

Economic Environment by Customer Domain

The KOBELCO Group operates businesses centered on seven segments, and its main customer fields can be divided into the three categories of Mobility, Life, and Energy & Infrastructure. The table below summarizes the economic environment, risks, and opportunities associated with each of these three categories.

Categories	Economic Environment	Risks and Opportunities	Related Segments
Mobility			
Automobiles	<ul style="list-style-type: none"> While global automobile production is recovering from the impact of the COVID-19 pandemic, there is growing risk of production cutbacks due to supply chain disruptions caused by lockdowns in China, where a zero-COVID policy was promoted, and the worsening situation in Ukraine. The tight supply of semiconductors is anticipated to continue until mid-2023. Over the medium to long term, global automobile production will be affected by a complex mix of factors driving decreases and increases in production. As the global movement toward carbon neutrality accelerates, various countries are strengthening efforts to promote zero-emission vehicles, which will further accelerate electrification. More and more new models will be "connected cars" that share internet access and data with various devices. There is a growing trend toward practical application of self-driving cars in countries around the world along with the advancement of testing and legislation. 	<p>Risks</p> <ul style="list-style-type: none"> Decline in demand for automobiles due to changes in lifestyles and increased adoption of sharing and Mobility as a Service (MaaS) Further tightening of fuel efficiency regulations and enactment of Life Cycle Assessment (LCA) regulations <p>Opportunities</p> <ul style="list-style-type: none"> Acceleration of electrification Expanded application of connected and self-driving vehicles 	<ul style="list-style-type: none"> Steel & Aluminum Advanced Materials Welding Machinery
Aircraft	<ul style="list-style-type: none"> With the easing of COVID-19 travel restrictions, air travel demand is recovering gradually. Demand is expected to return to pre-pandemic levels in fiscal 2023 or later. Airline profitability has improved. Along with the recovery in air travel demand, air cargo demand continues to be strong. As the global movement toward carbon neutrality accelerates, airlines are introducing fuel-efficient aircraft and improved engines and considering the adoption of alternative aviation fuels. 	<p>Risks</p> <ul style="list-style-type: none"> Decrease in air travel demand due to lifestyle changes Sluggish demand for new aircraft due to deteriorating profitability Soaring aviation fuel prices <p>Opportunities</p> <ul style="list-style-type: none"> Increase in air travel demand with the easing of travel restrictions Increase in cargo demand 	<ul style="list-style-type: none"> Advanced Materials Machinery
Shipbuilding	<ul style="list-style-type: none"> Orders were steady along with the recovery from weakened demand due to the spread of COVID-19. Despite the steady demand, the situation remains challenging due to factors such as soaring prices of equipment and materials such as steel and delays in delivery of ship components, which are becoming more serious due to supply chain disruptions caused by the deteriorating situation in Ukraine. With the significant tightening of environmental regulations, shipbuilders are accelerating the study for the introduction of zero-emission vessels. Advances in IoT and AI, the logistics revolution, etc. have led to innovations in the concept and value of vessels, including the concept of autonomous shipping. 	<p>Risks</p> <ul style="list-style-type: none"> Deterioration in the supply-demand balance Rise of Chinese and Korean shipbuilders Soaring steel product prices <p>Opportunities</p> <ul style="list-style-type: none"> Accelerated introduction of zero-emission vessels and additional needs Introduction of IoT and AI for vessels 	<ul style="list-style-type: none"> Steel & Aluminum Advanced Materials Welding
Life			
Food containers	<ul style="list-style-type: none"> Environmental considerations are driving a worldwide shift from plastic bottles to aluminum cans. Overseas demand is increasing due to the emergence of new types of canned beverages, such as the low-alcohol beverage hard seltzers (alcoholic sparkling water) and wines. Solid demand for aluminum cans is expected to continue. Total demand for aluminum cans in Japan is expected to be flat in 2022. 	<p>Risks</p> <ul style="list-style-type: none"> Disruption in the food supply chain caused by climate change Decline in domestic production due to imported materials <p>Opportunities</p> <ul style="list-style-type: none"> Return to metal containers due to the growing attention to microplastic problems 	<ul style="list-style-type: none"> Steel & Aluminum
IT and semiconductors	<ul style="list-style-type: none"> There is a significant increase in demand for semiconductors for game consoles and computers due to the increase in telework and stay-at-home consumption impacted by the spread of COVID-19. Semiconductor shortages occurred worldwide due to the rapid increase in demand for semiconductors driven by the spread of the 5th generation mobile communication (5G), the expansion of data centers, DX, and the moderate economic recovery from the impact of the pandemic, as well as due to further tight supply resulting from the shutdown of factory operations impacted by the pandemic, the tightening of export control regulations, and disruptions caused by natural disasters, etc. Despite cyclical changes in demand, this sector is anticipated to grow over the medium to long term. 	<p>Risks</p> <ul style="list-style-type: none"> Market fluctuations (supply-demand mismatches) Geopolitical risks <p>Opportunities</p> <ul style="list-style-type: none"> Advancement of DX Expanded application of connected and self-driving cars 	<ul style="list-style-type: none"> Steel & Aluminum Advanced Materials
Energy & Infrastructure			
Construction and civil engineering	<ul style="list-style-type: none"> While global demand is expected to recover from the decline in demand impacted by the COVID-19 pandemic and grow steadily in the US, Europe, and the ASEAN region, demand will continue to shrink in China due to a decline in infrastructure investment. Demand in Japan is expected to remain largely unchanged over the medium term, supported by large-scale redevelopment in the Tokyo metropolitan area for national resilience projects, linear high-speed train-related construction, and renewable energy projects, which will offset declining demand for private-sector housing due to Japan's declining population. 	<p>Risks</p> <ul style="list-style-type: none"> Decline in infrastructure investment in various countries due to economic downturn <p>Opportunities</p> <ul style="list-style-type: none"> Acceleration of efforts toward the development of smart cities IT for construction machinery (automatic operation, remote control, etc.) DX progress at construction sites 	<ul style="list-style-type: none"> Steel & Aluminum Welding Construction Machinery
Water treatment and waste treatment	<ul style="list-style-type: none"> While demand for domestic public investment is expected to continue for the time being due to the government's Plan for Building National Resilience and other programs, the market is undergoing changes such as population decline, regionalization, and public-private partnerships. Demand for water treatment-related infrastructure will continue to grow, especially in emerging Asian countries, as overseas populations increase and living standards improve. Initiatives toward carbon neutrality are accelerating under the national policy Material and energy prices are soaring due to the situation in Ukraine and further depreciation of the yen 	<p>Risks</p> <ul style="list-style-type: none"> Slowdown in public investment in Japan Decline in overseas demand due to the impact of the U.S.-China conflict and COVID-19 pandemic Upgraded technical standards for reducing environmental impact, etc., and increased cost burden and intensified competition in the development and verification of technologies Difficulties in sourcing raw materials and higher costs <p>Opportunities</p> <ul style="list-style-type: none"> Increase in needs driven by economic growth in emerging countries Increase in demand for new environmental businesses that contribute to carbon neutrality 	<ul style="list-style-type: none"> Engineering



Categories	Economic Environment	Risks and Opportunities	Related Segments
Energy & Infrastructure			
Oil refining and petrochemical	<ul style="list-style-type: none"> Global demand is expected to increase due to growing energy consumption driven by the recovery in the economy and increasing transportation demand with the slowdown of the spread of COVID-19. In particular, Asia, including China and the ASEAN region, is expected to drive the increase in global demand with increased energy consumption along with economic growth and increased demand triggered by the growth of the petrochemical industry. Despite the increase in global demand, the worsening situation in Ukraine has caused the prices of crude oil, natural gas, etc. to soar, which has severely affected the world economy. Demand in Japan is expected to recover as the economy improves, but over the medium term, oil demand will continue to decline due to the improved fuel efficiency of vehicles and the shift to other energy sources. In terms of refinery operations, additional cutbacks in capacity may be necessary. With changes in the business environment toward carbon neutrality, it is expected that the current uncertainty will continue due to delays in development and capital investment projects by major oil companies. 	<p>Risks</p> <ul style="list-style-type: none"> Tightening of regulations with a view to carbon neutrality Declining demand for crude oil and price fluctuations <p>Opportunities</p> <ul style="list-style-type: none"> Expansion of non-fossil energy businesses 	<ul style="list-style-type: none"> Machinery
Industrial machinery	<ul style="list-style-type: none"> Although capital investment is expected to recover due to the recovery in demand in major industries with the slowdown of the spread of COVID-19, the recovery is slow and the situation remains uncertain. Demand in Japan remains firm mainly in the manufacturing industry, centered on demand for energy-saving and high-efficiency solutions, as well as transportation systems for automation and labor-saving of logistics bases, and preventive measures against flood for national resilience. Global demand is expected to increase particularly in Asia, the Middle East, Europe, and the United States, as the global economy continues to recover along with the acceleration of post-pandemic growth strategies in each country. With the acceleration of carbon-neutral initiatives, demand for CO₂ reduction and energy savings is increasing. 	<p>Risks</p> <ul style="list-style-type: none"> Decline in corporate investment sentiment due to economic downturn <p>Opportunities</p> <ul style="list-style-type: none"> Growing demand for energy savings to achieve carbon neutrality Advancement of labor savings and work style reforms along with the progress of DX 	<ul style="list-style-type: none"> Welding Machinery
Renewable energy	<ul style="list-style-type: none"> Demand temporarily declined as the appetite for capital investment has receded due to the impact of the COVID-19 pandemic. Although the cost of power generation using renewable energy is steadily declining as it has become a power source that is cost-competitive compared to conventional power sources, it remains high in Japan compared to international levels due to factors such as construction costs and location restrictions. The application of renewable energy is expected to expand with the acceleration of carbon-neutral initiatives, resulting in significant growth over the medium to long term. The application of renewable energy may be further accelerated by future national policies. 	<p>Risks</p> <ul style="list-style-type: none"> Delays in the development of national policies and legislation Cost competition due to intensifying competition and increased cost burden for the development and verification of technologies <p>Opportunities</p> <ul style="list-style-type: none"> Acceleration of carbon neutrality leading to legislation and increased investment in various countries Expanded use of renewable energy driven by lower cost of energy-saving facilities 	<ul style="list-style-type: none"> Welding Machinery Engineering
Urban transit	<ul style="list-style-type: none"> In emerging countries where the population concentrates in metropolitan areas, there is a strong need for transportation systems to alleviate traffic congestion and prevent air pollution. Japanese ODA loan projects will continue, mainly in Southeast Asia. 	<p>Risks</p> <ul style="list-style-type: none"> Decline in users in Japan due to the declining birthrate and aging population Delays in projects and reduced appetite for investments due to the spread of COVID-19 <p>Opportunities</p> <ul style="list-style-type: none"> Demand for maintenance of existing projects and emergence of new and extension projects in Japan Continuation of Japan's infrastructure export policy 	<ul style="list-style-type: none"> Engineering
Direct reduced iron (DRI)	<ul style="list-style-type: none"> Interest has been increasing in the direct reduction ironmaking process, which emits less CO₂ than the blast furnace route. With growing global demand for green steel production, steel manufacturers are increasing their efforts to switch to DRI plants. 	<p>Risks</p> <ul style="list-style-type: none"> Decline in investment sentiment of steelmakers due to economic downturn Intensifying competition and lower barriers to entry due to the rapid expansion of the DRI market <p>Opportunities</p> <ul style="list-style-type: none"> Growing interest in low-CO₂ steel products along with the acceleration of the movement toward carbon neutrality Tighter regulations on CO₂ emissions in various countries 	<ul style="list-style-type: none"> Steel & Aluminum Engineering
Electric power	<ul style="list-style-type: none"> Demand for electric power increased year over year as economic activities, which had been stagnant during the pandemic, headed toward recovery in fiscal 2021, resulting in the pickup in electricity demand in the industrial and commercial sectors. However, demand is expected to decline again in 2023 and beyond as energy-saving efforts advance. Due to the deteriorating situation in Ukraine, various countries, including Japan, have adopted policies to ban and/or restrict imports of Russian resources such as coal, which led to a tight supply-demand balance for fuel and a surge in prices. In addition, soaring energy prices are causing the rises of electricity prices in the wholesale electricity market. In Japan, competition is intensifying due to changes in the structure of the electric power business along with the expansion of distributed power sources such as solar power and due to electricity system reform. With the trend toward decarbonization, Japan has been promoting investments in new energy sources such as renewable energy as well as effective use of existing power plants, centering on large-scale power generation facilities such as thermal/nuclear power plants, while responding to public requirements such as a stable power supply and economic efficiency. 	<p>Risks</p> <ul style="list-style-type: none"> Anti-coal trend and investor divestment movement Fading out of inefficient coal-fired power plants <p>Opportunities</p> <ul style="list-style-type: none"> With the progress of electrification and hydrogenation in the non-electric power sector, the amount of electricity required is expected to decrease in the short term, but increase in the medium to long term. Increasing needs for thermal power sources as a way to stabilize and adjust the electricity system Creation of new electricity markets triggered by the electricity liberalization 	<ul style="list-style-type: none"> Engineering Electric Power

Business Overview by Operating Segment

Materials Businesses



Makoto Mizuguchi
Executive Vice President

In the materials businesses, we are working on establishing a stable earnings base, which is a priority issue under the Medium-Term Management Plan. Along with this, we are also working on reducing CO₂ emissions in the Company's own production processes and contributing to the reduction of CO₂ emissions through our technologies, products, and services as key management issues.

Reducing CO₂ emissions from the ironmaking process is a major challenge in reducing CO₂ emissions in production processes. Our study in this area is proceeding steadily and has resulted in the launch of the low-CO₂ blast furnace steel product Kobenable Steel. We will continue to move forward with our study and take on the challenge of realizing carbon neutrality by 2050.

In terms of contributing to the reduction of CO₂ emissions through our technologies, products, and services, we believe we can contribute to the world through a wide range of products, such as lightweight materials and magnetic materials that support the weight reduction and electrification of automobiles and aircraft, steel products and welding solutions that are used in renewable energy facilities, etc.

In the materials businesses, we will contribute to the reduction of CO₂ emissions throughout society by promoting initiatives from these two approaches.

Strategy

Establishing a Stable Earnings Base

(1) Strengthening the Earnings Base in the Steel Business

On the assumption that demand for steel products in Japan will continue to decline over the long term, we aim to build a structure whereby we can secure stable earnings at 6.3 million tons of annual crude steel production and maintain profitability even at 6.0 million tons. In order to achieve this goal, we will continue to work tenaciously to lower the break-even point by improving steel product prices and product mix as well as by reducing fixed costs.

In terms of improving the product mix, we will continue to work to raise the ratio of special steel wire rods and high-tensile strength steel which was 46% in fiscal 2021, aiming to achieve our fiscal 2025 target of 52%. In terms of reductions of fixed costs, although we have factored into the budget increases in labor costs and in maintenance costs for stable operation, we will continue to proceed with automation and other initiatives by promoting DX.

(2) Restructuring Unprofitable Businesses

In the steel casting and forging business and the titanium business, we are streamlining the businesses through measures such as withdrawing from unprofitable products and reducing workforce in order to achieve stable profitability at an early stage. The titanium business returned to profitability in fiscal 2021, while the steel casting and forging business has progressed to the point where we can expect profitability in fiscal 2022. We will continue to work on measures for streamlining.

CO₂ Reduction Initiatives

For CO₂ reductions in the ironmaking process, we will promote our initiatives centered on CO₂ reduction solution

for blast furnace ironmaking that utilize hot briquetted iron (HBI) manufactured with the MIDREX® Process. In moving toward taking on the challenge of realizing carbon neutrality by 2050, we will take a multi-track approach. Along with our own internal efforts, we will engage in various projects such as three projects promoted by the NEDO, namely COURSE50, Ferro-Coke, and Super COURSE50, and proceed with initiatives for Hydrogen Utilization in Iron and Steelmaking Processes, which has been selected for funding by Japan's Green Innovation Fund and promoted by a consortium centered on steel manufacturers.

Applying the CO₂ reduction effect obtained by our CO₂ reduction solution for blast furnace ironmaking, we have launched the first low-CO₂ blast furnace steel in Japan, under the brand name Kobenable Steel. Many of our customers have been showing heightened interest in the product.

In addition to Kobenable Steel, the KOBELCO Group has many other technologies, products, and services that help reduce CO₂ emissions. These contribute not only to reducing CO₂ emissions in its own production processes but also to reducing CO₂ emissions in society as a whole. Initiatives aimed at achieving carbon neutrality are already underway around the world, including weight reduction of automobiles and aircraft to improve fuel efficiency, vehicle electrification, and increased use of renewable energy, but there are many technical issues for the widespread use of these items in terms of product characteristics and cost. We believe that our Group's materials (steel & aluminum, advanced materials, and welding materials) and solution technologies that utilize them will be useful in resolving such issues. Through contributing to CO₂ reductions, we will further strengthen our materials businesses.



Steel & Aluminum

Fiscal 2021 Summary

Steel products

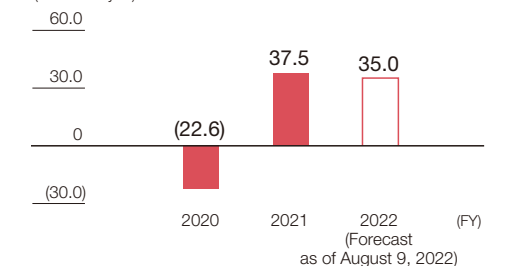
- Demand increased mainly in the automotive and construction sectors due to an increase in demand driven by the recovery from the impact of COVID-19.
- Selling prices increased due to the rise in steel market prices and the rise in raw material prices, which were passed on to selling prices.
- Ordinary income of 34.6 billion yen was recorded due to positive factors such as an increase in sales volume and an improvement in inventory valuation along with a rise in raw material prices, despite negative factors such as a delay in passing on the rise in raw material prices to selling prices.

Aluminum flat-rolled products

- Sales volume rose due to an increase in sales of beverage can stock as well as an increase in demand and sales promotion in the automotive sector.
- Ordinary income of 2.8 billion yen was recorded due to an increase in sales volume and an improvement in inventory valuation gains.

Ordinary Income (Loss)

(Billions of yen)



Promoting Sustainability Management

- We will provide customers with distinctive technologies, products, and services and provide solutions to the needs of society in various fields.
- Utilizing our HBI charging technology for blast furnaces, we will establish a low-CO₂ ironmaking process and achieve a sustainable supply of steel products.
- We will contribute to the preservation of the marine environment by reducing plastic waste (plastic bottles) through the production of highly recyclable aluminum can stock.
- We will work to reduce CO₂ emissions through measures such as expanding our supply capacity of aluminum sheet materials for automotive panels that contribute to weight reduction of automobiles, improving the recycling rate, and utilizing green aluminum.
- Leveraging synergies in the materials businesses, we will promote our Group's unique automotive weight-reduction proposal activities, which include the global supply of automotive weight-reduction technologies and lightweight materials, in order to contribute to further CO₂ reduction in the automotive sector.

Business Strengths

Steel products

- Improved cost competitiveness through consolidation of upstream processes
- Distinctive products (special steel wire rods, high-tensile strength steel)

Aluminum flat-rolled products

- Beverage can stock: Strong relationships with customers
- Automotive: State-of-the-art heat treatment line : Solution proposal (analysis, design)
- Disks: Approx. 60% of global market share

Social Changes to Impact on Business

- Response to climate change
- Shrinking demand for steel products in Japan
- Shift to EVs
- Trend toward plastic reduction
- Progress of DX

Important Issues and Initiatives

Steel products

- Establish a structure to secure stable earnings at 6.3 million tons per year of crude steel production and maintain profitability even at 6.0 million tons. → Reduction of fixed costs and variable costs
- Improve the product mix by leveraging the Group's distinctive products (special steel wire rods and high-tensile strength steel)
- Achieve a selling price that matches the value of the product
- Promote initiatives to become a leading company that contributes to reducing CO₂ emissions in the steel industry. → The launch of Kobenable Steel, Japan's first low-CO₂ blast furnace steel product

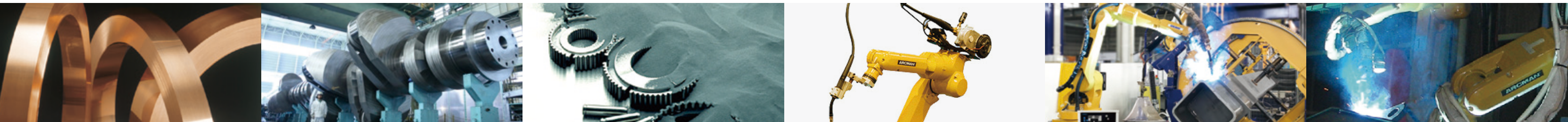
Aluminum flat-rolled products

- Respond to growing demand for automotive panels
- Pass on the increase in secondary material and energy prices to selling prices
- Ensure that strategic investment projects (aluminum sheet materials for automotive panels) contribute to earnings
 - Start mass production at Chinese subsidiary
 - Establish a mass production system with a new line of aluminum sheet for automotive panels at Moka Works
- Reduce costs by strengthening *monozukuri* (manufacturing) capabilities

TOPICS

KOBELCO Group's CO₂ Reduction Solution for Blast Furnace Ironmaking

For details, please refer to p. 49.

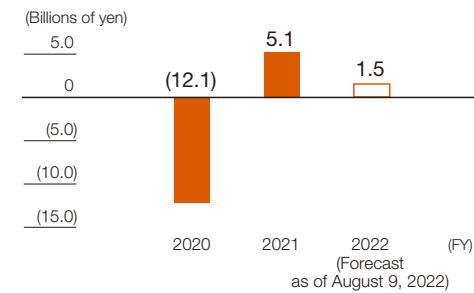


Advanced Materials

Fiscal 2021 Summary

- Demand increased mainly in the automotive, IT, and semiconductor sectors.
- Ordinary income of 5.1 billion yen was recorded due to an increase in sales volume and an improvement in inventory valuation driven by the rise in the copper market prices.

Ordinary Income (Loss)



Promoting Sustainability Management

- We will provide trusted products and services that are valued by customers and contribute to the creation of a safe and secure society by leveraging synergies through the integration of diverse business assets (human resources, information, intellectual property, etc.) and technological assets (such as castings, forgings, and fabrication).
- We will contribute to the sustainable development of society and industry and contribute to carbon neutrality by supplying aluminum (extrusions, suspensions, castings and forgings), titanium, steel castings and forgings, copper, and steel powder products globally to address the need for the weight reduction of transportation equipment (automobiles, aircraft, ships, rolling stock, etc.), the electrification of vehicles, and the expansion of the IT and semiconductor fields. We will also work to reduce environmental impacts by improving the product recycling rate and resource recycling rate.



Business Strengths

- Automobiles**
 - Own materials/parts products, and production bases that contribute to weight reduction and CASE
- Shipbuilding**
 - Japan's only full-lineup manufacturer of material products for ships
- Aircraft**
 - Strong relationships with customers and extensive delivery track record
- IT**
 - Strong relationships with customers and extensive delivery track record

Social Changes to Impact on Business

- Response to climate change
- Progress of DX
- Changes in industrial structure triggered by COVID-19
- Changes in the supply chain caused by conflicts, disasters, and other factors

Important Issues and Initiatives

Common issue

- The need to pass on increases in raw material and energy prices to selling prices

Steel castings and forgings

- Focus on profitability of orders, optimize the composition of the ordered projects, and achieve profitability at an early stage

Aluminum castings and forgings

- Expand sales in the IT field, strengthen *monozukuri* (manufacturing) in the sand-casting business

Titanium

- Review the strategy for large forgings targeted at aircraft in response to changes in industrial structure caused by COVID-19

Aluminum suspensions

- Respond to demand by maximizing production at the three bases of Japan, the U.S. and China (strengthen *monozukuri* capabilities)

Aluminum extrusions

- Improve the project mix by increasing the ratio of fabricated automotive components and expand sales in new fields
- Establish a production structure that can address changes in the project mix (making general-purpose facilities with multiple functions)

Copper rolled products

- Steadily capture growing demand for automotive terminals and semiconductors and maximize production; secure stable earnings in the leadframe business
- Steadily establish a new business base in Vietnam

Steel powder

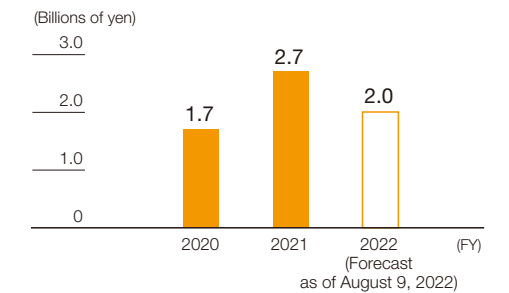
- Develop new products and new fields in response to the electrification of automobiles

Welding

Fiscal 2021 Summary

- In Japan, demand rose mainly in the architectural steel frame sector.
- Overseas demand increased in the automotive and construction machinery sectors in Southeast Asia.
- Ordinary income increased by 1.0 billion yen year on year to 2.7 billion yen.

Ordinary Income



Promoting Sustainability Management

- We will contribute to society through our welding solution business that meets the needs of our customers by providing distinctive products and services globally, including welding materials with lower environmental impact (solid wire with no copper coating); our REGARC™ welding process, which significantly reduces the amount of spatter generated; and our automation solutions (robotic welding systems for hull assembly in shipbuilding).
- We will contribute to reducing the weight of transportation equipment through developing, jointly with our customer, a welding process that reduces slag generation and enhances the anti-corrosion performance of chassis components, an issue that arises when reducing the weight of automobiles.
- Using AI to increase the functionality of welding robots, we will achieve the same quality of welding as skilled welders and contribute to customers' *monozukuri* (manufacturing) in terms of both efficiency and quality.
- We will bring our problem-solving assistance closer to the customer through the KOBELCO WELDING smartphone app, which gives customers access to technical information on welding and solutions for welding-related problems.



Business Strengths

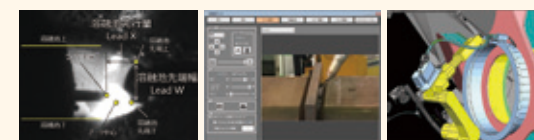
- The only company in Japan offering a total menu of welding materials, robot systems, power sources, and processes
- Ability to propose solutions based on thorough on-site focus and quick responses
- Largest sales organization for welding materials and welding systems in the Japanese welding industry

Social Changes to Impact on Business

- Response to climate change
- Labor shortage due to the declining birthrate and aging population
- Business transformation
- Progress of DX

Important Issues and Initiatives

- Strengthen earnings base through structural reforms
 - Review production structure and rightsize workforce
 - Promote DX and smart factories
- Increase earnings through practical application of welding solutions
 - Propose technical solutions by combining materials, systems, and processes
- Strengthen the earnings base of overseas businesses
 - Improve profits by improving management efficiency
 - Expand welding solutions overseas



(Left) AI molten pool sensor
(Center) ARCMAN™ View for production support DX
(Right) ARCMAN™ Offline Teaching System

TOPICS

Promoting DX in Customer *Monozukuri*

By combining advanced IT and AI technology with the know-how and welding technology that we have cultivated over many years, we will broaden the scope of welding robot automation and work to develop products that will resolve labor shortages and liberate people from heavy labor.



Atsushi Fukunaga
Welding System Department, Technical Center, Welding Business

(1) AI Molten Pool Sensor

By using AI to analyze molten pool images and optimize the wire aim point, we will automate the abilities of skilled welders.

(2) ARCMAN™ View for Production Support DX

By gathering and analyzing production data from robots, we will help enhance customer productivity and reduce downtime. We will also support remote operation of robots through the use of camera images, thus achieving safer work.

(3) ARCMAN™ Offline Teaching System

Using 3D-CAD data, robot operations are simulated offline and programs to control robots are created automatically. Even beginners can easily teach the robot using the program creation logic that has incorporated the knowledge of experienced operators.

Machinery Businesses



Kazuto Morisaki
Executive Vice President

In the machinery businesses, we have global customers in a diverse range of fields, including the automotive, aircraft, shipbuilding, construction and civil engineering, social and industrial infrastructure, and environment and energy sectors. Furthermore, our machinery businesses cover a broad range of technologies, products, and services that help reduce CO₂ emissions and environmental impact. On a global basis, our machinery businesses have the potential to provide solutions to the social issues faced by our customers and contribute to the environment and society.

We are receiving an increasing number of inquiries about hydrogen/renewable energy-related products, the MIDREX[®] Process, and other environmentally friendly options that lead to CO₂ reductions. We are actively working on business development while promoting Groupwide cooperation, as exemplified by the creation of environmentally friendly options that leverage the strengths of Kobelco Eco-Solutions Co., Ltd., which became a wholly owned subsidiary of Kobe Steel in fiscal 2021, and the CO₂ reduction initiative in collaboration with the steel business and the electric power business. In the construction machinery business, we will contribute to work style reforms at construction sites through the use of K-Dive Concept, a remote operation technology for construction machinery. Our Group's machinery businesses are playing an increasingly active role in the efforts to realize a sustainable society. We believe that creating and strengthening value through combining technologies, products, and services in the machinery businesses worldwide will be the driver of the medium- to long-term growth of our machinery businesses.

Strategy

Stabilizing Earnings and Responding to Growing Markets

Machinery Business / Engineering Business

In the machinery businesses, we have so far demonstrated our competitiveness in the fields that utilize fossil fuels, but from now on, we will strengthen and enhance our business in the environmental field, which is expected to grow in the future. Through the capital and business alliance with Miura Co., Ltd., we will provide systems that offer customers comprehensive solutions, including saving energy and reducing CO₂ emissions, and conduct research on hydrogen utilization technology.

In the engineering business, we aim to maximize earnings through promoting environmentally friendly options. By expanding the MIDREX[®] business and exerting the collective strengths of the Group through cooperation with the steel business, the electric power business, and Kobelco Eco-Solutions, which became a wholly owned subsidiary of Kobe Steel in November 2021, we will work to create value unique to the KOBELCO Group.

To respond to energy conversion and growth markets, we will begin demonstration tests of a hybrid-type hydrogen gas supply system, utilizing the management resources of the machinery business and the engineering business, in order to provide solutions aimed at the realization of a hydrogen society in the future.

Construction Machinery Business

In order to achieve a transformation to a stable earnings structure, we will strengthen and enhance our business operations based on three pillars of unit business, parts and maintenance business and solutions/peripheral business.

The Chinese market has been a major pillar of earnings for the Group's construction machinery business, but we expect the business environment to become more challenging as a result of the decline of the Chinese market and intensified competition from Chinese manufacturers. While ensuring stable earnings by working to optimize the business in China, we will target Europe, North America, and India as "offense areas" where we have room to increase our market share. The areas we have defined as "defense areas" include Japan and Southeast Asia, where we already have a large market share, and China, which we are reducing our dependence on. By developing optimal business structures, products, and logistics approaches for respective areas, we will depart from an earning structure that is dependent on the Chinese market.

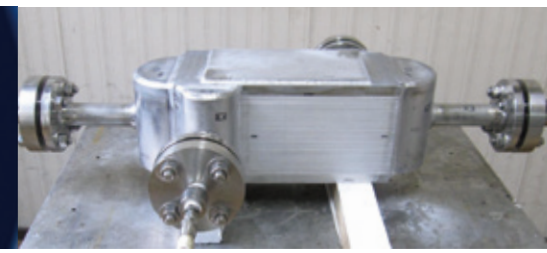
In addition, by taking steps to strengthen sales of parts and after-sales service, we will bolster earnings in the parts and maintenance business.

Furthermore, we are working to establish a new business model with the solutions/peripheral business as one of the new pillar of earnings of the construction machinery business by promoting business development in these areas. An example of this is the K-Dive Concept remote operation technology for construction machinery, which will start commercial service in stages from fiscal 2022.

For details on strategies for the machinery business, engineering business, and construction machinery business, please refer to the following materials.

Current Status of Progress on the KOBELCO Group Medium-Term Management Plan (FY2021-2023)

https://www.kobelco.co.jp/english/ir/library/investor_meeting/2022/220603_medium-term_en.pdf



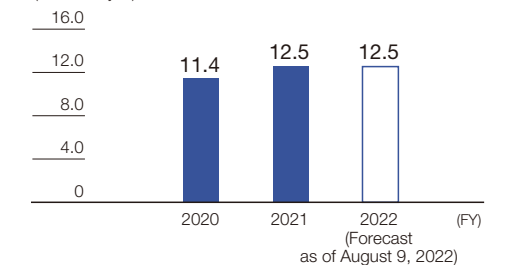
Machinery

Fiscal 2021 Summary

- Orders increased due to the recovery in capital investment and other factors.
- Sales declined due to sluggish orders in the previous fiscal year affected by the COVID-19 pandemic
- Ordinary income of 12.5 billion yen was recorded with an increase in service contracts and an improvement in profit margins due to changes in the project composition.

Ordinary Income

(Billions of yen)



Promoting Sustainability Management

Providing energy-related technologies with low environmental impacts

We will provide energy-related technology with low environmental impacts such as hydrogen by accelerating the transition to a more sophisticated industrial structure through the development of new machinery and manufacturing technologies focused on mixing, compressing, and heat exchange.

Promoting comprehensive energy conservation and reduction of CO₂ emissions

Through our capital and business alliance with Miura Co., Ltd., which has strengths in the heat supply business, we will provide new comprehensive solutions to energy savings and CO₂ reductions for a wider range of customers by expanding sales of heat pumps, which are clean heat sources, and recovering waste heat from compressors, etc.

Contributing to waste reduction

We will manufacture and sell equipment that contributes to higher efficiency and longer service life of components, with technologies such as surface treatment and IP processing, etc.

Providing stable operation by DX

We will achieve stable operation of delivered equipment by deploying the IoT cloud service "Kobelink" for standard compressors

Business Strengths

- Availability of all types of compressors (screw, turbo, and reciprocating) that allows the provision of the best compressor for each application
- Creating new value through collaboration with other businesses

Social Changes to Impact on Business

- Changes in the energy mix as a result of stricter environmental regulations (shifting from coal and oil to LNG, and in the future to renewable energy and hydrogen)
- Waste reduction

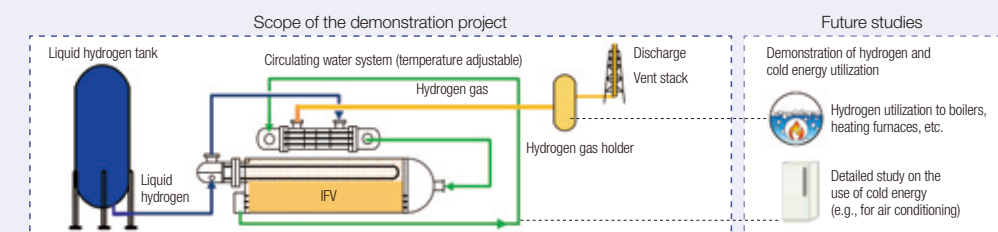
TOPICS

NEDO Entrusts Kobe Steel with Development of Intermediate Fluid Vaporizer for Liquid Hydrogen that Enables Use of Liquid Hydrogen Cold Energy

On March 9, 2022, the NEDO selected the "Development of an intermediate fluid vaporizer for liquid hydrogen that enables the use of liquid hydrogen cold energy" proposed by the KOBELCO Group as the development of large-scale equipment required for the liquid hydrogen receiving terminal under the Technology Development Project for Creating a Hydrogen Society / Technology Development Project for Large-Scale Utilization of Hydrogen.

We will demonstrate a liquid hydrogen vaporizer, which is able to recover liquid hydrogen cold energy, to develop a platform for a large-scale vaporizer by obtaining data of heat transfer and mechanical reliability, utilizing the KOBELCO Group's proven technologies and experience of the Intermediate Fluid Vaporizer (IFV) for LNG. In relation to this project, NEDO also selected our "Study on hydrogen utilization model for decarbonization of factories that mainly consume energy as heat" on December 3, 2021.

Through this project, the KOBELCO Group will contribute to the realization of a hydrogen society, which is a social issue.



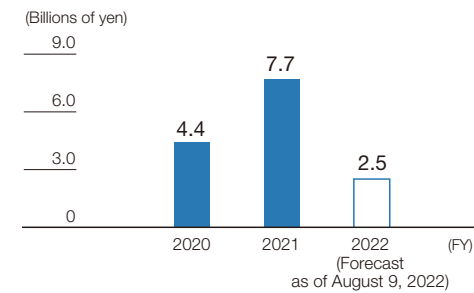


Engineering

Fiscal 2021 Summary

- Orders increased due to an increase in orders of large-scale projects in the DRI-related business and the waste treatment-related businesses.
- Ordinary income of 7.7 billion yen was recorded due to improvements in the progress of overseas projects that had been affected by the COVID-19 pandemic in the previous fiscal year, and improvement in profit margins along with changes in the project composition.

Ordinary Income



Promoting Sustainability Management



- **Contributing to CO₂ reduction**
In addition to the MIDREX® Process, which contributes to CO₂ reduction, we will provide renewable energy sources through hydrogen oxygen generators and woody biomass generators, etc.
- **Contributing to securing safe water sources and the creation of sustainable communities**
 - We will provide technologies, products, and services that contribute to infrastructure development and a recycling-oriented society based on the water treatment and waste treatment businesses.
 - We will contribute to the development of transportation infrastructure leveraging self-driving technologies and system integration capabilities that we developed through supplying new transit systems.

Business Strengths

- Extensive lineup of environmentally friendly options focused on CO₂ reduction, waste treatment, and renewable energy
- Being the owner of the MIDREX® Process, with a high global DRI market share.
- Creating new value through collaborations with other businesses, such as CO₂ reduction solution for blast furnace ironmaking and co-firing of biomass fuel (sewage sludge and food residue) at the Kobe Power Plant

Social Changes to Impact on Business

- Efforts to achieve carbon neutrality
- Support for a recycling-oriented society

TOPICS

Kobelco Eco-Solutions Becomes a Wholly Owned Subsidiary through a Simplified Share Exchange

On November 1, 2021, Kobelco Eco-Solutions Co., Ltd. became a wholly owned subsidiary of Kobe Steel, Ltd. through a simplified share exchange. We will move forward with initiatives that demonstrate greater synergies of the Group and strive to maximize profits from environmentally friendly options and enhance corporate value. To this end, we will take measures such as accelerating Group-wide efforts to create new businesses and achieve carbon neutrality, expanding Kobelco Eco-Solutions' business by utilizing the collective strengths of the Group, improving management efficiency, and speeding up decision-making.

Kobelco Eco-Solutions to Undertake Two Projects for Converting Sewage Sludge into Fuel

The special-purpose construction joint venture (Special JV) formed by Kobelco Eco-Solutions and other companies concerned has received successive orders from the Japan Sewage Works Agency. The first one is for the renovation work of the sludge treatment facilities at the wide-area sewage sludge treatment site for the eastern Hyogo area, and the second one is for the installation work of sludge utilization facilities under the Fukuchiyama City sludge treatment facilities rebuilding project. In both projects, the Special JV will undertake the renovation of existing facilities, as well as the construction of new facilities, for the digestion of sludge and for the conversion of sludge into fuel. The sludge digestion facilities and sludge fuelization facilities at the wide-area sewage sludge treatment site for the eastern Hyogo area will be among the largest in Japan. In these projects, the Special JV will work to produce biogas and sludge fuel derived from sewage sludge and utilize them to promote the effective use of sewage sludge energy and the reduction of greenhouse gas emissions.

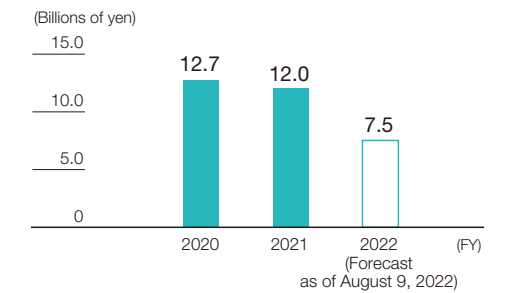


Construction Machinery

Fiscal 2021 Summary

- Unit sales of hydraulic excavators increased due to a recovery in demand driven by increased infrastructure investment, particularly in Southeast Asia and Europe, despite a decline in demand in China, where infrastructure investment has dwindled.
- Unit sales of crawler cranes remained at the same level as the previous fiscal year due to a recovery in demand in India and Europe, despite a decline in North America affected by the certification problem of the engine employed in our products.
- Ordinary income decreased by 0.6 billion yen to 12.0 billion yen due to a deterioration in the product mix and an increase in procurement costs despite the impact of a weaker yen against the U.S. dollar and the euro.

Ordinary Income



Promoting Sustainability Management



- **Contributing to solving the shortage of construction workers, improving site productivity, and ensuring essential safety through unmanned operations**
K-DIVE CONCEPT, a remote operation technology for construction machinery, enables "telework at construction sites"
- **Contributing to the creation of a global recycling-oriented society**
Providing a wide range of recycling machinery such as automobile dismantling machinery, building demolition machinery, and metal-handling machinery
- **Contributing to the reduction of climate change risks**
Development and commercialization of construction machinery that employs low-carbon technologies such as electrification and fuel cells

Business Strengths

- Energy-saving technology for construction machinery and a wide lineup of environmental recycling machinery
- Next-generation technical development capabilities, such as the K-DIVE CONCEPT technology for remote operation of hydraulic excavators




Social Changes to Impact on Business

- DX
- Diversification of work styles
- Declining and aging population in the construction industry
- Carbon neutrality

TOPICS

K-DIVE CONCEPT – Remote Operation Technology for Hydraulic Excavators

Kobelco Construction Machinery Co., Ltd. has promoted research and development for its K-DIVE CONCEPT under the slogan of realizing a teleworking system centered on people who work at construction sites. As a result, preparations for remote operation services at designated yards are being put in place, and the service will be launched in phases in fiscal 2022. This system will enable on-site construction work that is free from constraints such as location and time, helping to eliminate shortages of skilled construction workers and improving productivity through unmanned on-site operation.

Phase 1	Phase 2	Phase 3
Work at a designated yard Remote operation of heavy equipment at designated yards, such as a metal scrapyard, industrial waste treatment yard, or mud pits 	Work at a general civil engineering site Remote operation of heavy equipment at sites with short construction periods, such as general civil engineering sites and sites for land formation 	Matching service Support efficient development of operators, and expand the pool of operators 
Service to launch in fiscal 2022		

Electric Power Business



Jiro Kitagawa
Executive Officer

In February 2022, we began operation of the Kobe Power Plant No. 3 unit, employing cutting-edge power generation facilities. The power plant contributes to the stability of electric power system with low transmission loss due to its proximity to areas of high electricity demand. We believe that, by providing a stable supply of electric power with high operational and economic efficiency, we can contribute to the further development of local communities. Construction of the Kobe Power Plant No. 4 unit is proceeding as planned, and commercial operations are scheduled to begin in the second half of fiscal 2022.

In recent years, the energy situation in Japan has changed significantly. In March 2022, the Japanese government issued its first power supply warning due to earthquakes and deteriorating weather, which heightened the risk of unexpected large-scale power outages. Subsequently, in June 2022, the government issued an advisory for possible power shortages after the shortest-ever rainy season followed by consecutive days of extreme heat. While renewable energy is becoming one of the main power sources in Japan, the importance of a stable power supply from thermal power sources has been reaffirmed in situations where power supply is tight. Our Group owns disaster-resistant large-scale thermal power plants that can provide a stable supply of high-capacity electricity, which is of great social significance. We will strive to realize safe, secure, and prosperous lives by providing a stable supply of economical electric power through the operation of highly efficient power generation facilities in accordance with the national energy policy, and by working for even higher efficiency and decarbonization toward realizing carbon neutrality by 2050.

Strategy

National Energy Policy

In 2020, Japan declared its aim to achieve carbon neutrality by 2050 and made an international pledge at the G7 summit in June 2021. In October 2021, the Cabinet of Japan decided on the 6th Strategic Energy Plan in October 2021, and, in May 2022, the Act of Partial Revision of the Act on the Rationalization etc. of Energy Use and Other Acts was enacted with the aim of achieving the reduction target for greenhouse gas emissions (46% reduction compared to the 2013 level) by 2030.

In order to achieve these decarbonization goals, the Clean Energy Strategy has been set forth as a growth strategy to show the direction Japan should take. This incorporates two strategies of ensuring energy security and achieving economic, social, and industrial structural reforms toward a carbon-neutral society.

In this strategy, thermal power generation is expected to play a role as a stable supply source of electric power in a tight supply situation. It is also required as a power source that performs functions such as adjusting the

supply-demand balance to compensate for the variability of renewable energy, which is increasingly being used, and providing inertial force to reduce the probability of blackouts.

In addition, Japan aims to proceed with the decarbonization of thermal power plants by gradually reducing inefficient thermal power plants and increasing the use of ammonia and hydrogen as fuels for higher efficiency and lower CO₂ emissions toward realizing a carbon-neutral society.

KOBELCO Group's Initiatives

Based on the roadmap set out in the Medium-Term Management Plan, the Group will continue to provide a long-term stable supply of electric power with low environmental impact and high economic efficiency, while strengthening its efforts to achieve even higher efficiency and lower CO₂ emissions with the aim of realizing carbon neutrality by 2050. Through the stable supply of electricity, we will contribute to local communities and the global environment in order to realize a world in which people can enjoy safe, secure, and prosperous lives.

Roadmap for 2030

Kobe Coal fired	<ul style="list-style-type: none"> Increase the energy efficiency of cities/regions by supplying heat and hydrogen from steam utilization Study co-firing of biomass fuel Study co-firing of ammonia Ensure generation efficiency of at least 43% through the above initiatives
Moka Gas fired	<ul style="list-style-type: none"> Continue low-CO₂ power generation through high-efficiency GTCC

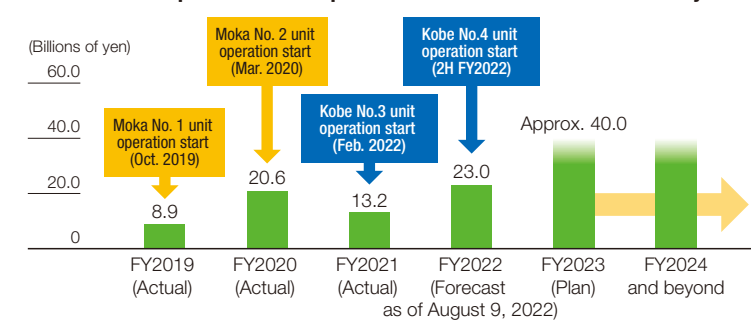
Roadmap for 2050

Kobe Coal fired	<ul style="list-style-type: none"> Increase the rate of ammonia in co-firing fuel, and take on the challenge of single-fuel firing <p>Social and technological innovation: Establishment and commercialization of low-cost, zero-emission ammonia technology</p>
Moka Gas fired	<ul style="list-style-type: none"> Maximize utilization of carbon-neutral city gas <p>Social and technological innovation: Widespread use and commercialization of carbon-neutral city gas</p>



Fiscal 2021 Summary

Smooth Startup and Stable Operation of New Electric Power Projects



In fiscal 2021, ordinary income decreased by 7.4 billion yen year on year to 13.2 billion yen due to an increase in idle time resulting from periodic inspections of the Moka Power Plant, and a decline in demand from the previous fiscal year that saw a rise in demand in response to temporary power supply-demand tightness in the winter.

Note: Figures are actual results and forecasts of ordinary income in the electric power segment

Promoting Sustainability Management

The electric power business will lead sustainability management based on the Group Corporate Philosophy. In order to continue to provide solutions to the needs of society, by making the best use of the talents of our employees and our technologies, as stated in KOBELCO's Mission, we will accelerate the practical application of CO₂ reduction technologies in the electric power business through Groupwide collaborations with the engineering and other businesses.

Business Strengths

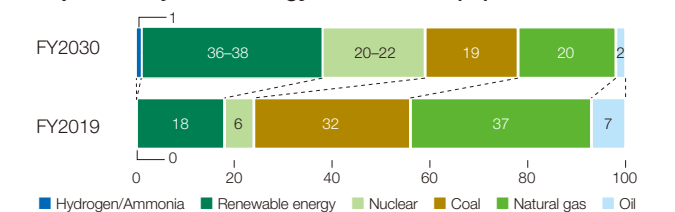
Kobe Coal fired	<ul style="list-style-type: none"> Contributing to further improvement of electric power self-sufficiency rate in Kobe City and Hanshin area Compliance with toughest environmental standards in Japan Improving overall regional energy efficiency by supplying heat generated from power generation facilities Plans to use sewage sludge from urban areas as biomass fuel Very low transmission losses from power plants due to the proximity to areas of high electricity demand Operating technologies accumulated through in-house power generation in the steel industry Utilization of infrastructure of port facilities
Moka Gas fired	<ul style="list-style-type: none"> Japan's first inland thermal power plant with low risk of damage from natural disasters such as earthquakes and tsunamis, serving as backup to Tokyo metropolitan area Adoption of the world's highest level of Gas Turbine Combined Cycle (GTCC) Utilization of existing infrastructure such as gas trunk lines and industrial complexes that have already been developed, as well as technologies and know-how accumulated through in-house power generation

The 6th Strategic Energy Plan

In October 2021, Japan formulated its 6th Strategic Energy Plan, which sets out new policy targets for 2030 with respect to the energy mix aimed at simultaneously achieving safety, energy security, economic efficiency, and environmental compliance.

For the development of our electric power business in accordance with national policies, we will move ahead with initiatives aimed at higher efficiency and lower CO₂ emissions, while leveraging the strengths of the KOBELCO Group's businesses, in order to achieve energy security, economic efficiency, and environmental compliance.

Japan's Projected Energy Mix for 2030 (%)



Note: Prepared by Kobe Steel, based on materials released by the METI

TOPICS

Progress in New Electric Power Projects

Kobe Power Plant No. 3 and No.4 units (artist's impression)



No. 3 unit: Began commercial operations in February 2022
No. 4 unit: Scheduled to begin commercial operations in the second half of fiscal 2022

Moka Power Plant No. 1 and No. 2 units (panoramic view)



No. 1 unit: Began commercial operations in October 2019
No. 2 unit: Began commercial operations in March 2020