

Second ESG Explanatory Meeting

Research and Development Aimed at the Realization of a Sustainable Society and Circular Economy Initiatives

February 15, 2022

Corporate Brand & Communications Group

 **Hitachi Construction Machinery Co., Ltd.**

Introduction

1 Value Creation Strategy of the Hitachi Construction Machinery Group

Kotaro Hirano
Executive Officer, President & CEO

2 Research and Development Initiatives to Support Value Creation

Hideshi Fukumoto
Vice President and Executive Officer, CTO, President of Client
Solutions Group

3 Initiatives to Realize the Circular Economy Which Supports Value Creation

Atsushi Tamane
President, Sustainability Promotion Group

1. Value Creation Strategy of the Hitachi Construction Machinery Group

Corporate vision

**To pass on a productive environment and prosperous cities
to future generations...**

Hitachi Construction Machinery Group helps to create comfortable living spaces

Shared values and code of conduct: Kenkijin spirit



Challenge

Spirit of challenge

Customer

Individual customer orientation

Communication

Open atmosphere

Our mission is to accurately perceive the risks and opportunities with respect to our sustainable growth and rapidly provide products and services that contribute to solving issues at customers' site or social issues

Global social and environmental issues

- **Progression of global warming**
- **Mass consumption and depletion of resources**
- **Development of infrastructure to withstand natural disasters**

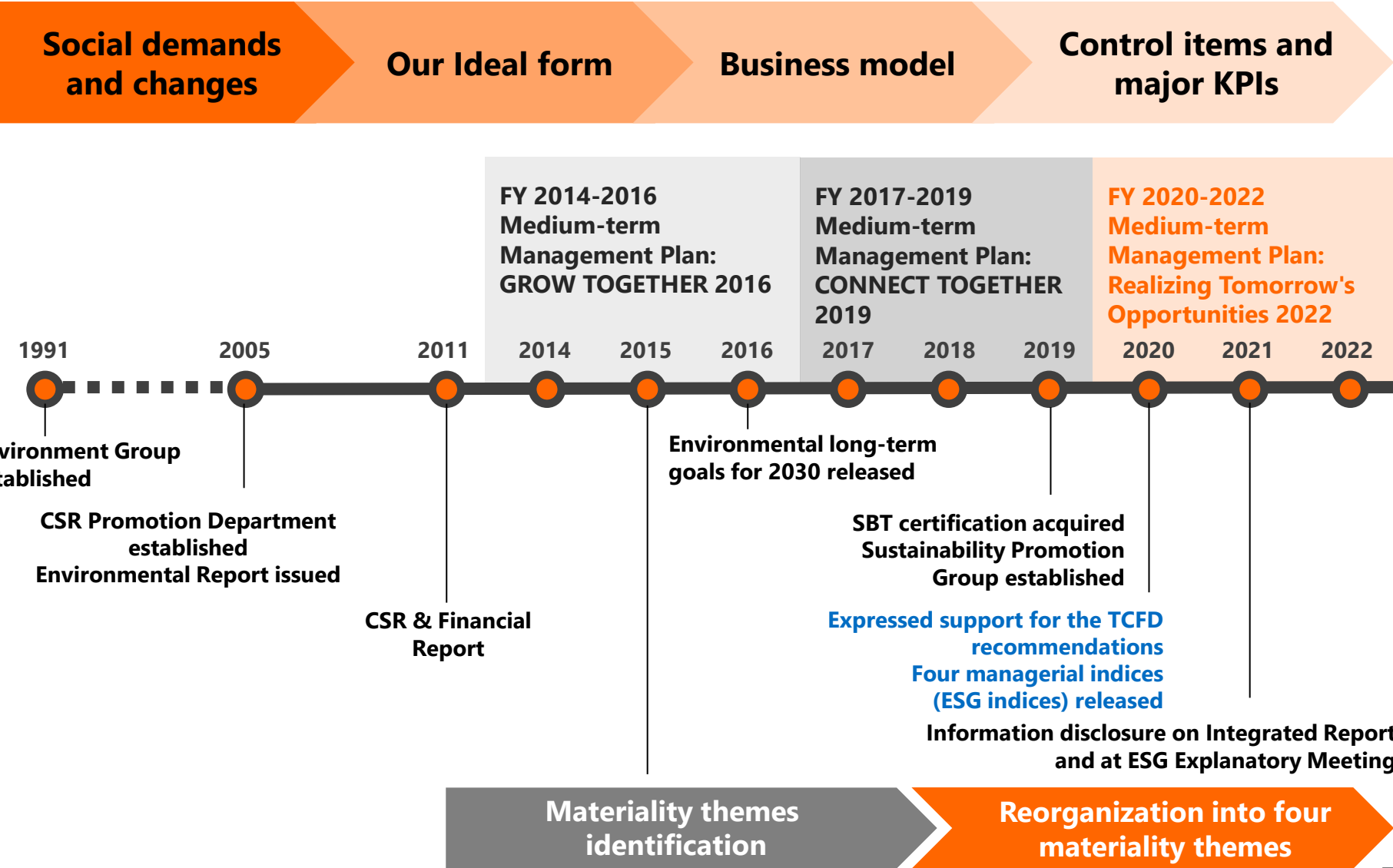
Conversion to sustainable growth model

Issues at customers' site

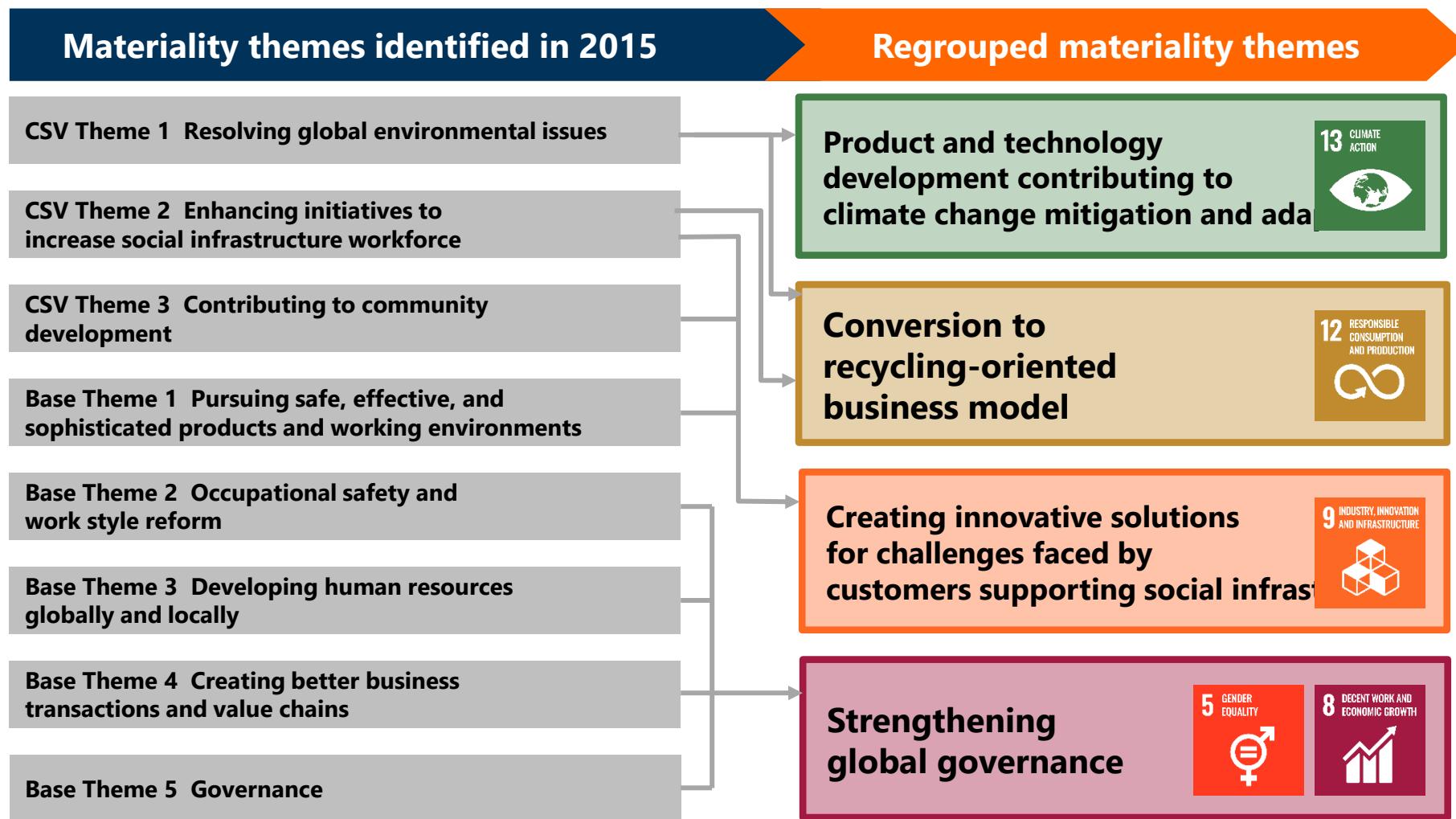
- **Improving safety**
- **Increasing productivity**
- **Reducing lifecycle costs**

Conversion from hardware products to experiences

Medium-term Management Plan development process



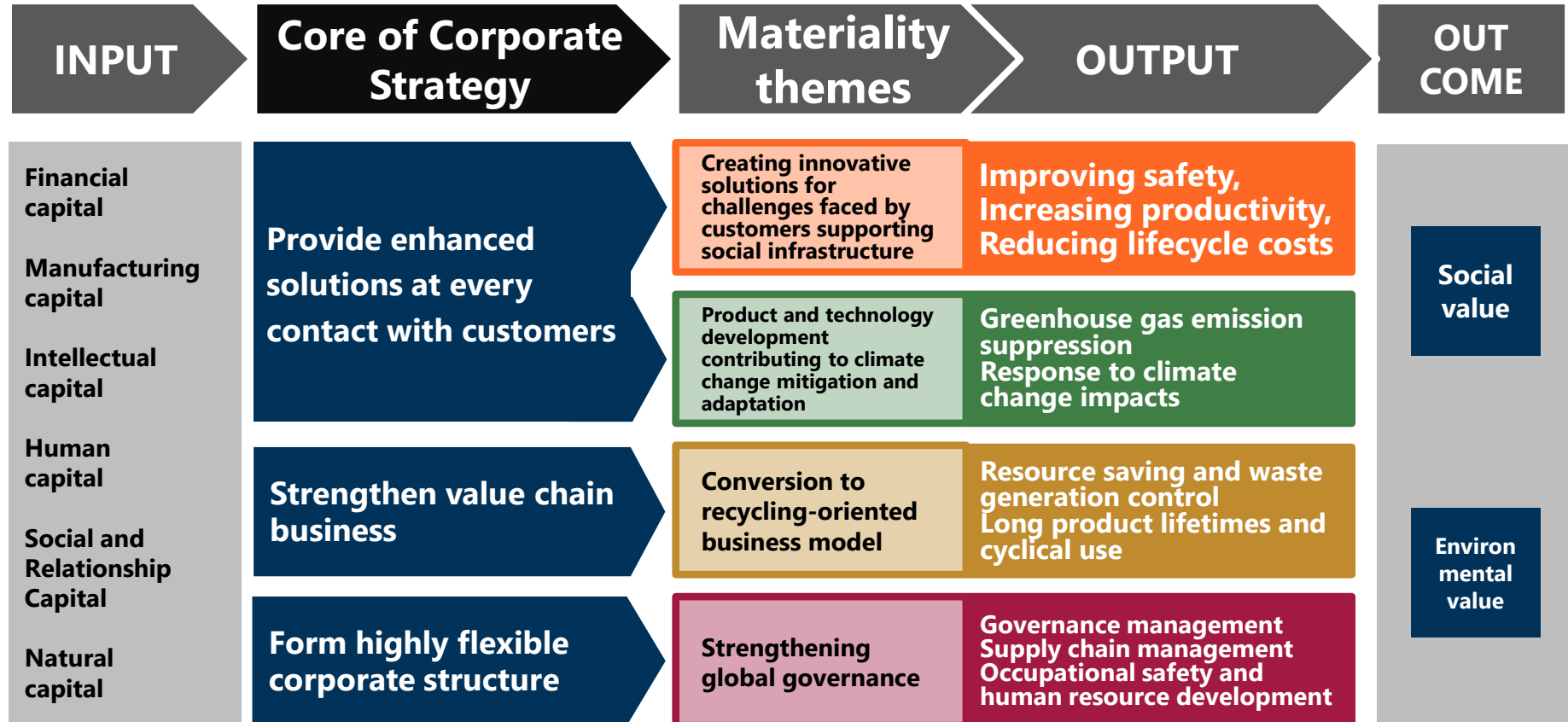
In addition to the perspectives of SDGs and ESG, emphasize issues that are connected to improving and damaging Hitachi Construction Machinery's enterprise value, tie them to the business plan, and revise the materiality themes



Positioning of the Hitachi Construction Machinery Medium-term Management Plan and Materiality Themes

HITACHI

Reliable solutions



2. Research and Development Initiatives to Support Value Creation

Pursuit of reliable solutions

Maximization of social and environmental values

**SUSTAINABLE
DEVELOPMENT
GOALS**



Value for customers

Solution Linkage



Response to
climate change



Improving
safety



Increasing
productivity



Reducing
lifecycle
costs

Realization of a sustainable society

- Injection of management resources with a strong will
- Collaborative creation with eco-partners

New pillars of differentiation



- Solving customer issues
- Providing outstanding customer experiences
- Collaboration creation with customers

Sources of all value



- Maintenance of competitiveness
- Customer value creation platform

Hardware Products' Value



Globally strengthen development capabilities and drive development that corresponds to local needs

European Application Center

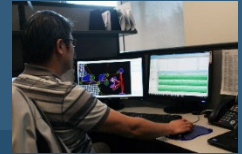
- Electrification and applied product development
- Survey local needs



Established in
2018

Wenco

- Systems for mining



Subsidiary
acquisition in 2009

TATA Hitachi Construction Machinery Company

Hitachi Construction Machinery China

Hitachi Construction Machinery Indonesia

- Locally-oriented product development
- Survey local needs

Hitachi Construction Machinery and Hitachi Construction Machinery Tierra



Compact

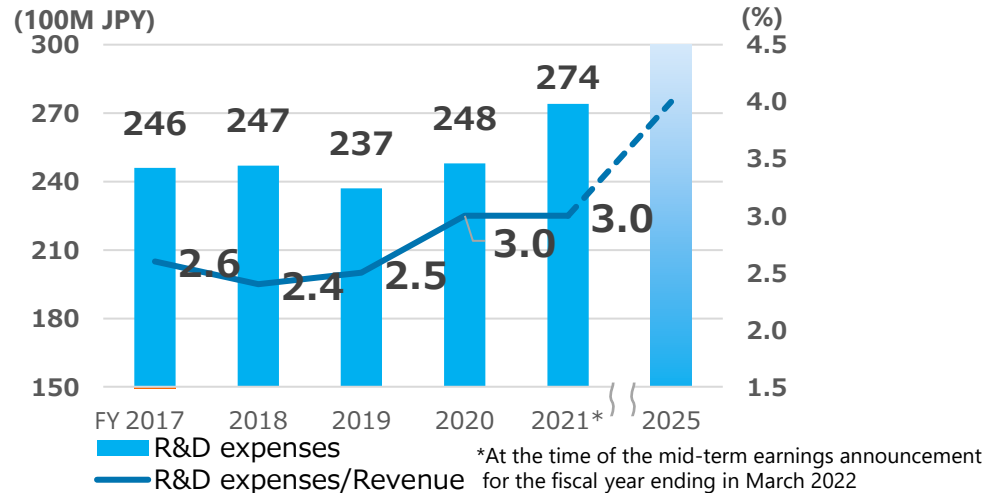
Construction

Mining

- Core product and technology development
- Cutting-edge product and solution development

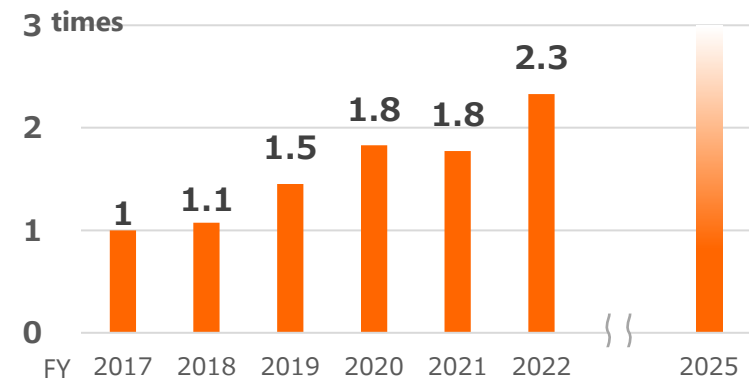
Expand research and development investment in advanced development areas aimed at sustainable growth

Research and Development Investment



Investment trends in advanced development areas

*Index set to 1 for FY 2017



Advanced development areas aimed at sustainable growth



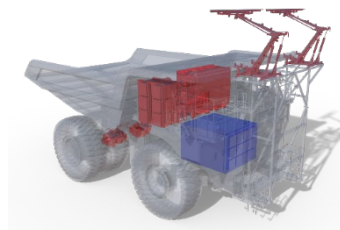
Improving safety



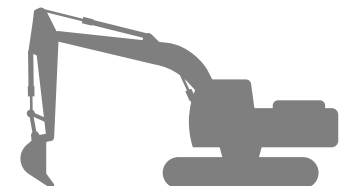
Increasing productivity
(Automation, autonomy, and driving support)



Reducing lifecycle costs



Decarbonization



Next-generation machinery, etc.

Materiality Themes

▶ **Creating innovative solutions for challenges faced by customers supporting social infrastructure**



Product and technology development contributing to climate change mitigation and adaptation



Conversion to recycling-oriented business model



Strengthening global governance



Past

- Provide products with better specifications
- Customers select products by specifications

Hitachi Construction Machinery



Hardware products

Excavating force, fuel consumption, and working speed...



Customer

Going forward

- Provide total value through connected machines and solutions
- Shift to machinery that connects to the surrounding environment, operational data, and site solutions
- Customers select based on their own value judgment

Hitachi Construction Machinery



Surrounding environment and operational data + AI



Advanced site solutions

Productivity, safety, and cost reductions...



Products shifting to "connected machines"

Connected to site solutions and the surrounding environment to provide autonomy, operations support, collaborative safety, and remote operation...



Customer

Value is determined by the customer

Introduction of ICT construction from the customer's perspective and site solutions which support the accumulation of know-how

Expansion of the Solution Linkage series of ICT construction solutions

Solution Linkage Assist

ICT machine that supports operation



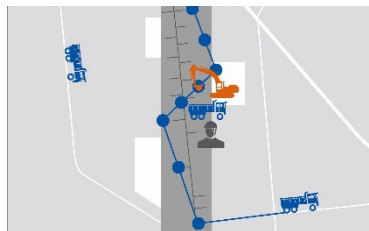
Solution Linkage Point Cloud

Utilize drones more to create 3D point cloud data



Solution Linkage Mobile

Operation management of dump trucks, etc. to easily "visualize" the work site



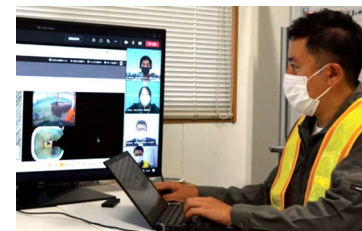
Solution Linkage Survey

Easy measurement of soil volume with smartphones and be available for progress-based income



Solution Linkage Work Viewer Cloud

Remotely verify construction progress via video



Connected machines: development of remote, automated systems

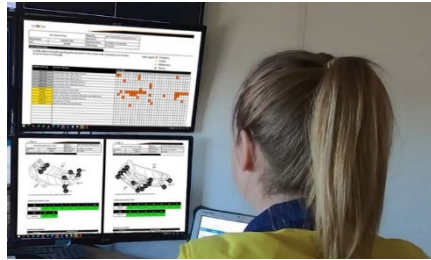


ZCORE concept machine



Autonomous vibrating roller for earthwork

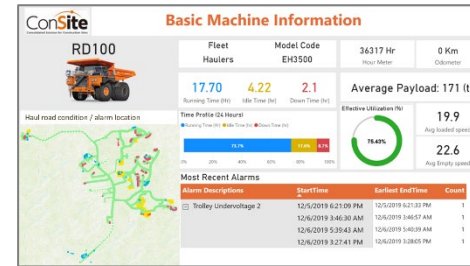
ConSite Mine, Mining machinery remote monitoring solution (on sale in 2022)



Monthly alarm report delivery



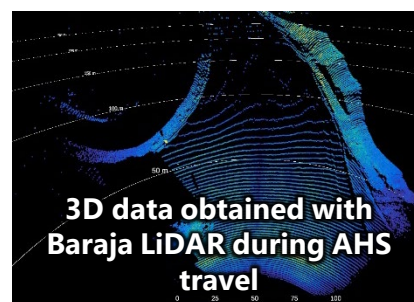
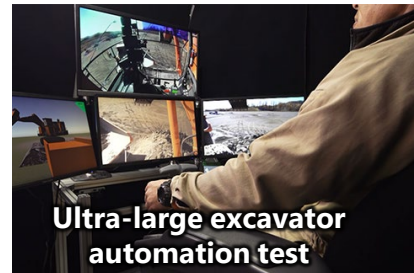
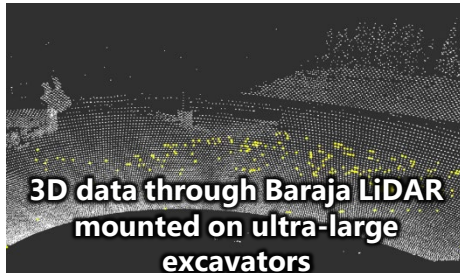
Prediction of anomalies such as stress-related issues in booms and arms



Integration with the Wenco monitoring system planned



Remote operation of ultra-large hydraulic excavators and AHS advancement



Schedule

During FY 2023: Test completion at the Urahoro Test Site
Until 2030: Practical application of operations support features in manned operation and autonomous driving features

Merits for customers

- Be retrofitted onto the EX-7 series of ultra-large hydraulic excavators, so mining customers can effectively utilize the equipment they currently possess.

Solve customer issues with solutions that consider "what customers truly want"

Paving on athletic fields and residential roads, etc. is small-scale, but accurate construction is required...

ICT?



Not spacious enough for an ICT bulldozer, and I want to reduce the number of machines...



Customer

Would you like to use a mini-excavator blade and develop it together?



Hitachi
Construction
Machinery



Realizing ICT construction with a mini-excavator blade together with a customer

I want to find cracks in booms and arms before they lead to significant damage



Inspection is difficult and takes time
If possible, I would like to avoid shutting off the machinery...

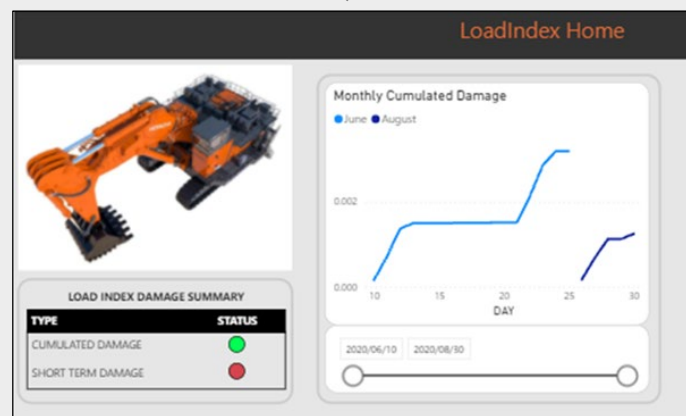


Customer

We can predict the anomalies such as stress-related issues in booms and arms with our own analysis technologies and AI!



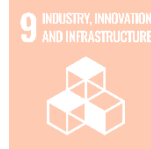
Hitachi
Construction
Machinery



Piloting the ConSite Mine at customer mining sites

Materiality Themes

Creating innovative solutions for challenges faced by customers supporting social infrastructure



Product and technology development contributing to climate change mitigation and adaptation



Conversion to recycling-oriented business model



Strengthening global governance

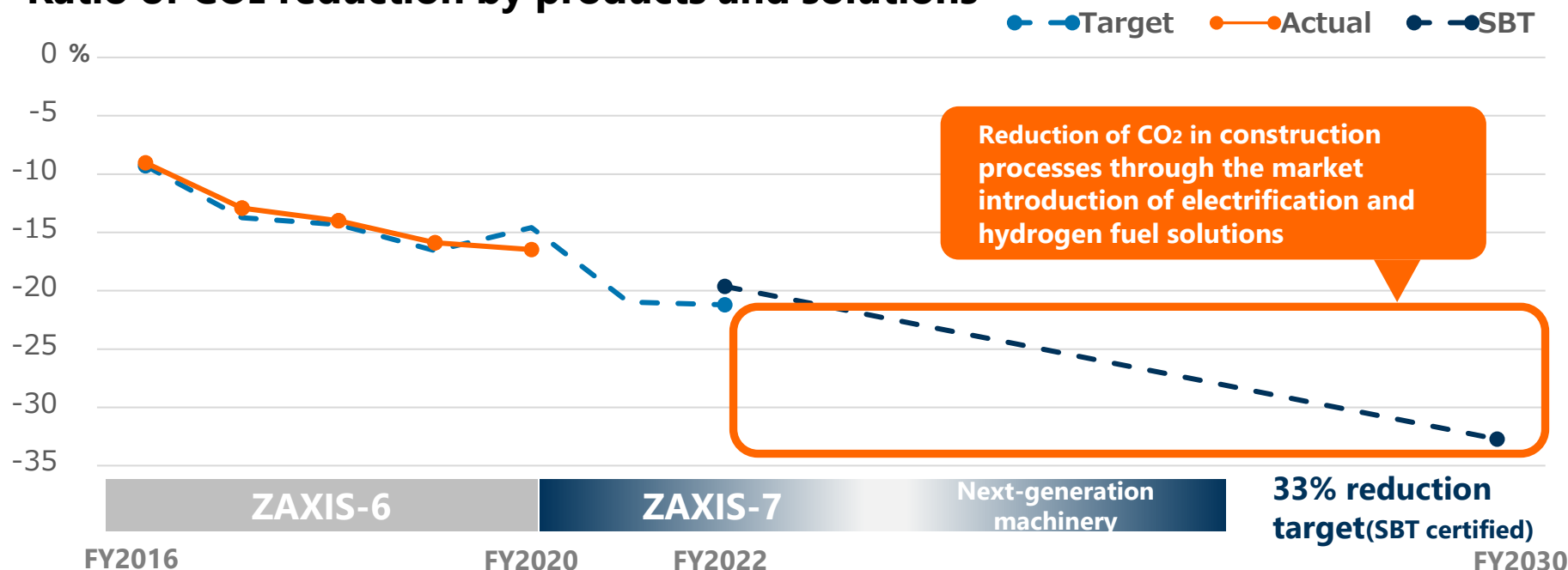


Accelerate electrification and hydrogen fuel aimed at an SBT-certified target of 33%

Ratio of CO2 emissions within the lifecycle of construction machinery



Ratio of CO2 reduction by products and solutions*1



*1 Compared to FY 2010

*2 SBTi: abbreviation of Science Based Targets initiative. Third-party certification of target values calculated by companies and organizations based on scientific grounds for climate change.

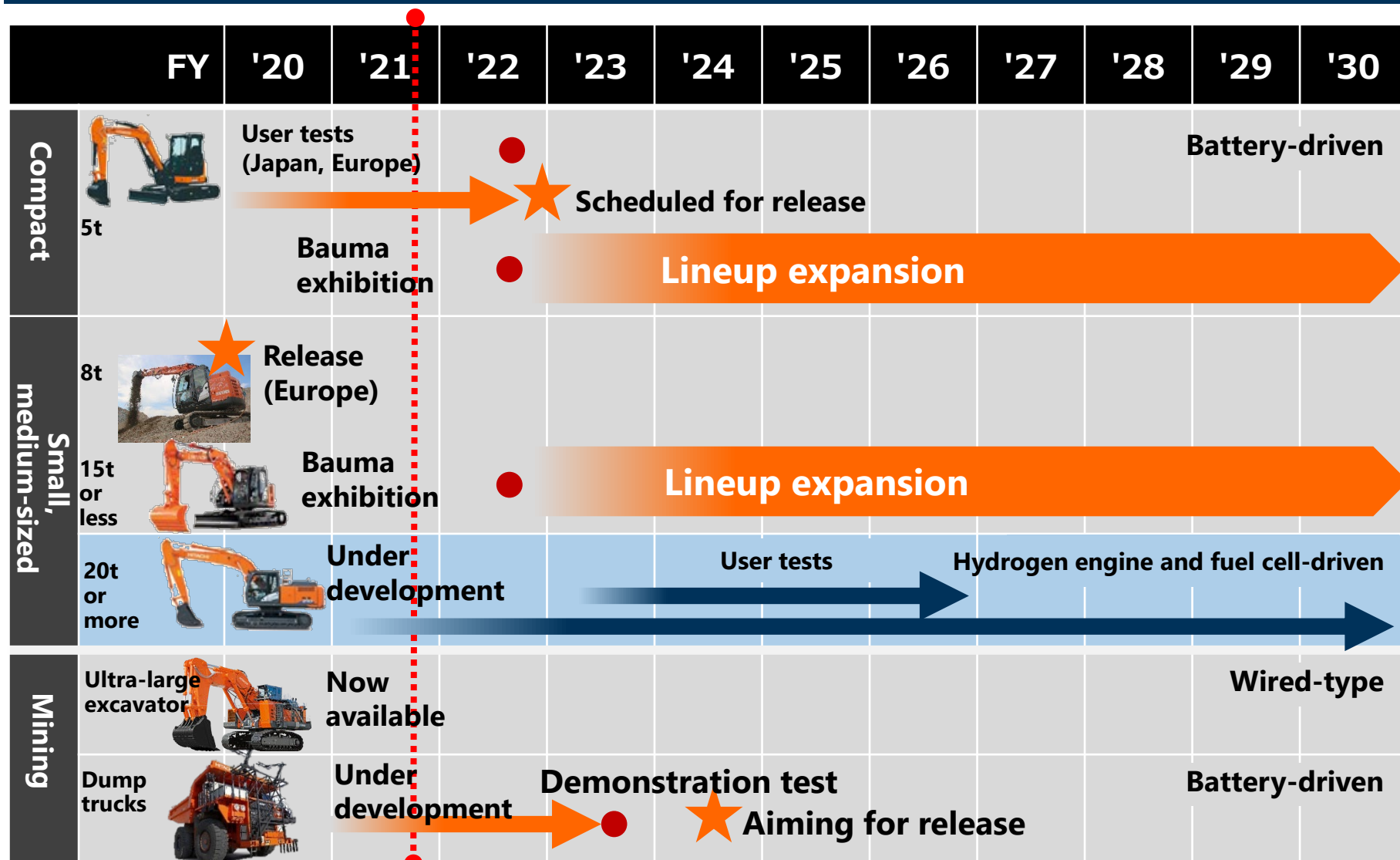
Environmentally-Friendly Products Development Roadmap

Contributing to climate change mitigation and adaptation

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Reliable solutions

Expand the number of environmentally-friendly products and accelerate the speed through open innovation



Promoting sales of mini and small-sized electric excavators in the European market, further lineup expansion

- Steadily expanding sales with the tailwind of investment promotion policies in various European countries
- Low noise and ICT functions that matches European needs

Number of units sold

25 -> **40** -> **70**
2020 2021 2022 (target)



8t class currently being sold by the European Application Center in the European market

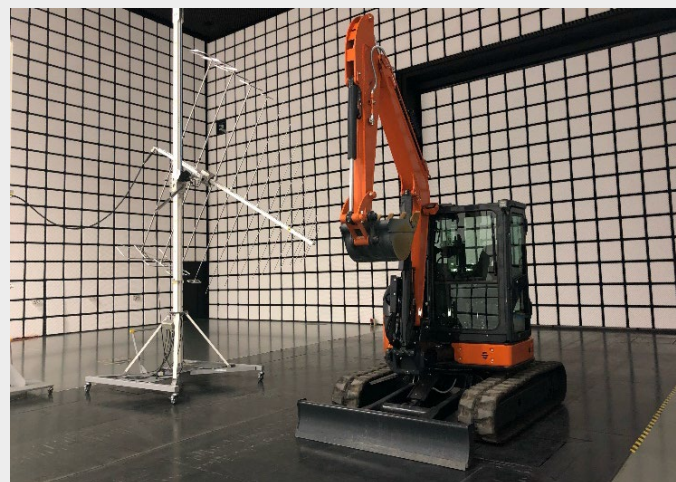
- Rear ultra-small turning types that emphasize usability on narrow job sites
- Now making final arrangements for market launch in FY 2022
- Scheduled to be exhibited at Bauma2022

Rear-end swing
radius

1m

Commercial power supply and
battery-driven

2 -way operation



5t class prototype machine being tested in the latest anechoic chamber

Significant room for mining machinery to help reduce CO₂
The development of electrified products and solutions needs to be accelerated

Ratio of CO₂ emissions in all processes at mining sites

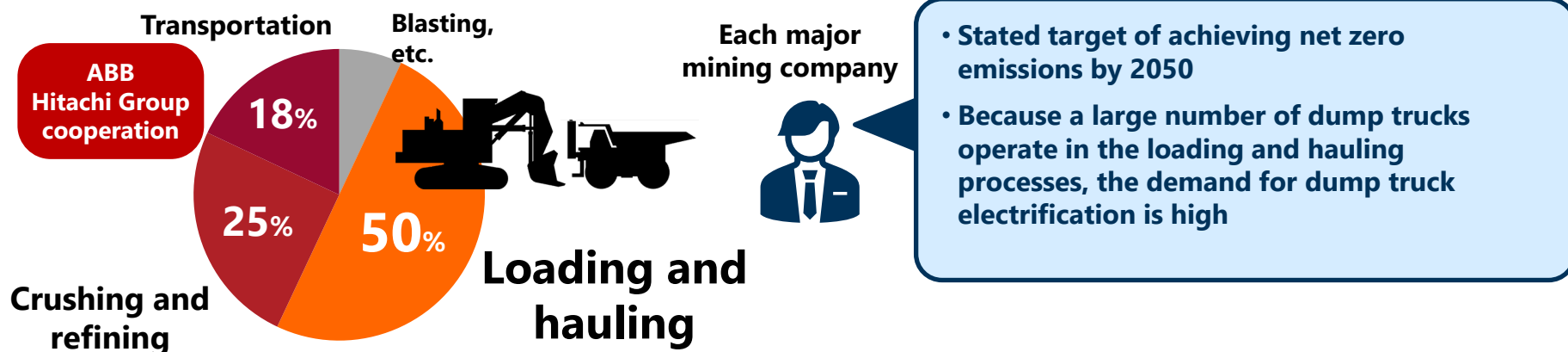


ABB cooperation



Hitachi Construction Machinery

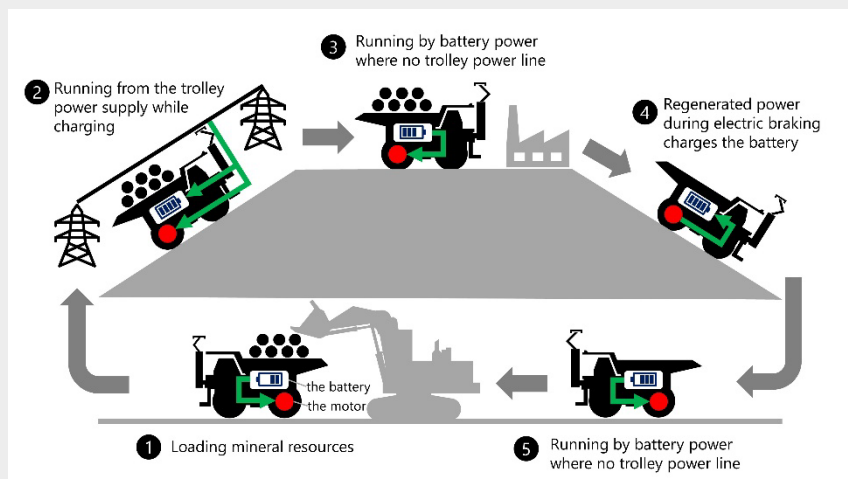


Hitachi Gr. cooperation



Cooperating with ABB and the Hitachi Group with the goal of net zero emissions at entire mining sites

Using a fully electric dump truck with trolley charging



Merits for customers

- Limits the required battery capacity through the dual use of a trolley feed and battery running
- The battery charges during trolley traveling, so there is no need for charging equipment or stopping for charging
- Shortening the development period through open innovation with ABB



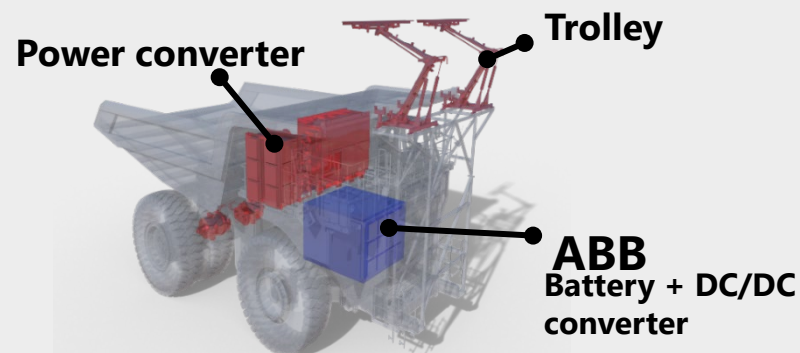
Effect of CO2 reduction in a simulation with the EH3500AC-3

Diesel engine-type

6.8t/day, 20-hour operation

Fully electric-type

6.8t reduction



Contributions to the environment

- Reducing the CO2 emissions of the many dump trucks in operation at mining sites



1 **Creating new forms of value through customer collaboration aimed at the realization of a sustainable society**

2 **Introducing products and solutions in a timely manner to achieve customer safety and productivity improvements and lifecycle cost reductions**

3 **Accelerating the expansion of electrified machinery and the technology development of hydrogen fuel products the goal of reducing CO2 emissions from products and solutions by 33%**

3. Initiatives to Realize the Circular Economy Which Supports Value Creation

Materiality Themes

Creating innovative solutions for challenges faced by customers supporting social infrastructure



Product and technology development contributing to climate change mitigation and adaptation



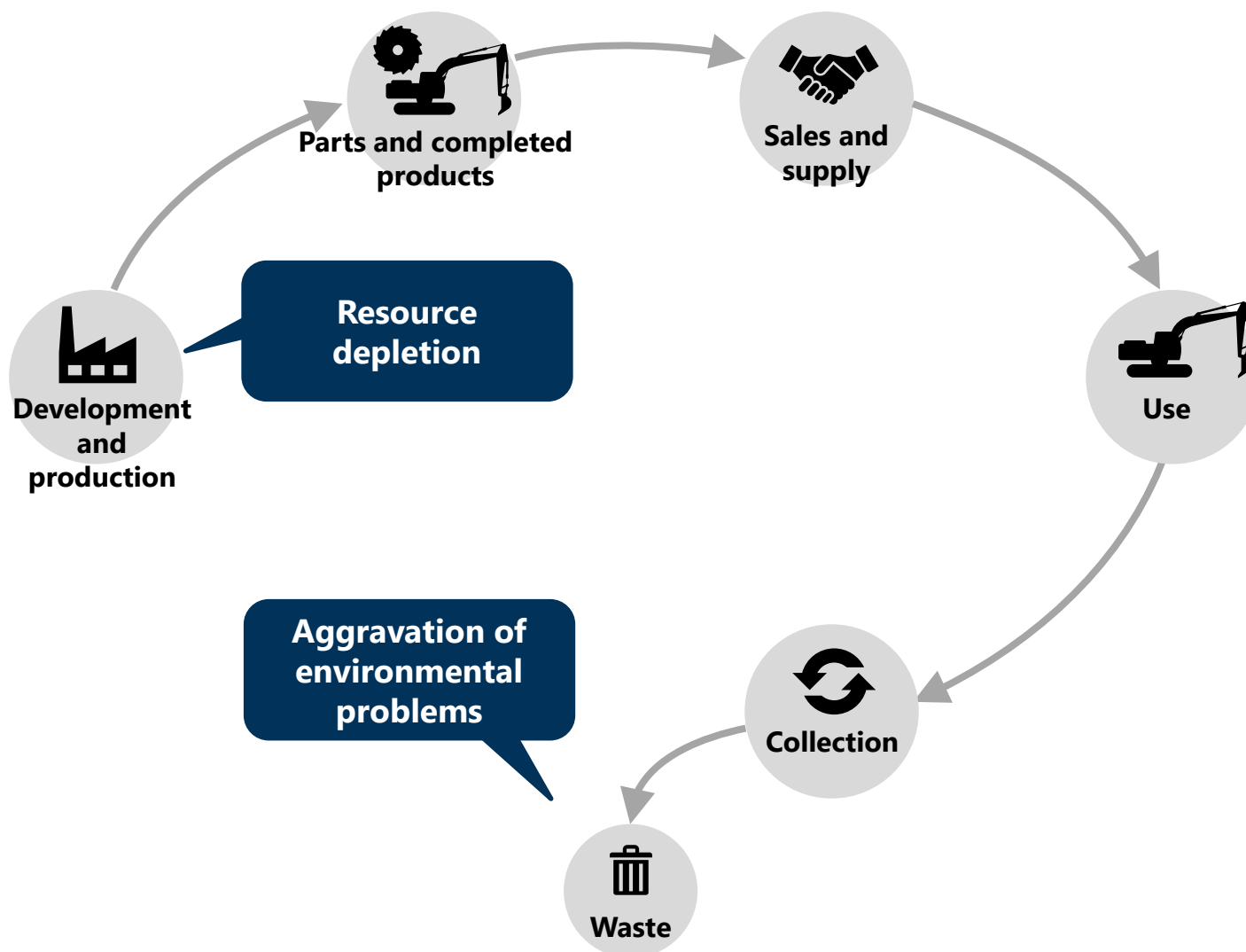
Conversion to recycling-oriented business model



Strengthening global governance



Conventional one-way type of business model is reaching its limits



Our Goal for Conversion to Recycling-oriented Business Model

Recycling-oriented
business model

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Reliable solutions

Aiming for conversion to recycling-oriented business model through the value chain business

Undertaking the **4Rs**
across the entire
company

Reduce

Waste generation
control

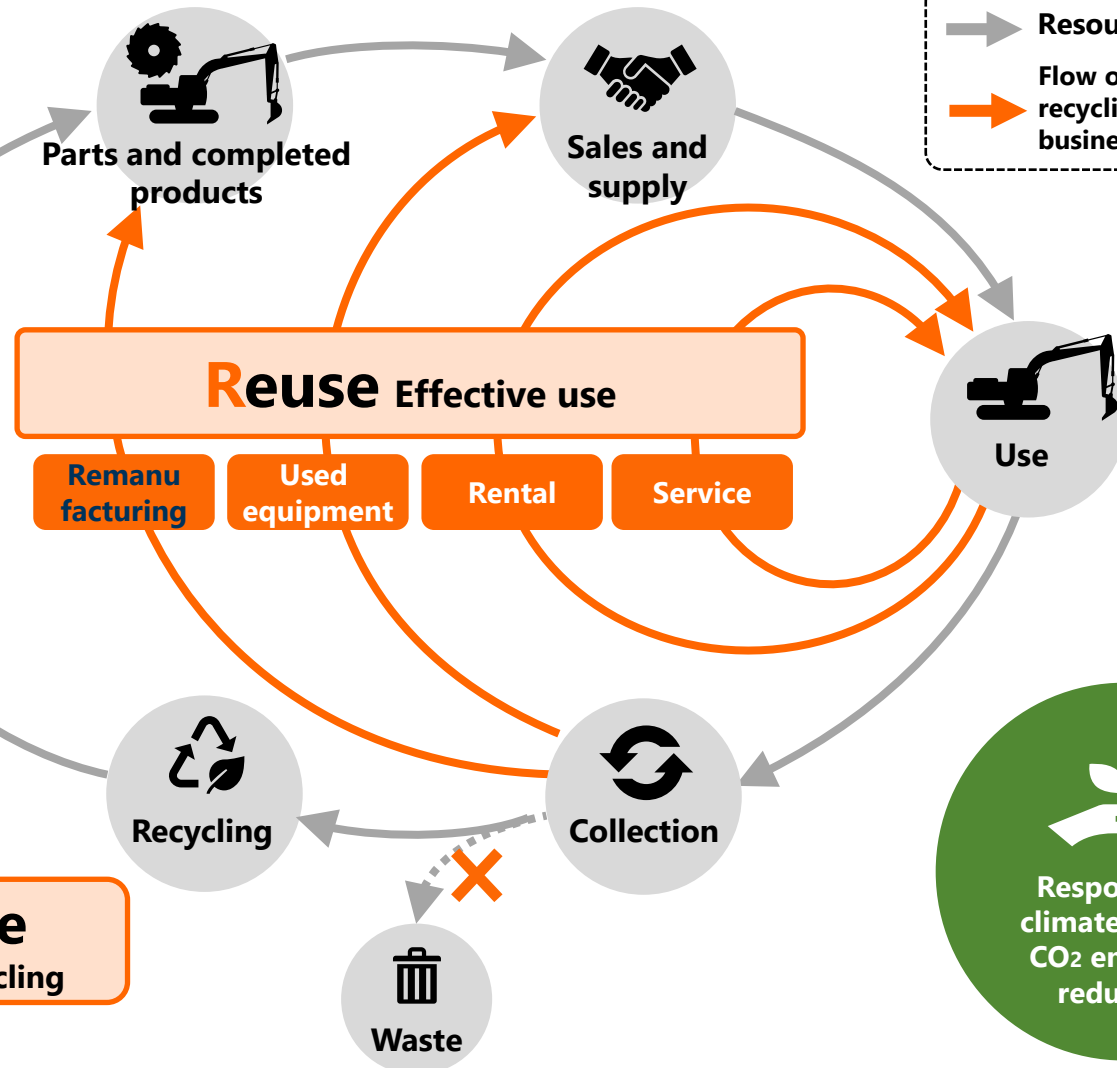


Renewable

Use of renewable
resources

Recycle

Resource recycling



→ Resource flow
→ Flow of our
recycling-oriented
business model

Response to
climate change
CO₂ emission
reduction

Limit the volume of resource utilization by prolonging the lifetime of parts through remanufacturing technologies

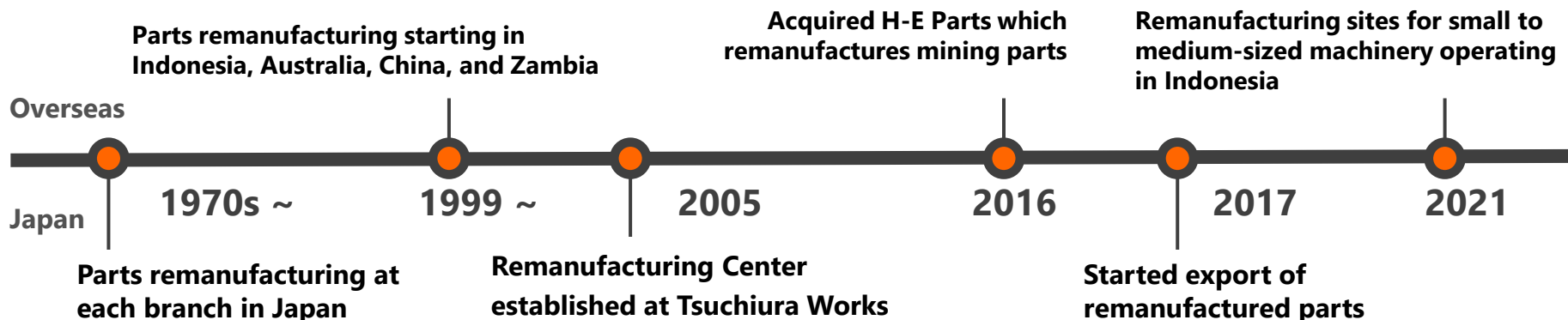
What are remanufactured parts?

Remanufactured parts manufactured in the parts reuse and recycling business which have the same functionality as new parts

Features

- Remanufactured parts are inexpensive compared to new parts
- Warehoused close to operation sites, so quick delivery
- Performance equal to new parts guaranteed by the manufacturer

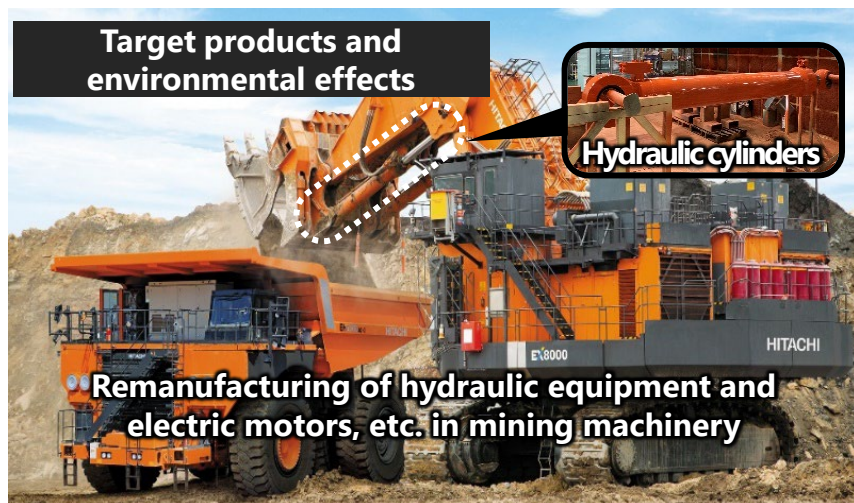
History



Parts remanufacturing flow



Construction and mining machinery parts are heavy goods which significantly contribute to CO2 reduction



- Expanding remanufacturing sites beyond previous mining demand focus
- Newly establishing remanufacturing sites small to medium-sized machinery in Southeast Asia

Comparison of CO2 emissions for new and remanufactured parts*1

New parts

Approx. 9.3 tons

Remanufactured parts

Approx. 4.6 tons

CO2 reduction effect through global application

360k tons*2

*1: Numerical value for the manufacturing of one EX2600 boom cylinder (Hitachi Construction Machinery estimate)

*2: Calculated based on approx. 72,000 Hitachi Construction Machinery hydraulic excavators in operation around the world (Hitachi Construction Machinery estimate)

Technology development

Determining whether gears can be reused



Determining by visual inspection

Reuse rate improvement

Approx.
30%



Determining with new technology

Approx.
65%

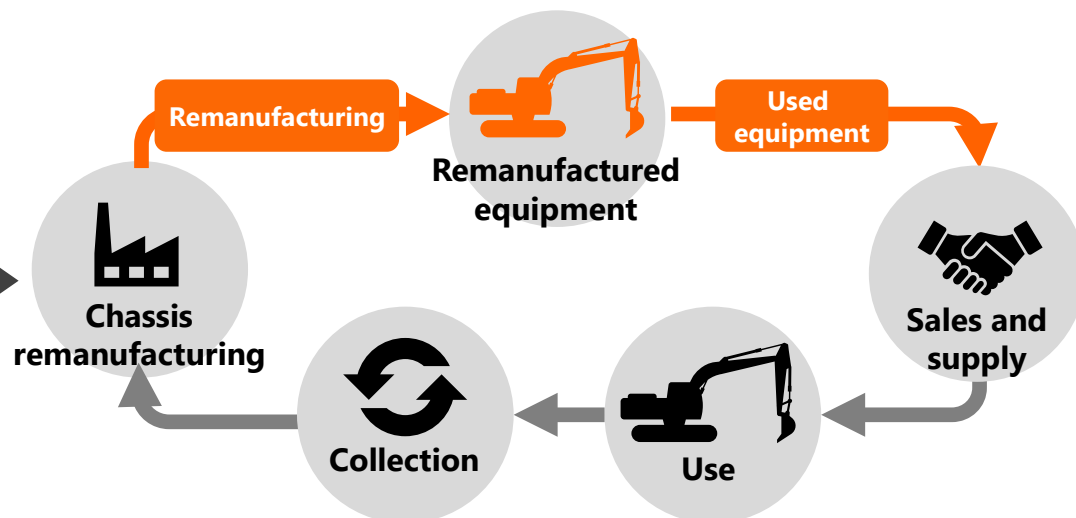
Parts Remanufacturing Business (Reduce Materials Used in New Parts)

Recycling-oriented
business model

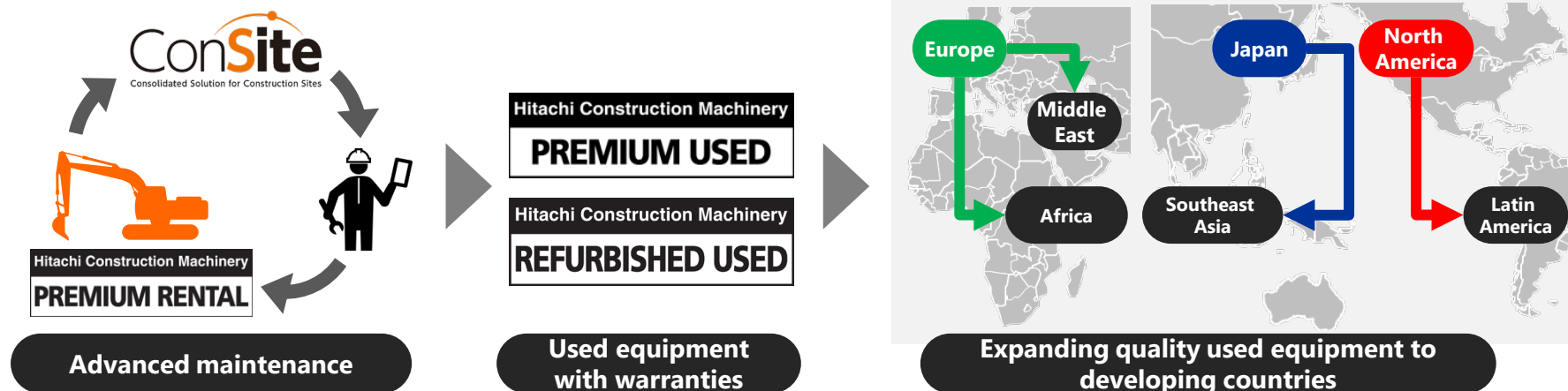
HITACHI

Reliable solutions

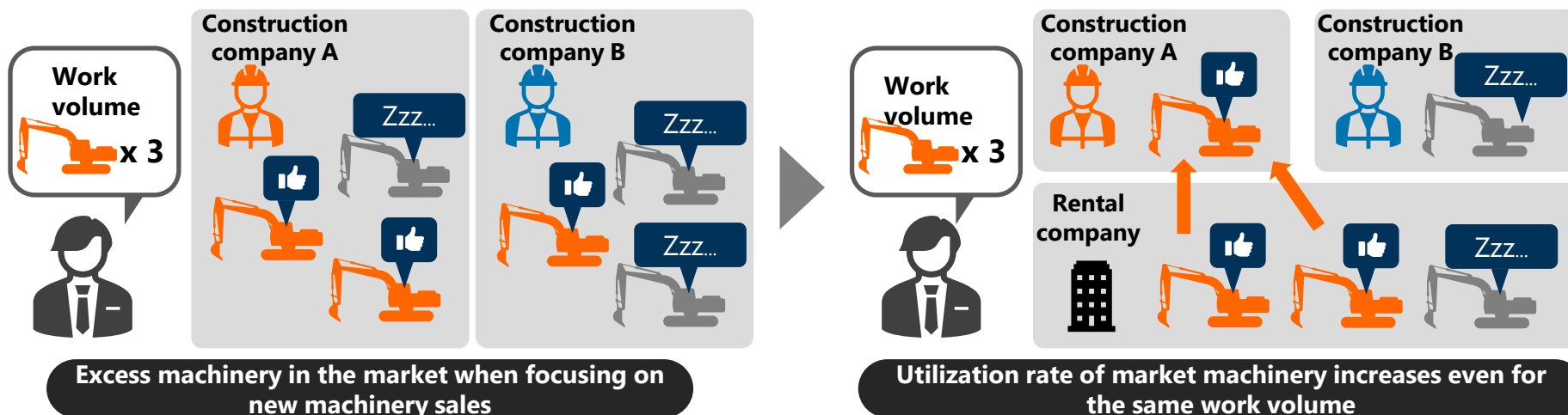
Building a new business model that remanufactures entire machines to sell as used equipment



Extending the lifetime of machinery through our own rental and used equipment business to reduce the volume of waste



Machinery operating rate increases through rentals, the volume of machinery in the market decreases, and waste volume is reduced



Also introducing for hydraulic excavators for the Americas from March 2022
Improving the lifetime and work efficiency of machinery around the world and helping to reduce CO2



- Information infrastructure that connects to customers around the world 24 hours a day and 365 days a year
- Monitoring each machine to extend the lifetime and improve the work efficiency



Rapid response through emergency alerts



Extend machinery lifetime through appropriate repairs and maintenance

Global e-Service



Big data analysis



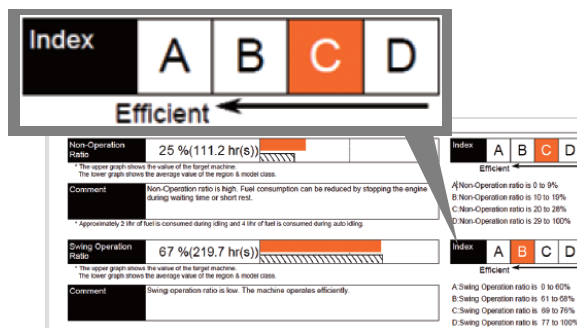
ConSite
Consolidated Solution for Construction Sites



LUMADA

**Predictive failure
detection rate
2023 target**

90%



Visualize work efficiency with monthly reports



Fuel consumption and work efficiency improvement proposals

The value chain business is a sustainable business that simultaneously contributes to solving issues faced by customers, society and the environment

	Merits for customers	Contributions to society and the environment
Parts remanufacturing	<ul style="list-style-type: none"> • Inexpensive compared to new parts • Performance guaranteed to be equal to new parts • Warehoused close to operation sites for quick delivery 	<ul style="list-style-type: none"> • Extending part lifetimes limits the volume of resource utilization and reduces CO₂ • Contributes to employment promotion and community development in developing countries
Rental and used equipment	<ul style="list-style-type: none"> • Machinery purchasing and retention cost reduction • Latest models and special machinery can be used • High quality machinery with meticulous maintenance can be used 	<ul style="list-style-type: none"> • Machinery lifetime can be extended through appropriate maintenance to reduce waste volume • Machinery operating rate increases, the volume of machinery in the market decreases, and waste volume is reduced • Contributes to the growth of developing countries through quality used equipment
Parts and service	<ul style="list-style-type: none"> • Machinery downtime reduction • Lifecycle cost reductions 	<ul style="list-style-type: none"> • Machinery lifetime can be extended through appropriate maintenance to reduce waste volume • Promotes high-efficiency machinery operation and reduces CO₂

4. Expressing Support for the TCFD Recommendations

Incorporation of growth opportunities utilizing the TCFD recommendations and risk management

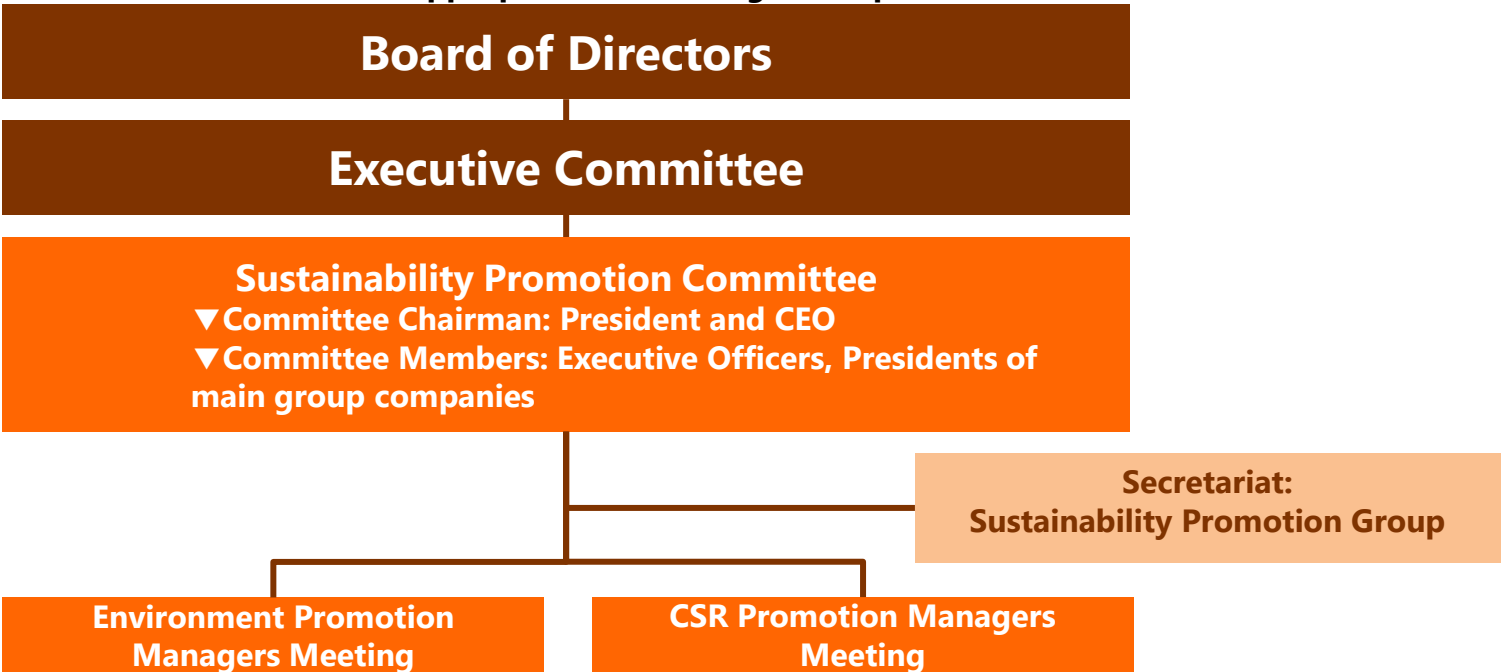
Organize an internal task force that cuts across the entire company to support the TCFD recommendations
Also focus efforts on strengthening engagement with stakeholders

TCFD recommended disclosure items		Our support and progress at the current time	
Governance	<ul style="list-style-type: none"> ● Board of Directors monitoring system for climate-related risks and opportunities 	<ul style="list-style-type: none"> ● Executive Committee and Board of Directors: reporting on important items related to climate change, discussion and approval of priority measures and KPIs 	
	<ul style="list-style-type: none"> ● Role of executives in the evaluation and management of climate-related risks and opportunities 	<ul style="list-style-type: none"> ● Sustainability Promotion Committee with the CEO as Chairman (held twice a year): climate-related and other group-wide sustainability promotion policies, discussion and approval of priority measures and KPIs 	
Strategy	<ul style="list-style-type: none"> ● Short, medium, and long-term climate-related risks and opportunities 	<ul style="list-style-type: none"> ● Identification of short, medium, and long-term climate-related risks and opportunities 	
	<ul style="list-style-type: none"> ● Impact of climate-related risks and opportunities on the business, strategy, and financial planning 	<ul style="list-style-type: none"> ● Quantification of the financial impact of climate-related risks and opportunities 	
	<ul style="list-style-type: none"> ● Strategy resilience based on various climate-related scenarios 	<ul style="list-style-type: none"> ● Identification of priority measures and verification of strategy resilience 	
Risk management	<ul style="list-style-type: none"> ● Climate-related risk recognition and evaluation process 	<ul style="list-style-type: none"> ● Climate change risk identification, evaluation, and priority ranking decision ● Recognize and evaluate climate-related risks in the Sustainability Promotion Group 	
	<ul style="list-style-type: none"> ● Climate-related risk management process ● Integration of the climate-related risk organization into comprehensive risk management 	<ul style="list-style-type: none"> ● Building an Enterprise Risk Management (ERM) Committee 	
Indices and targets	<ul style="list-style-type: none"> ● Evaluation index for climate-related strategy and risk management ● Scope 1-3 GHG emissions, related risks ● Management targets and results for climate-related risks and opportunities 	<ul style="list-style-type: none"> ● SBT certification acquired (May 2019) ● Disclose Scope 1, 2, 3 GHG emission results 	

Incorporation of growth opportunities utilizing the TCFD recommendations and risk management

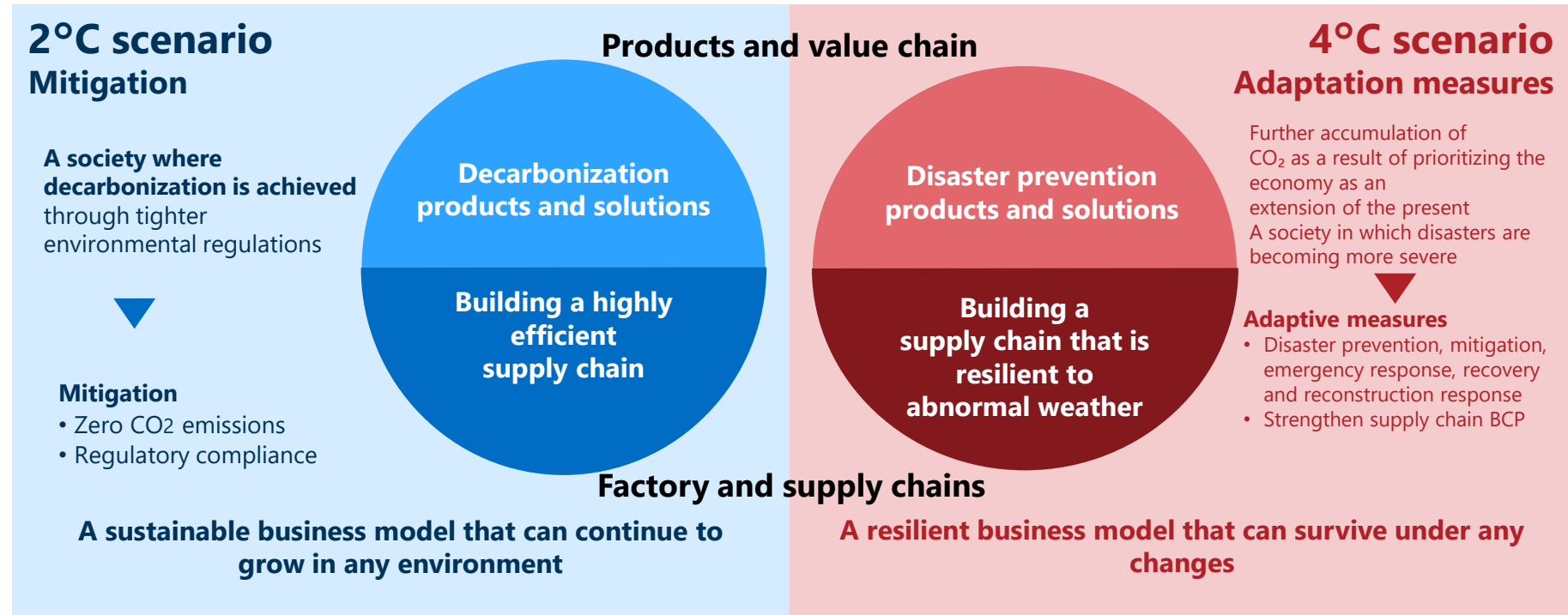
TCFD recommended disclosure items		Our support and progress at the current time
Governance	Organizational governance regarding climate-related risks and opportunities	<ul style="list-style-type: none">Executive Committee and Board of Directors: reporting on important items related to climate changeSustainability Promotion Committee (held twice a year): Deliberation and approval of the Hitachi Construction Machinery Group's sustainability promotion policy, including climate change, priority measures and KPIs

Strengthen the "organization and governance system" concerning responses to climate change
System which receives approval in the Executive Committee, reports to the Board of Directors, and carries out the appropriate monitoring and supervision



Incorporation of growth opportunities utilizing the TCFD recommendations and risk management

TCFD recommended disclosure items		Our support and progress at the current time	
Strategy	Actual/latent impact of climate-related risks and opportunities on the business, strategy, and financial planning	<ul style="list-style-type: none"> ● Identification of risks and opportunities in the 2°C and 4°C scenarios (short/medium/long-term), quantification of the financial impact ● Identification of priority measures and verification of strategy resilience 	



Promote business expansion under both climate change mitigation and adaptation

5. Summary

1

Value Creation Strategy of the Hitachi Construction Machinery Group

Accurately grasp the risks and opportunities with respect to our sustainable growth and rapidly provide products and services that contribute to solving issues at customers' site or social issues.

2

Research and Development Initiatives to Support Value Creation

Create new value through customer collaboration aimed at the realization of a sustainable society, introduce products and solutions that solve customer issues in a timely manner, and accelerate our response to climate change.

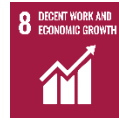
3

Initiatives to Realize the Circular Economy Which Supports Value Creation

Set up initiatives aimed at the realization of a circular economy as the mission of a construction machinery manufacturer and establish and promote a sustainable recycling-oriented business model which simultaneously contributes to solving social and environmental issues with customers through the value chain business.

Corporate vision

To pass on a productive environment and prosperous cities to future generations



2030 social value

Provide solutions that offer
safety, productivity, and life cycle cost reductions
to the global infrastructure development

Safety improvement

Contribute to zero deaths
due to falls or contact
accidents

Productivity improvement

Standardize automation,
labor-saving construction
machines

Reduction of life cycle cost

Aim for
zero downtime

2030 environmental value

Provide **low-carbon technology** to the
global infrastructure development

Preventing global warming

Product life cycle CO₂ reductions: Aim for
Products -33%;
Production -45%

2022 management goals (social value)

Safety improvement

Achieve contact prevention
technology
Commercialize human-machine
cooperative control technology

Productivity improvement

Promote ICT Machinery
2800 units*

*Applicable worksites:
Over 5,000 sites

Reduction of life cycle cost

Operating status
management system
dissemination rate: 90%

Applicable units: 200,000 units

(Environmental value)

Preventing global warming

Reduce CO₂ emissions
products CO₂ -20%
Production CO₂ -25%

Applicable units: 500,000 units

Item			Description	FY 2019 results	FY 2020 results	FY 2022 targets	FY 2030 Goals
Product and technology development contributing to climate change mitigation and adaptation	CO2 reduction	Products (Scope3)	CO ₂ reduction (absolute emissions) compared to fiscal 2010	-15.9%	-16.5%	-20%	-33%
		Production (Scope1+2)	CO ₂ reduction (absolute emissions) compared to fiscal 2010	-20.1%	-27.2%	-25%	-45%
		Value chain	Save CO2 through used equipment/parts remanufacturing	19,100 t	16,563 t	23,800 t	Minimize the environmental load across the entire value chain
	Disaster response, recovery, and reconstruction support		Emergency disaster and other forms of cooperation (Number of disaster agreements with local municipalities in Japan)	42 agreements	54 agreements	83 Agreements	Partnerships and support for major municipalities and industry groups
Conversion to recycling-oriented business model	Resource recycling	Value chain	Waste reduction	7,700 t	6,630 t	9,500 t	Minimize the environmental load across the entire value chain
		Waste	Recycling rate (Japan)	89.6%	83.3%	99.5%	Aiming for 99.5% or higher
		Water	Usage reduction (intensity)compared to fiscal 2010	-28.9%	-36.8%	-28%	Advanced water recycling usage / Minimization of regional impact
	Regional coexistence through the promotion of a circular economy		Expand the parts remanufacturing business sales revenue compared to fiscal 2010	296%	308%	420%	Adoption of services that meet regional needs
			Expand the used equipment business sales revenue compared to fiscal 2010	87%	90%	280%	Adoption of products that meet regional needs

Item		Description	FY 2019 Results	FY 2020 Results	FY 2022 targets	FY 2030 Goals
Creating innovative solutions for challenges faced by customers supporting social infrastructure	Improving safety	Functionality to reduce accidents caused by Hitachi Construction Machinery's products	Expanded the functionality of the "Aerial Angle" peripheral vision display system to detect objects and restrict movement	Development of System Platform "ZCORE" for Autonomous Construction Machinery	Achieve cooperative control between people and machinery	Contribute to "zero" overturn and fatal accidents
	Increasing productivity	Number of ICT machines adopted (target work sites)	493 units (total) (1,675 total work sites)	699 units (total) (2,579 total work sites)	2,800 units (total) (5,000 total work sites)	Aiming for the standardization of automated and labor saving construction machinery
	Reducing lifecycle costs	Adoption rate of machinery status management systems (ConSite)	73%	75%	90%	Aiming for "zero" downtime
	R&D system	Ratio of R&D costs to sales revenue	2.5%	3.0%	3.0%	3.0% or higher
	Technology transfer	"Kataribe" (Storytelling) sessions	Held: 41 sessions Participants: 918	Held: 52 sessions Participants: 891	Quality improvement	Quality improvement

Item		Description	FY 2019 Results	FY 2020 Results	FY 2022 targets	FY 2030 Goals
Strengthening global governance	Occupational hazards	Zero occupational hazards (compared to the previous FY)	-18% (Compared to FY2018, Japan)	-49% (Compared to FY2019, Japan)	-50% (Compared to FY2021, Japan)	Aiming for zero
	Employee education	Number of e-learning participants	175% (Compared to FY2018, Total number by Hitachi Construction Machinery alone)	553% (Compared to FY2019, Japan, Hitachi Construction Machinery Group as a whole)	200% (Compared to FY2019)	500% (Compared to FY2019) Increase the total number of people by expanding enrollment opportunities
	Global leaders	Leadership training enrollment ratio (global)	60.4% (total)	78.0%(total)	100% (total)	100% (total)
	Diversity initiatives	Ratio of women in managerial positions (global)	Female 8.6% (Male 15.7%)	Female 8.7% (Male 16.2%)	Female 9.4% (Male 13.3%)	Aim for an equal ratio of men and women
		Local ratio at overseas group companies (General Manager positions)	69%	67.3%	72%	87%
	Fair procurement	Implement supplier of CSR surveys	83.5% (collection rate)	94%	Standardized to improve the collection rate	100% Aim for a 100% collection rate by establishing the operation
	Eradicate corruption and bribery	Number of corruption and bribery legal violations	0 cases	0 cases	0 cases	0 cases
	Corporate governance	Outside, female, and foreign national directors	Outside Directors: 3 out of 10 people Female Directors and Foreign national Directors: 1 person	Outside Director: 4 out of 10 Female and Foreign national Directors: 2 persons	Outside Director: Over 1/3 of all directors Female and Foreign national Directors: 2 or more in total	Shift to a system suitable for strengthening the business and improving governance
	Corporate ethics and behavior	Continue to provide examples and education to employees	Implement "compliance training" for roughly 10,000 employees	Conducted "Hitachi Group Corporate Ethics and Compliance Code Training" for 26,080 employees	Zero compliance violations	Zero compliance violations
	Respect for human rights	Education enrollment rate	Enrollment rate of 79% in the "business and human rights" e-learning course	Enrollment rate of 78% in the "business and human rights" e-learning course	100%	100%

END

[Trademark Notes]

"Lumada" is a registered trademark of Hitachi, Ltd.

"AERIAL ANGLE," "ConSite," "Global e-Service," "Solution Linkage," "ZAXIS," and "ZCORE" are registered trademarks of Hitachi Construction Machinery Co., Ltd.

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 **Hitachi Construction Machinery Co., Ltd.**

Corporate Brand & Communications Group