

KOBELCO

KOBELCO Group's DX Strategy

February 21, 2022
Kobe Steel, Ltd.

Today's Topics

1. Overview of KOBELCO Group's DX Strategy
2. Our DX Initiatives
3. Framework for Promoting DX Initiatives and IT-Related Capital Investments

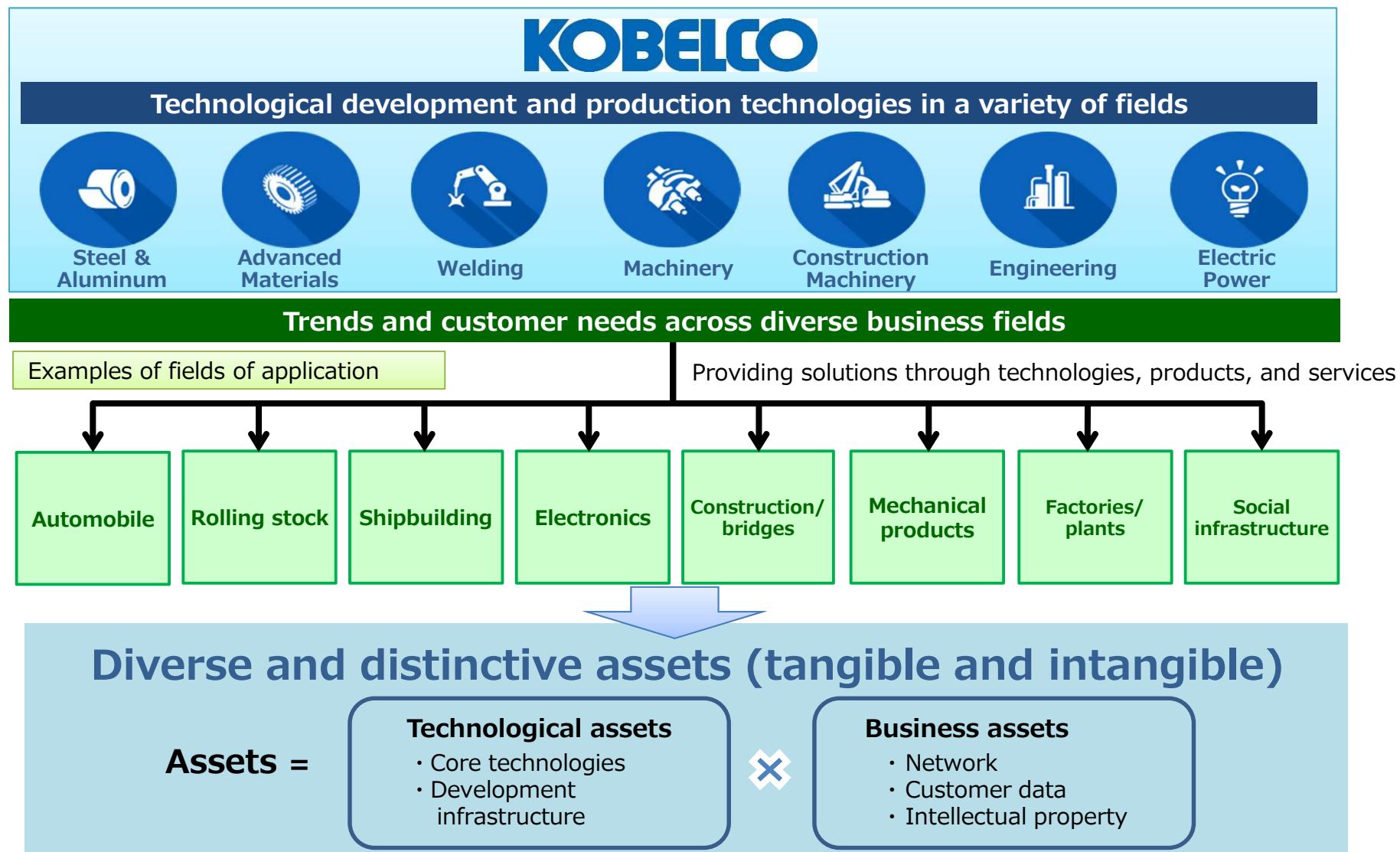
Q&A session

Appendix: Reference materials

1. Overview of KOBELCO Group's DX Strategy

Resources for KOBELCO Group's DX Strategy

The KOBELCO Group has been operating a wide range of businesses since its founding.



The Aim of the KOBELCO Group in DX Promotion

In order to promote sustainability management and enhance corporate value, we must implement DX strategy utilizing a wide variety of our unique assets (tangible and intangible).

Internal Digitalization Initiatives

Staff operations

Visualizing diverse and distinctive internal assets

Manufacturing sites

Promoting the development of diverse digital solution technologies (in materials, components, machinery)

Customer and social needs

Accelerating knowledge exploration (creation of new value) by actively utilizing AI



Open innovation and collaboration with other companies

Benefits Gained Through DX Strategy

We aim to become a group of people who can foresee future market trends and act proactively, transcending the conventional concept of business practices and existing frameworks.

Stabilize profitability and reduce capital cost
→ Improved corporate value

Shift to a co-creation culture in which all employees work to create new value



Solutions to various social issues

Business development targeting new areas and customers

KOBELCO Group's Basic Policy on DX Strategy

We aim to become a provider of products and solutions to achieve carbon neutrality by 2050 and address other social issues together with our customers.

Realize the KOBELCO's View of the Future together with customers and society

STEP 2. Pursuit of KOBELCO's Uniqueness Through DX –Explore new value by leveraging diverse and distinctive assets

- ◆ Transform existing businesses and respond to changes in the external environment through data visualization and analysis
- ◆ Create new businesses

STEP 1. DX Base Building Activities –Innovative productivity improvement through comprehensive digitalization (RPA, IoT, AI and more)

- ◆ Promote the automation and efficiency of plant operations
- ◆ Improve the skills of human resources
- ◆ From repetitive work to high-value-added work

Realize early improvement of productivity through DX and DX capabilities of employees and allocate the saved time to create new value

2. Our DX Initiatives

STEP 1. DX Base Building Activities

- (1) **Demonstration of level-4 Autonomous Driving Technology at Kakogawa Works** (Collaboration with UD Trucks Corporation)
- (2) **Development of DX Experts**

STEP 2. Pursuit of KOBELCO's Uniqueness Through DX

- (3) **CO₂ Reduction Solution for Blast Furnace Ironmaking**
- (4) **K-DIVE CONCEPT: Telework System for Construction Sites**

STEP 1. DX Base Building Activities

Innovative productivity improvement through comprehensive digitalization
(RPA, IoT, AI and more)

- ◆ **Promote the automation and efficiency of plant operations**
- ◆ Improve skills of human resources
- ◆ From repetitive work to high-value-added work

(1) Demonstration of Level-4 Autonomous Driving Technology at Kakogawa Works (Collaboration with UD Trucks Corporation) P9 ↻

- In November 2021, UD Trucks and Kobe Steel have reached an agreement to conduct an autonomous driving trial using a heavy-duty truck equipped with L4 autonomous driving technology, provided by UD Trucks.
- The demonstration test is scheduled to be conducted in the second half of FY2022 on a part of the Kakogawa Works granulated slag transport route.
- The technology will help alleviate labor shortages at manufacturing and logistics sites, automate and streamline plant operations, and reduce the burden of workers.



Vehicle similar to the one used in the demonstration test

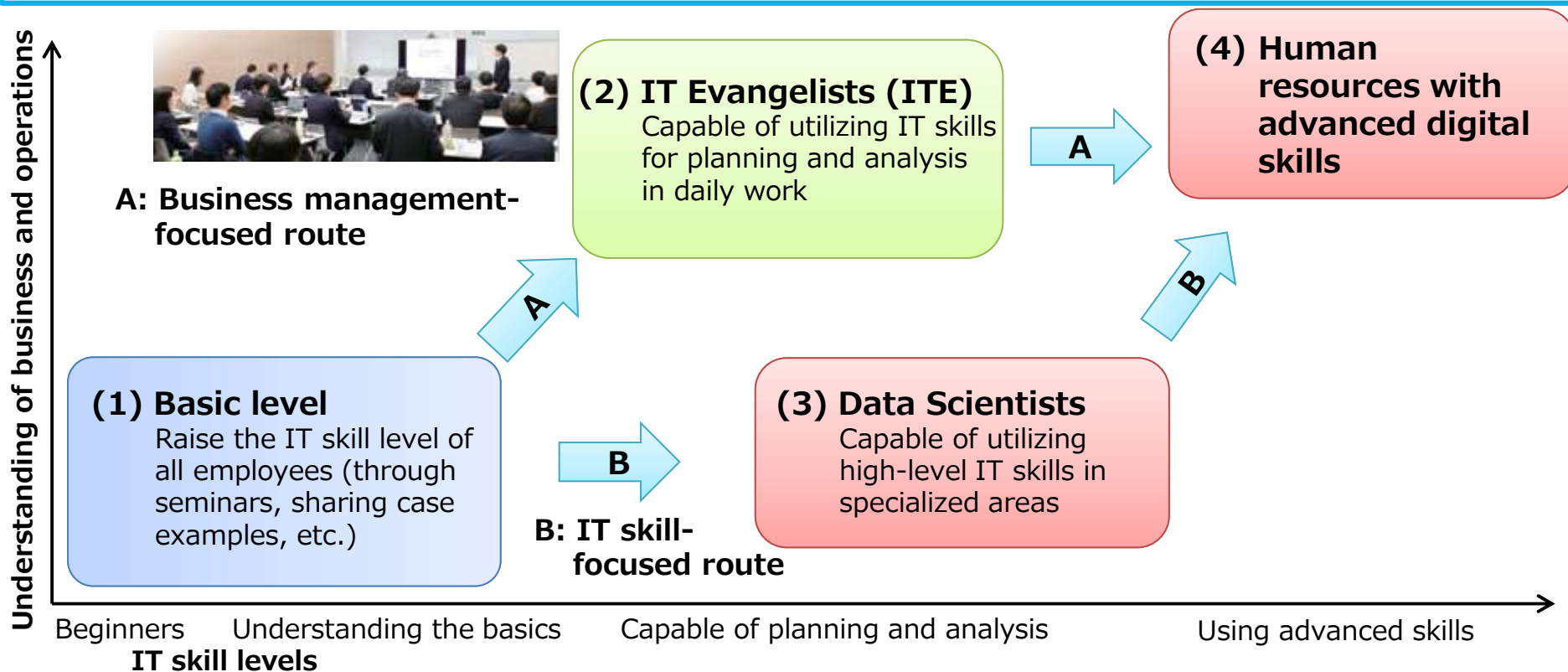
STEP 1. DX Base Building Activities

Innovative productivity improvement through comprehensive digitalization
(RPA, IoT, AI and more)

- ◆ Promote the automation and efficiency of plant operations
- ◆ **Improve skills of human resources**
- ◆ **From repetitive work to high-value-added work**

(2) Development of DX Experts – Roadmap

- We are improving the skills of human resources and developing DX experts through **two routes focusing on either business management or IT skills**.
- In FY2017, we started a Data Scientist training program. To date, 104 people trained.
- In FY2019, we started an IT Evangelist training program. We will have 135 people trained by the end of FY2021 and **a total of 485 trained by the end of FY2023**. IT Evangelists will lead business improvement in their respective departments. Their achievements in digitalization include high-speed processing and trend analysis of large amounts of data, file consolidation to improve efficiency, etc.



(2) Development of DX Experts – Internal Portal Site

A portal site for sharing internal case examples has been launched to ensure that all employees share awareness and stay keen on DX issues. We are promoting the creation of an environment in which all employees are willing to voluntarily engage in DX activities.

Sharing information on DX



Kobe Steel became a DX-Certified Operator under the program organized by the Ministry of Economy, Trade and Industry.



Regular messages from the Director who oversees companywide information systems

Interactive communication with employees

KOBELCO Questionnaire No. 4

We are conducting a simple questionnaire about our DX strategy. The theme is "Has your interest in DX increased since the launch of the portal site?" Please answer the questionnaire by pressing the buttons below.

Answer

See results

Case examples from sub-committees



STEP 2. Pursuit of KOBELCO's Uniqueness Through DX

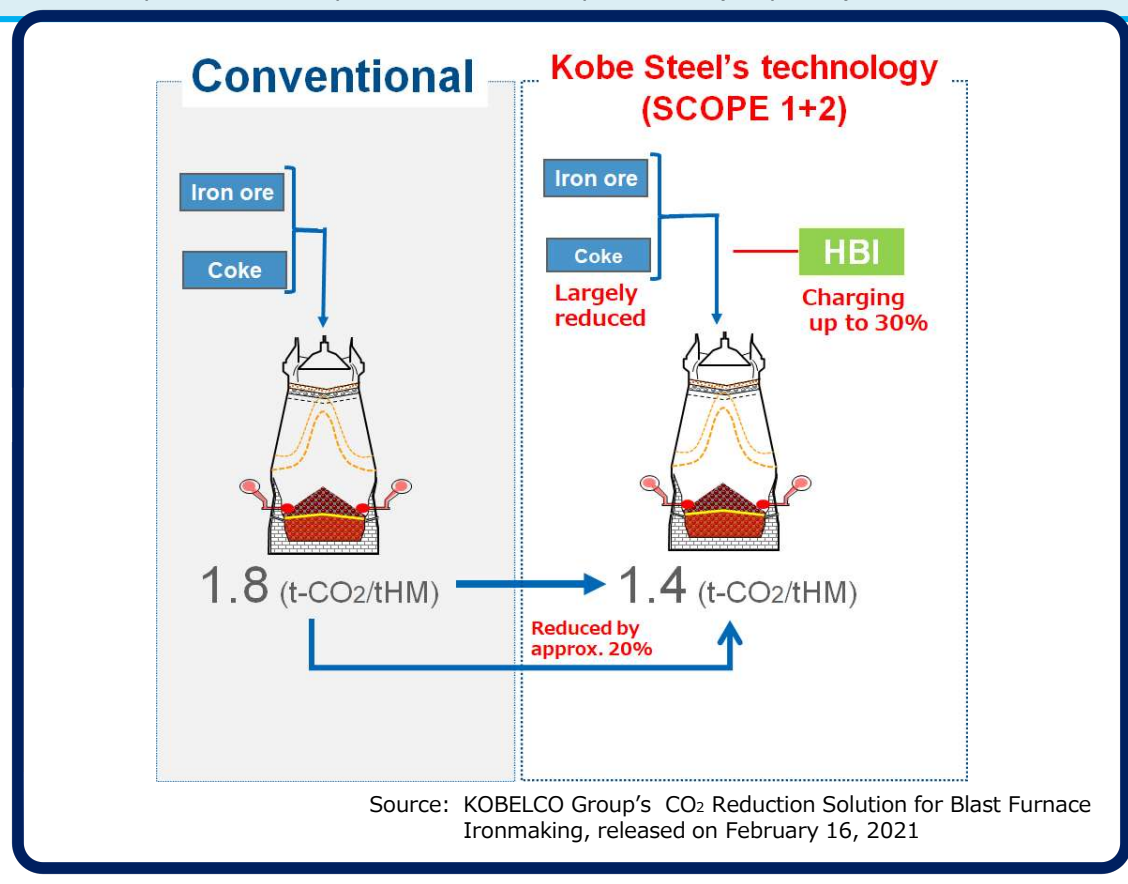
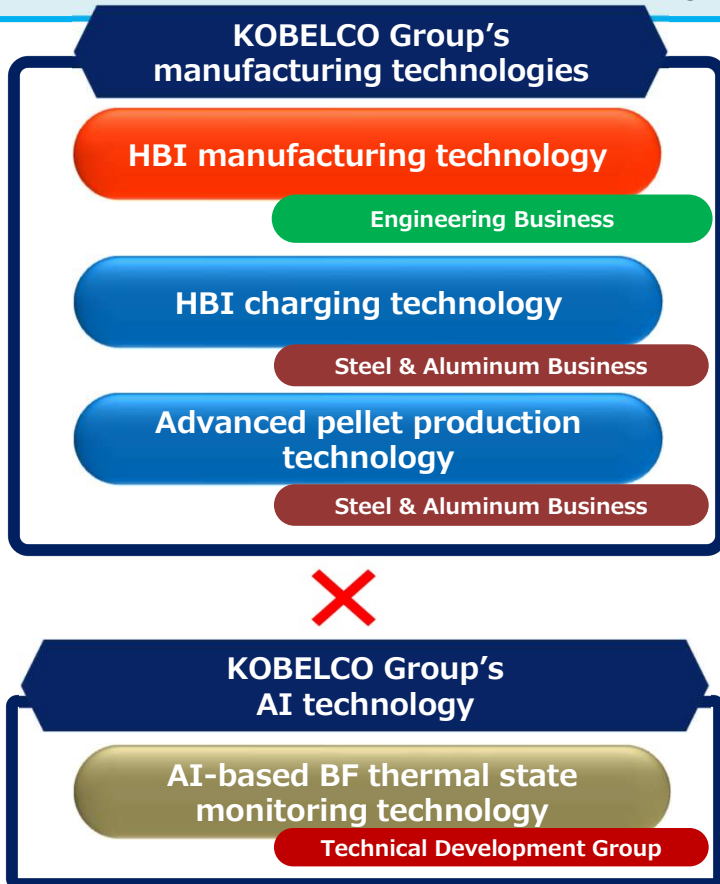
- Explore new values by leveraging diverse and distinctive assets

- ◆ **Transform existing businesses and respond to changes in the external environment through data visualization and analysis**
- ◆ Create new businesses

(3) CO₂ Reduction Solution for Blast Furnace Ironmaking – Demonstration Test of Low CO₂ Blast Furnace Process

- We successfully demonstrated low CO₂ BF process by charging a large amount of HBI*, leveraging the synergy between the steel and engineering business divisions (**approximately 20% reduction of CO₂ emissions** (SCOPE 1+2) compared to FY2013).
- Our Group's CO₂ reduction solution is supported by Kobe Steel's proprietary AI-based blast furnace thermal state monitoring technology.

*Hot Briquetted Iron (HBI): Direct reduced iron (DRI, contains 90% or more iron) in a briquetted form. DRI is produced by direct reduction processes (such as MIDREX® Process) using hydrogen-based reducing gas. Since hot DRI is not suitable for marine and other long-distance transportation, it is pressed into a compact solid (briquette).

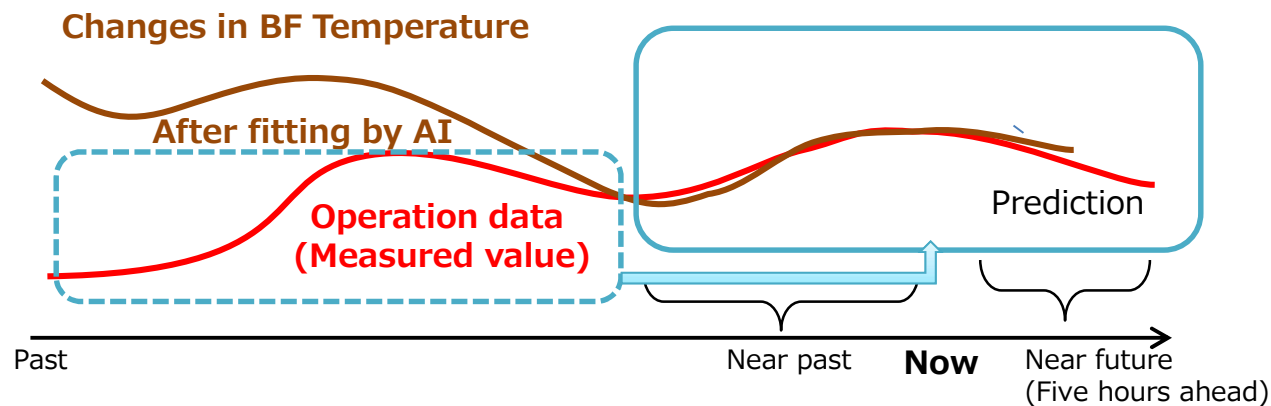


- One of the challenges faced in the demonstration test:
Reducing the charging amount of coke (a carbon fuel), which plays a role in maintaining air permeability in the BF, will fluctuate the temperature of hot metal in the BF, increasing the risk of unstable operating conditions.
- Kobe Steel's proprietary **AI-based BF thermal state monitoring technology** helped reduce coke rate by 2.5 times compared with the conventional method.

AI-Based Blast Furnace Thermal State Monitoring Technology

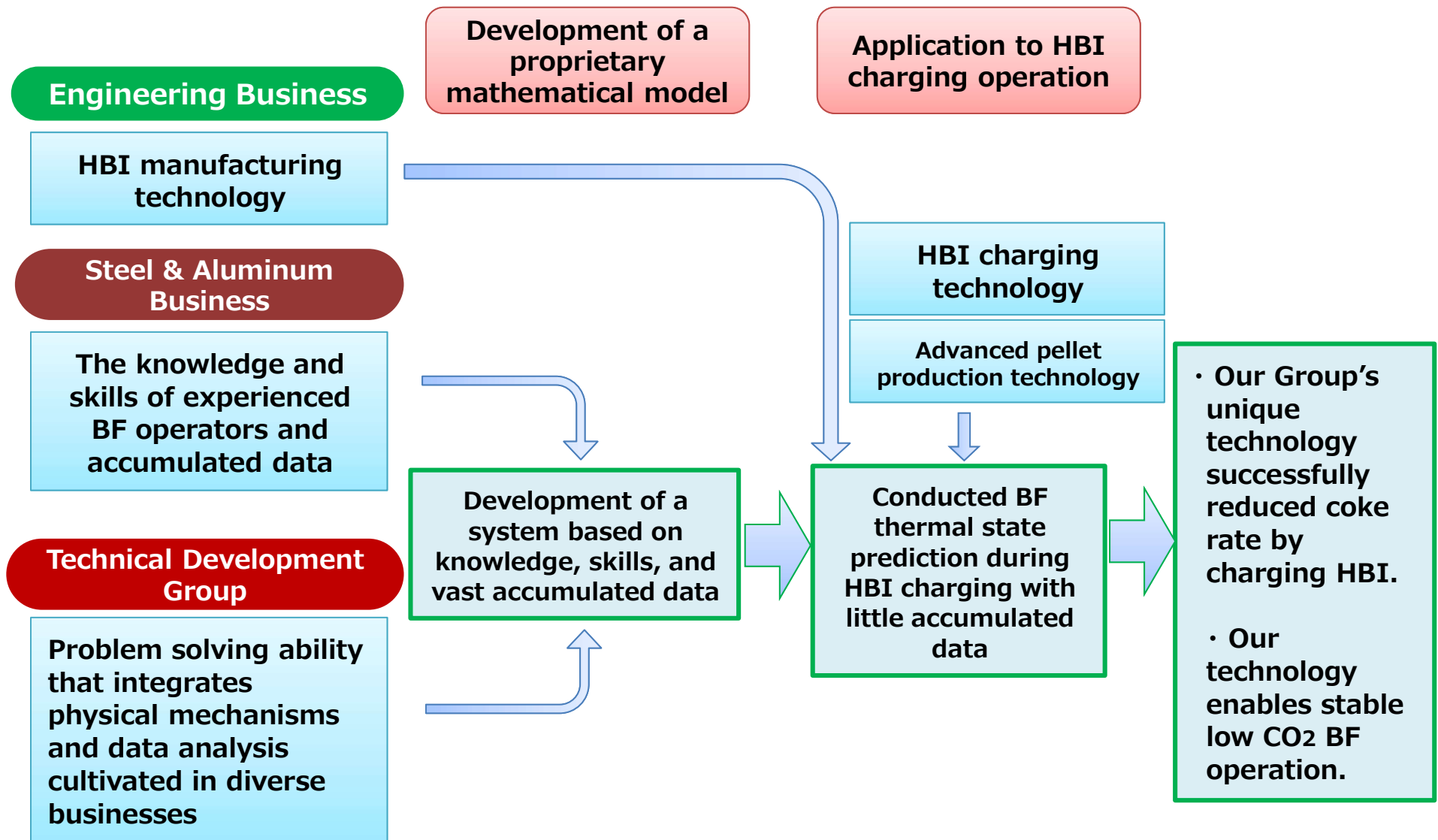
- A system to automatically and accurately predict the temperature of hot metal five hours ahead:
We have developed a system that can determine the next action and timing for blast furnace thermal adjustment, which was carried out by skilled furnace operators based on their experience and knowledge. The system also prevents operational troubles such as a drop in the temperature inside the furnace.
- The system's prediction accuracy is high as it targets a relatively short time of up to 5 hours ahead.

■ How the System Works



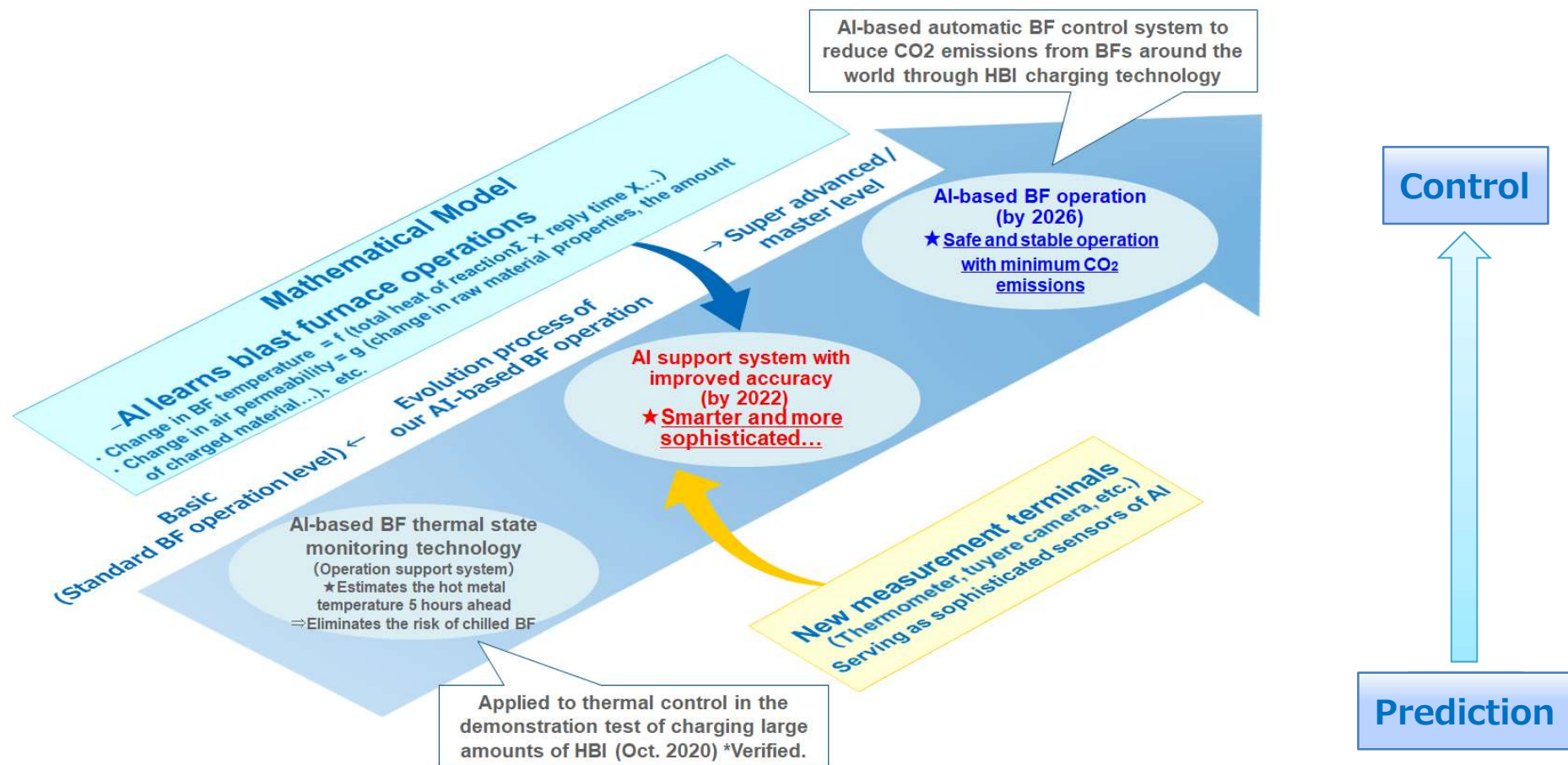
Based on data over the past several dozens of hours after being fitted by AI, the system can predict the blast furnace temperature in the near past (past several hours) and near future (up to five hours ahead) with very high accuracy.

(3) CO₂ Reduction Solution for Blast Furnace Ironmaking – Development of AI-Based Blast Furnace Thermal State Monitoring Technology



(3) CO₂ Reduction Solution for Blast Furnace Ironmaking – Roadmap Toward AI-Based Blast Furnace Operation

- We are currently promoting the development of **AI-based blast furnace operation**, an automatic blast furnace control system utilizing AI, with the aim of reducing CO₂ emissions (through HBI charging) by FY2026 and moving further toward carbon neutrality.
- We aim to realize “**human-free blast furnace operation**” by applying the technology utilizing our proprietary mathematical models and AI to blast furnace operations in our company and around the world.



STEP 2. Pursuit of KOBELCO's Uniqueness Through DX

- Explore new value by leveraging diverse and distinctive assets

- ◆ Transform existing businesses and respond to changes in the external environment through data visualization and analysis
- ◆ **Create new businesses**

(4) K-DIVE CONCEPT

Creating the jobsite where anyone can work
KOBELCO IoT



K-DIVE



Dig out

K-DIVER



a next standard

Telework system for construction sites, focused on the individual worker

DIG OUT A NEXT STANDARD



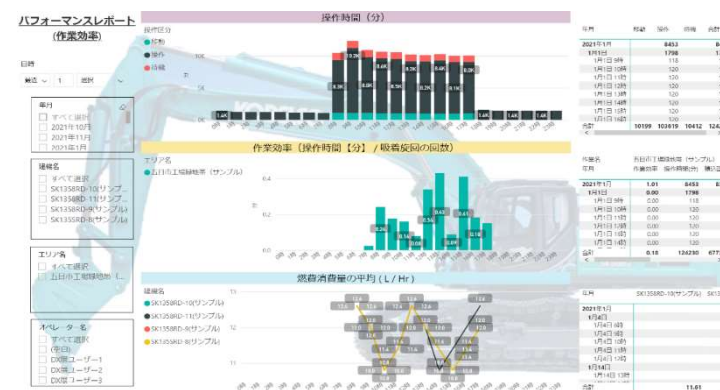
(4) Overview of the K-DIVE CONCEPT

Telework system for construction sites, focused on the individual worker, utilizing next-generation remote operation technology

Heavy machinery remote operation system



Utilization of operation history and remotely operated heavy machinery data



Achieve DX at construction sites
by connecting people, heavy machinery, and construction sites through the utilization of the remote operation system with its operation history and remotely operated heavy machinery data.

(4) Overview of the K-DIVE CONCEPT

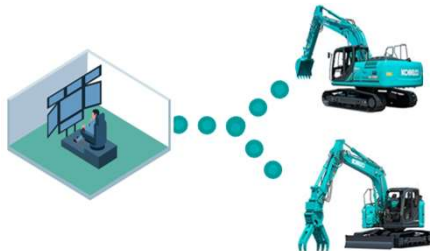
Heavy machinery remote operation system

Haptics feedback function



- **Motion Seat** optimally reproduces tilt, vibration, and surrounding sound

Multi-connection function



- **Multi-connection** allows an operator to control multiple machines

Face recognition and driver distraction detection function



- Recognition feature ensures better security and safety

+

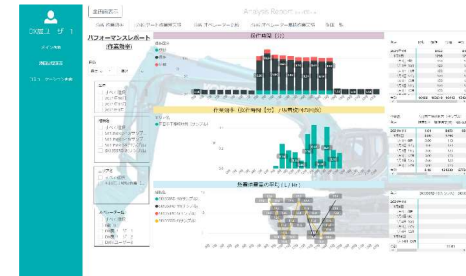
Utilization of operation history and remotely operated heavy machinery data

Realtime map information



- On-screen location and machine info

Performance report



- Data analysis tailored to customer needs
- The operator can easily communicate with the supervisor and people at the site.
- Videos are uploaded to the cloud and used for sharing work procedures and providing operational guidance.

Communication function

Operation video recording function

(4) K-DIVE CONCEPT – Challenges in the Construction Industry

The construction industry is faced with various challenges amid changing social situations

Hazardous work environment

Increasingly serious labor shortages

Structural low profitability



The solution to these challenges:

To transform the construction site into a place where anyone can work"

A7

<https://www.kobelcocm-global.com/innovation/technology/kdive/>

作成者, 2022/02/25

(4) K-DIVE CONCEPT – Three Merits

The Three Merits Offered by K-DIVE CONCEPT Services

Essential safety

- Remote operation reduces the need for the operator to be at the construction site



Improved on-site productivity

- Smooth operation of the entire construction site by remote operation from the construction management office
- Improvement of work efficiency with connectivity to multiple operations
- Improvement of work efficiency and work analysis by real-time information acquisition



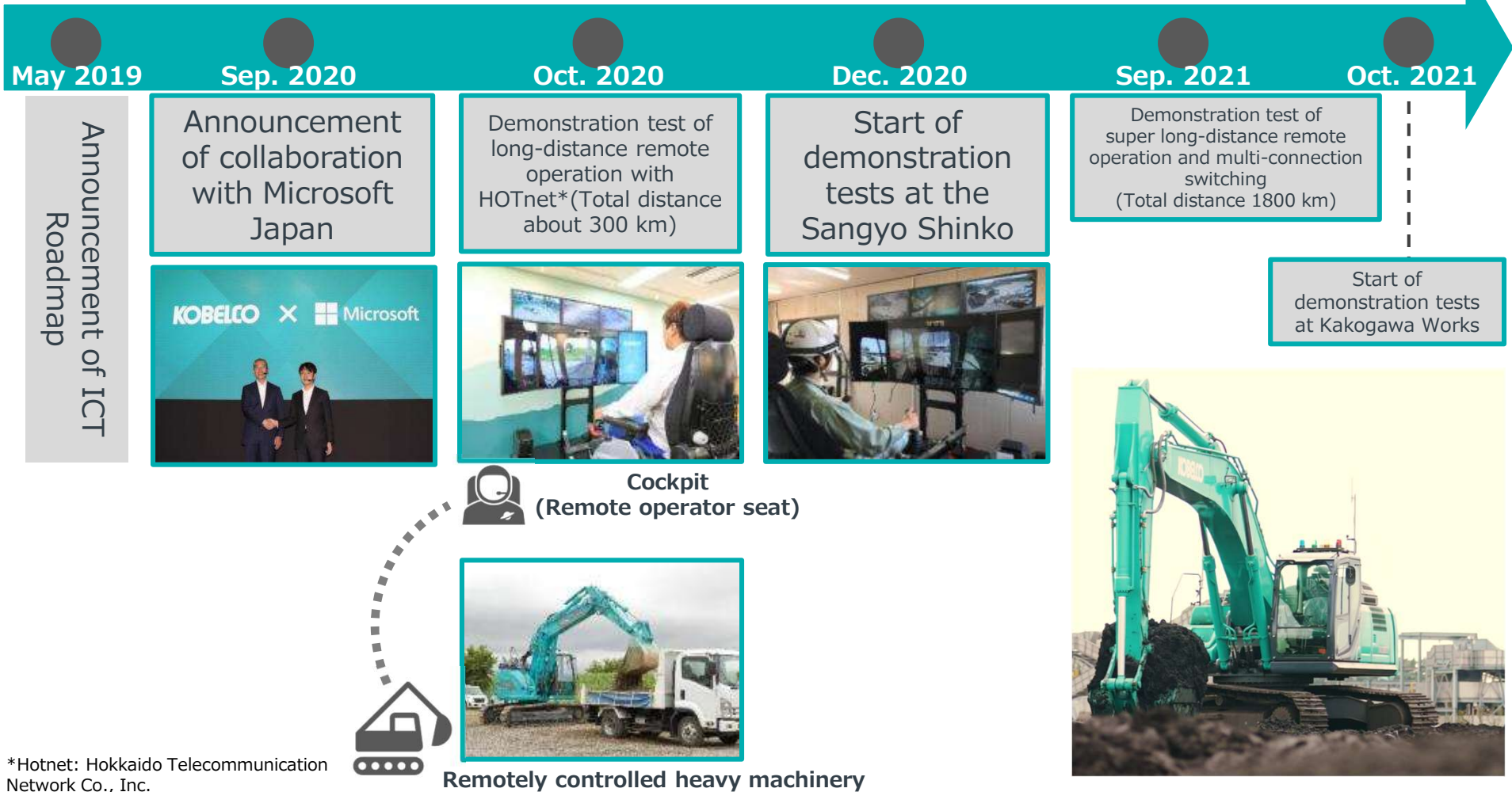
Organizational revitalization

- Long-term human resource development and utilization
- Revitalization of communication through workplace reforms
- Expansion of potential pool of employees and improvement of retention rate



(4) K-DIVE CONCEPT – Development Progress

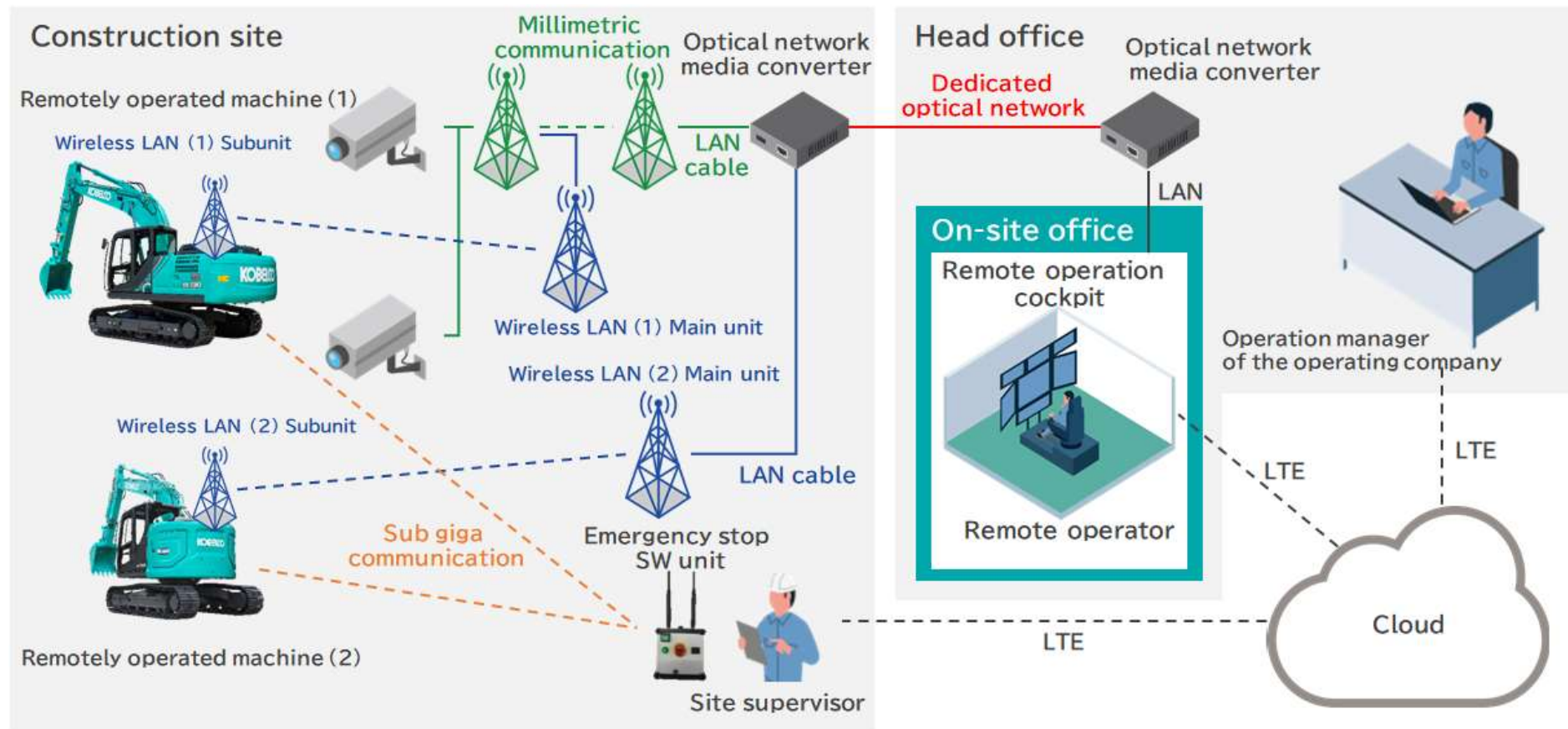
- The concept was initiated by young employees in an ideathon event in 2015.
- The project has been promoted through open innovation, aiming for the **phased launch of the service in FY2022.**



(4) K-DIVE CONCEPT – Development Progress

- Technical development of remote operation is in the final stage toward the phased launch of the service in FY2022.
- Service will be deployed from fixed yards such as scrap metal, industrial waste treatment, and mud pits.

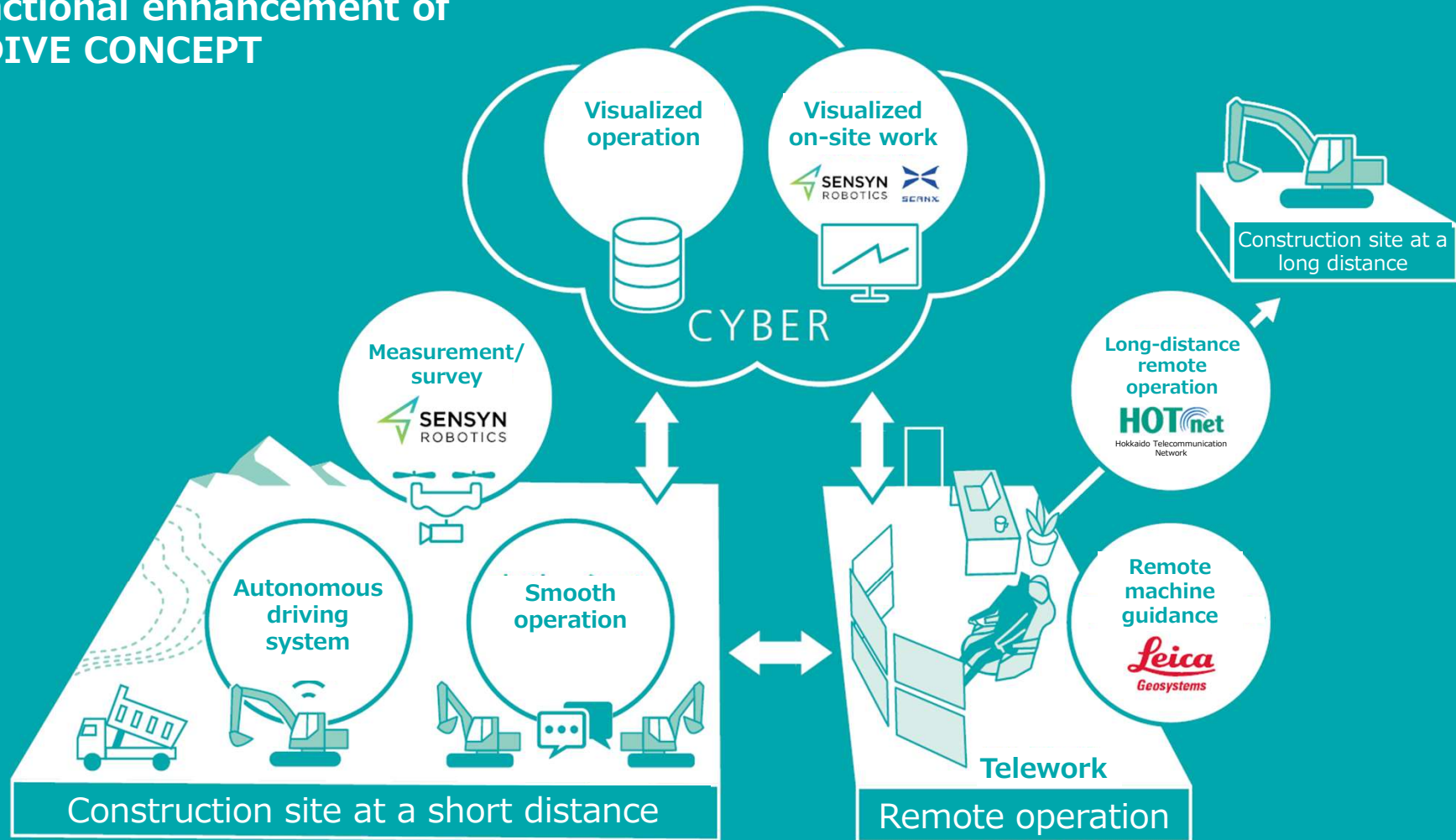
Configuration of Remote Operation System



(4) K-DIVE CONCEPT – Further Functional Enhancement

We are collaborating with partners to further enhance the functionality.

Functional enhancement of K-DIVE CONCEPT



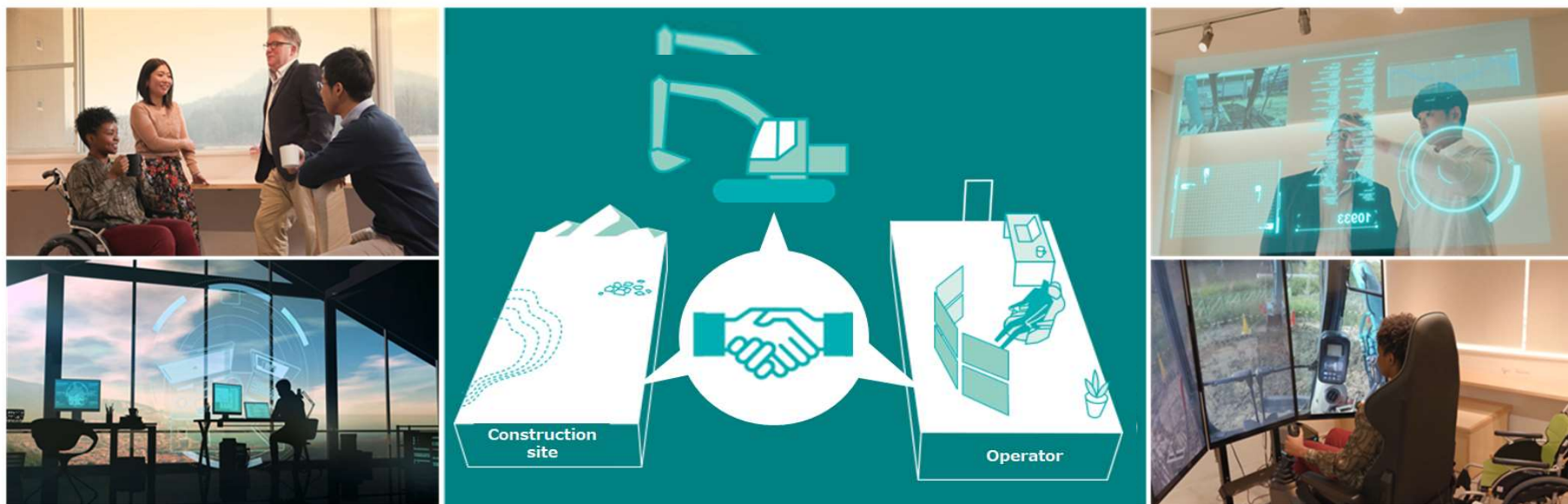
(4) K-DIVE CONCEPT – Vision for the Future

To create the jobsite where anyone can work, we plan to offer a matching service that will transform the way people work at the construction site in the future.

Matching service to connect heavy machinery, operators, and construction sites

We plan to build a network system to connect remote operators and construction managers. Our aim is to provide a staffing service that will match the right operator and construction work according to the required skill levels and construction schedules, while offering an option of remote operation performed by freelance operators from satellite offices.

We will provide support services for the efficient development of operators by utilizing the cockpit as a virtual training facility and contribute to expanding the operator pool as well.

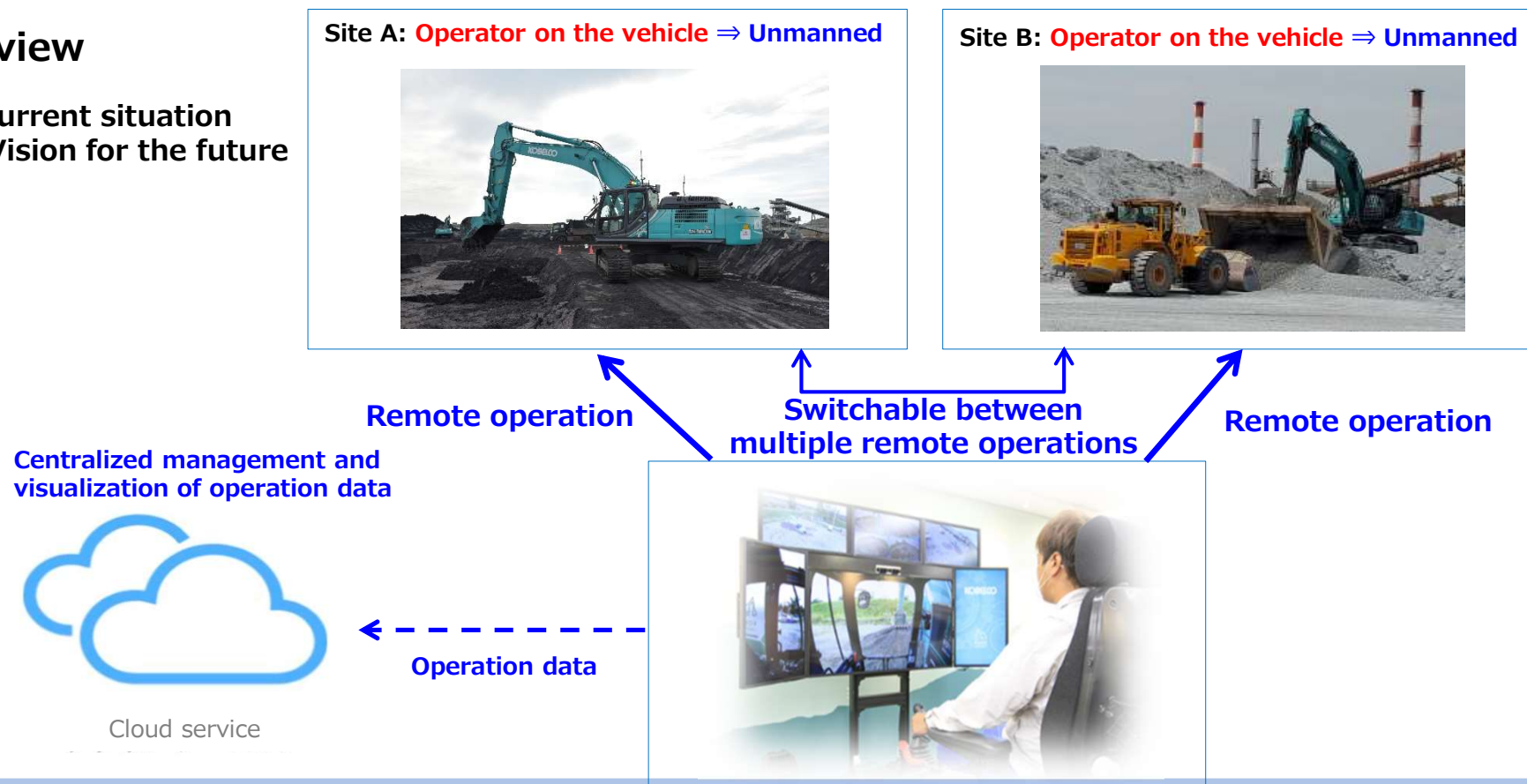


(4) K-DIVE CONCEPT – Remote Operation Demonstration Test at Kakogawa Works

- Since the second half of FY2021, we have been conducting remote operation demonstration tests with an excavator equipped with the K-DIVE CONCEPT technology at our production site Kakogawa Works.
- There is a future concern about shortages of operators of heavy machines for transportation and other purposes at steel works. The K-DIVE CONCEPT system will offer solutions for this by **improving work efficiency with multiple remote operations switching system**, enhancing data visibility, and ensuring safety. While addressing identified issues, demonstration tests are progressing smoothly.

Overview

Red: Current situation
Blue: Vision for the future

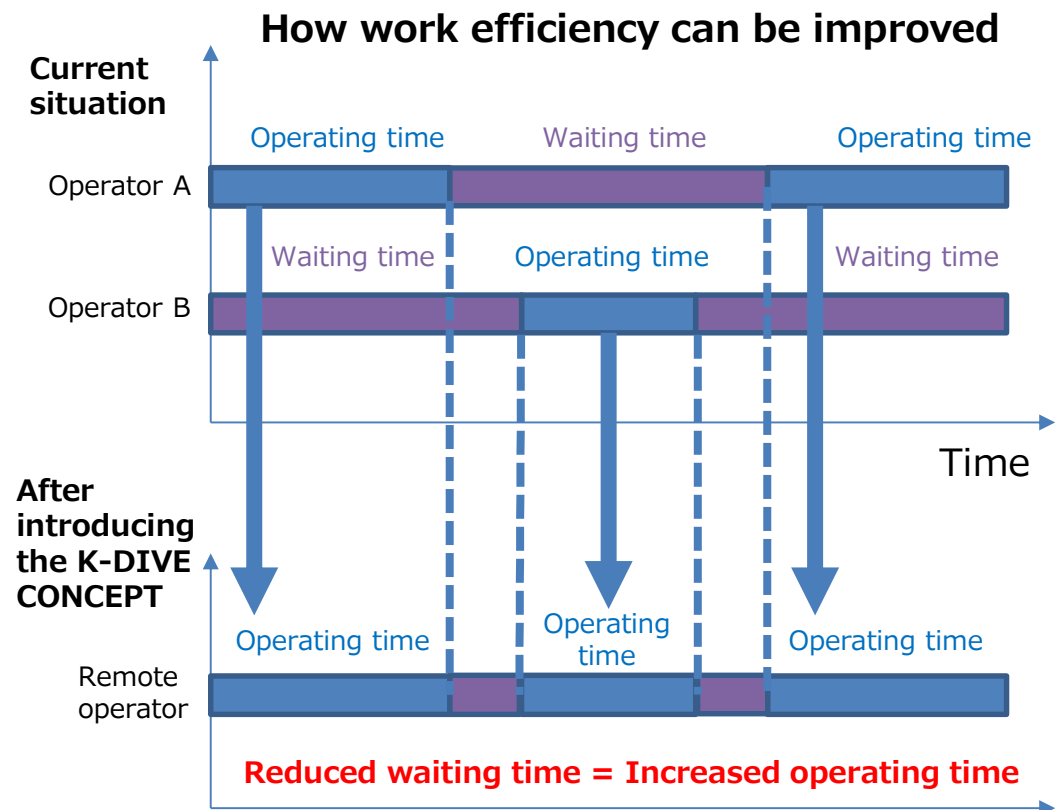


(4) K-DIVE CONCEPT – Expected Improvement in Operations

- Currently, operators need to stand by and wait for prolonged hours in multiple operation workflows.
- Work efficiency (percentage of actual operating time in working hours) can be improved by reducing waiting time through switching between multiple remote operations. **The K-DIVE CONCEPT can also help resolve labor shortages by employing a small number of operators who work across multiple construction sites.**



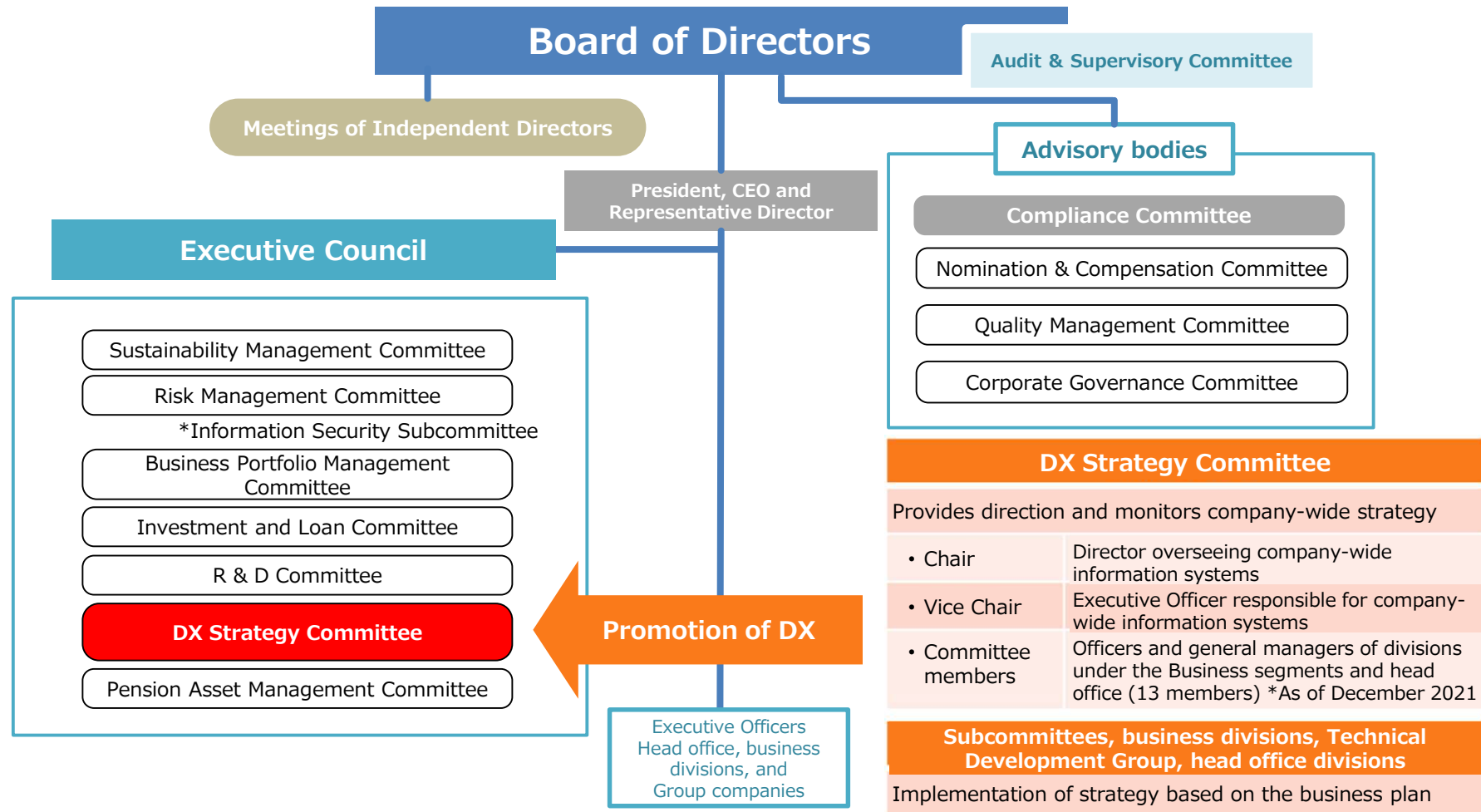
Contribute to solving labor shortages



3. Framework for Promoting DX Initiatives and IT-Related Capital Investments

3. Framework for Promoting DX Initiatives

We have established the DX Strategy Committee, a company-wide cross-sectional body chaired by the Director overseeing company-wide information systems. The committee formulates the Company's DX strategy and monitors its implementation to ensure the promotion of DX throughout the entire Group.



3. IT-Related Capital Investments

- We plan to invest 45 billion yen in IT infrastructure over 3 years starting from FY2021. This aims to reconstruct the core systems that form the foundation for data utilization in management and to build the foundation for the digital shift in *monozukuri* and services.
- Through the investment, we will improve productivity, increase customer value, and promote data utilization in management.

| Area | Investment sector | Objective | Three-year investment (billion yen) |
|---------------------|---|--|-------------------------------------|
| Value creation | Smart factories, digital engineering | Innovative productivity improvement in <i>monozukuri</i> | 10 |
| | Digital services, digitalization of customer contact points | Improving customer value by transforming existing businesses | 5 |
| | Use of AI and RPA in office operations | Shifting employees to value creating work | 0.5 |
| Business foundation | Core system reconstruction, IT architecture design and construction | Data-driven management, high-speed management | 17 |
| | Security, governance | Minimizing management risks | 0.5 |
| | Others | | 12 |

Based on our Group's diverse businesses, we will promote the development of unique solutions that address issues faced by customers and society.



Selected as a DX Certified
Business Operator in Jan. 2022

For reference: Companywide DX Initiatives

Value Creation

A

Monozukuri DX



Improve monozukuri capabilities by promoting data utilization through cutting-edge digital technology

B

Customer Experience DX



Strengthen customer contact points and services from the customer's perspective to enhance the value of the customer experience

C

Work Style DX



Achieve drastic productivity improvement by utilizing digital technology to create an environment that facilitates work without being bound by conventional practices

X

Creation of New Businesses

Create new businesses and contribute to the innovation of many customers by utilizing unique digital solutions that have been proven in our manufacturing.

Business Foundation

D

System Reconstruction



Completely reconstruct complicated existing systems, which are hindering the adoption of advanced technologies, to create an environment that can respond flexibly to changes.

E

Human Resource Development



Establish programs to quickly and continuously develop DX experts that are in short supply

F

Infrastructure and Security



Build infrastructure and ensure a security level to support DX initiatives in the value creation area and the reconstruction of existing systems

G

IT Architecture



Establish IT technology standards and processes for efficient Companywide reconstruction of existing systems

For reference: Examples of Initiatives (for strengthening the foundation)

- (1) Integration & renewal of SAP ERP (Reconstruction of existing systems)**
- (2) Security management structure (Infrastructure, security)**
- (3) Monitoring with integrated security tools (Infrastructure, security)**
- (4) Integration of system execution platform (IT architecture)**

For reference: Reconstruction of Existing Systems – Integration & Renewal of SAP ERP

- We have started the integration & renewal of the SAP ERP system which has been a hindrance to digitalization and data utilization.
- Under the basic policy of Fit to Standard*, we will streamline operations in non-competitive fields and reduce the lifecycle cost of our systems.

*To minimize add-on program development by aligning operations to the standard functions of SAP

Building a business foundation to realize DX

203x

2021-2025

Now

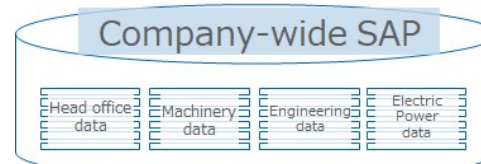
Coordination between individual systems

- Separately developed for respective business divisions
- Data exchange takes place between multiple systems.

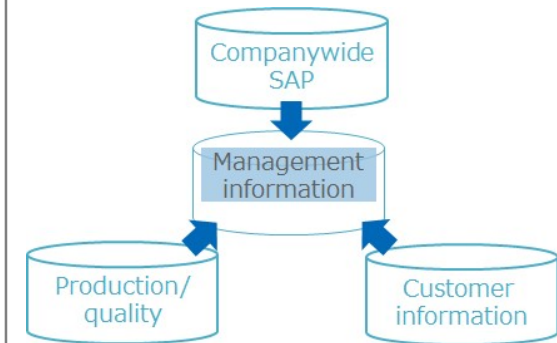


System integration (SAP One Instance)

- Develop a single system for the entire company
- Functions are shared with no need for data coordination.



Companywide management information database



For reference: Security Management Structure

- New digital technologies are emerging one after another. While such technologies support our transformation, cyber security risks are growing.
- To respond effectively and efficiently to cyber attacks that are becoming increasingly shrewder and more sophisticated, we have established a single integrated organization responsible for the planning and execution of security measures across the Group. We will continue to enhance our information security measures as a prerequisite for promoting our DX initiatives.

■ Information Security Subcommittee

- Deliberate the Group's basic policies and key measures on information security

■ Main Roles of KOBELCO CSIRT

- Plan and execute security measures
- Establish and revises rules and standards
- Provide security education and training
- Conduct risk assessments and audits
- Collaborate with external bodies
- Respond to incidents

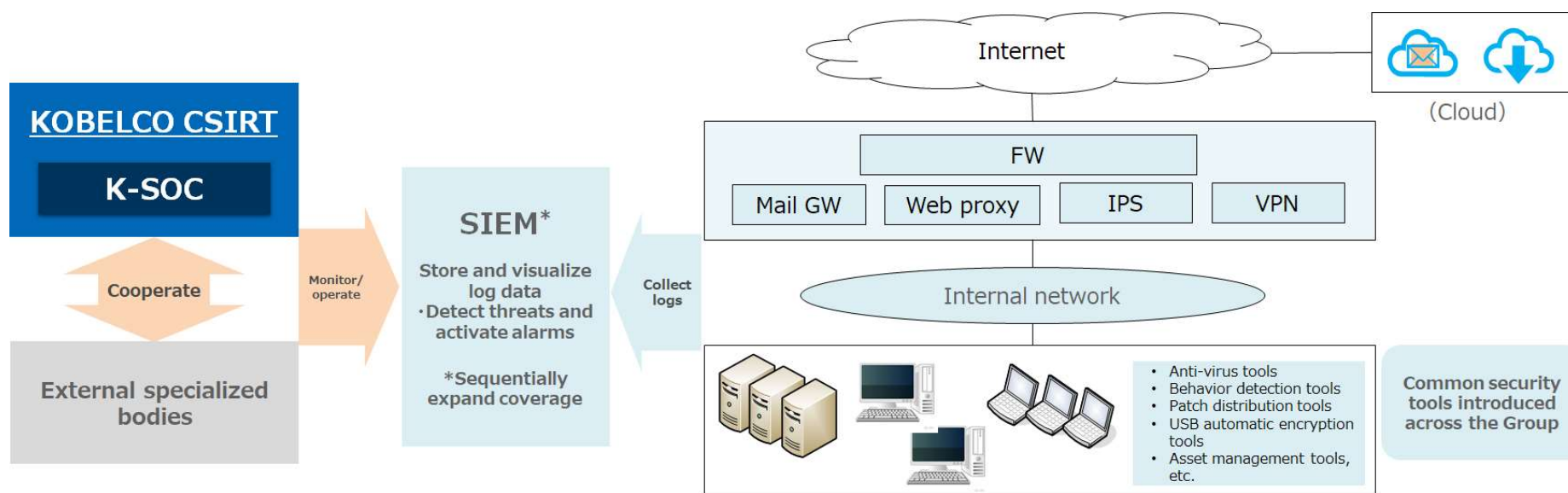
■ Main Roles of K-SOC

- Respond to infection with known computer viruses
- Take initial action in response to an incident or abnormality detected
- Collect and communicate vulnerability information
- Respond to security-related inquiries



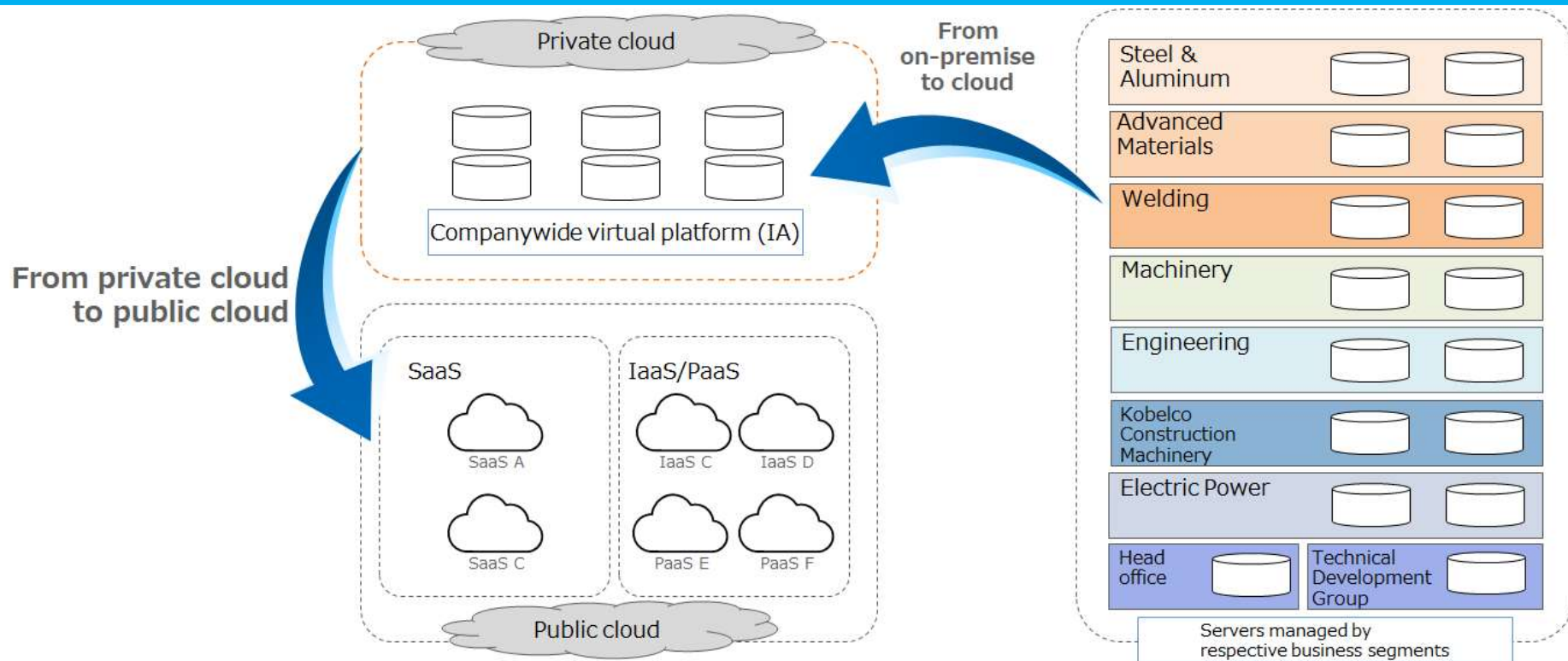
For reference: Monitoring with Integrated Security Tools

- Braced for cyber attacks, we have consolidated the management of security tools throughout the Group including domestic and overseas Group companies. This allows us to carry out log monitoring 24 hours a day, 365 days a year, detect malware infection, suspicious behavior, and signs of incidents in the early stage, and take prompt steps from initial response to containment.
- We will continue to implement security measures as necessary according to the progress of our DX initiatives, workstyle reforms, and other changes (estimated budget of 4.5 billion yen for the current medium term).



For reference: IT architecture – Integration of System Execution Platforms

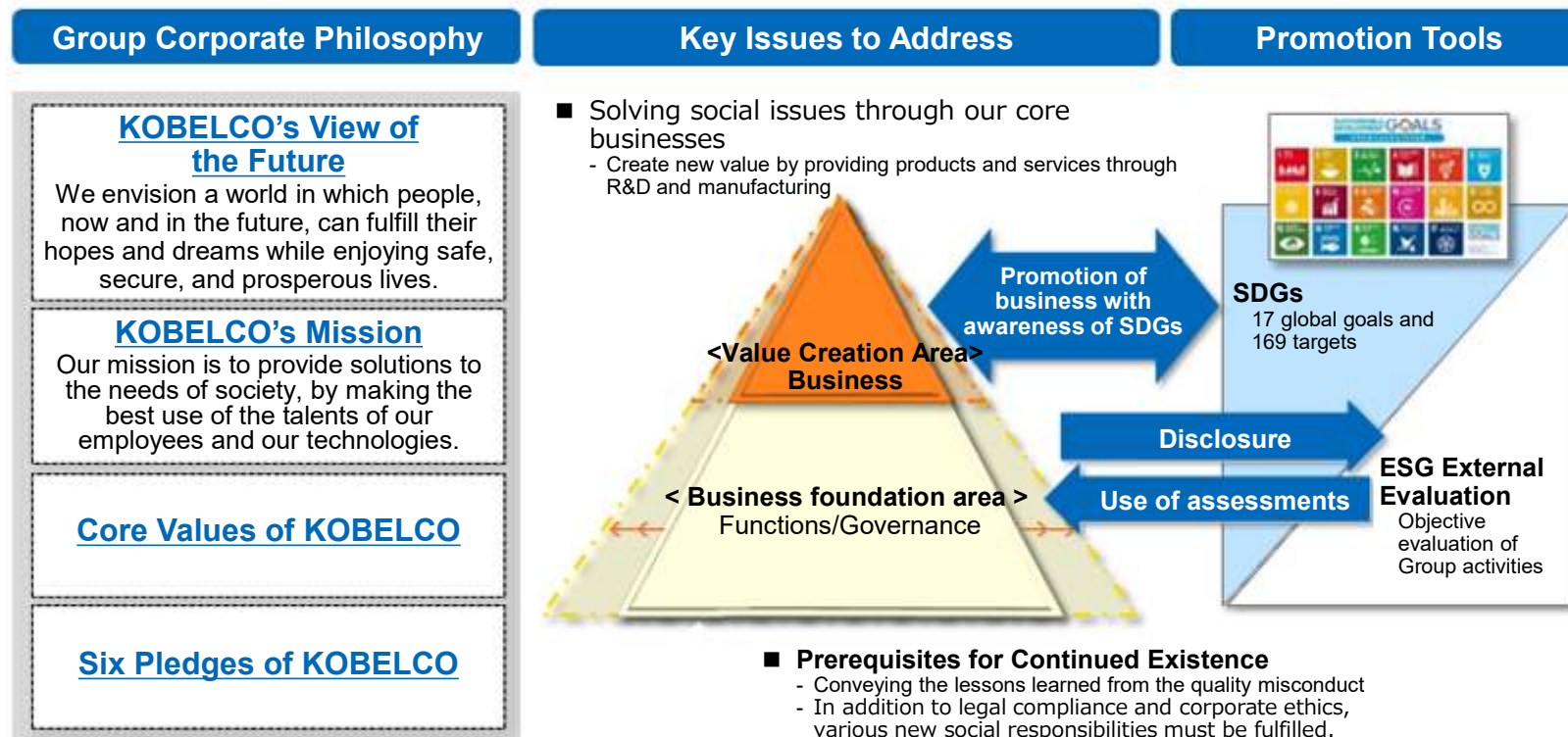
- There are many inefficiencies in the company's information system, as it encompasses a range of different system execution platforms that have been tailored to the business operations of respective divisions in the course of the company's development in diverse fields of businesses over the years.
- For improvement, we consolidate these system execution platforms and shifted to the cloud-based management, based on the policies of "cloud first" and "optimizing the execution platform." Through this, we aim to achieve stable system operation and reduce operation and maintenance costs.





















For reference: KOBELCO Group's Sustainability Management

KOBELCO Group's Sustainability Management

- Promote sustainability management based on the Group Corporate Philosophy under the framework as provided below.
- Address key issues in the value creation area and business foundation area to achieve sustainable growth and to raise corporate value.



For reference: KOBELCO Group's Materiality (Medium- to long-term important issues)

| Materiality of the KOBELCO Group | | Relevance to SDGs |
|---|---|---|
| Value Creation Area Business Foundation Area | <p>Contributing to a green society (*)</p> <p>Response to climate change</p> <p>Response to resource recycling</p> |    |
| | <p>Ensuring safety and security in community development and manufacturing</p> <p>Supplying energy focused on on energy security, economic efficiency, environment, and safety (3E plus S)</p> <p>Providing materials and machinery that meet needs</p> <p>Improving safety and productivity</p> |     |
| | <p>Providing solutions for the future connecting people and technology</p> <p>Reforms in manufacturing and operations through digital transformation</p> <p>Fusion and innovation of diverse intellectual assets</p> |    |
| | <p>Promoting active participation of diverse human resources</p> <p>Diversity and inclusion</p> <p>Work style reforms</p> <p>Human resources development</p> |     |
| | <p>Pursuing governance that supports sustainable growth</p> <p>Compliance and risk management</p> <p>Respect for human rights</p> <p>Safety and health</p> <p>Quality assurance</p> <p>Corporate governance</p> |     |

(*) A green society is not limited to the narrow meaning of a society merely using natural energy, but is defined as a society that deals with climate change issues and resource recycling

For reference: KOBELCO Group's Corporate Philosophy

We aim to contribute to “a world in which people, now and in the future, can fulfill their hopes and dreams while enjoying safe, secure, and prosperous lives” as we carry out our mission of “providing solutions to the needs of society, by making the best use of the talents of our employees and our technologies,”

| | |
|-------------------------------------|--|
| KOBELCO's View of the Future | <p>Our view of a society and future to be attained as we carry out KOBELCO's mission</p> <p>We envision a world in which people, now and in the future, can fulfill their hopes and dreams while enjoying safe, secure, and prosperous lives.</p> |
| KOBELCO's Mission | <p>Our mission and the social significance of the KOBELCO Group that we must fulfill</p> <p>Our mission is to provide solutions to the needs of society, by making the best use of the talents of our employees and our technologies.</p> |
| Core Values of KOBELCO | <p>The commitments of the KOBELCO Group to society and the values shared by the entire KOBELCO Group</p> <ol style="list-style-type: none"> 1. We provide technologies, products and services that win the trust and confidence of our customers we serve and the society in which we live. 2. We value, and support the growth of, each employee on an individual basis, while creating a cooperative and harmonious environment. 3. Through continuous and innovative changes, we create new values for the society of which we are a member. |
| Six Pledges of KOBELCO | <p>Code of Conduct for all Group employees to follow to fulfill the Core Values of KOBELCO and the Quality Charter</p> <ol style="list-style-type: none"> 1. Uphold the Highest Sense of Ethics and Professionalism 2. Contribute to the Society by Providing Superior Products and Services Quality Charter 3. Establish a Comfortable but Challenging Work Environment 4. Live in Harmony with the Local Community 5. Contribute to a Sustainable Environment 6. Respect Each Stakeholder |



Please read the “Next 100 Project” page below in our website for specific initiatives to spread our corporate philosophy:
https://www.kobelco.co.jp/english/about_kobelco/outline/next100/index.html

Cautionary Statement

- **Certain statements in this presentation contain forward-looking statements concerning forecasts, assertions, prospects, intentions and strategies. The decisions and assumptions leading to these statements were based on information currently available to Kobe Steel. Due to possible changes in decisions and assumptions, future business operation, and internal and external conditions, actual results may differ materially from the projected forward-looking statements. Kobe Steel is not obligated to revise the forward-looking contents of this presentation.**

- **Uncertain and variable factors include, but are not limited to:**
 - Changes in economic outlook, demand and market conditions
 - Political situation and trade and other regulations
 - Changes in currency exchange rates
 - Availability and market conditions of raw materials
 - Products and services of competing companies, pricing policy, alliances, and business development including M&As
 - Strategy changes of alliance partners