A Recycling-Oriented World
DOWA

Corporate Strategy Briefing

Strengthening sustainability Management

DOWA HOLDINGS CO.,LTD.

November 18, 2024

Direction of the Dowa Group

A Recycling-Oriented World

promotion of resource recycling × provision of excellent materials and technologies = Realization of a sustainable world Sustainable Growth

Non-ferrous metals, with their diverse functions, play an important role as key materials supporting the realization of innovation, in pursuit of solutions to social issues such as the realization of a decarbonized society and the digitization of society.

The DOWA Group has been working in metal recycling ahead of the rest of the world since the 1990s and has continued to refine its technologies for adding value to metals, thereby practicing management that balances contribution to solving various social issues and sustainable growth.

The DOWA Group will continue to further develop its unique “recycling-oriented business model” based on the pillars of “resource recycling” and “provision of superior materials and technologies” and play a central role in resource recycling towards a realization of a sustainable world.

Basic Strategy Under the Midterm Plan 2024

- The DOWA Group defines “Strengthening sustainability management” as a basic strategy in addition to the business growth through “Evolution of recycling-oriented business model,” and will achieve improvement in both its economic value and social value by further deepening integrated management.

Social issues that the DOWA Group should contribute to solving (The DOWA Group’s Materiality)

E	Creating a resource-recycling society
	Enhancing products and services that reduce social and environmental risks
	Responding to climate change
	Protecting the environment
S	Ensuring occupational safety and health
	Increasing organizational power (including promotion of diversity, job security, and human resource development)
G	Promoting risk management
	Strengthening corporate governance
	Driving DX (data utilization)

Evolution of recycling-oriented business model (Seizing opportunities)

Integrated management

Strengthening sustainability management (Risk mitigation)

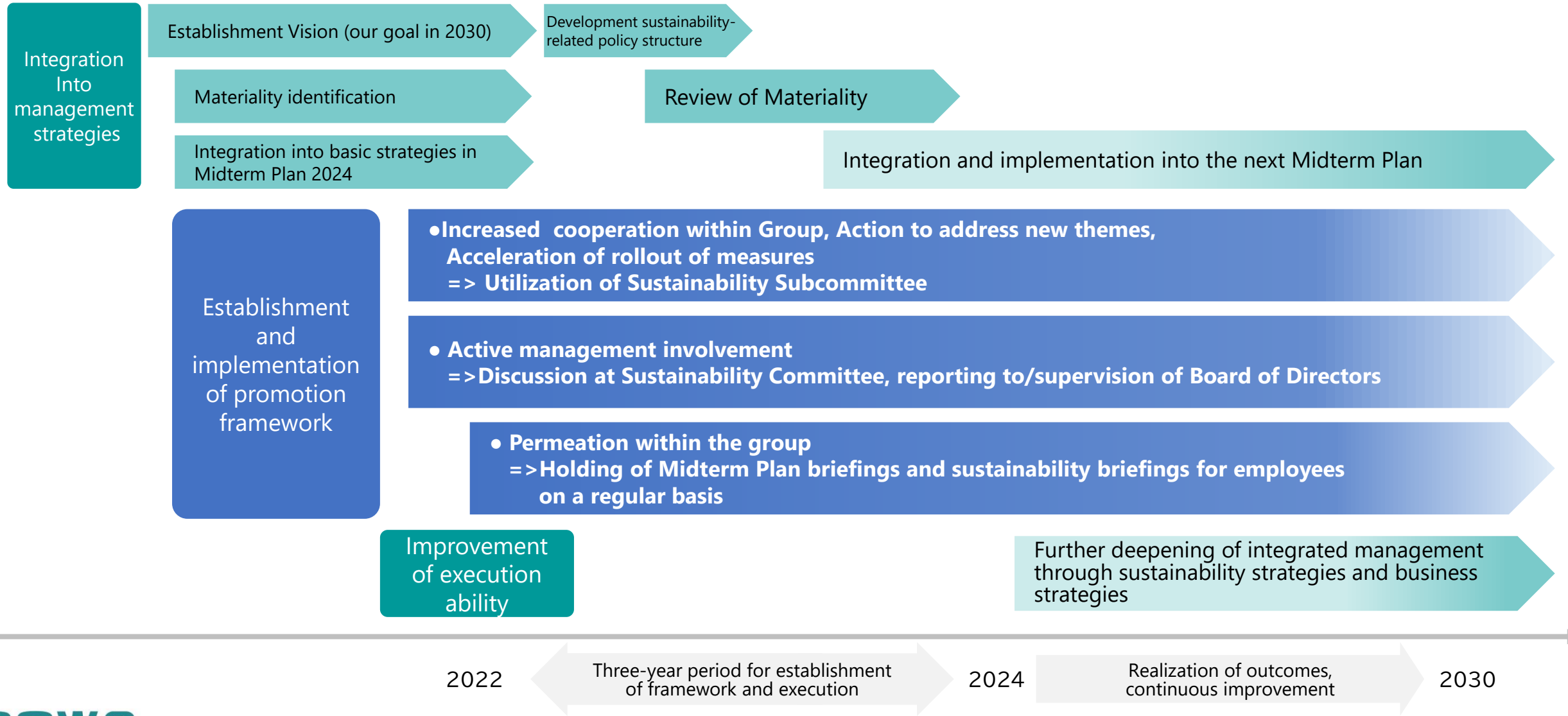
Vision (our goal in 2030)

Contribute continuously to building a sustainable future through our core businesses, the promotion of resource recycling, and the provision of excellent materials and technologies

Achievement of Vision

Strengthening Sustainability Management

- We will unite as a Group to steadily implement initiatives, aiming to substantively execute strategies.



Establishment of Sustainability Promotion Framework

- Improve the ability to implement and drive measures for each materiality by sharing information across the Group and consider countermeasures.

Sustainability Promotion Framework

Sustainability Committee

Members President and representative director (Chairperson), Full-time directors, executive officers and the person in charge of each theme

Holding Twice a year **Activities** Discussing and making decisions on important sustainability policies and measures as well as their progress

Sustainability Subcommittee

Members

Director responsible for Corporate strategy(Chairperson), Each Company department, Operating companies and Operating support companies

Holding

Monthly starting in April 2022

Activities

Sharing information and discussing countermeasures on each Materiality

	Main Activities in FY2023
Apr.	- Reviewed feedback from Sustainability Committee and Board of Directors - Discussed announcement of roadmap for responding to climate change, Shared information about ESG rating
May	- Confirmed and discussed progress of initiatives on four themes, including climate action
Jun.	- Confirmed and discussed progress of initiatives on four themes, including Environmental protection and Ensuring occupational safety and health - Shared information about selection for ESG indexes
Jul.	- Confirmed and discussed progress of initiatives on four themes, including Creating a resource-recycling society and Driving DX (data utilization) - Discussed third-party assurance for sustainability disclosures and action on human rights
Aug.	- Reviewed activities in H1 - Discussed on human rights response, Shared information about results of ESG rating
Sep.	(Convened jointly with Sustainability Committee)
Oct.	- Reviewed feedback from Sustainability Committee and Board of Directors
Nov.	- Confirmed and discussed progress of initiatives on five themes, including Enhancing products and services which reduce social and environmental risks - Discussed announcement of roadmap for responding to human rights
Dec.	- Confirmed and discussed progress of initiatives on four themes, including Increasing organizational power and Promoting risk management
Jan.	- Confirmed and discussed progress of initiatives on four themes, including Strengthening corporate governance and Driving DX (data utilization)
Feb.	- Reviewed activities in H1
Mar.	- Summed up activities in FY2023 and discussed action plan for FY2024

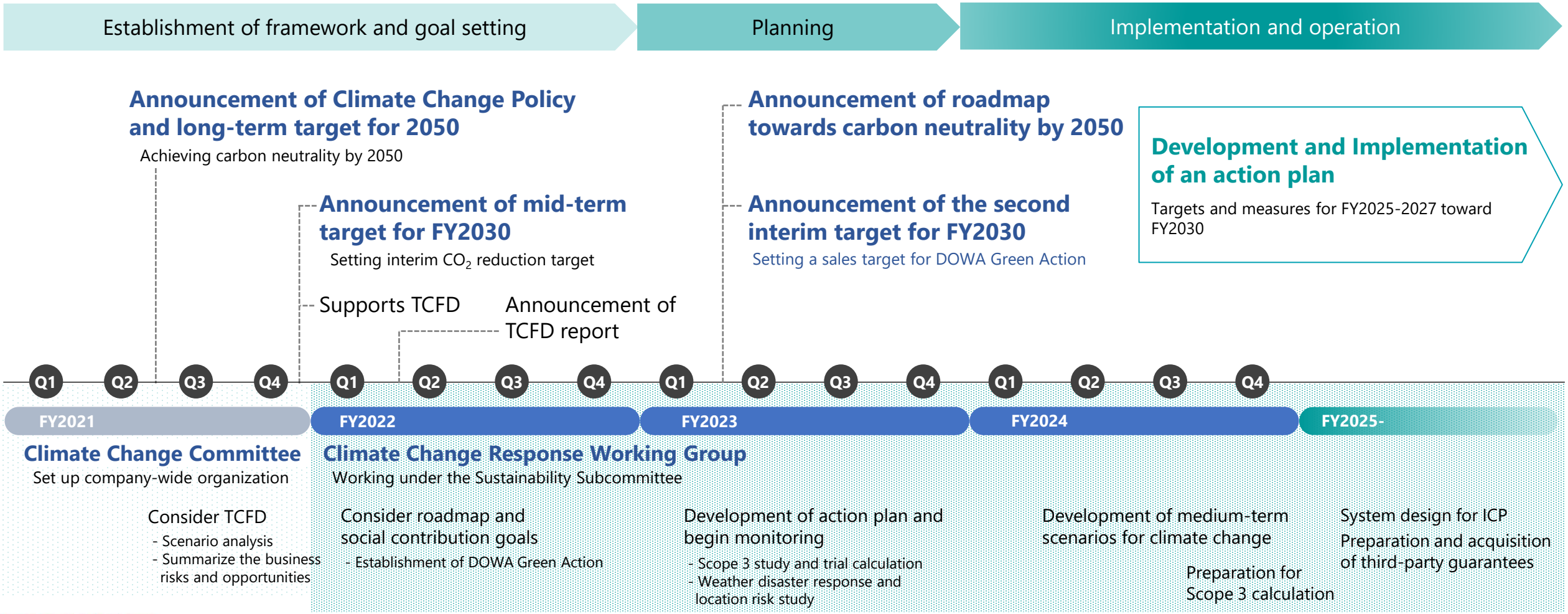
Initiatives for Materiality

Introducing 3 themes we have focused on in the Midterm Plan 2024.

- Creating a resource-recycling society
- Enhancing products and services which reduce social and environmental risks
- **Responding to climate change**
- Protecting the environment
- Ensuring occupational safety and health
- **Increasing organizational power**
- Promoting risk management
- Strengthening corporate governance
- **Driving DX (data utilization)**

Responding to climate change | Initiatives

- Developing the framework to promote group-wide initiatives for responding to climate change.
- Steadily making progress with the publication of our Climate Change Policy and long-term/mid-term targets, TCFD report and roadmap.
- An action plan to achieve the two mid-term goals for FY2030 plan is being developed in conjunction with developing the next Midterm Plan.

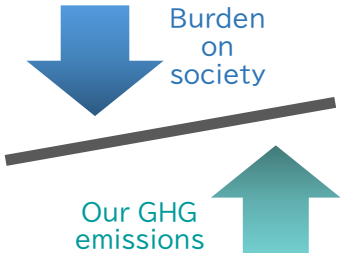


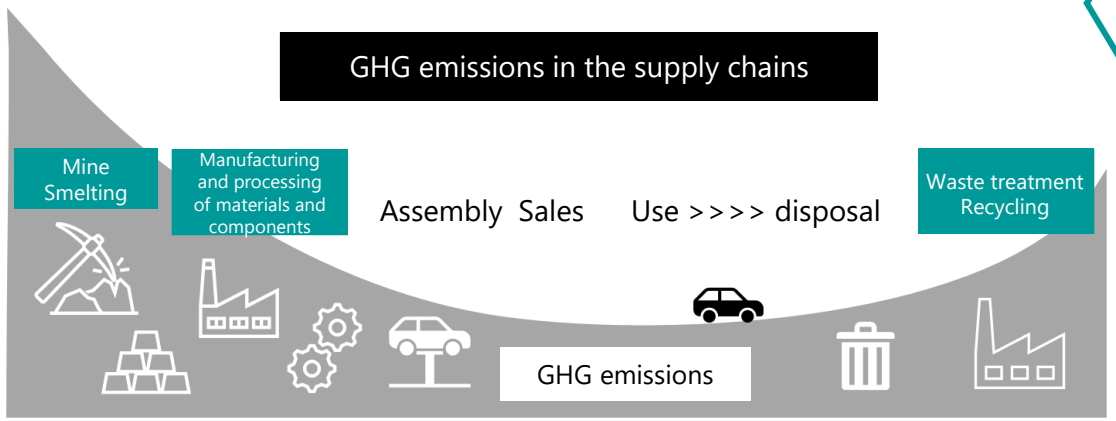
Responding to climate change | Achieving Both Decarbonization and Resource Recycling

- Resource recycling needs to be accelerated for the stable supply of non-ferrous metals, which are essential for a decarbonized society.
- The DOWA Group contributes to the decarbonization of society as a whole by recycling a wide variety of non-ferrous metals and providing them to customers as raw materials and functional components such as batteries and EV parts.

Issues

- The material manufacturing and waste treatment/recycling industries have processes in the supply chains that generate particularly high CO_2 emissions.
- The dilemma we face is that, as demand for materials and services that contribute to the decarbonization of society grows, our GHG emissions will increase.





Our Approach

- Strengthen the resource recycling business while at the same time working to decarbonize our own operations for the realization of carbon neutrality by 2050.
- Work to ensure that the value create through resource recycling is properly appreciated by society.

Initiatives/ Issues for Consideration

- Expand introduction of renewable energy
- Enhancement of recycled metal recovery technology
- In-house generation and introduction of biomass energy
- Enhancement of value of recycled materials
- Consideration of indicators that show contribution materials made to society

Responding to climate change | Role of Waste Treatment in Society

- The DOWA Group is putting effort into the waste treatment business as well as the metal recycling business.
- Incineration of waste is essential not only for public health and safety, but also as social infrastructure for recycling.
- The establishment of new landfill sites in Japan is problematic, and extending the life of existing landfill sites is an important social issue.

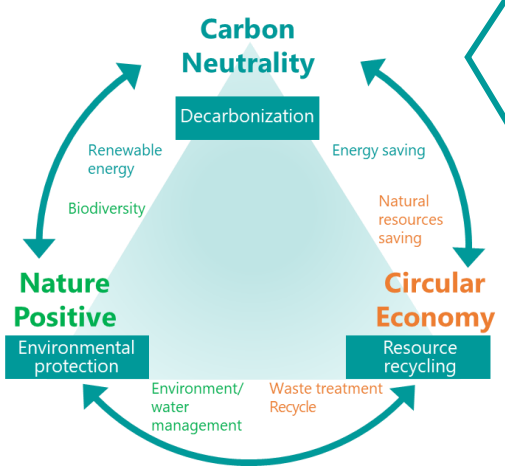
Issues

GHG emissions from incineration

- Difficulty of controlling GHG emissions from incineration because they are derived from waste received from customers.
- Balancing the continuity and economic efficiency of hazardous waste treatment that is essential for expanding and promoting resource recycling.

Cross-disciplinary initiatives

- Integrated perspectives and approaches to interrelated issues such as protection of the environment and circular economy, as well as GHG emissions reduction, is required.



Our Approach

- Implement lower carbon waste treatment through the adoption of more efficient technologies and processes.
- Develop technologies to treat waste that is difficult to treat, strengthen dissemination of information to raise recognition of the importance of waste treatment.
- Contribute to reducing society's GHG emissions by destroying CFCs.
- Focus on integrated measures for decarbonization, protection of the environment and resource recycling to build a sustainable world.

Initiatives/ Issues for Consideration

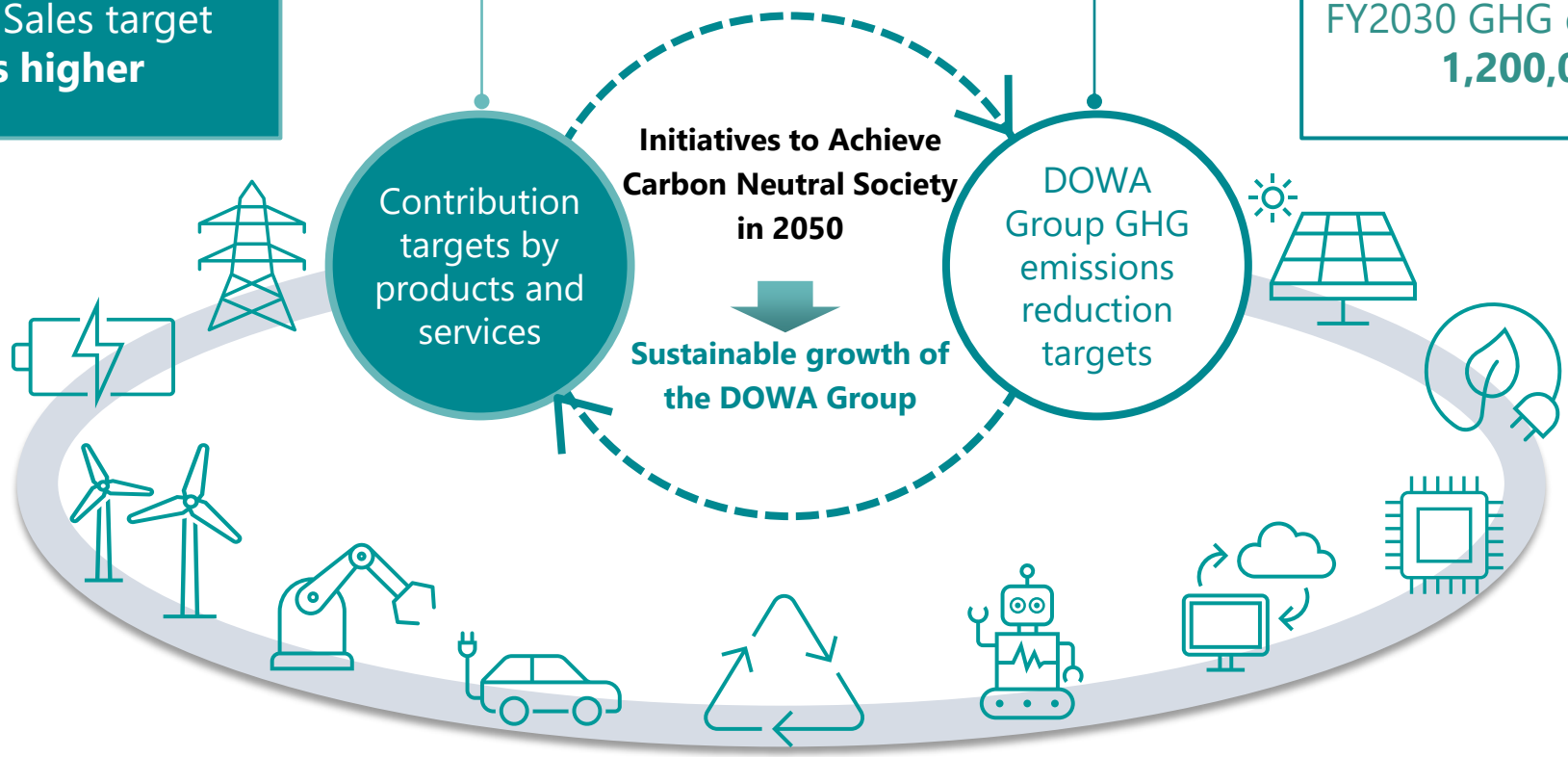
- Improvement of recycling efficiency through enhancement of pre-treatment
- Implementation of biomass energy
- Expand introduction of renewable energy
- Determination of carbon footprint of waste treatment
- Implementation of TNFD initiatives

For the Formation of a Recycling-Oriented Society and the Realization of a Decarbonized Society

- The DOWA Group is addressing to climate change by driving through both the “reduction of its own GHG emissions” and the “creation and expansion of products and services that contribute to society’s efforts to combat climate change”.

FY2022 DGA Sales result
Approx. 360 billion yen
↓
FY2030 DGA Sales target
1.6 times higher

FY2013 GHG emissions result
1,730,000 t-CO_2
↓
FY2030 GHG emissions target
1,200,000 t-CO_2

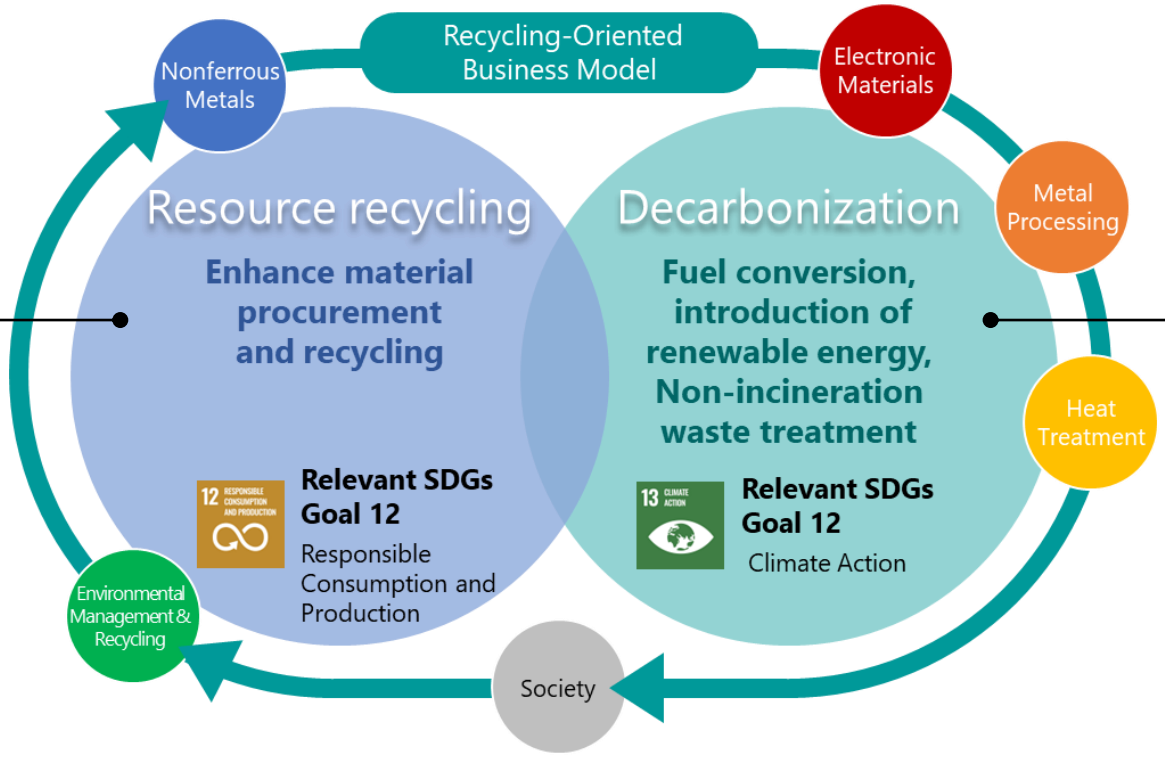


Responding to climate change | Contribution Through DOWA Green Action

- In May 2023, we established DOWA Green Action (DGA) and set a sales target for DGA products and services (FY2030 sales targets), in addition to its own GHG reduction target, to demonstrate internally and externally the Group's response to climate change and our readiness to contribute.
- The Dowa Group will contribute to addressing climate change through its business activities and make addressing climate change a growth opportunity for the Group.

Providing materials that contribute to the realization of a decarbonized society

- Collect more materials for recycling globally
- Increase the ratio of metals derived from materials for recycling
- Establish metal recycling from new types of waste, such as lithium-ion batteries and solar panels



Products and services that help customers and society cope with climate change

- Reduce consumption of fossil fuels
- Expand the use of renewable energy
- Utilize waste in energy sources
- Enhance productivity in metal smelting and reduce the electric power consumption rate
- Shift from waste incineration to recycling

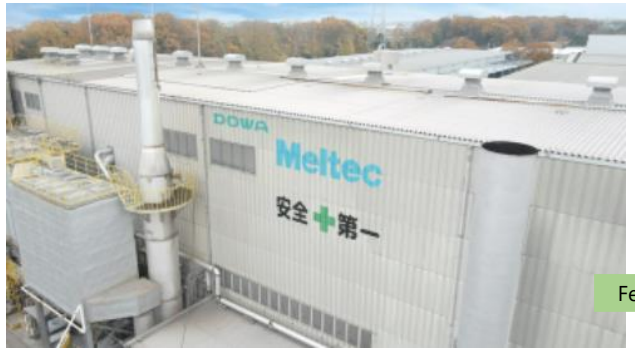
Responding to climate change |
The New Business Model to Achieve Both Resource Recycling and Decarbonization

Raw materials Energy

- In the Environmental Management & Recycling Business, we have established an integrated system for the development and production of Bio-coke.
- We are building a business model to achieve both resource recycling and decarbonization.

- We established the first integrated system for the development, production, and evaluation of Bio-coke* in the private-sector in joint research with Professor IDA Tamio of Kindai University.
- Replacing a portion of the coke used by MELTEC with Bio-coke.

MELTEC (Tochigi Prefecture)



【Products】

Mel-mine
(Precious metal-containing metal)

Mel-ace

Incineration ash derived from waste

Bio-coke (Alternative coke)

Development → Establishment of integrated system internally → Production → Evaluation → Use → Feed Back

Market-based procurement

To KOSAKA SMELTING & REFINING

Utilize as raw materials for roadbed materials

・We will also pursue reduction in CO_2 emissions from raw materials by using molten metal (Mel-mine) in some recycled raw materials.
・We are conducting tests to convert pulverized coal used in TSL furnaces into biomass fuel and set up a testing furnace in September 2024.

recycled raw materials

biomass fuel (Alternative pulverized coal)

Kosaka Smelting & Refining
(Alita Prefecture)

【Products】

Gold Silver Tin etc.

Nonferrous Metals

Environmental Management & Recycling

Recycling-Oriented Business Model

Social

*Bio-coke: A type of biomass solid fuel produced from biological resources such as animal and plant matter, developed by Professor IDA Tamio of Kindai University. Compared to other biomass solid fuels, Bio-coke is expected to be adopted as an alternative fuel to coal coke because it maintains its strength even under high-temperature combustion and lasts longer as a fuel.

DOWA

Responding to climate change | Role of Waste Treatment in Society

Resource recycling

Recycling of new kinds of metals

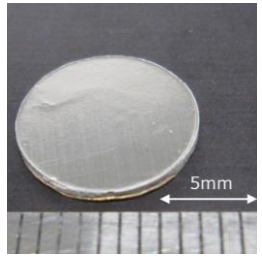
- Enhancing the recycling of nonferrous metals, which are indispensable for energy saving and the improvement of functionality in automobiles and electronic devices, for the realization of a decarbonized society.

- Started recycling ruthenium in addition to base metals and precious metals and considering recovery of yttrium and scandium.

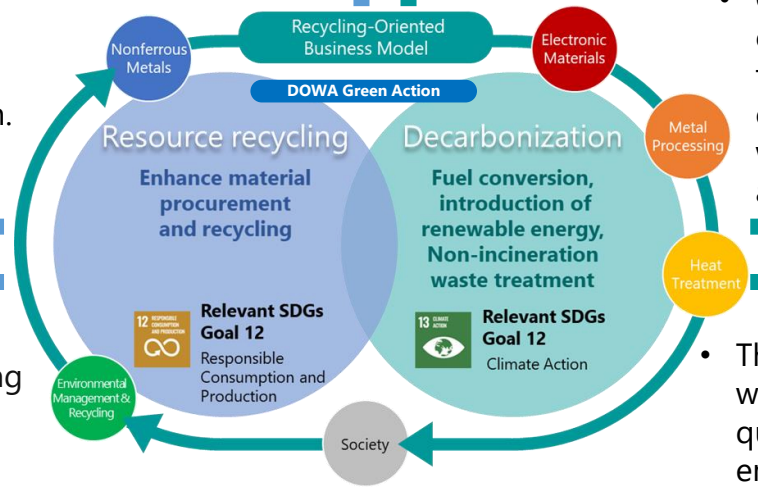
Decarbo nization

Solid electrolytes for all-solid-state lithium-ion batteries

- Developed garnet-type solid electrolytes with globally best-in-class low-temperature sintering property for oxide-based all-solid-state lithium-ion batteries through joint research with the National Institute of Advanced Industrial Science and Technology (AIST).



- Garnet-type solid electrolytes are considered to be promising materials that will increase the output and capacity of all-solid-state batteries, which are expected to have practical applications to large batteries.



- Even large batteries can be processed safely, without requiring them to be dismantled, thereby enabling even more efficient recycling.
- Achieving highly efficient recovery of iron, copper and cathode material components (black mass) by crushing and sorting after separation of iron and copper.

Resource recycling

Recycling of lithium-ion batteries

- The Z-TKM can shorten lead times while maintaining heat treatment quality, minimizing gas and CO_2 emissions from the heat treatment process.
- By combining green energy, ammonia burners, and hydrogen burners, operation that emits almost no CO_2 in-process could be achieved.

Decarbo nization

Next-generation carburizing and hardening furnace “Z-TKM”

Increasing organizational power

- Securing human resources is a matter of urgency as labor force shrinks in Japan. Rural areas are experiencing more rapid population decline.
  => securing a labor force and create organizations in which diverse human resources play an active part in enhancing our corporate value through our business activities.

Key themes

Main measures

Securing human resources

- Strengthening of group-wide recruitment ability
- Initiatives to reduce of resignation rate

Developing human resources and promoting organization building that will create change

- Publication of the human resource development policy
- Renewal of in-house training structure

Establishing diverse workstyles

- Initiatives to reduce total hours worked
- Support for balancing childcare and nursing care with work
- Promotion of KENKO Investment for Health
- Strengthening of employee engagement

Promoting diversity and spreading awareness of human rights

- Strengthening of human capital disclosures
- Strengthening recruitment for promoting of the participation and advancement of women
- Initiatives to extend retirement age
- Initiatives to raise human rights awareness

Promoting DX initiatives among human resource

- Promotion of in-house talent identification
- Strengthening of employee engagement

Increasing organizational power | Initiatives within the Group (AKITA ZINC CO., LTD.)

- We have been conducting activities for many years aimed at strengthening our business foundations by improving employee engagement, in pursuit of the sense of purpose advocated in our mission.
- We encourage organizations to come together in activities that contribute to local communities such as cleanup activities around the Port of Akita and support for various events.

Key measures

[Recruitment] Recruiting in cooperation with each company in the zinc business
[Development] Introducing and implementing of mentor system
[Work environment] Encouraging employees to take various types of leave
[Dialogue] Implementing surveys and counselling

AKITA ZINC

Results

2012	Achieved retention rate*1 of over 98% （Maintained）
2014	Reduced 3 year attrition rate*2 to less than 10% (Maintained）
2015	Became first company in Akita Prefecture to be certified as 'Youth Yell' company
2017	Became the second company in Tohoku to receive the Innovation Award in the Good Career Company Awards
2021	Achieved employee satisfaction*3of over 70%
2022	Number of days paid leave taken per employee exceeded 20 days
2023	Certified under Akita City's Child-Friendly City Planning program
2024	Certified under the Certified Health & Productivity Management Organizations Recognition Program 2024

*1 Number of employees at the beginning of fiscal year who are still in employment at the end of the fiscal year, expressed as a percentage of the total number of employees
*2 Number of employees who resign within three years of joining the company, expressed as a percentage of the total number of employees
*3 Percentage of employees who, on a 1-5 scale for employee satisfaction, gave the top two ratings, which indicate "satisfied" and "very satisfied"

Increasing organizational power | Respect for Human Rights

- Respect for human rights is the foundation for creating a prosperous society and is one of the most indispensable and important initiatives to our business activities.
- DOWA Group positions respect for human rights as one of its most important management issues. We strive to fulfil our corporate responsibility to respect human rights by implementing various human rights initiatives including establishing a Human Rights Policy based on the "UN Guiding Principles on Business and Human Rights".

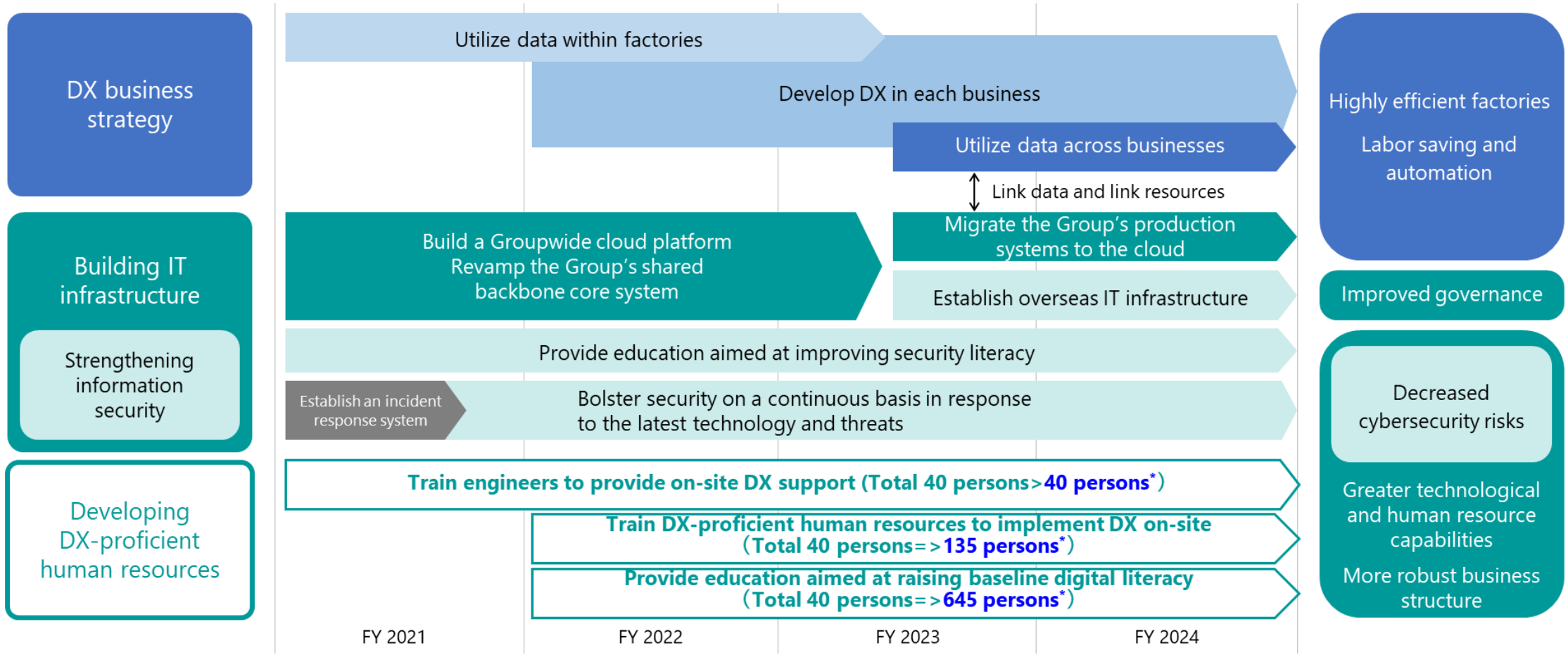
Midterm Plan 2024

Mar. 2023	Policy and System	Establishment of Human Rights Policy
Sep. 2023	Policy and System	Establishment of a project team to prepare human rights response =>Shift from individual activities to group management
Oct. 2023	1. Identification and assessment of risks	Implementation of Human Rights Due Diligence
Dec. 2023	1. Identification and assessment of risks	Disclose DOWA Group Human Rights Response Roadmap and Action Plan
Mar. 2024	1. Identification and assessment of risks	Assessing human rights risks and identifying to important human rights issues (limited to domestic subsidiaries)
Future Initiatives	1. Identification and assessment of risks 2. Prevention and mitigation of negative impacts 3. Tracking and checking progress Corrective and remedial measures	- Identification of and response to significant human rights issues at overseas subsidiaries - Enhancement of internal education programs on human rights - Establishment of a management system for comprehensive monitoring and review - Establishment of internal reporting system and supplier reporting desk

Driving DX (data utilization) | DOWA Transformation

- The three key measures for promoting our DX business strategy ; "Building IT infrastructure", "Strengthening information security" and "Developing DX-proficient human resources" are progressing according to plan.
- We have developed more DX-proficient human resources than initially planned, and the implementation of DX at our sites is shifting up a gear.

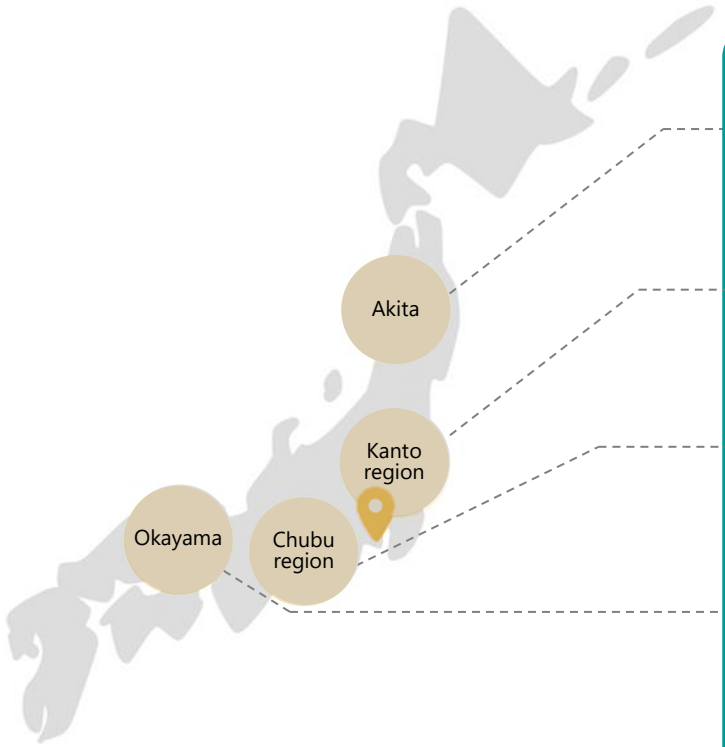
"DX Business Strategy" Promotion Plan in Midterm Plan 2024



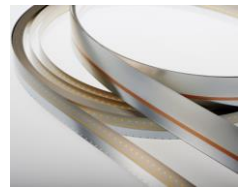
*Cumulative estimate at the end of FY2024

Driving DX (data utilization) | Initiatives and Achievements

- Established support centers for production technologies and information systems at key locations in Japan (Akita, Kanto, Chubu, Okayama), and provide support for the implementation of DX at the Group's key production locations.
- In addition to supporting various AI-related improvements (image analysis, data science, natural language processing), these centers also meet the needs of each company in relation to cloud computing and information security.
  =>Began contributing profits to the business as well as sophisticating the manufacturing at each production locations.



Examples of initiatives	Achievements
Utilization of data science in refining of tin to improve grade and yield	Eliminated quality problems
Utilization of AI to increase efficiency of precious metal plating production planning	Reduced duration of 1 day task by 5 hours
Utilization of AI to detect surface defects of copper rolled products	Reduced number of manual inspections by more than 90%
Improvement of equipment safety through AI-powered human detection system	Achieved detection accuracy of more than 98%
Operation of DOWA Generative AI System	Increased efficiency of administrative tasks



Developing the Next Midterm Plan

We are currently developing our Next Midterm Plan aimed at further strengthening integrated management based on sustainability and business strategies, for the realization of our vision. (The Next Midterm Plan will be announced in May 2025.)

Aiming to be a leader in the building of a recycling-oriented world, we will step up collaborative creation with customers and business partners and seek further evolution of our Recycling-Oriented Business Model.

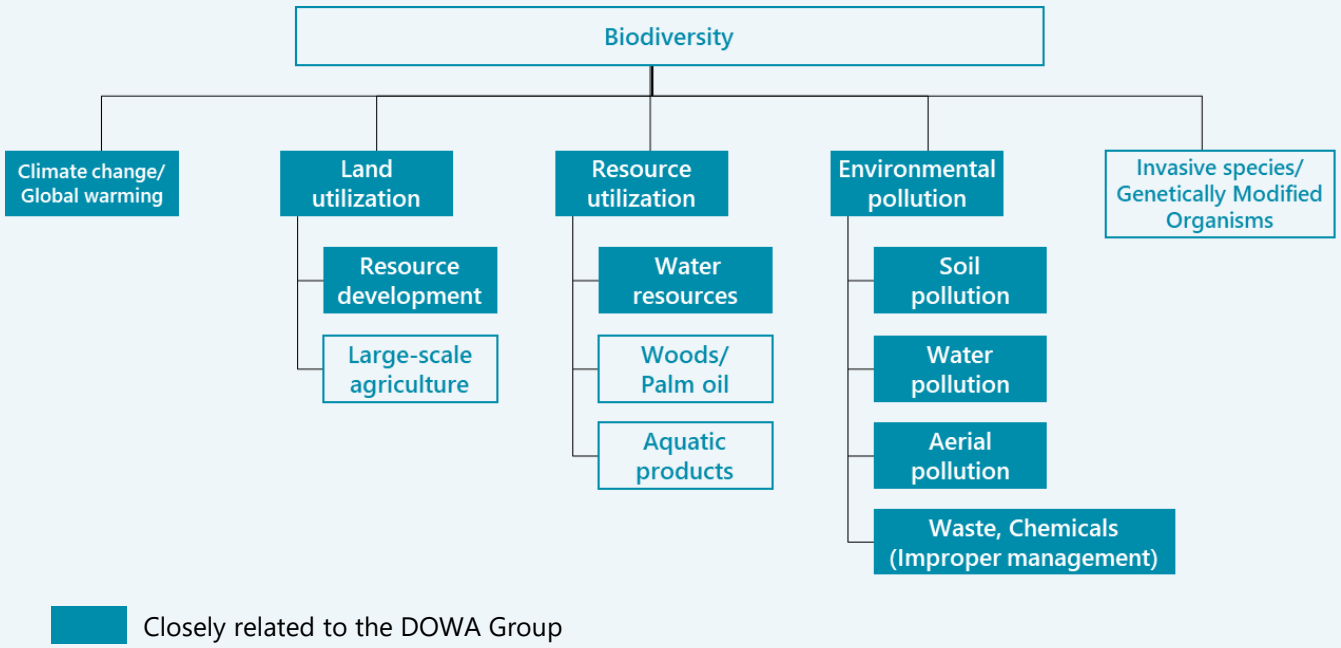
Appendix

- Protecting the environment
- Promoting risk management / Strengthening corporate governance
- Initiatives to achieve management that is conscious of the cost of capital and share prices
- FY2024 Forecasts

Protecting the Environment | Biodiversity Initiatives

- We have identified key themes of particular relevance based on the Taskforce on Nature-related Financial Disclosures (TNFD) framework.
- Going forward, we will conduct an evaluation of various risks based on these key themes.

Examples of risks to biodiversity



The following three themes were selected as important themes

Mine | Water | Forest

Examples of initiatives

Forest **Planting Forests in Kosaka (Akita Prefecture)**

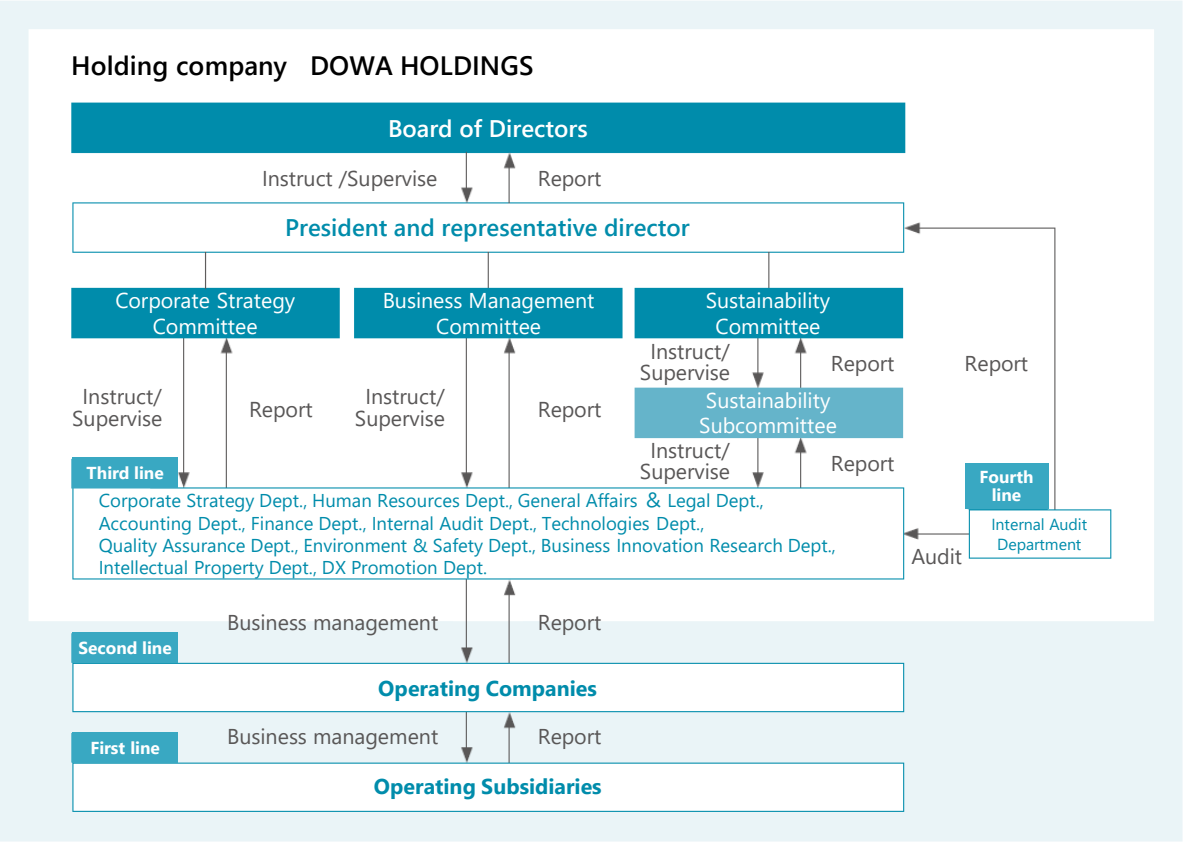
- The Group started planting trees in 2006 on the grounds of KOSAKA SMELTING & REFINING.
- With the aim of creating a nature and stable forest that does not require maintenance and management, we have worked to restore the original vegetation of the area by “making a local forest with local trees.”
- In 2007, we started tree planting activities with local residents under the "Reforestation of Kosaka / Hometown tree-planting ceremony" initiative.
- In FY2023, during the month of June, we planted 1,000 seedlings, consisting of 16 species of broad-leaved trees, including Japanese oak, Japanese beech, Japanese zelkova and maple trees. As of 2023, we had planted around 200,000 trees.

Promoting Risk Management/ Strengthening Corporate Governance

Promoting Risk Management

- Seeking more sophisticated risk management through the risk management system based on the Four Lines Model for internal control and the strengthening and enhancement of the risk management flow.

Risk management system based on the Four Lines Model



Strengthening Corporate Governance

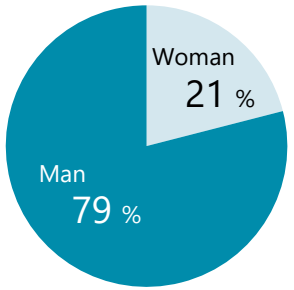
- Continuously focus on developing and operating effective and efficient internal control systems to strengthen corporate governance.

Composition of the Board of Directors

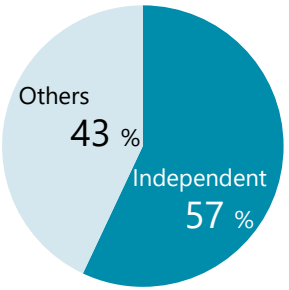
Director		Corporate auditor	
Inside Directors	Outside Directors	Inside auditors	Outside auditors
6 persons	4 persons	-	4 persons
	All are independent		All are independent

Man Woman

Percentage of women on the Board of Directors



Percentage of independent on the Board of Directors



- Appointing one more Outside Director
- Increasing the ratio of woman officers
- Ensuring that all Outside Directors and Audit & Supervisory Board Members are independent officers

Achieving Management That is Conscious of the Cost of Capital and Share Prices

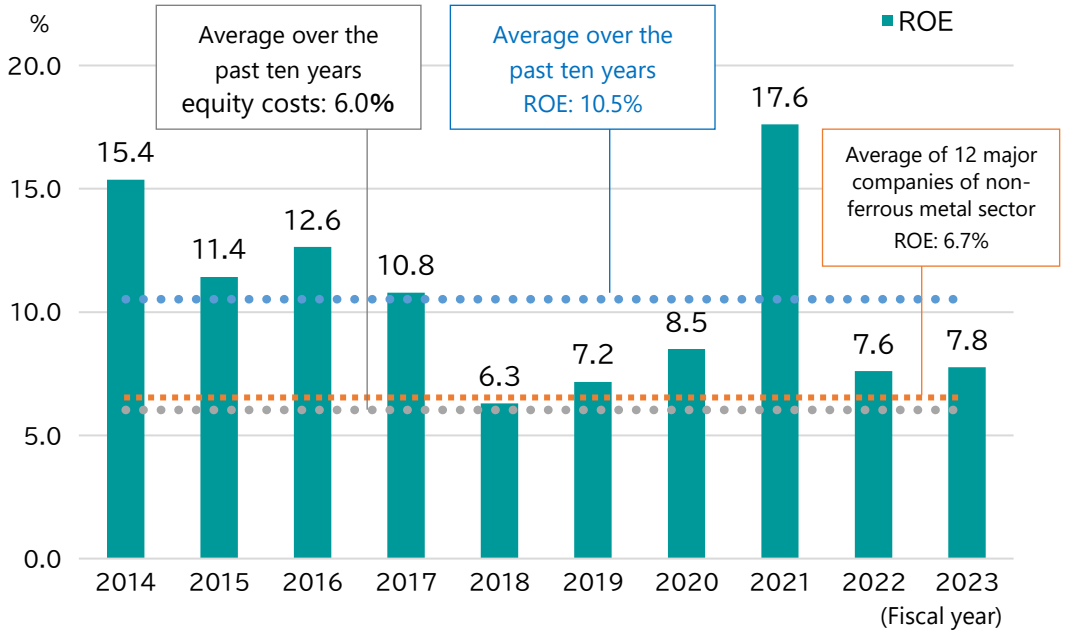
Analysis of current status and recognition of issues

- 10 years ROE*：10.5% ⇔ Cost of equity 6%（determined using CAPM）
  =>Although ROE is higher than the equity costs, our PBR has remained below 1.
- 5 years ROE excluding 2021, which was a record year, is 6-8%
  => Widening the equity spread by improving profitability and reducing the cost of capital is a priority, to enable us to play a central role in a society that aims to achieve both a recycling economy and decarbonization.

Basic policy for improving PBR

On the basis that PBR＝ROE×PER, seek improvement in both indicators.

Annual trends in ROE and shareholders' equity costs



*We evaluate ROE over a certain period due to the nature of our business, in which profits in a single fiscal year fluctuate greatly depending on external conditions.

Improvement of ROE (improvement of profitability)

- Improve profitability of existing businesses and establish new businesses
- Continue making investments for growth, and ensure returns on investments
- Consider and announce new capital measures (Discuss in the process of developing next midterm plan)

Improvement of PER (reduction of cost of capital)

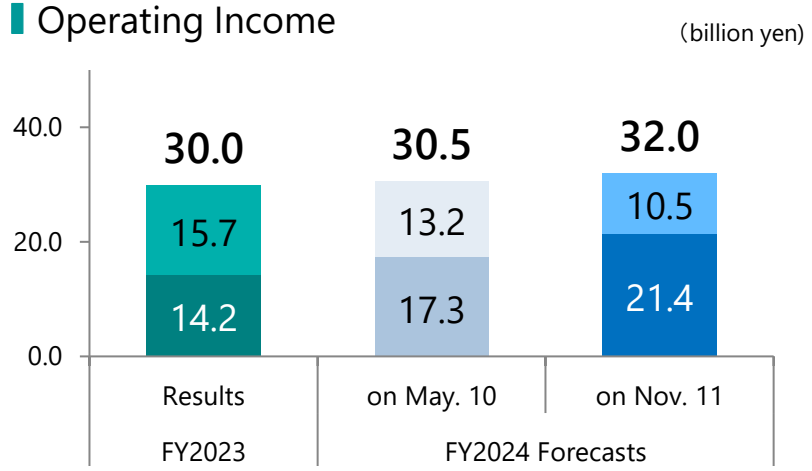
- Communicate growth strategies of individual businesses through business briefings, plant visits, etc.
- Enhance information disclosures on website, in IR materials, etc.
- Increase engagement (dialogue) of management (including Outside Directors) and officers in charge of ESG with investors

FY2024 Forecasts

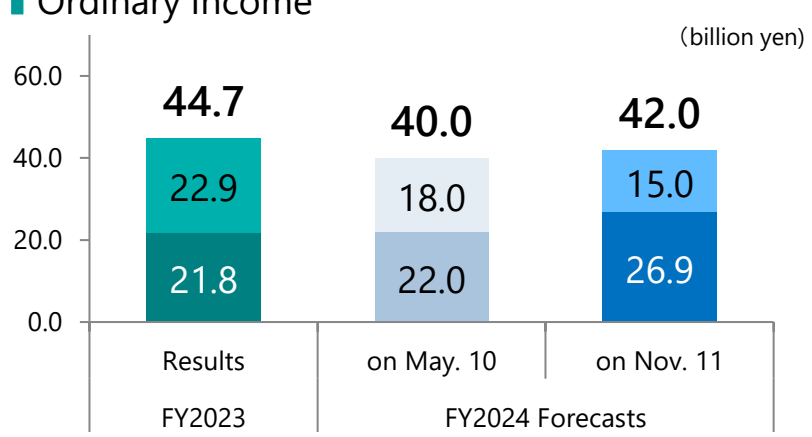
- In H1 FY2024, profits increased year-on-year due to favorable foreign exchange and metal price market conditions and firm orders for information/communication-related products and waste treatment.
- Slowdown in the outlook of orders for products and services related to the automobiles and new forms of energy is reflected in H2 forecast.

Billion yen		FY2024/H1 Results	Year-on-Year	FY2024/H2 Forecasts	Year-on-Year	FY2024 Forecasts	Year-on-Year
Net Sales		**352.5**	(18.1)	**347.4**	+0.9	**700.0**	(17.1)
Operating Income		**21.4**	+7.2	**10.5**	(5.2)	**32.0**	+1.9
Ordinary Income		**26.9**	+5.1	**15.0**	(7.9)	**42.0**	(2.7)
By Segment	Environmental Management & Recycling	7.7	+1.8	5.6	+0.3	13.4	+2.2
	Nonferrous Metals	12.2	+2.7	4.6	(4.0)	16.9	(1.3)
	Electronic Materials	1.2	(0.4)	(0.5)	(2.3)	0.7	(2.8)
	Metal Processing	3.8	+1.6	1.7	(1.2)	5.6	+0.4
	Heat Treatment	0.6	(0.7)	2.0	+0.1	2.7	(0.5)
	Other/ Eliminations	1.2	0.0	1.4	(0.8)	2.7	(0.7)
Profit attributable to owners of parent		**20.5**	**+7.3**	**9.4**	(5.1)	**30.0**	+2.1

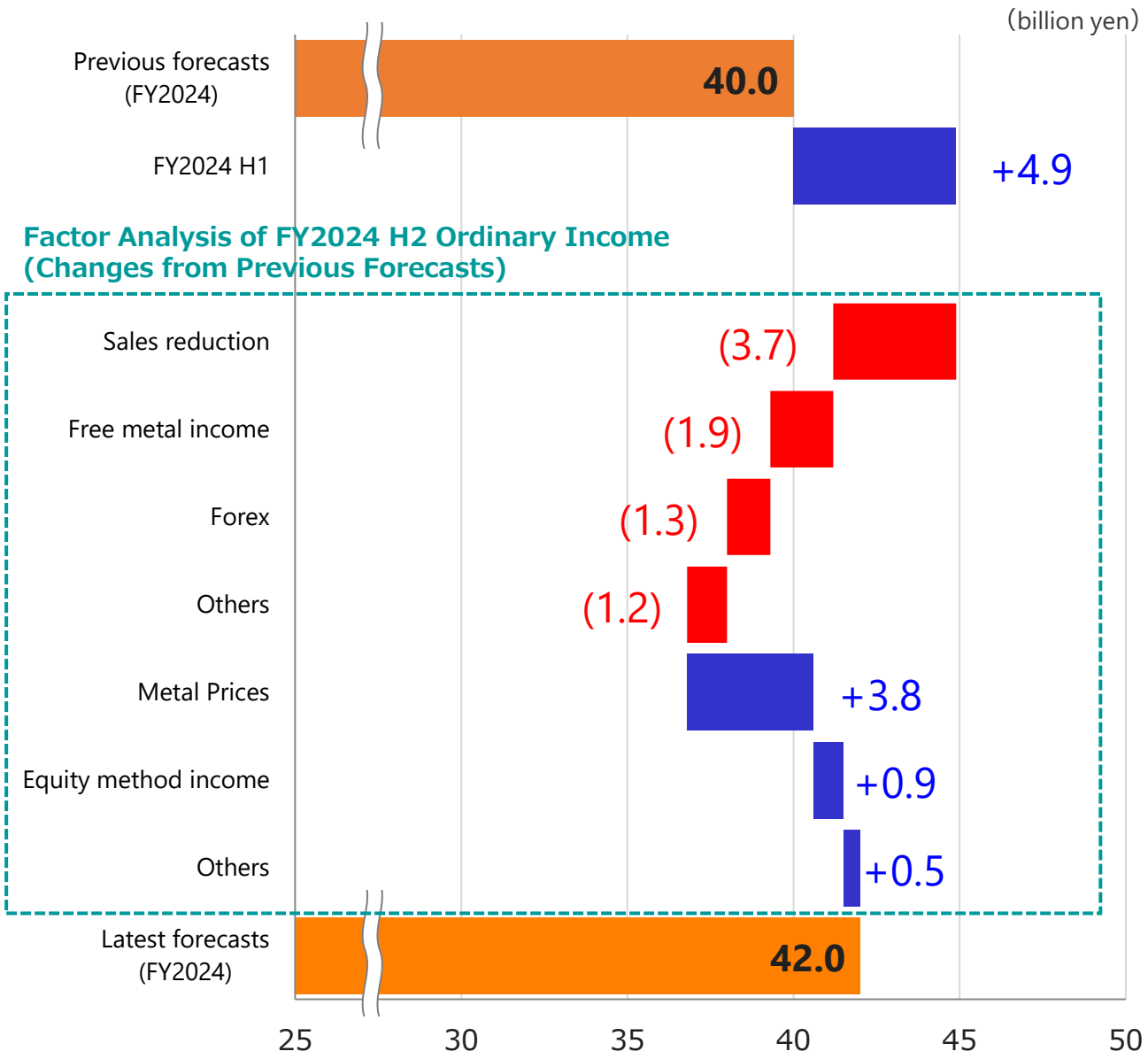
Operating Income



Ordinary Income



FY2024 Forecasts | Factor Analysis of FY2024 Ordinary Income (Changes from Previous Forecasts)



Major factors for change (FY2024 H1)

- Under the circumstances of a weakening yen and rising prices for major metals, our profit increased by 4.9 billion yen compared to the previous forecasts, due to robust orders for waste treatment and products for information and communication equipment.

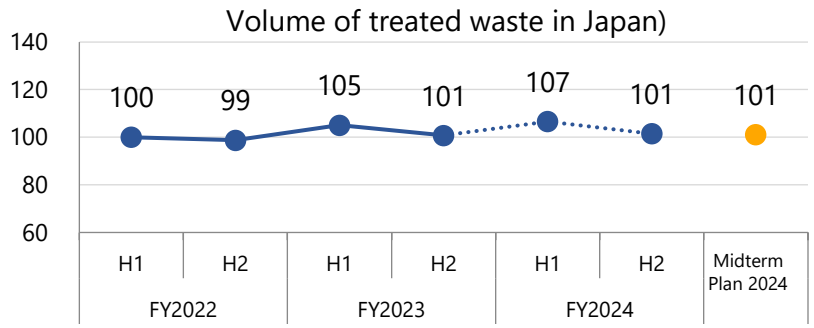
Major factors for change (FY2024 H2)

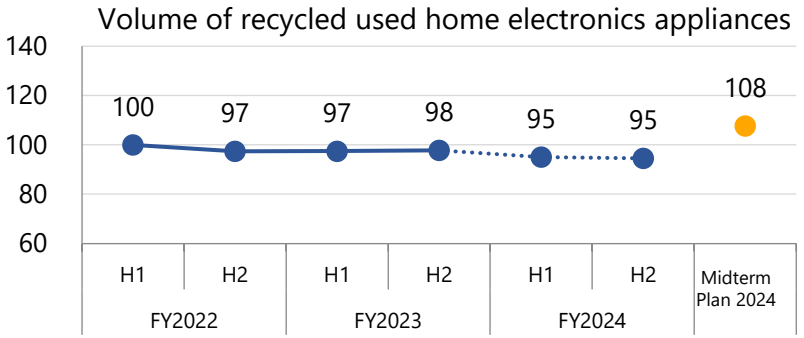
- Sluggish demand related to the automobiles and a downturn in demand for silver powder for solar panels.
- Decrease in the collection of spent catalysts due to the fall in the prices of platinum group metals.
- Assuming an exchange rate of 145 yen to the US dollar for H2, compared to an average of 152 yen in H1.
- Purchase conditions of raw materials in the Nonferrous Metals Business ,etc.
- The average prices of gold, silver, copper, and zinc are expected to rise above the levels achieved in H1.
- Improved profitability of overseas zinc mines with rising metal prices.
- Demand for information/communication-related products and waste treatment is expected to remain firm in H2.

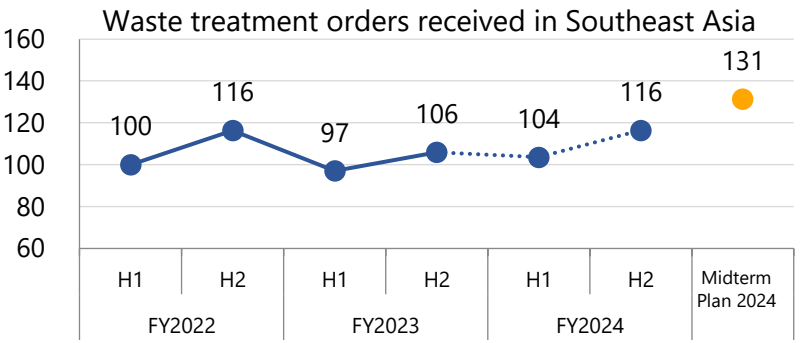
An increase in profit of 2.0 billion yen compared with the previous forecast is expected.

FY2024 Forecasts | Major Market Trends (1) (Compared to H1 of FY2022)

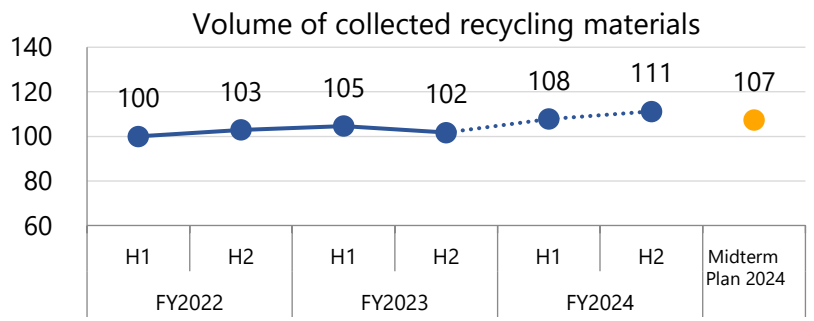
Environmental Management& Recycling

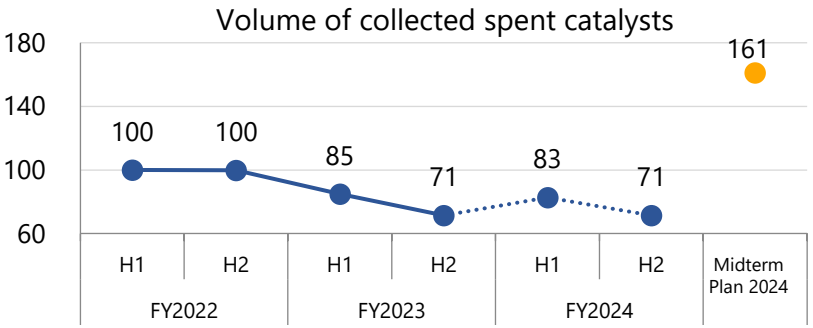


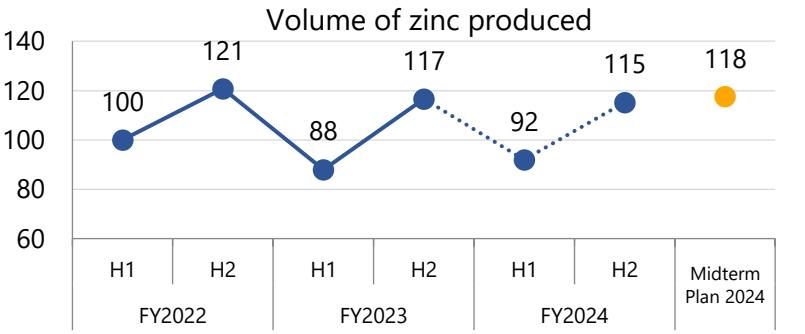




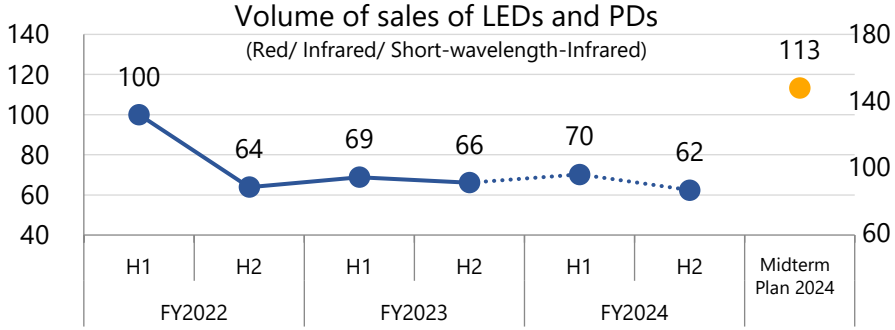
Nonferrous Metals

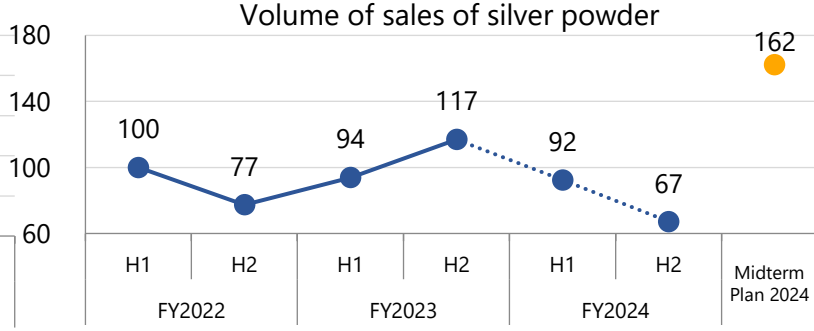


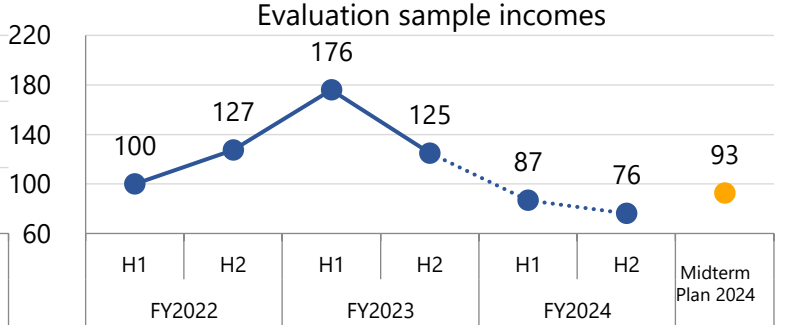




Electronic Materials



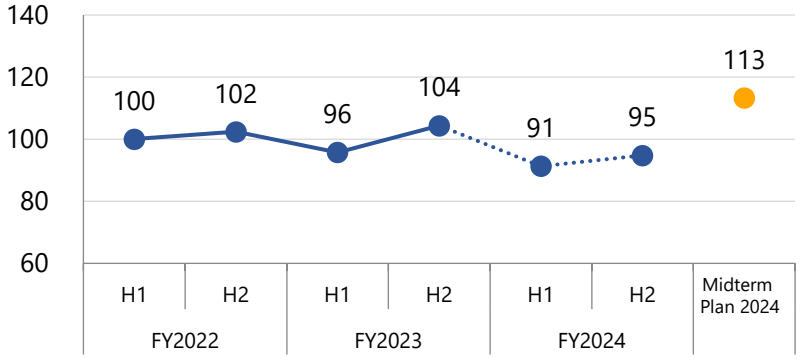




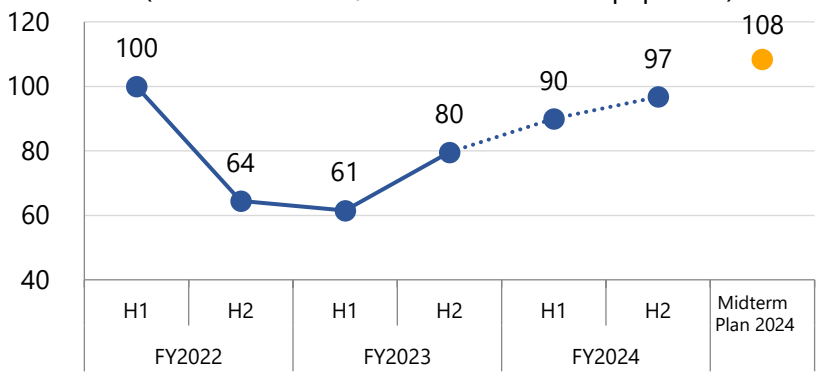
FY2024 Forecasts | Major Market Trends (2) (Compared to H1 of FY2022)

Metal Processing

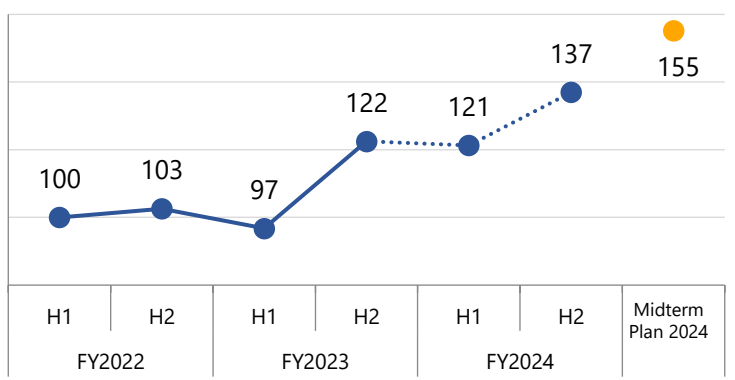
Volume of sales of copper rolled products (for automobiles)



Volume of sales of copper rolled products (for information / communication equipment)

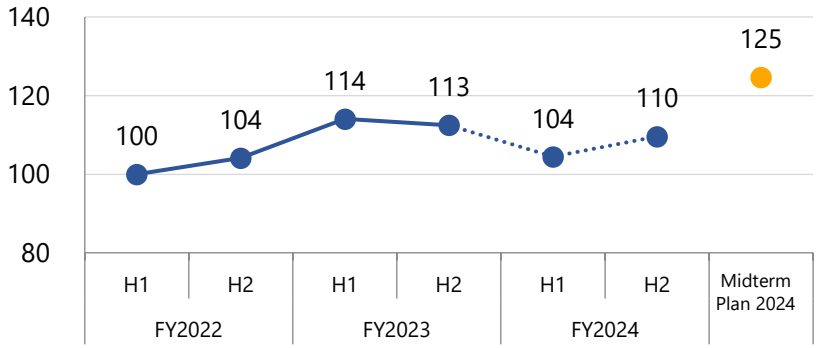


Volume of sales of copper rolled products from the Subsidiaries in Asia

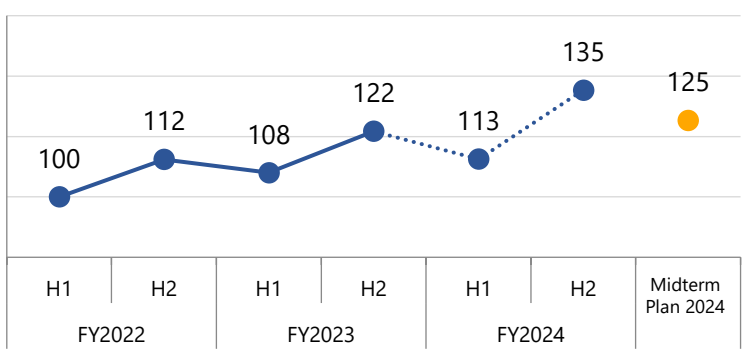


Heat Treatment

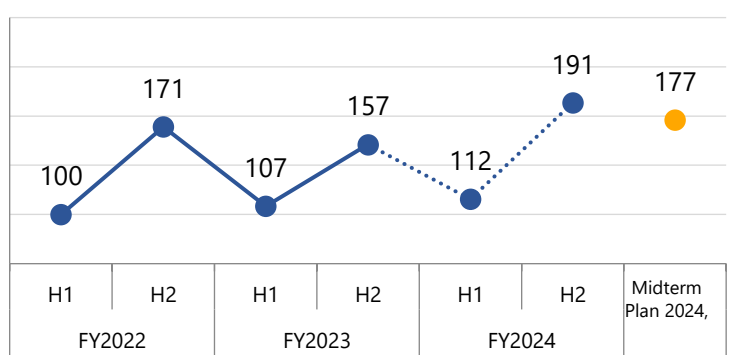
Carburization Treatment Volume in Japan



Carburization Treatment Volume in Overseas



Industrial Furnaces Sales Amount



FY2024 Forecasts | Assumptions and Sensitivities (FY2024 H2)

Sensitivity (Operating Income / FY2024 H2)

Million yen

	Assumptions	Fluctuation	Sensitivity
Exchange rate	145.0 ¥/$	±1 ¥/$	**220**
Copper	9,500 $/ton	±100 $/ton	**10**
Zinc	2,900 $/ton	±100 $/ton	**300**

* Exchange rate sensitivity; Nonferrous Metals Business 190 million yen and Electronic Materials Business 30 million yen.

Exchange Rate and Metal Prices

	FY2023			FY2024			Midterm Plan 2024
	H1	H2	Full-year	H1	H2 assumptions	Full-year assumptions	
Exchange Rate: (¥/$)	141.0	148.3	144.6	**152.6**	**145.0**	**148.8**	120.0
Copper: ($/t)	8,417	8,306	8,362	**9,477**	**9,500**	**9,489**	10,000
Zinc: ($/t)	2,484	2,474	2,479	**2,806**	**2,900**	**2,853**	3,800

A Recycling-Oriented World

DOWA

Forward-looking statements made in this document, such as business forecast, are based on the information available at this time and on certain premises that the Company assumes to be reasonable. Actual performance may differ materially from such forecasts due to a variety of factors.

