

KOBELCO Group Medium-Term Management Plan (FY2021–FY2023)

Under the Fiscal 2016–2020 Group Medium-Term Management Plan that commenced in April 2016, we aimed to establish three core business areas: materials, machinery, and electric power. However, we have yet to establish those three business pillars due to changes in demand forecasts for our automotive weight reduction strategy, which we have aggressively invested in, as well as due to the emergence of issues concerning our *monozukuri* capabilities and profitability particularly in the materials businesses. In these circumstances, we must continue to work to restore profitability.

Looking at the business environment surrounding our Group, we anticipate further deterioration of structural problems in the steel industry, changes in society moving towards carbon neutrality, and the advancement of digital transformation. We will need to proactively address all of these areas as opportunities for business structure reform and as new sources of earnings.

In light of these circumstances, we have placed top priority on establishing a stable earnings base and taking on the challenge of realizing carbon neutrality in the new KOBELCO Group Medium-Term Management Plan for fiscal 2021–2023.



The two most important issues to be addressed under the new Medium-Term Management Plan

- (1) Establishing a stable earnings base
- (2) Taking on the challenge of realizing carbon neutrality

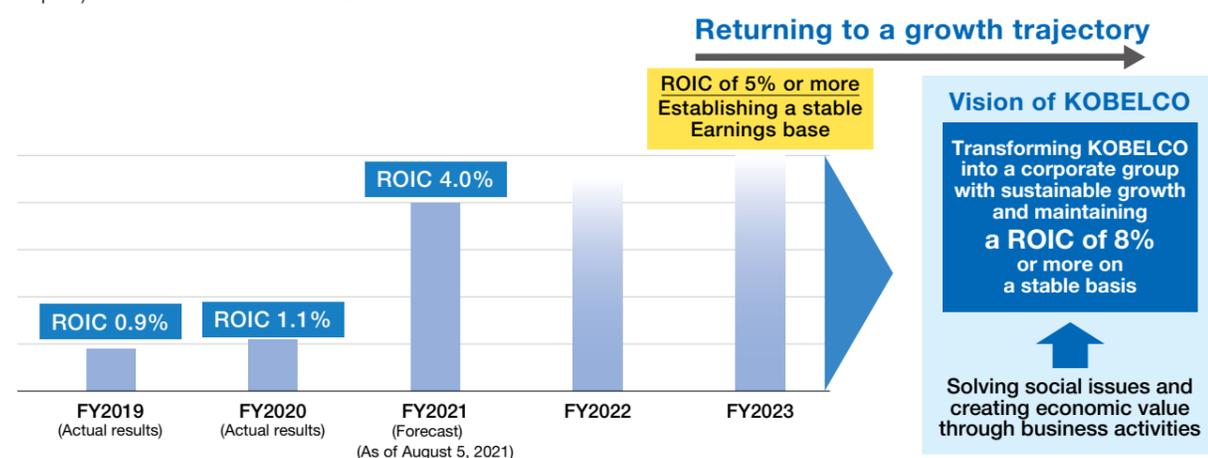
(1) Establishing a Stable Earnings Base

During the period of our new Medium-Term Management Plan, we will further pursue initiatives aimed at strengthening profitability focused on the materials businesses and establish a stable earnings base for the KOBELCO Group.

We will look to achieve a ROIC (return on invested capital) of at least 5% in fiscal 2023 when our new electric

power projects come into operation and fully contribute to earnings. In the future, our Group aims to maintain a stable ROIC of 8% or higher and achieve sustained growth.

To this end, we will steadily implement the following five key measures.



Strengthening the earnings base of the steel business

- Under the assumption that domestic demand will continue to decline over the long term, we will establish a structure that can guarantee stable earnings with crude steel production of 6.3 million tons of and secure profitability even with 6.0 million tons.

Smooth startup and stable operation of new electric power projects

- We will secure earnings of 40.0 billion yen/year from the stable operation of Kobe Power Plant's No. 1 and No. 2 units and Moka Power Plant's No. 1 and No. 2 units and the planned commercial operation of Kobe Power Plant's No. 3 and No. 4 units.

Strategic investment in the materials businesses leading to earnings contribution

- We will promote strategic investment for automotive weight reduction to realize early earnings contribution by responding to the continuously growing need for lighter vehicles, despite adverse factors such as delays in demand rise and challenges in *monozukuri* capability.

Restructuring unprofitable businesses

- Amid changes in the demand environment and industrial structure, we are streamlining the steel casting and forging business and the titanium business, which incurred impairment of fixed assets in fiscal 2019, as well as the crane business, which continues to suffer losses, with the aim of turning profits from fiscal 2021–2022.

Stabilizing earnings in the machinery businesses and responding to growing markets

- In the machinery and engineering businesses, we will expand environmental contribution menu, including solutions to CO₂ reductions, and respond to the growing markets while promoting intra-Group collaboration.
- In the construction machinery business, we will work to depart from dependence on the Chinese market, turn profits from businesses leading to new value creation through providing solutions for innovations such as workstyle reforms in the construction industry, and promote commercialization of peripheral businesses through providing know-how on the installation of new systems.

(2) Taking on the Challenge of Realizing Carbon Neutrality

The KOBELCO Group has set targets for 2030 and a vision for 2050 from two angles: (1) reducing CO₂ in the Group's production processes; and (2) contributing to reducing CO₂ emissions with the Group's technologies, products, and services.

In order to achieve carbon neutrality in 2050, we will make bold efforts to reduce CO₂ in our production processes mainly by promoting technological development

and utilizing external innovative technologies. In addition, we will capture growing demand for these menus as a business opportunity, taking advantage of our strengths that enables the fusion of technologies and diverse menus that contribute to reducing CO₂ emissions, such as MIDREX[®] Process and materials for lightweight and electric vehicles.

	FY2030 targets	FY2050 vision
Reduction of CO ₂ emissions in production processes	30–40%* ¹ (vs. FY2013)	Take on the challenge of achieving carbon neutrality
Contribution to reduction of CO ₂ emissions through technologies, products, and services* ²	61 Mt (including 45 Mt or more through MIDREX [®] Process* ³)	100 Mt or more

*1 Most of the reduction targets are associated with iron and steel making processes. We reviewed the targets announced in September 2020 (with the change from BAU to the total amount basis, and the increased use of original solutions reflected).

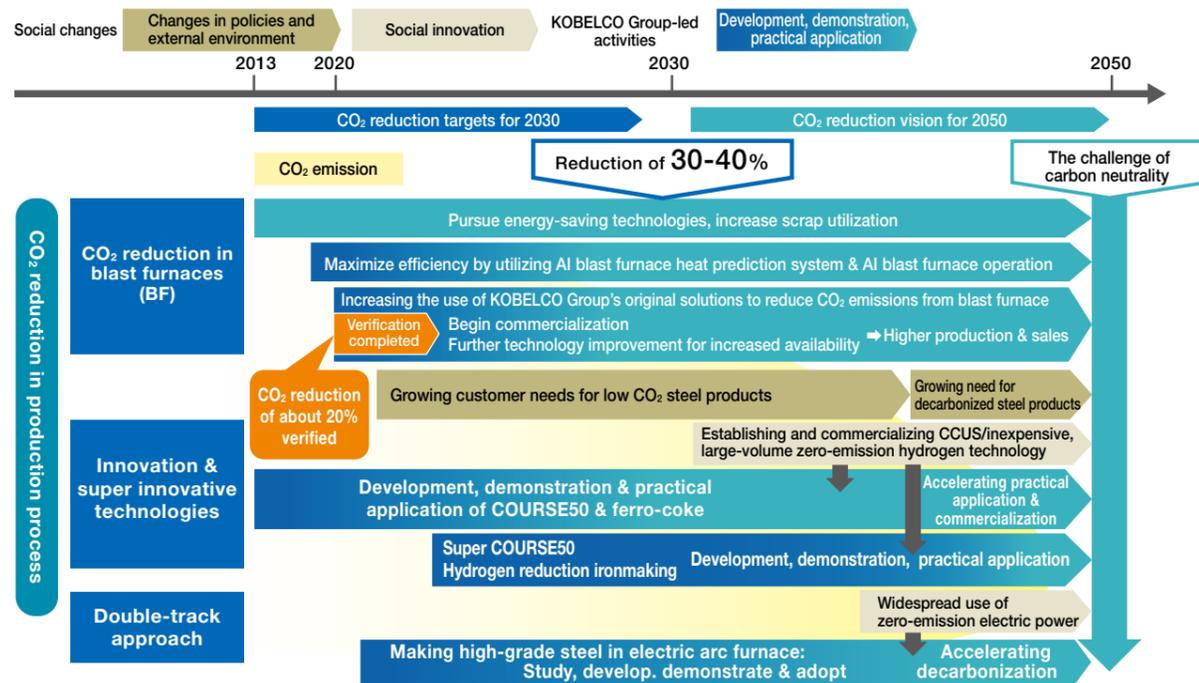
*2 The KOBELCO Group contributes to the reduction of CO₂ emissions in various areas of society through its distinctive technologies, products, and services.

*3 Reviewed calculation formula announced in September 2020

Roadmap for Carbon Neutrality in Ironmaking Process

We will strive to lead the industry in the field of CO₂ emission reduction and differentiate ourselves from other companies by utilizing our Group's original MIDREX[®] technologies for blast furnaces as announced in February 2021, while promoting the development of existing

technologies (energy-saving technologies, increased use of scrap, blast furnace operation technology utilizing AI, etc.) as well as innovative technologies (COURSE50, ferro-coke, etc.). We are also considering the introduction of high-grade steel production using electric arc furnaces.



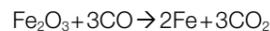
Blast Furnace Ironmaking

Why does the blast furnace emit so much CO₂?

Roughly 80–90% of CO₂ emissions from iron and steel production is generated by the blast furnace process. This owes to the two functions of the blast furnace.

(1) Reduction of iron ore

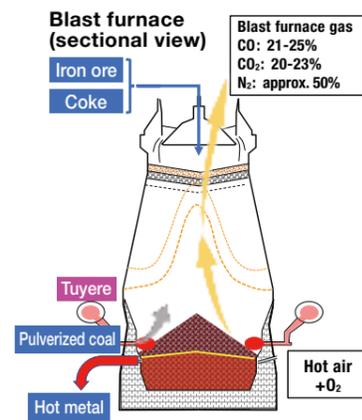
Carbon contained in coke is used to remove oxygen from iron ore.



(2) Melting of iron (from solid to liquid)

Iron is melted with combustion heat during carbon combustion and reaction heat during reduction.

These functions make it possible to produce high-grade steel with less impurities compared to the electric arc furnace route that melts scrap iron.



MIDREX[®] Process

The MIDREX[®] Process is a direct reduction ironmaking technology developed by Midrex Technologies, Inc., Kobe Steel's wholly-owned U.S. subsidiary in the US.

It is the world's leading natural gas-based direct reduction ironmaking method, accounting for roughly 80% of the world's natural gas-based direct reduced iron (DRI) production (approximately 60% of the world's total DRI

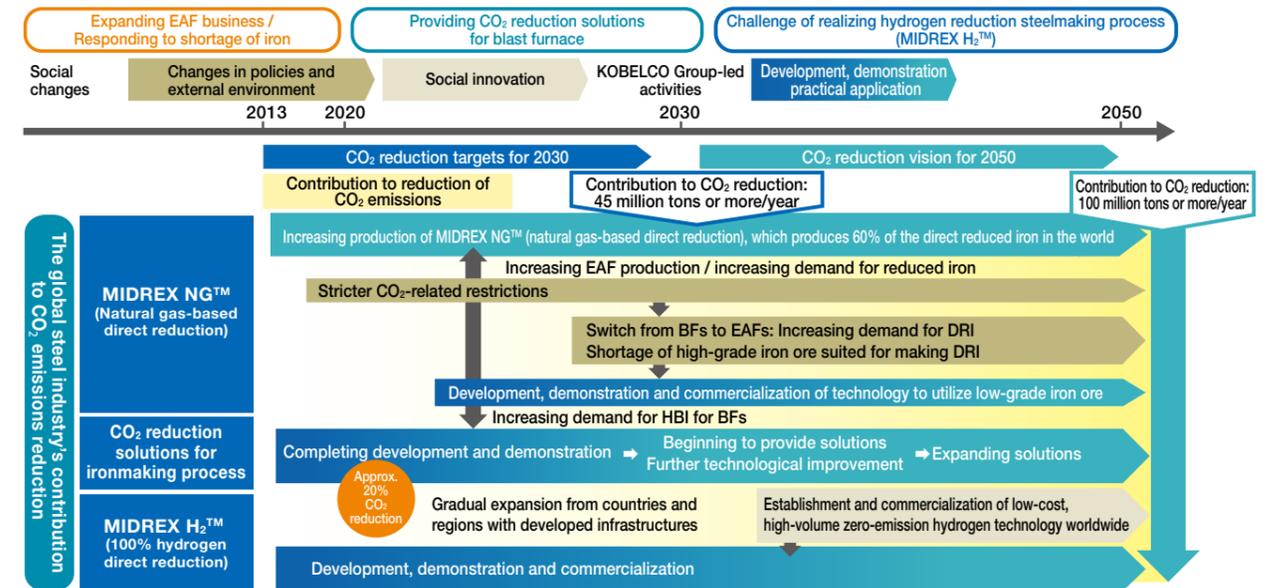
production). Compared to the blast furnace method, the MIDREX[®] Process can lower CO₂ emissions in the ironmaking process by around 20–40%. Over 80 MIDREX[®] plants have been in operation worldwide.

Please refer to the interview with the Midrex President & CEO on pages 30–32.

Roadmap for CO₂ Reduction through Midrex[®] Process

The MIDREX[®] Process—a proprietary technology of the KOBELCO Group—is a direct reduction ironmaking method that uses natural gas. This process accounts for approximately 60% of the global direct reduced iron (DRI) production. We will continue to drive earnings growth and contribute to the reduction of CO₂ emissions by

providing solutions through the MIDREX[®] Process, while striving to meet greater demand for electric arc furnaces, providing CO₂ reduction solutions for blast furnaces, and taking on the challenge of developing hydrogen reduction ironmaking processes.



CO₂ Reduction Solutions for Ironmaking Process

We successfully demonstrated technology that can reduce CO₂ emissions from blast furnace operations by charging a large amount of HBI* produced with the MIDREX[®] Process

in a blast furnace. Please refer to page 70 for more details.

*Hot briquetted iron: direct reduced iron (DRI) in a briquetted form. Since hot DRI is not suitable for long-distance transportation, it is pressed into a compact solid (briquette) upon being discharged from the reduction furnace.

MIDREX H₂[™] (100% hydrogen-based direct reduction)

In the MIDREX[®] Process, natural gas can be gradually replaced with hydrogen to achieve even greater CO₂ emission reductions. In addition, it has been confirmed that the process can be switched to a hydrogen-based reduction ironmaking method that uses 100% hydrogen gas as reductant without the need for additional large investment.

Midrex Technologies, Inc. has entered into a joint research agreement with ArcelorMittal, the world's largest steelmaker, to supply the hydrogen-based direct reduction ironmaking technology in the research and development of low-carbon ironmaking using hydrogen, promoted by ArcelorMittal.

As part of the agreement, Midrex Technologies also entered into an agreement to undertake the design of a demonstration plant for the production of reduced iron using hydrogen, which will be constructed at ArcelorMittal's

Hamburg plant in Germany, utilizing Midrex's technology.

In this demonstration plant, verification of hydrogen reduction will be conducted by recovering hydrogen contained in the top gas from the existing DRI plant that uses natural gas as reductant. The plant will produce about 100,000 tons of DRI per year, making it the world's largest DRI plant that uses only hydrogen as reductant.



ArcelorMittal's existing DRI plant in Hamburg, Germany

Initiatives in the Automotive Field

Many major countries have set targets for vehicle electrification as part of their efforts to achieve carbon neutrality, and automakers are accelerating their move toward vehicle electrification. The KOBELCO Group is contributing to this shift in the automotive industry with products that enhance the electric vehicle (EV) qualities, including bearing steel, special steel, magnetic materials,

and titanium foil.

And making vehicles lighter not only improves the fuel efficiency of conventional gasoline-powered vehicles but also extends the driving range of EVs. We are working to reduce CO₂ emissions through the supply of materials and components that contribute to the automotive weight reduction.

KOBELCO Group's Contribution to Vehicle Electrification		
Products	Main applications (target parts)	Anticipated effects
Steel: High strength steel	Body frame, bumper, door impact beam	Improved characteristics from lightweighting (Easing weight increase in electrification) • Improved fuel economy for hybrid cars • Longer driving range of electric cars • Improved collision safety (Easing increased braking distance)
Aluminum: Extrusions		
Aluminum: Panel material	Hood, door, roof, fender	Improved characteristics of electric cars
Aluminum: Forged suspensions	Suspension	
Steel: Bearing steel, Special steel wire rod	Electromagnetic parts (motor, etc.) Cold-forged parts (gears, shafts, etc.)	Improved characteristics of electric cars
Steel: Pure iron soft magnetic material (wire rod)		
Steel powder: Magnetic steel powder		
Titanium: NC titanium	Fuel cell stack	Improved characteristics of fuel cell cars

Note: Applications for ICEV (Internal Combustion Engine Vehicle), HEV (Hybrid Electric Vehicle), PHEV (Plug-in Hybrid Vehicle), BEV (Battery Electric Vehicle), FCEV (Fuel Cell Electric Vehicle)

Renewable Energy Initiatives

From a long-term perspective, we expect a shift from fossil fuels to natural gas and renewable energy as a result of significant changes in the composition of global primary energy sources. In the machinery businesses, our Group will help reduce CO₂ emissions through the provision of technology, products, and services that can

contribute to these fields. In the welding and other materials businesses, we will contribute to the transition to renewable energy through our distinctive technologies, products, and services.

Please refer to pages 56-59 for information about our initiatives in the machinery businesses.

Welding Solutions

Liquefied CO₂ Storage Tanks

For liquefied CO₂ storage tanks, the industry plans to use high-strength steel, but the possibility of using cryogenic steel is increasing in the future. We have been developing high-efficiency electroslag welding materials and methods that employ cryogenic steel for fuel tanks of ships. Going forward, we believe this technology can be applied to liquefied CO₂ storage tanks. By proposing a high-quality, high-efficiency welding process and responding to demand for the construction of liquefied CO₂ storage tanks, we will contribute to the building of a CO₂ recycling infrastructure and the reduction of CO₂ emissions.

high-quality, high-efficiency technologies, including narrow groove welding, high-speed weldability, and high rigidity. We have started developing our own welding materials and processes with a view to commercial application. In particular, the Japanese market is moving toward the introduction of offshore wind power generation, so we expect an increase in demand for high-efficiency welding to lower power generation costs. Going forward, we will continue to develop high-efficiency welding processes and optimal welding materials and increase customer value by proposing welding solutions of our expertise, thereby supporting offshore wind power generation from the welding field and contributing to the reduction of CO₂ emissions.



Offshore Wind Power Generation Towers

In the welding of offshore wind power generation towers, special welding processes are used. These require

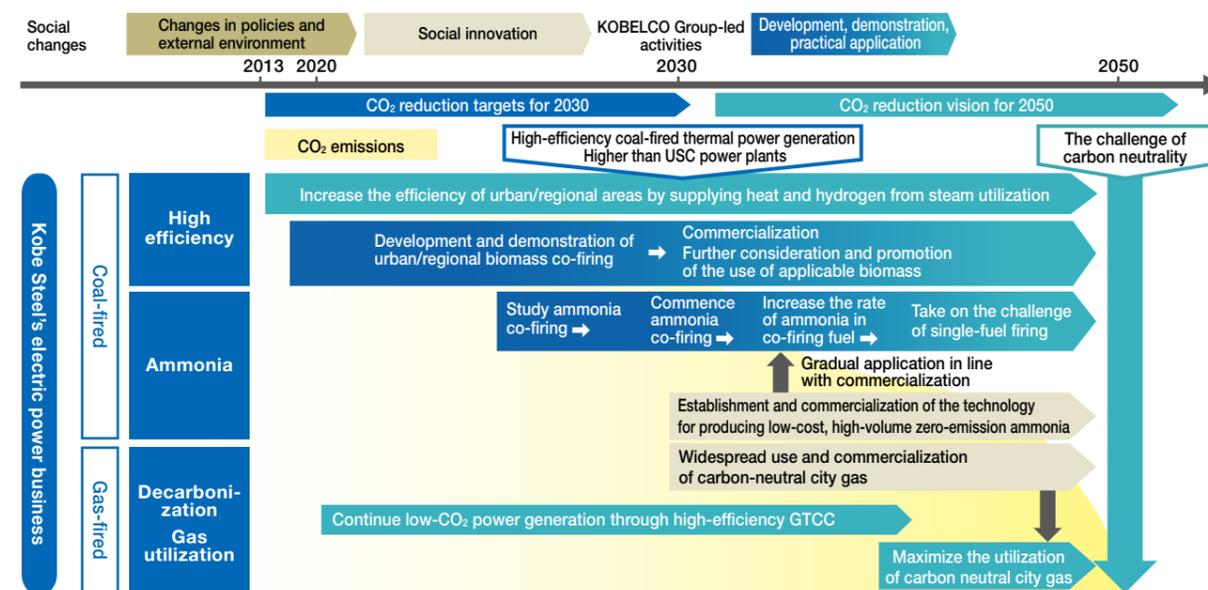


Roadmap for Carbon Neutrality in the Electric Power Business

In the coal-fired power generation at the Kobe Power Plant, we will supply heat and hydrogen to surrounding areas using steam from the power plant and increase the efficiency of region-wide energy use. We will promote the collaboration of the Electric Power Business and the Engineering Business divisions to strengthen CO₂ reduction initiatives such as co-firing of biomass fuel (sewage sludge and food residue) and ammonia, aiming to achieve the world's most advanced urban coal-fired power plant. In

the gas-fired power generation at the Moka Power Plant, we will continue stable operation of low-CO₂ power generation using high-efficiency GTCC.

In addition, at the Kobe Power Plant, we will increase the rate of co-firing of ammonia, and ultimately we will take on the challenge of single-fuel firing. At the Moka Power Plant, we are also considering the maximum use of carbon neutral city gas, and through these measures, we aim to achieve carbon neutrality by 2050.



Urban/Regional Biomass Co-firing: Initiatives for Effective Use of Underutilized Energy

In collaboration of Kobelco Eco-Solutions Co., Ltd., which operates sewage sludge treatment business, and the Kobe Power Plant, we plan to convert sewage

sludge into fuel and use it as a biomass fuel for co-firing at the Kobe Power Plant.

