1</b>



Ohgishima Power Station

\*1 Totals of Idemitsu's owned (or contributed) capacity

\*2 Geothermal power generation is a business within the Resources Segment. Additionally, 27,000 kW worth of steam for power generation is supplied to energy companies.

## FY2023 Initiatives

With the international trend toward electrification and decarbonization, we forecast worldwide growth in demand for power and an expansion of the introduction of renewable energy. On the other hand, in Japan, the business environment is becoming increasingly uncertain, as wholesale electricity market prices fluctuate violently due to tight supply and demand caused by the instability of resources prices and the ongoing retirement of aged thermal power plants, etc. In FY2022, there were reports of price hikes by several major electric power companies and an increase in withdrawal by new power companies.

In light of this business environment, we are formulating and executing business strategies to both address society's needs for electrification and decarbonization and to secure stable earnings.

In Japan, in power supply, we are promoting the stable operation of competitive thermal and renewable energy power plants by

taking advantage of the sites and fuels in the petroleum business. In sales, we are strengthening cooperation with sales subsidiaries and dealers and restructuring sales to within our own supply capacity.

Overseas, we aim to expand business opportunities in the future while leveraging our accumulated capabilities in the development and operation of solar power plants.

In addition, at Solar Frontier, we are promoting a transformation in our business model to become a company that provides solutions throughout the entire life cycle of solar power plants, from development, including EPC\* business, to long-term stable use and recycling of these plants.

In the medium- to long-term, we aim to contribute to business structure reforms by leveraging our accumulated knowledge and business assets to secure stable earnings, create synergies within the group, and achieve social implementation.

\* Engineering Procurement Construction

## Message from a General Manager

We are engaged in business operations with an integrated supply chain as a new electric power company. This division is engaged in the development and operation of various power plants, electricity supply and demand, electric power sales, and various services to meet a wide range of needs from high-voltage to low-voltage for corporate and individual customers in Japan. On the other hand, overseas, we have a subsidiary in the U.S. that has the capacity to develop large-scale solar power plants, and in Asia we are also involved in the PPA business using renewable energy sources.

In our wide range of businesses, our objective is not simply to expand in scale but to

leverage the Group's assets, sales network, and accumulated knowledge as our strengths to efficiently and effectively deliver value that meets the expectations of society and our customers.

While securing stable earnings through these initiatives, we also aim to contribute to the realization of a long-term business model by securing non-fossil power sources and building regional distributed energy systems in the future.

Although the business environment is becoming increasingly uncertain, we will steadily execute our strategy to ensure that our business continues to contribute to the Group and society in both the short and long term.



Power & Renewables Business Department General Manager  
**Hiroshi Yoshida**

## TOPICS

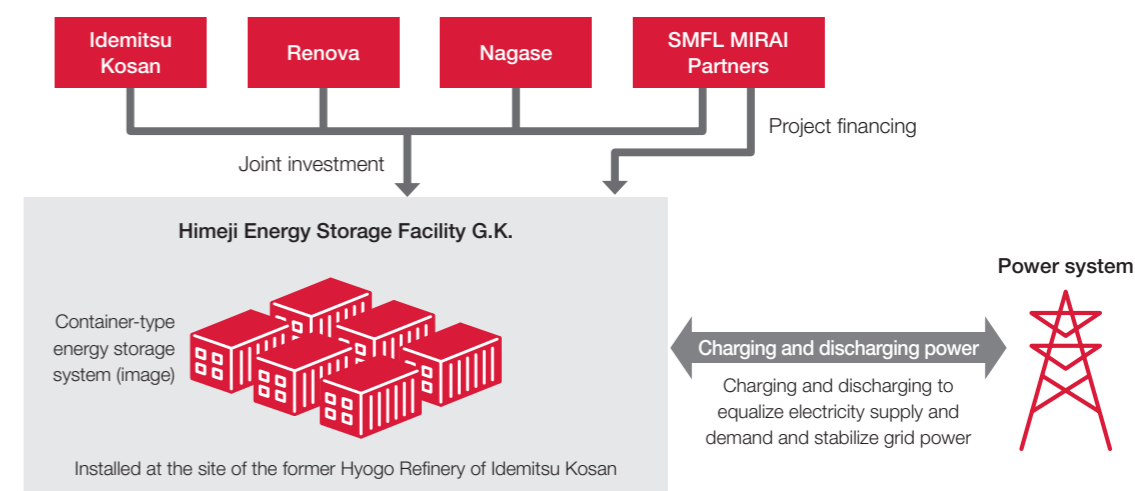
### Storage Battery Business for the Grid at the Former Hyogo Refinery

Amid the challenges posed by the unstable supply and demand of electric power caused by the recent expansion of renewable energy, we have decided to enter the grid storage battery business via a joint venture with RENOVA, Inc, Nagase & Co., Ltd. and SMFL MIRAI Partners Company, Limited. Grid storage batteries are large-scale storage batteries operated to stabilize the power system, and are expected to be widely adopted as one of the energy storage facilities effective in stabilizing the supply and demand of electrical power.

In this project, grid storage batteries (15MW/48MWh) installed at the former Hyogo Refinery will be directly connected to the power transmission and distribution network. By charging and discharging power according to the time of day, it contributes to adjusting the supply-demand balance of power systems,

which in turn contributes to the introduction of more renewable energy sources toward the realization of a carbon neutral society. The business is scheduled to begin operations in October 2025 and will leverage the know-how and human resources we have accumulated in the power and renewable energy business. Our goal is to establish a profitable model for the electric power business that leverages storage batteries for the grid and to gain knowledge for the future.

Looking ahead, we will continue to leverage the Group's strengths, such as our own idle land and ties with the local community, while actively oriented toward collaboration with other companies, thereby achieving both capital efficiency and competitiveness.



# Resources Segment

## Strengths

- A wealth of experience in oil and gas field development
- More than 30 years of project experience and relationships of trust with oil-producing countries and partner companies
- Integrated value chain spanning from coal production to sales and relationships of trust with customers
- The accumulated knowledge at Japan's only specialized coal research institute and a wealth of our technologies, such as black pellets, supporting low-carbon solutions

## Manufactured Capital (as of March 31, 2023)

### Oil and gas production volume

Name	Location	Production volume (thousand BOE <sup>*1</sup> /day)
		FY2022
Vietnam Gas Field	Off the coast of southern Vietnam	15.0
Norway Oil and Gas Field <sup>*2</sup>	Norwegian North Sea	15.6
<b>Total</b>		<b>30.6</b>

\*1 Barrels of oil equivalent

\*2 Figures include the impact of the acquisition of equity method affiliate Idemitsu Snorre Oil Development Co.,Ltd. (currently, INPEX Idemitsu Norge AS)

### Coal production volume

Name	Location	Production volume (thousand t)
		FY2022
Ensham Mine	Australia	2,670
Muswellbrook Mine	Australia	1,130
Boggabri Mine	Australia	4,590
<b>Total*</b>		<b>8,390</b>

\* Production capacity based on the Company's equity stake

## FY2023 Initiatives

The business environment surrounding the Resources Segment continues to be uncertain, as resource prices have experienced violent fluctuations since Russia's invasion of Ukraine in February 2022. We forecast that energy demand will continue to increase in the future, especially in Asia, and while we will continue to produce oil, gas, and coal, we also plan to offer a variety of solutions to our customers considering the current situation where environmental considerations are becoming more and more important.

In the oil exploration and production business, we are advancing exploration, development, and production activities for gas fields in the Southeast Asia region. Vietnam Gas Field has been producing steadily since the start of commercial production in 2021, and looking ahead, we will continue to develop the surrounding area to contribute to the stable supply of energy in Vietnam. Smooth operations are also continuing in the Norway Oil and Gas Field.

Major initiatives in the coal business under the Medium-term Management Plan include the sale of interests in the Ensham Mine

in Australia in response to our policy to reduce fossil fuel assets by 20% by 2030. We also terminated the Australia-based Muswellbrook Mine in March 2023, and the Company's coal production reduced from 8.4 million tons per year in FY2022 to 5.3 million tons per year.

Despite heightened environmental awareness around the world, coal remains an important energy source from the perspective of security of supply and economic efficiency compared to other energy sources. For customers who need coal, we provide a stable supply of high-quality coal and, at the same time, make various proposals based on environmental considerations.

In July 2023, we completed the construction of a commercial production plant for Idemitsu Green Energy Pellets in Vietnam, and are now making preparations to supply the products. In addition, leveraging our many years of experience in coal mine operations, we are also entering the rare metal mining business in Australia as a new initiative.

## Message from a General Manager

Idemitsu's coal business has an integrated supply chain from production at mines to transportation, storage, and sales, and has over 40 years of accumulated knowledge and experience. Within this, we have a history of working together with our employees and partners in each country and local community. In order to realize a carbon neutral society by 2050, we are promoting initiatives to reduce our environmental impact while striving for a stable energy supply by making maximum use of the management resources we have developed over the years.

In Australia, while continuing to provide a stable supply of coal from the Boggabri Mine, we will leverage the terminated Muswellbrook Mine site as a renewable energy base. We are

also taking on new business challenges, such as developing rare metal mines by leveraging the knowledge we have gained from coal mine operations.

In terms of reducing environmental impact, we have launched a commercial production plant for Idemitsu Green Energy Pellets in Vietnam as a solution that contributes to the low-carbon operation of coal boilers. Furthermore, we have established the Japan Black Pellet Forum in Japan to make suggestions to the government and are working toward the realization of a carbon neutral society through the promotion and expansion of the use of black pellets.



Executive Officer  
General Manager of Coal and Energy Solution Department  
**Yuzo Yoshida**

## Business Structure Reforms in Australia

Australia, rich in mineral resources, is home to many rare metals such as vanadium and lithium. Since rare metals are used in batteries, etc., which are indispensable for realizing a low-carbon society, Idemitsu is leveraging our business foundation developed through the operation of coal mines to promote entry into the rare

metal mining business. Through our investments in Critical Minerals Group and Vecco, which are promoting a vanadium mining project, and we have invested in Delta Lithium to advance their lithium coal mining project.

### ■ The supply chain from vanadium mining development to power supply (visual representation)



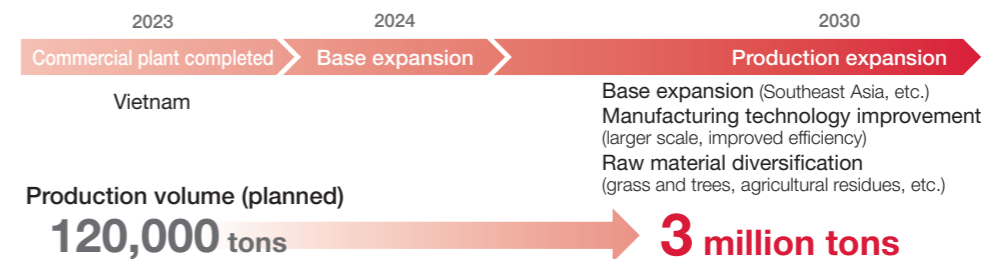
## Idemitsu Green Energy Pellets

Compared to other power sources, coal-fired power generation produces more CO<sub>2</sub> emissions per kWh (amount of electric power generated), so there is a need to find solutions to reduce CO<sub>2</sub> emissions. One of these solutions is to use biomass fuels, which are carbon-neutral raw materials. Biomass fuels are organic materials derived from plants, which absorb CO<sub>2</sub> through photosynthesis

during biological growth.

Idemitsu aims to produce 3 million tons per year of Idemitsu Green Energy Pellets, a biomass solid fuel to replace coal, by 2030. In FY2023, we completed the construction of a plant in Vietnam and continue to contribute to carbon neutrality by expanding our production bases and production volume.

### ■ Production system roadmap (image)



# Initiatives for Regional Development and Solutions to Social Issues

We position solving social issues as an important management issue and is working on co-creation solutions closely attuned to local issues in not just energy but also transportation, welfare, indus-

try, the environment, human resources development, crime and disaster prevention, and tourism.



## Local Energy Production for Local Consumption Initiatives

In April 2023, we launched a joint pilot test of supplying electricity to each facility through small-scale on-site PPA\*1 and EV charging at the Minamitane Town Hall and Tanegashima Airport Terminal Building in Kagoshima Prefecture. In this pilot test, we are utilizing "IDEPASS™\*\*2, a renewable energy power separation and supply system developed by the Company, and the "Re-Energy Choice™\*\*3 system, which enables the selection of renewable energy power for EV recharging.

gashima Sekiyu) and the payment system provided by our affiliated companies will be leveraged to settle those recharging fees.

Through these initiatives, we aim to diversify energy sources and achieve a low-carbon society, thereby contributing to the realization of people's comfortable daily lives in local communities.



In the aforementioned pilot test, Tanegashima Sekiyu K.K. and Idemitsu have been working together to promote local production for local consumption of energy in Tanegashima through pilot tests of EV-related businesses, including the conversion and recharging of public transportation vehicles to EVs in Nishinoomote City, Kagoshima Prefecture. In addition, in May 2023, we launched a pilot test in which EV rental cars provided by Nippon Rent-A-Car Service, Inc. will be recharged at two quick chargers on the island (operated by Tane-

\*1 On-site PPA: A type of electric power purchase agreement in which a solar power generation facility owned by a PPA company is installed on the roof of the user's premises, office, factory, etc., and electricity is supplied.  
 \*2 IDEPASS™: A system that enables facilities that can procure electricity derived from renewable energy to separate the electricity supplied (renewable energy electricity/non-renewable energy electricity) and allows customers to choose for themselves which type of electricity they want to use.  
 \*3 Re-Energy Choice™: A system where EV users can select to recharge with renewable energy from the electricity separated by IDEPASS.

## Launch of a Pilot Test Project for Next-Generation Farm-Based Solar Power Generation

In June 2023, we launched a pilot test of next-generation farm-based photovoltaic power generation that combines agriculture and renewable energy generation in rice paddies in Kisarazu City, Chiba Prefecture. Using solar panels with double-sided light-receiving solar panels and a mounting that automatically tracks sunlight, it prioritizes the irradiation of sunlight on crops grown under the solar panels during the farming season to maintain and improve the yield and quality of the crops. The electric power generated will be sold to general customers through our subsidiary Idemitsu Green Power Co., Ltd. By achieving power generation that takes into consideration the growth of crops, we aim to build a business model that balances farming and power generation. This system also was

awarded the Good Design Award 2023 by the Japan Institute of Design Promotion.



## Solving Regional Mobility Issues Through the Development of Mobility Services

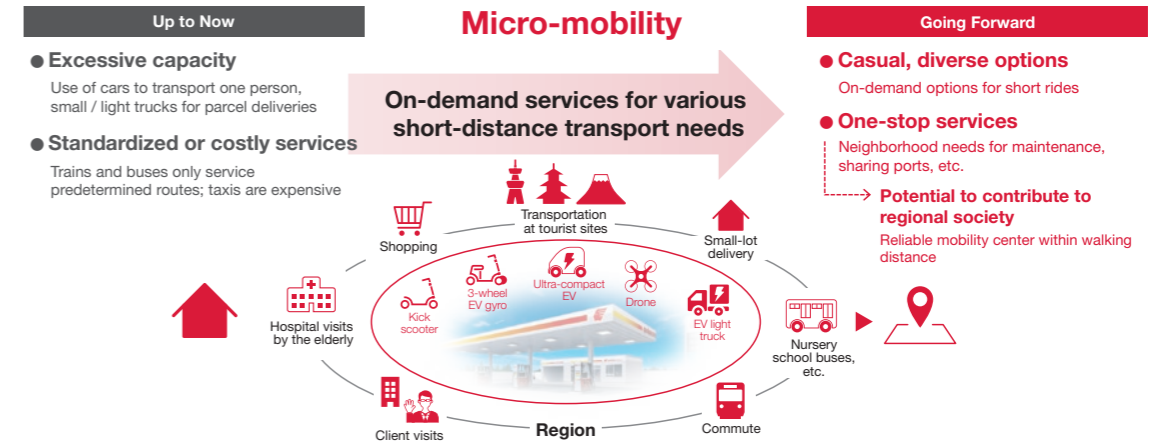
By leveraging our strengths in the mobility domain, which has supported motorization, and the strengths of our bases, which have contributed to local communities through the stable supply of energy, we will continue to work to solve social issues related to mobility.

By further expanding our customer contact base, which we have built up to now, we will respond to potential mobility-related requirements through our service stations network, vehicle maintenance technology, and a variety of mobility lineups, including ultra-compact EVs.



Also, we will not only develop and provide vehicles, but also develop new subscription and car-sharing models, build a digital platform related to MaaS, and develop recycling systems.

Going forward, we will also engage in efforts to develop mobility services, including the development of new services that combine electric power sales at apollostation with various mobility devices, the building of distributed energy that treats each vehicle as a rechargeable battery, and vehicle and battery reuse and recycling systems.



As a specific example of this effort, we conducted a car sharing pilot test in Okuma Town, Fukushima Prefecture, from October 2022, utilizing an ultra-compact EV. In this pilot test, in cooperation with the town of Okuma and local communities' dealers, we are addressing the transportation needs of residents and visitors working to recover from the earthquake disaster and they are using the system as a new means of transportation. Looking ahead, we will continue to work with local governments and dealers to develop new services rooted in the needs of each local community. In June 2023, we began monitoring public road driving using a prototype of the ultra-compact EV ideta at our training facility, the Ishioka Training Center (Ibaraki Prefecture). We will continue development while identifying areas for improvement.

## Ultra-compact EV (under development) ideta



## Future Concepts Using Drones

In light of the revision of the Civil Aeronautics Act in December 2022, we have begun joint development of domestically produced drones for their social implementation with Futaba Corporation. Using these, we will develop community-based services through our service stations.

Currently, in addition to methods of provision, including the service station's maintenance of the drones, we have begun to consider business opportunities for plant equipment inspections, agricultural applications, such as growth monitoring and pesticides spraying, and future distribution and delivery. Leveraging the strengths of service stations, we will develop the commercialization of drones through the entire process, from the development of the drones to their operation and nurturing of human resources.



# Research and Development

## Initiatives for Materiality (Key Challenges) and Research and Development Structures

We are developing a strategy to leverage external technologies as well as company-wide technologies, with “Contribute to carbon neutral and circular society” and “Contribute to regional society” as key challenges. The R&D system consists of Advanced Technology Research Laboratories and research laboratories for each division, which are responsible for specialized development. We have also established a Research &

Development Committee that spans the entire company, not only to consider directions and strategies but also to strengthen collaboration among research laboratories and improve technological capabilities.

The total R&D expenses for the entire group in the fiscal year 2022 amount to 23.6 billion yen (including 12.7 billion yen in the Functional Materials segment).

Research Field	Name of Laboratory	Japan	Over-seas	Outline of Initiatives
Corporate R&D	Environment & Energy Research Laboratory	●		GHG reduction and resource-recycling (biomass, CO <sub>2</sub> -derived fuels, bio-chemicals)
	Environment & Biotechnology Research Laboratory	●		GHG reduction and resource-recycling (resource crops, biofuels) Development of functional materials (bio-materials)
	Advanced Organic Materials Research Laboratory	●		Development of functional materials (organic polymer materials)
	Advanced Inorganic Materials Research Laboratory	●		Development of functional materials (inorganic materials)
	Analytical Technology Center	●		Providing advanced analysis and analytical solutions to a wide range of fields throughout the Group (including computational science)
	Idemitsu Kosan Collaborative Research Cluster for Advanced Materials	●		Creating next-generation materials, enhancement and expansion of fundamental technologies and acquisition of technologies in the CNX solution area
Production engineering	Technology & Engineering Center	●		Technology development in the area of engineering design, construction, operation, and quality control & assurance of production facilities Technology-driven contributions to new businesses through the development of production processes
Lubricants	Lubricants Research Laboratory	●		Research and development of lubricants and tribology (lubrication technology)
	Idemitsu Lubricants America Corporation R&D Center		●	Local-based research and development of lubricants
	Idemitsu Lube (China) Co., Ltd. Research & Development Center		●	Global development of lubricants products and technologies with the Lubricants Research Laboratory (Japan) as the mother research center
	Idemitsu Lube Asia Pacific Pte. Ltd. R&D Center		●	Rapid product development and provision of technical services to meet local needs overseas
Advanced materials & performance chemicals	NIPPON GREASE Co., Ltd. Technical Research Laboratory	●		Research and development of grease, heat treatment oil, metal processing oil, etc.
	Performance Materials Laboratories	●		R&D and development of applications for engineering plastics, adhesive base materials, liquid rubber, electronic materials, etc. Provision of solutions based on catalyst, synthesis, material design, compounds, and practical assessment technologies
	Idemitsu Unitech Co., Ltd. R&D Center for Plastic Products	●		Research and development of molded plastic products
Electronic materials	IDEMITSU FINE COMPOSITES CO., LTD. Composite Materials Research Laboratory	●		Research and development of plastic composite materials that meet market requirements
	Electronic Materials Development Center	●		Research and development of OLED materials
Bitumen	Idemitsu Research and Business Development Europe AG		●	Research and development of OLED materials
	Technology Section	●		Basic and applied research on asphalt and its applications Development of high-performance asphalt
Pesticides and functional feed	SDS Biotech K.K. Tsukuba Research & Technology Center	●		Development of pesticides and feed additives derived from microorganisms and natural products Development of safe and useful products for the protection of plants and livestock and the prevention of diseases
Lithium battery material	Battery Material Development Center	●		Development of sulfide-based solid electrolyte materials, which are key to all-solid-state lithium-ion secondary batteries (all-solid-state batteries), and development of manufacturing processes and mass production technology development
	Technology & Engineering Development Center	●		Development of manufacturing technology and design/construction of mass production facilities for the commercialization of the aforementioned solid electrolyte materials
	Technology Planning Office	●		Examining and exploring recycling technologies and next-generation battery materials
Solar power generation	Solar Frontier K.K. Kunitomi Office	●		Exploring solutions for new business development Research and development for the commercialization of recycling technologies for solar panels, including crystal silicon panels
		●		
Coal and the environment	Coal & Environment Research Laboratory	●		The only private research specializing in coal Provision of technical services and development of clean use technologies for coal for a low-carbon society, such as biomass fuels that help reduce GHG emissions as well as carbon recycling and highly efficient combustion technologies

■ Petroleum Segment, corporate research ■ Functional Materials Segment ■ Power and Renewable Energy Segment ■ Resources Segment

## Examples of New Technology and R&D

### The development of a new method for synthesizing ammonia (green ammonia)

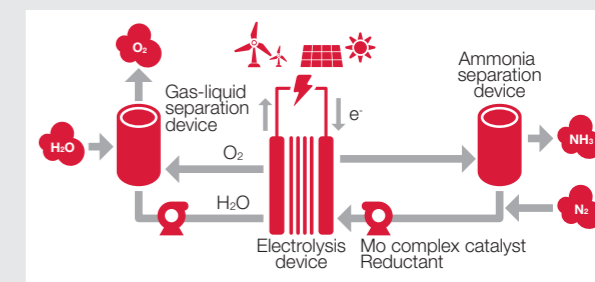
Ammonia is expected to be a next-generation fuel for coal-fired power plants and marine vessels due to its lack of CO<sub>2</sub> emissions during combustion. Currently, ammonia is commonly produced by the Haber-Bosch (HB) process, which involves the reaction of nitrogen with hydrogen derived from fossil fuel sources under high temperature and high pressure, resulting in significant CO<sub>2</sub> emissions.

Idemitsu is conducting research on the green ammonia production technology in a NEDO\* project; based on a Mo catalyst developed by Prof. Nishibayashi's group, the University of Tokyo, we have demonstrated the continuous generation of ammonia from nitrogen, water, and renewable energy even under ambient temperature and atmospheric pressure condi-

tions, using a newly developed reductant.

Our current focus is on establishing this cutting-edge technology for practical use, as a replacement for the HB process.

\* NEDO: New Energy and Industrial Technology Development Organization (NEDO)



## Strengthen Activities for the Creation of New Businesses

In the initial stages of R&D, such as exploration and investigation, which are the keys to create new businesses, we are working for the transformation of our business portfolio, not only with a focus on open innovation as the core of our initiatives, through active cooperation with external parties, but also by leveraging our in-house technologies and knowledge.

### Promoting open innovation

We are working with venture capital\* to promote cooperation with startup globally. As an example, in Bio / life solutions, in April 2023 we invested in Bacchus Bio innovation Co., Ltd. and launched a smart cell development initiative.

Through the activities of the “Idemitsu Kosan Collaborative Research Cluster for Advanced Materials” established at Tokyo Institute of Technology in FY2020, we promoted the acquisition of technologies in the focus areas of advanced materials and CNX solutions with Tokyo Institute of Technology, resulting in five patent applications and four conference presentations in FY2022.

To expand business creation further, we established a joint research department with Kobe University in 2023 and started academic cooperation with the University of California, Santa Barbara.

\* Universal Materials Incubator (headquarters: Japan), Emerald Technology Ventures (headquarters: Switzerland), Azimuth Capital Management (headquarters: Canada), Hatch Blue (headquarters: Ireland)

## Enhance R&D Activities Through MI / DX

We are promoting initiatives to accelerate R&D by spreading Materials Informatics (MI) and strengthening DX.

- (1) Reskilling: We provide education to improve data science literacy and acquire the necessary skills through training courses, sharing examples of in-house initiatives, and workshops across all research departments.

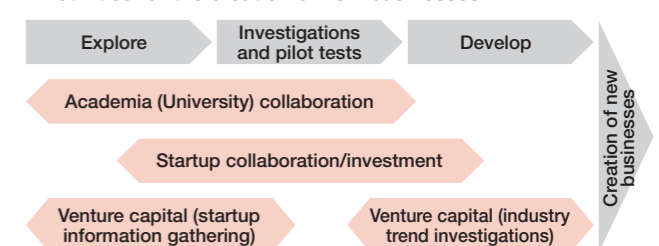
### Creating themes through cross-functional initiatives

The creation of new medium- to long-term business themes (Advanced Materials Project) is now in its third year and continues to bring together the wisdom and expertise of a total of 30 people and is continuing its activities.

The themes from the initiative are not limited to in-house discussions. Also bring excellent technologies of academia / SU in this.

Through these efforts, we are promoting initiatives to continue to train innovative employees.

### Activities for the creation of new businesses



- (2) DX Solution: We are accelerating the development of solutions that solve key MI/DX issues in each R&D collaborating with domestic and international consulting firms.
- (3) Data Science Environment: We are building a company-wide cloud environment dedicated to data science that allows us to safely and flexibly leverage open databases and open source software, which are essential for MI/DX.

# Intellectual Property Activities

## Overview of Our Intellectual Property Activities

The Idemitsu Group's business department, R&D department, and Intellectual Property Department collaborate to apply for and obtain rights to patents, trademarks, and other intellectual property, maintain and utilize them, and strive to improve our Group's business and enhance the value of the brand.

With regard to risks and compliance related to intellectual property, such as respecting the intellectual property rights of other companies and managing confidential information, we design and implement appropriate processes to prevent the occurrence of risks.

## Results of Intellectual Property Activities

### Number of patent applications and registered patents held

In order to leverage its patents to differentiate itself from its competitors and ensure business competitiveness, the Group works to build a robust patent portfolio.

Patent applications are submitted based on application strategies that are in line with business development, such as not submitting applications in Japan but only in specific overseas countries in accordance with the market trends of each business. For this reason, the number of domestic applications (disclosed) decreased in FY2022 compared to the previous year, but the number of foreign applications increased significantly.

Looking at patent applications by business segment, the Functional Materials segment, which consists of technology-driven business divisions, accounted for more than 80% of all patent applications, both domestic and foreign.

In the Functional Materials business department, the number of patent applications is set as one of the key performance indicators (KPI) to evaluate innovation efforts. We also use the number of patent applications to measure the effectiveness of our R&D investments.

Looking at the number of patents held, the number of foreign patents held, which are necessary for global business development, is steadily increasing.

With regard to foreign patents, we are strengthening the acquisition of patents ahead of competitors in the countries in which we have operations. By effectively leveraging the knowledge and experience of overseas attorneys, such as by providing opportunities for direct discussions with attorneys from overseas law firms, we are ensuring that we secure intellectual property rights that will strengthen our business competitiveness.

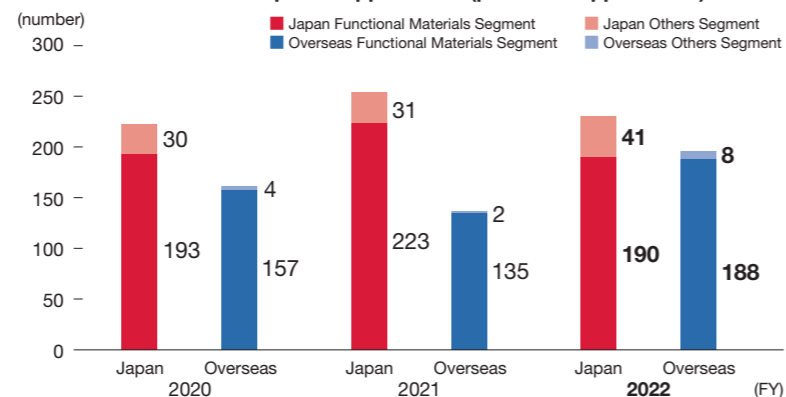
### Value of patents held

The value\* of the patents held by the Company has been enhanced by continuous R&D investments.

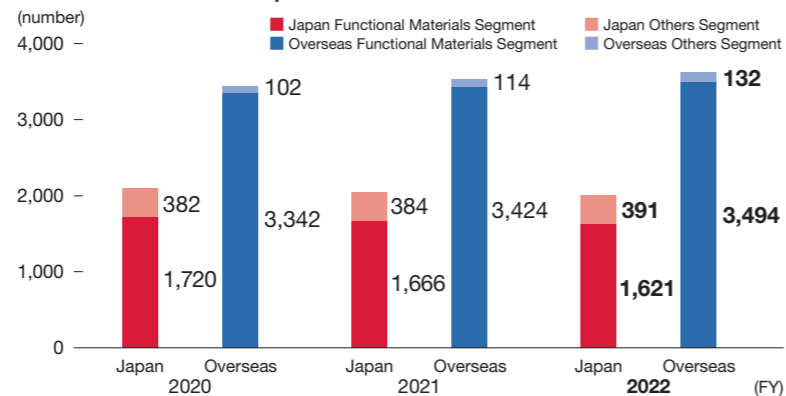
The overall value of patents held is "1.89," well exceeding "1." Furthermore, in FY2022, patents with high value represent more than half of all patents held, an increase of about 2 percentage points over FY2020.

\*Technology Relevance (TR): Value calculated based on the number of citations in the examination by the Patent Office in each country (the average value of TR is "1"). TR data in this report are calculated using PatentSight®, a patent analysis tool of LexisNexis®. Patents with TR>1 are defined as patents with high value, and the ratio of patents of high value to patents held is calculated.

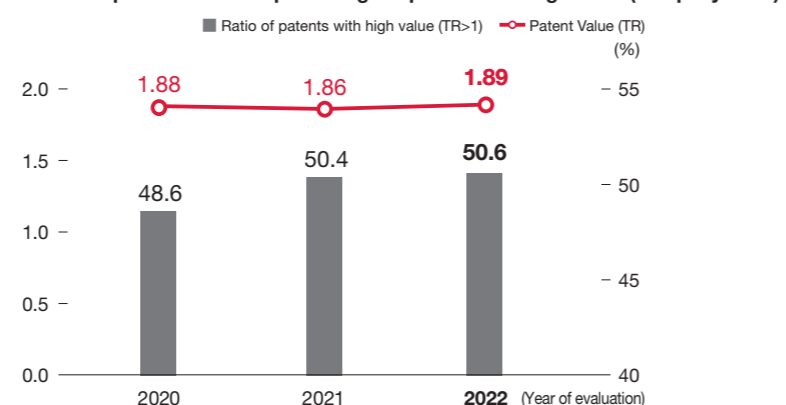
### Trends in the number of patent applications (published applications)



### Trends in the number of patents held



### Value of patents held and percentage of patents with high value (company-wide)



In 2022, the patents of the Functional Materials business show a high value (2.20). These patents with high value have contributed significantly to improving the profitability of existing businesses, including the electronic materials business.

In addition, the patents held in the three focus areas of the Functional Materials Segment ("Electrification & Electrification Solutions," "Bio / life solutions," and "ICT Solutions") set forth in the Medium-term Management Plan have shown even higher values (3.60). We expect that this will contribute greatly to our business competitiveness in these fields in the future.

In addition to demonstrating our accumulated abilities in technology, the Group will promote external cooperation with academia and start-ups that generate technological innovations, acquire valuable patents that will become a source of business competitiveness, and build a patent portfolio.

### Patent data analysis (IP landscape) activities

The Group's patents with high value (technologies) are analyzed to identify technological strengths (core competencies) that can serve as a source of competitive advantage. In the future, we will consider and establish candidate themes for new growth areas based on these core competencies.

We also consider third-party technologies and patents that can augment and complement startups and supply chains, and we are engaged in initiatives to find partners that can help us launch new businesses.

### Rewards for inventions (Incentives for employee inventions)

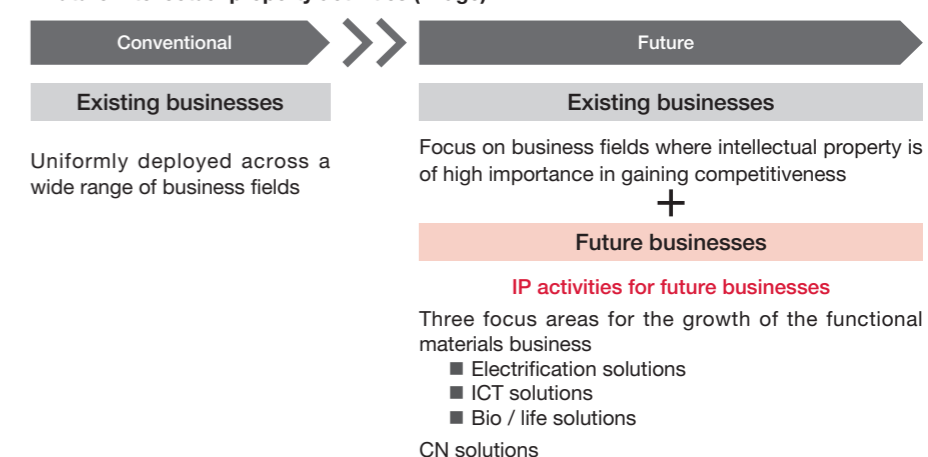
To motivate employees to invent new things and encourage the creation of innovative inventions that lead to business growth, we established Company's own "Employee Invention Incentive Program," praising inventors, especially those who have made significant contributions to business earnings.

In FY2022, 51 inventors were recognized for their outstanding results in the electronic materials field (7 products) and advanced materials & performance chemicals field (3 products) with the "Employee Invention Incentive" honor.

## Future Intellectual Property Activities

Future IP activities will focus even more on those business fields where intellectual property is of high importance in gaining business competitiveness. We will promote an IP strategy to demonstrate our abilities to be highly competitive by prioritizing and maximizing the leverage of IP resources in business fields where intellectual property is of high importance. We will also invest intellectual property resources in future business development, promoting initiatives in new growth areas and innovative technology development.

### Future intellectual property activities (image)



### Value of patents held by the Functional Materials Segment and Functional Materials business focus areas (2022)

Segment	Patent Value (TR)	Number of patents
Total patents held	1.89	5,638
Of which, patents held by the Functional Materials Segment	2.20	5,115
Of which, Functional Materials business focus areas	3.60	1,196

### Digital transformation (DX) activities

We promote the use of AI in a phased manner to improve the quality and efficiency of IP operations. We have established an environment that enables researchers to conduct prior technology investigations themselves through the use of AI, which IP managers had previously conducted. We have also begun considering the leverage of AI technology for researching registered trademarks and determining the patentability of completed inventions. We will continue to proactively incorporate AI technology into our intellectual property activities and promote high-quality intellectual property activities that adapt to the changing business environment.