

1. Introduction

1.1 Overview of the company

Hitachi Zosen Corporation (hereafter “Hitz” or “the Issuer”) is a plant engineering company rooted in Osaka Tekkosho (Osaka Iron Works) and founded in 1881 by E.H. Hunter. Hitz has globally expanded and developed its business in the field of “Environmental systems”, “Machinery and Infrastructure” in order to provide the values for society through manufacturing and engineering technologies developed by shipbuilding technology (since the shipbuilding business division was divested in 2002). Its head office is located at Osaka in Japan. The global enterprise activity is executed with 11,089 employees and 115 consolidated subsidiaries.(as of end-March, 2021)

1.2 Environmental Strategy of the company

1.2.1 Corporate philosophy

Our corporate philosophy is "We create value useful to society with technology and sincerity to contribute to a prosperous future." Under this philosophy, we will commit to become an impactful corporate that devotes to achieving SDGs by providing the products and services using our experience of manufacturing and engineering and our advanced technology, and Hitz will continuously build trust with society by communicating with social stakeholders and through fair and spontaneous disclosure.

1.2.2 Policy on Environmental Issues

Since the 1970s, Hitz has been working on environmental conservation measures for offices, factories and local communities. In 1992, Hitz established its “Basic Environmental Protection Policies and Action Guidelines” for its employees as a good corporate citizen.

In 1993, we have also established the “Hitachi Zosen Environmental Protection Promotion Plan” by the Environmental Protection Promotion Committee, built on the prior policies with a concrete agenda based on the Action Guidelines. It adds breadth to our previous regional environmental protection activities, with additional focus on areas like ozone layer protection, global warming prevention, waste reduction and recycling.

In this environmental policy, we have established our ISO14001 management system, and set up our "Environment Policy" to carry out our business activities.

- (1) Regarding our company products, service and business activity, we try to improve environmental load-reducing and improve global environmental protection.
- (2) Observe statutory and regulatory requirements, agreements and the other requirements that the organization has agreed to and also our company's self-imposed controls.
- (3) Set environmental objectives, and environmental targets for the year (an Environment Management Program), and make a continuous commitment to reducing burden on the environment and preventing environmental pollution.
- (4) Review regularly, make continuing improvements and maintain operations of Environment Management System effectively.

All factories located in Japan and the two business headquarters of Environment, Machinery and Infrastructure have acquired ISO14001 certificate. Also, ISO14001 periodical environmental audits are conducted by an external reviewer in ISO14001 acquiring offices at all the sites.

1.2.3 Mid/Long Term Vision

Hitz considers creating a sustainable, safe, secure society through providing “clean energy and water”, environmental conservation” and “building a disaster-resilient, prosperous community” to every stakeholder a vital mission. We are committed to continue working on “Forward 22”, the 3 year medium-term management plan which launched in 2020 and pass on to achieve our long-term goal “Hitz 2030 Vision” in 2030.

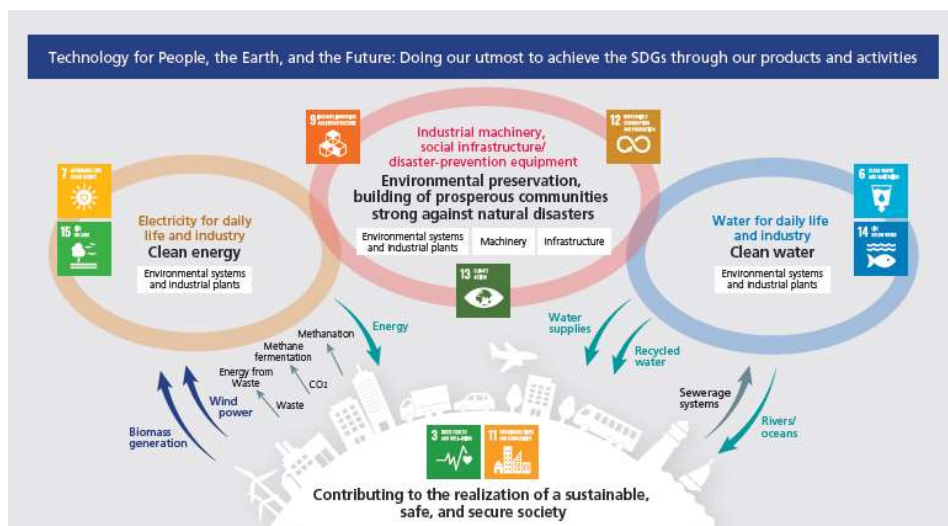
Long-term vision: Hitz 2030 Vision

“Hitz 2030 Vision” is a long-term vision that has been laid out for Hitz to commit to boosting our own profitability through optimizing the value supplied to customers and aiming to become a corporate group that can achieve sustainable growth as the understanding of UN’s SDGs expand globally and the social movement toward the realization of sustainable development and recycling-based society. Actions that align with Hitz Value, our management stance proclaiming that quickly understanding clients’ needs and providing solutions lead to the prosperous society, is the premise for the setting of long-term management goals.

As a part of our initiatives for providing clean water and clean energy, we will aim to expand the use of renewable energy that contribute to the reduction of CO2 emissions by speed up to expand capacity of Energy-from-Waste plant operations and develop wind power and biomass power generation.

Also we will foster cooperation between public-private partnerships by involving local government to cover the lack of financial resources and will respond to water demand in an emergency through rental equipment. In addition, we will tackle waste treatment and waste plastic issues through the Energy-from-Waste and recycling facility business to promote environmental preservation and protection, and work on maintenance and remote monitoring of infrastructure such as aging expressways, and constructing flap-gate type seawalls and GPS wave meter to mitigate natural disasters such as Tsunami.

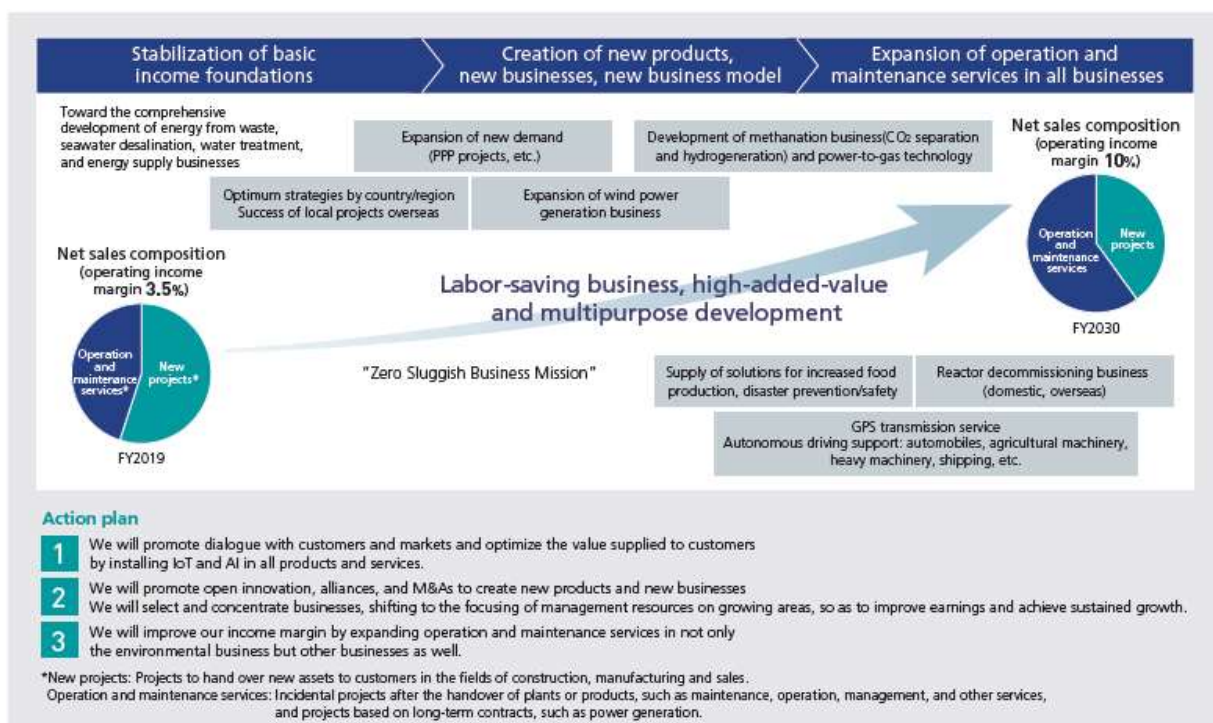
Hitz 2030 Vision:Overall Business Policy



Regarding the direction of our business activities toward 2030, on the basis of previous mid-term management goals, we will strive to strengthen our earning capacity through the creation of new products, new businesses and will also aim to expand operation and maintenance services for all businesses. Regarding specific product and business strategies, in addition to existing EfW plants, desalination plants, we will channel efforts into the expansion of public-private partnership (PPP) projects, as well as projects of methanation and power-to-gas, wind power generation, food security, nuclear power plant decommissioning, support for highly accurate autonomous driving through GPS transmission, and other lines of businesses. In addition, we will optimize the value supplied to customers by utilizing the IoT and AI in all businesses.

We will continue to speed up investment, development and commercializing of offshore wind power generation and hydrogen business, both of which are considered crucial for achieving Green Growth Strategy of Japanese government which aims to achieve carbon neutral in 2050.

Hitachi 2030 Vision: Direction of business activities toward 2030



Medium-term management plan: Forward 22

In our medium-term management plan "Forward 22", Hitachi Zosen Group positions the three-year term starting in fiscal year 2020 a period for boosting profitability and ensuring that results are achieved. As the slogan for Forward 2022 is "I'll do it! Stepping forward will change the future", company will become together as one and keep working to increase the added value of products and services, promoting business selection and concentration of businesses and shifting resources to growth areas, and promoting work style reforms by improving operational efficiency and productivity. We will contribute to the realization of a sustainable, safe, and secure society through approaching three corporate activities.

(1) Initiatives for clean energy

Our energy-from-waste plant, which is our main product, conducts sanitary waste treatment and generates electricity at the same time, contributing to the reduction of greenhouse gas emissions. In addition, we are also working on power generation from biomass, onshore and offshore wind power, and on technologies such as Power to Gas that use the surplus power from these renewable energy sources to generate hydrogen and methane. Our aim is to expand the use of renewable energy and contribute to the reduction of CO₂.

(2) Clean water, environmental conservation, and building a disaster-resilient, prosperous community

In our water businesses, we are engaged in actively responding to the needs of public-private partnerships in Japan and are promoting the utilization of reverse osmosis membrane technology from Osmoflo (Australia), one of our overseas group companies, for water and sewage treatment as well as the utilization of mobile equipment. In terms of environmental protection, we are working to promote the marine SCR system technology to clear NO_x emission regulations for ships, and land-based aquaculture technologies to ensure food safety. Further, we are also actively engaged in responding to the needs of social foundations, including reinforcement and renovation of infrastructure such as aging expressways, special shield tunneling machines for urban areas, and flap-gate type seawalls to protect against flood disasters caused by tsunamis or storm surges.

(3) Contribution to CO₂ emission reduction

Clean energy facilities designed and constructed by our company including our energy-from-waste and our biomass and wind power generation facilities, contribute to the reduction of CO₂ emissions through our customers' business activities. As of the end of fiscal 2019, our products have reduced CO₂※ by 15 million tons per year, equivalent to 4.9% of Japan's reduction target for the fiscal year 2030. We seek to continue contributing to CO₂ reduction through our products, and we aim to reduce CO₂ emissions by 22 million tons per year by the end of fiscal 2022 and about 40 million tons per year by the end of fiscal 2030.

	End of FY2019 (current status)	FY2022 (target)	FY2030 (target)	Cumulative total for FY2020~2030
Amount of CO ₂ Reduction (Including Licensees)	15.18 million tons of CO ₂ /year	22.06 million tons of CO ₂ /year	About 40.00 million tons of CO ₂ /year	About 320 million billion tons of CO ₂

※Based on "The Method of Calculating Greenhouse-Gas Emissions and List of Emission Coefficients" issued by the Japanese Ministry of the Environment, and for the emission coefficients of other countries, on the "Global Warming" issued by Japan's Agency for Natural Resources and Energy. These estimates of the amount of CO₂ reduction are based on the power generation capacity of working facilities (expected in 2022) excluding decommissioned facilities, and does not include heat utilization in the facilities. Targets for fiscal 2023 and thereafter were calculated proportionally based on the results up to fiscal 2019. The target reduction of approximately 308 million tons of CO₂ / year was calculated from the amount of energy-derived CO₂ emissions indicated in the "Submission of Japan's Intended Nationally Determined Contribution (INDC)" issued by the Ministry of the Environment, and was used to estimate the Group's contribution rate.

1.2.4 Our commitment to SDGs

As awareness towards SDGs surges globally, the world has been working together to create a sustainable and circular society. This trend aligns with our corporate vision which aims to contribute to the realization of sustainable, safe and secure society through products and businesses.

Hitz approaches SDGs in two different ways: "Directly through products and businesses", and "Internally through sustainability efforts". These two types of approaches resonate with each other and contribute to SDGs as whole corporate activities.

1. Directly through products and businesses

Renewable energy (Reducing CO2 emission)



Our energy-from-waste plant, which is our main product, conducts sanitary waste treatment and generates electricity at the same time, contributing to the reduction of greenhouse gas emissions. In addition to above, we aim to contribute to the society in the field of energy by providing clean energy through means such as methane fermentation, wind power as well as development of SOFC, and the use of surplus power from these renewable energy sources to generate hydrogen and methane to develop metanation system.

- Energy-from-waste plant
- Methane fermentation system
- On/off shore wind power

Water shortage/prevention of environmental deterioration



Hitz support people's living industrial growth through water supply; Seawater desalination plants provide drinking water to areas where natural water cycle is hard to occur, and our water treatment system prevents contamination from inflow of industrial water into natural system.

- Seawater desalination system
- Water treatment

Food security, food loss



By using our image recognition technology, it allows judge the state of a parking area (full or empty), to determine the combustion state of refuse incineration power generation facilities, to automatically detect any cracks on pavement, and to streamline quality control of food production line. Also we apply water treatment technology to developing fish farms which will lead to robust food security.

- Production line image recognition technology
- Contamination detection
- Water treatment for fish farms

Making disaster-resilient city; saving lives from natural disaster



We have been involved in building many suspension bridges, cable-stayed bridges, and truss bridges for more than 100 years in Japan. By utilizing technology that we cultivated through developing seawalls, we are currently developing flap-gate type flood prevention systems and which occur in higher frequency than ever due to climate change as well as due to Tsunami. In addition, our technology is incorporated into satellite system that helps people to navigate evacuation route under Tsunami emergency, and underground spaces that expand underneath the ground has been used to prevent flooding.

- Flap-gate type seawall against flood disaster

2. Internally through making sustainability efforts

Diversity management



At the Hitachi Zosen Group, we promote diversity management and strive to create a corporate culture that encourages women employees to participate in business, and moreover, helps all employees live up to their full potential. We hope to generate innovations by enabling employees to reach across attributes and respect one another's different senses of value.

Work style reforms

Work-at-home, satellite office, "super flexible" work hours, company-wide focus time, and designated days for leaving the office on time—we are introducing various schemes toward creating workplace environments that are friendly to all employees. By using the Internet of things (IoT) and artificial intelligence (AI) to improve productivity, we are promoting work style reforms that offer employees a sense of reward both at work and in private.

Environmental education



The Energy-from-Waste plants and other environment-related facilities we operate throughout Japan organize plant tours and environmental lessons for the community. Outside Japan, in Laos we organize environmental education events for high school and college students, and compile learning materials for elementary school pupils, in efforts to relay the significance of protecting the environment through hygienic waste treatment and recycling. We have a permanent exhibit on environmental education at the Osaka Science & Technology Center (OSTEC) Exhibition Hall.

1.3 Purpose of issuing Green Bond

Hitz will issue the Green Bond to provide Hitz's environmental solution technology and service (facilities and management). We believe that delivering service consistent with our environmental policy in all the business phases from funding to providing technology and services to customers will achieve Hitz's mission. We made this framework for the Green Bond to ensure consistency with Green Bond Principles (ICMA 2021), Green Bond Guidelines (Ministry of the Environment 2020), and Climate Bond Standards (CBI, v3.0).







2. Green Bond Framework








For the issuance of the Green Bond, this framework is designed in align with the Green Bond Principle 2021's four core components which are: Use of Proceeds, Process for Project Evaluation and Selection, Management of Proceeds, and Reporting. This framework will be released on our web page, and components of framework will also be revealed on legal documentations for the relevant Green Bond issuance and disclosed information to the stakeholders.

2.1 Use of Proceeds

All the net proceeds from the issuance of the Green Bond will be allocated to finance and/or refinance of expense for development, construction, installation and operation of projects which meet the following eligible criteria. Refinancing for existing projects are limited to be finalized/taken into operation within 24 months preceding to the date of issuance of the Green Bond.

Eligible Projects

Eligible project category	ICMA GBP category	Eligible project and eligibility criteria	SDGs
Energy-from-Waste	Pollution prevention and control	Capital investment and costs related to facility / equipment development, manufacturing, construction, installation, operation, and maintenance of energy-from-waste facilities that meet either of the following criteria: <ul style="list-style-type: none"> Energy from Waste (EfW) facilities efficiency meet criteria for Energy from Waste set by Climate Bonds Initiative in Waste Management Criteria of December 2019 energy-saving and emission saving type of energy-from-waste facilities and equipment 	 
Onshore and offshore wind power	Renewable energy	Capital investment and costs related to facility / equipment development, manufacturing, construction, installation, operation, and maintenance of onshore and offshore wind power facilities that meet the following criteria: <ul style="list-style-type: none"> Direct CO₂ emissions shall be 100gCO₂/kWh or less Offshore wind power should consider environmental and social impact on aquaculture 	 
Methane fermentation systems	Pollution prevention and control	Capital investment and costs related to facility / equipment development, manufacturing, construction, installation, operation, and maintenance of equipment that extracts biogas from solid organic waste such as food waste and pruned branches and converts it into energy, and that meet the following criteria: <ul style="list-style-type: none"> CO₂ equivalent of methane emissions per ton of waste input meet criteria for anaerobic digestion set by Climate Bonds Initiative in Waste Management Criteria of December 2019 	 

		Business example: Hitz Kompogas system, WTM system	
Land aquaculture system	Environmentally sustainable management of living natural resources and land use	<p>Capital investment and costs related to facility / equipment development, manufacturing, construction, installation, operation, and maintenance of land-aquaculture facilities and equipment that are implemented in consideration of reducing the environmental impact of marine-aquaculture itself while supplementing the sustainable use of natural resources, and that meet the following criteria:</p> <ul style="list-style-type: none"> • Conformity to environmental laws, regulations, etc., required by the central and local governments of the area where the operation site exists • Discharge the residual feed and manure to the outside of the system after proper processing • Conservation of nature and biodiversity outside the farm and prevent harm for biosystem 	 
Flap-Gate	Climate change adaptation	<p>Capital investment and costs related to facility / equipment development, manufacturing, construction and maintenance of flood disaster countermeasure equipment that requires no electricity or manual operation, using of the power of nature itself such as tsunamis and storm surges.</p> <p>Business example: neo RiSe, Seabed-type Movable Flap-Gate type Breakwater system</p>	  
Hydrogen Generation System	Circular economy adapted products, production technologies and processes	<p>Capital investment and costs related to facility / equipment development, manufacturing, installation and maintenance of equipment that generates hydrogen from electricity and water that meet any of the following criteria:</p> <ul style="list-style-type: none"> • Electrolyzed by electricity derived from renewable energy • The amount of electricity required for hydrogen production per ton meets EU Taxonomy thresholds • direct or indirect CO2 emissions and electricity consumption are lower than other hydrogen production measures <p>Business example: On-site type water electro-chlorination hydrogen generator Hydrospring</p>	 

2.2 Process for Project Evaluation and Selection

The list of selected eligible projects to be allocated with proceeds from the Green Bond will be evaluated in each responsible department implementing each eligible project and the Finance Department. The Board of Directors, Hitz's supreme decision-making body on operational execution, will give final approval to the eligible project selection and allocation of Green Bond Proceeds.

We will confirm that the following measures are taken for all the eligible projects in order to reduce environmental and social risks.

- The environmental impact assessment by the country of residence or local government is carried out appropriately, if necessary.
- Providing adequate explanations to local residents when conducting business.
- Making efforts to decrease the environmental risks through management of emissions by setting voluntary standards and target values that are more strict than the law on the emission of pollutants to the environment in the equipment manufacturing process.
- To prevent environmental problem and minimize environmental risks, make sure employees are strictly following manuals when at work and also all the equipment are thoroughly checked on a regular basis.
- Being aware of the risk of bringing environmental disaster, and prepare manual that demonstrate procedures to minimize the effect of the disaster. Also, conduct emergency drills on a regular basis.

2.3 Management of Proceeds

The Finance Department is in charge of allocation of the proceeds to eligible projects and managing the proceeds. The budget and actual outlay of the proceeds from the Green Bond issuance will be traced and managed using an internal management system on a monthly basis in accordance with Hitz's cash management flow by numbering each eligible project. We will preserve cash management related documents complying with Hitz's accounting rule defining the range of accounting documents and preservation of the documents, and manage the documents with document saving books. Hitz intends to allocate most of the proceeds of the Green Bonds within 3 years of the issue date. Until the allocation of the proceeds is decided, unallocated proceeds will be managed in cash or cash equivalent forms.

2.4 Reporting

Hitz will provide information on the allocation of the net proceeds and environmental effects of the eligible projects on an annual basis. During construction of the eligible projects, Hitz will only disclose allocation of the net proceeds. After completion of the eligible projects, Hitz will report environmental impact from the year starting operation until the redemption of the green bond.

2.4.1 Reporting by issuer

Allocation Reporting

Hitz will provide information of both allocated amount and unallocated amount annually on our website or integrated report until net proceeds are fully allocated. In addition, Hitz will disclose allocation breakdown in proportion by each project level subject to the clients' approval. For long-term assets that will be continuously refinanced by using several green bonds, we will report the elapsed years, remaining durable year as well as refinancing amount in the possible extent at the time of green bond issuance.

The first allocation report will be made public within 1 year from the date of the Green Bond issuance. In case of material developments, we will renew the information on the use of proceeds on a timely basis even after the full allocation of the proceeds.

Impact Reporting

Hitz commits to report on the any of or several of the following impact indicators related to eligible projects on an annual basis until the redemption of the Green Bond on the company's website or the integrated report to the extent practicably feasible considering confidentiality.

Eligible project category	ICMA GBP category	Indicators for environmental impact (example)
Energy-from-Waste	Pollution prevention and control	<ul style="list-style-type: none"> > Outline of each facility constructed / installed (including processing capacity, whether it is under construction or completed) > Annual power generation output after the start of operation of the constructed and installed facility (MWh/year) > Annual GHG emission reduction based on annual power generation output (t CO₂/ year)
Onshore and offshore wind power	Renewable energy	<ul style="list-style-type: none"> > Number of facilities constructed / installed and outline of each facility (including whether under construction or completed) > Annual power generation output (capacity) after the start of operation of the constructed and installed facility (MWh/year) > Annual power generation output after the start of operation of the constructed and installed facility (MWh/year) > Annual GHG emission reduction based on annual power generation output (tCO₂/year)
Methane fermentation systems	Pollution prevention and control	<ul style="list-style-type: none"> > Outline of each facility constructed / installed (including processing capacity, whether it is under construction or completed) > Biogas generation capacity > Annual CO₂ emission reduction based on annual biogas generation capacity (tCO₂/year)
Land aquaculture system	Environmentally sustainable management of living natural resources and land use	<ul style="list-style-type: none"> > Outline of each facility constructed / installed (Including certification acquisition / preparation status, whether under construction or completion status, and response status to nature conservation outside the farm)
Flap-Gate	Climate change adaptation	<ul style="list-style-type: none"> > Number of facilities constructed / installed and outline of each facility (including installation purpose, assumed disaster prevention target area / population, whether under construction or completion) > Operation status and disaster prevention effect at the time of disaster (disaster reduction status)
Hydrogen Generation System	Circular economy adapted products, production technologies and processes	<ul style="list-style-type: none"> > Outline of each facility constructed / installed (including installation purpose, hydrogen production capacity (Nm³/h), whether under construction or completion)

2.4.2 External Review

We plan to assign DNV Business Assurance Japan to provide an external review to evaluate whether the eligible projects conform to this framework within 1 year after issuance date of green bond. This review will be conducted annually until all proceeds by the green bond have been allocated.