

FY2021

SDGs・ESG Briefing

October 25, 2021

Today's Work, Tomorrow's Heritage



SHIMIZU CORPORATION supports the Sustainable Development Goals

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SDGs & ESG Information Session

- 16:00 **Opening remarks**
Kazuyuki Inoue, President and Representative Director
- 16:05 **Presentation 1 "New Environmental Vision SHIMZ Beyond Zero 2050 and the Environmental Strategy Office's Role"**
Mika Kaneko, Director, Environmental Strategy Office, General Manager, SDGs & ESG Promotion Department
- 16:20 **Presentation 2 "Action to Achieve SHIMZ Beyond Zero 2050"**
(1) Construction case: Hokuriku Branch, new office bldg.
Koichi Horibe, General Manager, Design Dept., Hokuriku Branch
(2) Civil engineering case: Green Infrastructure + (PLUS)
Jun Hashimoto, General Manager, Green Infrastructure Promotion Dept., Environmental Strategy Office
(3) Non-construction business case: Shimizu's renewable energy business
Toru Yamaji, Executive Vice President and Director, General Manager, LCV Headquarters, in charge of Engineering Business, Emerging Frontiers, and New Business Development
- 17:05 **Q&A**
- 17:25 **Closing remarks**
Representative Director and Vice President Kimio Handa

Presentation 1

Our New Environmental Vision: SHIMZ Beyond Zero 2050 and the Environmental Strategy Office's Role

Mika Kaneko, Director, Environmental Strategy Office,
General Manager, SDGs & ESG Promotion Department

Background

Sep 2015: SDGs adopted

Dec 2015: Paris Agreement adopted

- Attempt to suppress the increase in average worldwide temperature to 1.5°C, or at least 2°C, compared to pre-industrial levels.
- All countries set targets suited to their circumstances and review results.

Oct 2020: Japanese government declared a goal of carbon neutrality by 2050

Dec 2020: Japan released the Green Growth Strategy

Apr 2021: Climate Summit

- Japan set a goal of reducing greenhouse gas emissions by 46% of FY2013 levels by FY2030, with further efforts thereafter to reach 50%.

Environmental Strategy Office

- Established in April 2021, under the direct authority of the President
- Purpose

While strongly promoting implementation of environmental strategy within Shimizu, create new environmental values and advance to sustainable businesses in order to realize a zero-carbon society, a recycling-oriented economy, and self-sufficient and independent communities across Japan.

The Environmental Strategy Office's Purview

Increase Shimizu's Value

- **Plan environmental strategy, policy & action**
- **Supervise environmental action & deliver messages to various stakeholders**
- **Gather and analyze environmental data**
- **Cultivate environmental specialists, provide education program for employees**
- **Eliminate carbon emissions in construction businesses**

Create Customer & Social Value

**Create new
environmental value**

Gifu Academy of Forest Science and Culture,
Kawaba GVP, etc.

Outside coordination

Coordinate with existing in-house action

Soil & water purification

Renewable energy,
hydrogen

Wood buildings

Energy conservation, ZEB

Agriculture

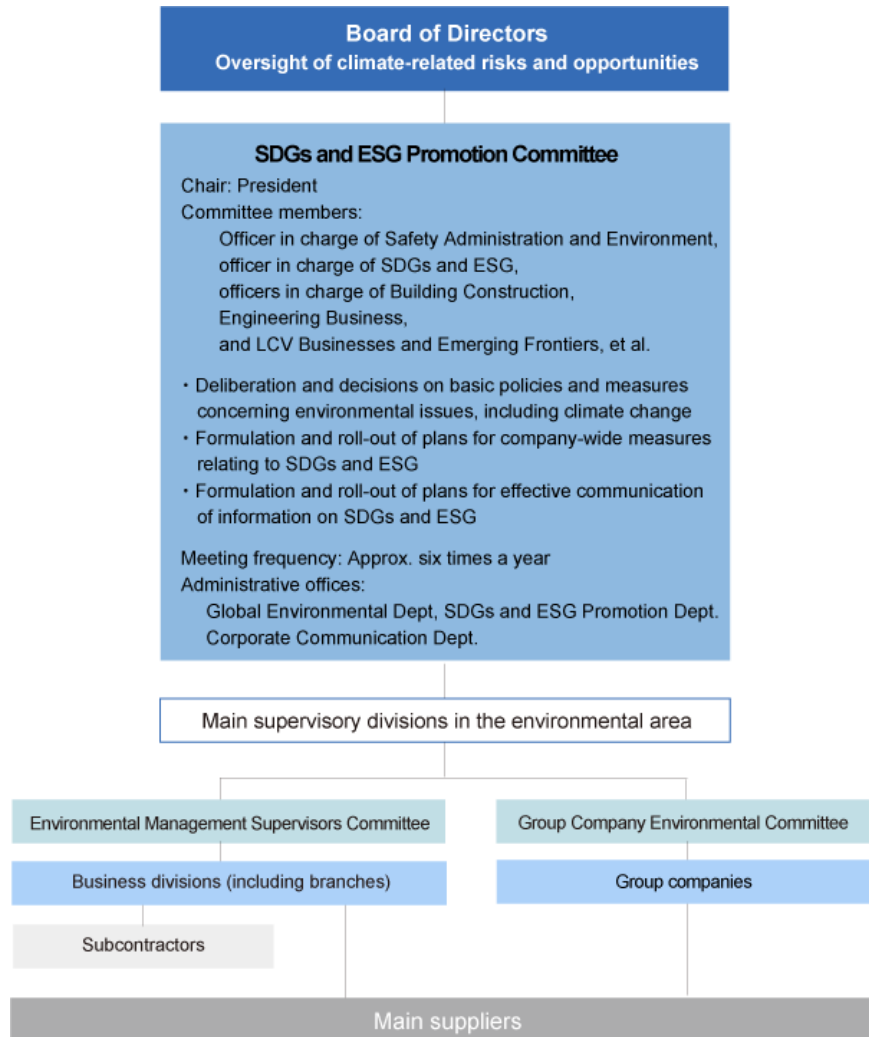
Biochemicals

Disclose Climate Info According to TCFD Recommendations

Oct 2019: Shimizu declared support for TCFD recommendations

Joined TCFD consortium

From 2020: Climate info disclosures according to TCFD recommendations



Analysis of major factors affecting climate-related risks and opportunities

Risk with the most impact for Shimizu

- Rise in average summer temperature

Opportunities

- Expansion of need for energy-saving buildings
- Will expand the need for renewable energy
- Policies that strengthen national resilience
- Market changes caused by climate change

Shimizu Group's New Environmental Vision 「SHIMZ Beyond Zero 2050」

**“Zero carbon society,” a “Resource recycling society,”
And a “Society that coexists harmoniously with nature.”**

Officially announced on June 25, 2021

大きく育てたい未来がある

**SHIMZ
Beyond Zero
2050**

Shimizu's Environmental Policy

Shimizu Global Environmental Charter

(Established in April 1991, and revised in 2002.)

Shimizu contributes to building a sustainable society by working to preserve the global environment and to create a better environment as a corporate citizen and as a member of the construction industry.

Basic Environmental Policy

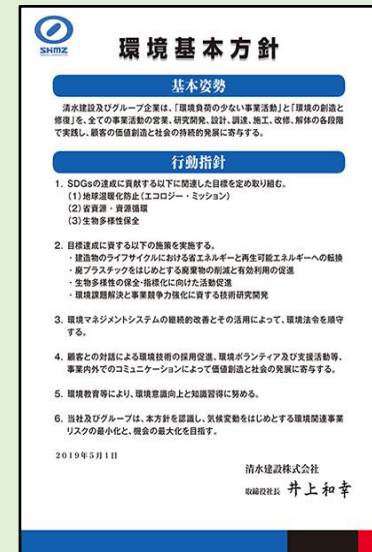
(Established in 1997, and amended in 2003, 2004, 2006, 2019.)

Position statement

Shimizu Corporation and group companies practice “Business activities with less environmental impact” and “Environmental creation and restoration” for contribution to customer value creation and sustainable society, at each stage of sales, R&D, design, procurement, construction, renovation and demolishing.

Guidelines

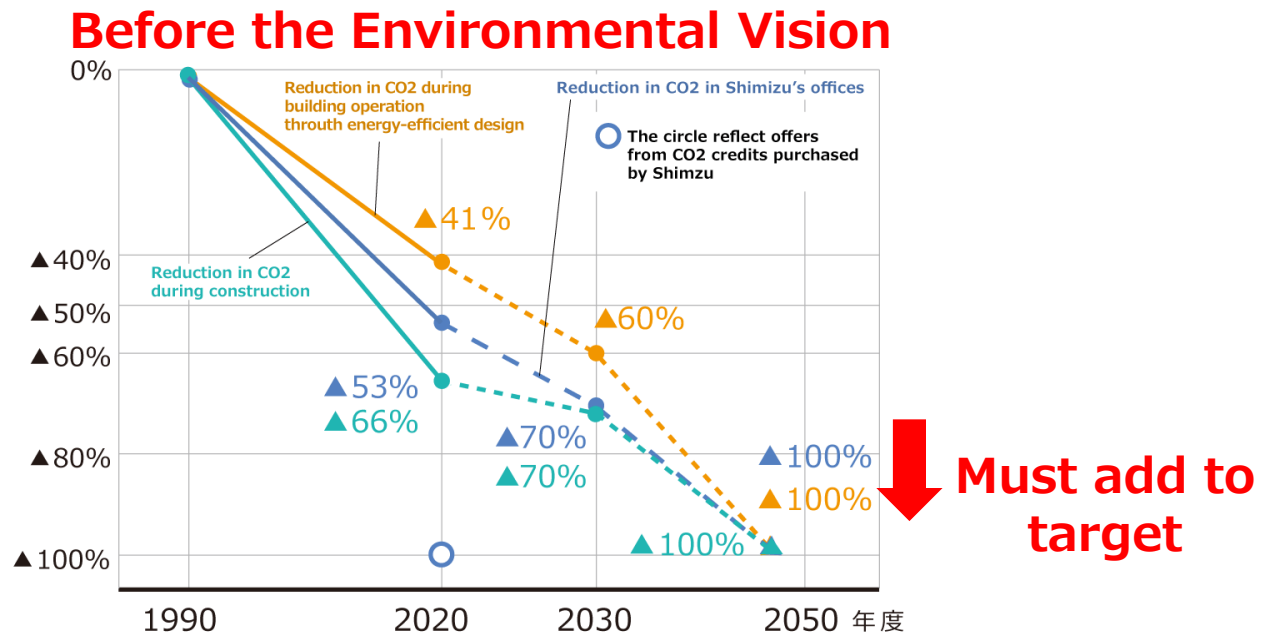
1. Setting goals to contribute to the achievement of SDGs
 - (1) Prevent global warming
 - (2) Resource conservation and reuse
 - (3) Preserving biodiversity
2. Implement the following measures that contributes to achieving the goal . . . Omitted below . . .



CO₂ Emissions Reduction Targets

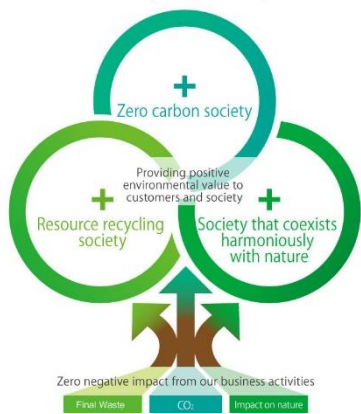
「Ecological Mission2030-2050」

- Established in 2016, reduction target compared to 1990 figures.
- Target category for CO2 reduction
 - Own business activities(Construction, Shimizu's offices)
 - Design-build building operation



Policy for Formulating the Environmental Vision

- **State a vision of the Shimizu Group should be in 2050 (in terms of the environment).**
- **In addition to reducing CO₂ emissions, establish a vision that sets the agenda for the Basic Environmental Policy: (1) prevent global warming, (2) conserve and recycle resources, (3) protect/preserve biodiversity.**
- **Set targets that include value for customers and society, not only Shimizu's own activities.**

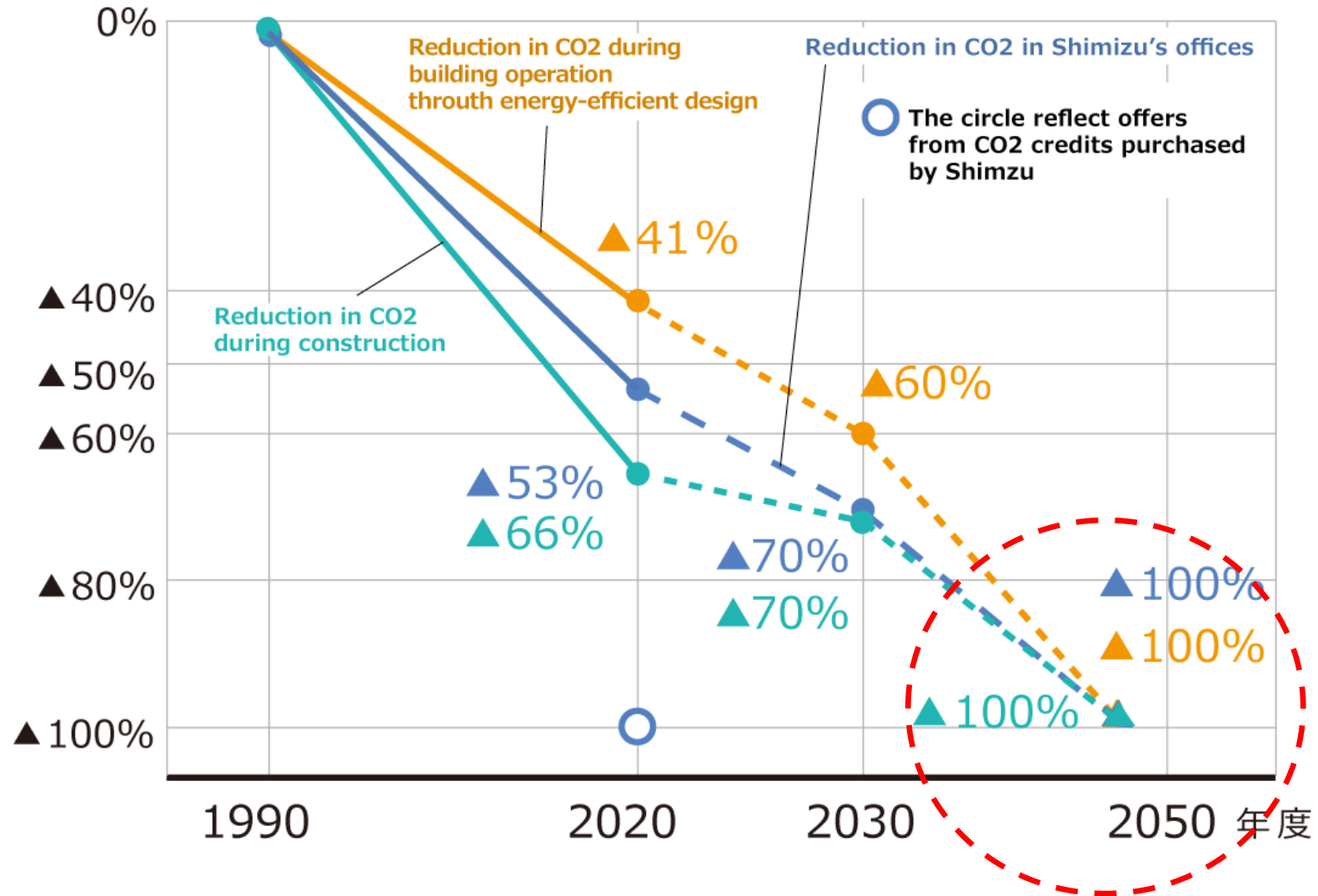


SHIMZ Beyond Zero 2050

Providing positive environmental value (Beyond Zero) to our customers and society in addition to reducing the negative impact from our business activities to zero.

	Zero impact from Shimizu's activities	+	Beyond Zero Providing environmental value to customers & society
Zero carbon society	<ul style="list-style-type: none"> Zero CO2 emissions from Shimizu's workplaces and offices 	+	<ul style="list-style-type: none"> Contribute to a zero carbon society through the supply chain by zero CO2 emissions from operation of buildings designed and built by Shimizu Drive progress toward a zero carbon society through technological innovation and generating power from renewable energy
Resource recycling society	<ul style="list-style-type: none"> Zero final waste disposal from Shimizu's business 	+	<ul style="list-style-type: none"> Contribute to resource recycling over the entire lifecycle of a building, from procurement of materials through dismantling
Society that coexists in harmony with nature	<ul style="list-style-type: none"> Zero negative impact from Shimizu's business on nature 	+	<ul style="list-style-type: none"> Add to biodiversity and contribute to sustainable coexistence with nature through the introduction of green infrastructure

Revised Ecological Mission 2030-2050



Actions Toward a Zero-Carbon Society

Reduce CO₂ emissions from the company's activity



Switching the power used at the headquarter building to "Aqua Premium", a green energy source produced by hydropower



Use green certificates to make power usage at construction sites green



Reduce energy consumption at construction sites with ICT-integrated construction machinery

Actions Toward a Zero-Carbon Society

Constructing buildings and facilities that contribute to zero-carbonization



Net Zero-Energy Buildings (ZEB)

Design and construct ZEBs that conserve, create, and store energy



“ Hydro Q-BiC”

Shimizu developed a hydrogen energy utilization system for buildings, “Hydro Q-BiC” jointly with the National Institute of Advanced Industrial Science and Technology (AIST).

Actions Toward a Zero-Carbon Society

Renewable energy facility construction and renewable energy business



SEMP ship construction

Build an efficient, self-propelled SEM ship with world-class carrying capacity and crane capabilities for building large offshore wind power facilities



Local biomass power

Generate renewable power from local forest resources, facilitate sustainable forest management, fight global warming, promote the forestry industry, and stimulate the local economy (Tomi, Nagano Pref.)

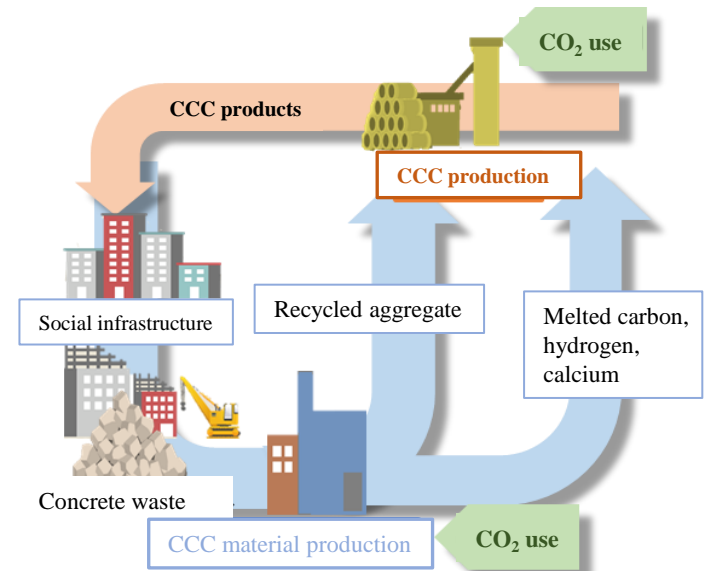
Actions Toward a Resource Recycling Society

Resource conservation and recycling in our business



The 4 Rs

We support the 4 Rs (refuse, reduce, reuse, recycle) to reduce and recycle construction work byproducts.

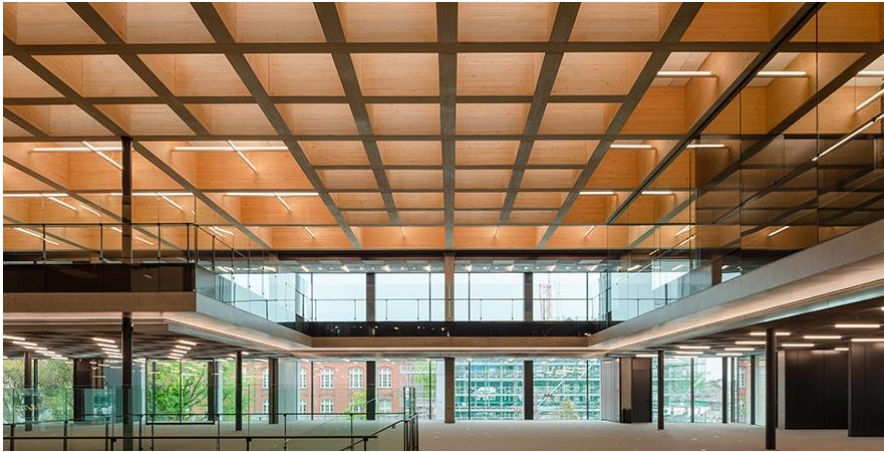


Concrete recycling

In 2020, we began a collaborative project with a university and a manufacturer to establish a feasible method of producing concrete that captures and sequesters atmospheric CO₂.

Actions Toward a Society That Coexists in Harmony With Nature

Contributions through facility construction and operation



Promote wood buildings

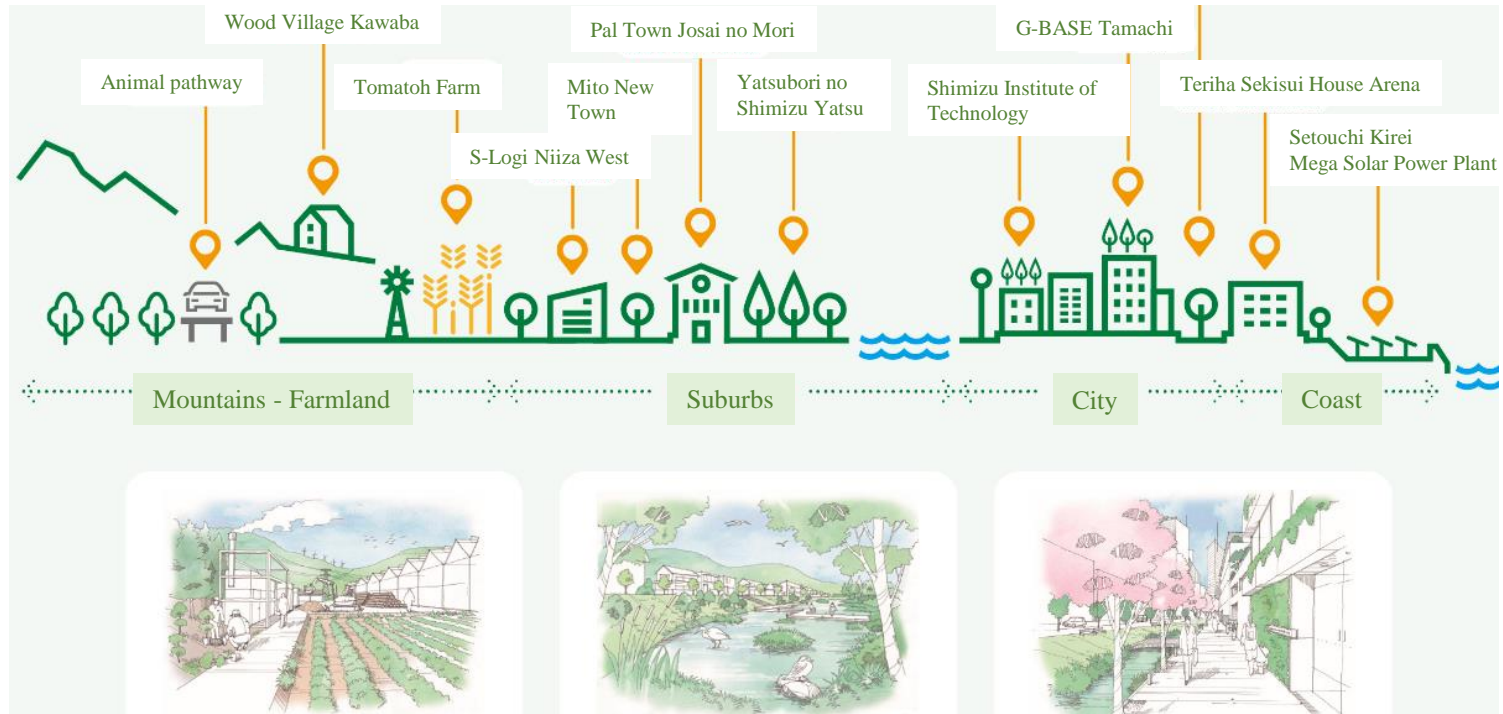
Making wood buildings more widespread encourages the use of lumber and spurs recycling of forest resources.
(Photo: Hokuriku Branch)



Building life cycle support

We contribute to resource conservation by sustaining asset value and extending the lifespan, while reducing costs, over the course of a building's life cycle.

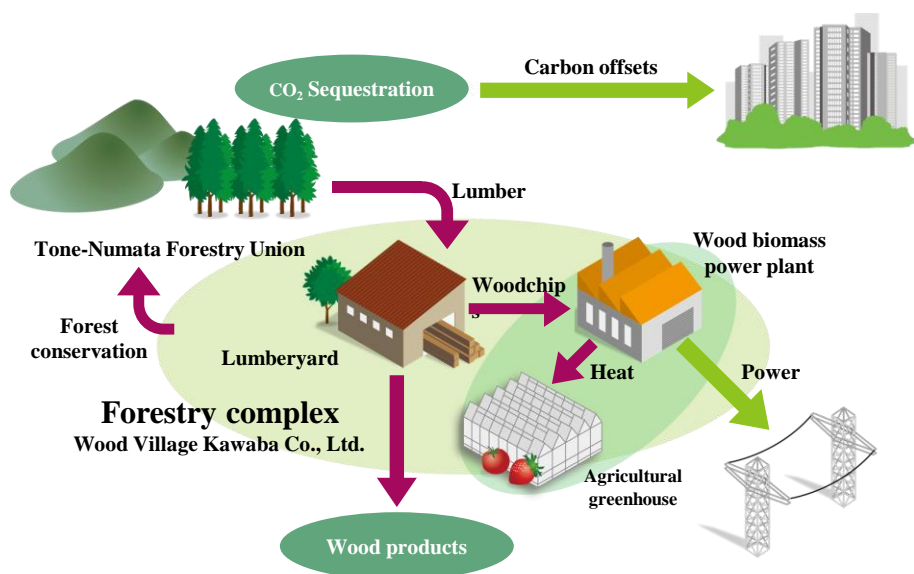
Green Infrastructure+ (PLUS)



Green infrastructure is an approach to wisely utilizing nature's diverse capabilities to create sustainable, appealing cities and communities. By adding to this Shimizu's technology and knowledge, we promote business activities that contribute to creating sustainable societies.

Actions Toward a Society That Coexists in Harmony With Nature

Partnerships with communities and the agriculture/forestry sectors



Green Value Program in Kawaba

An industry-academia-government partnership with Kawaba, Gunma Prefecture and the Tokyo University of Agriculture aims to stimulate a local circulating society and fight global warming through effective use of forest resources.

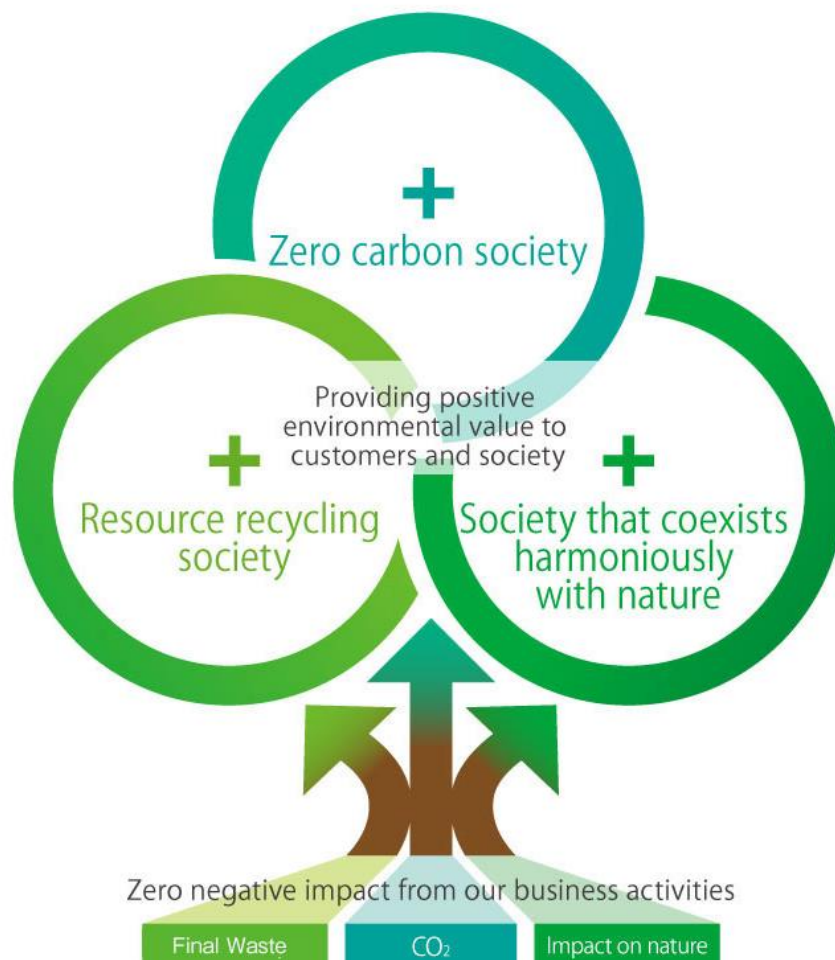


Partnership with the Gifu Academy of Forest Science and Culture

We aim to create a sustainable society starting in the forest, through collaboration with the forestry sector.

SHIMZ Beyond Zero 2050

Sustainable Society Targeted by the Shimizu Group



Looking Forward

Take appropriate action in a timely manner,
based on future social trends and technological development

Zero-carbon

Zero CO₂ emissions by Shimizu

- Raise energy productivity at construction sites
- 100% renewable energy for Shimizu's power consumption
- Electrify construction machinery, FCV, BDF introduction
- Electrify all company vehicles
- Introduce carbon offsetting

Reduce society's CO₂ emissions

- Design and construct ZEBs
- Zero-carbon urban development
- Produce renewable energy
- Utilize hydrogen

Resource recycling

- CSR procurement
- Promote the 4 Rs
- Extended architectural construction lifespans
- Recycling waste materials in building demolition

Harmonious coexistence with nature

- Accelerate use of green infrastructure
- Create new value through wood buildings
- Arrange recycling for lumber procurement and use

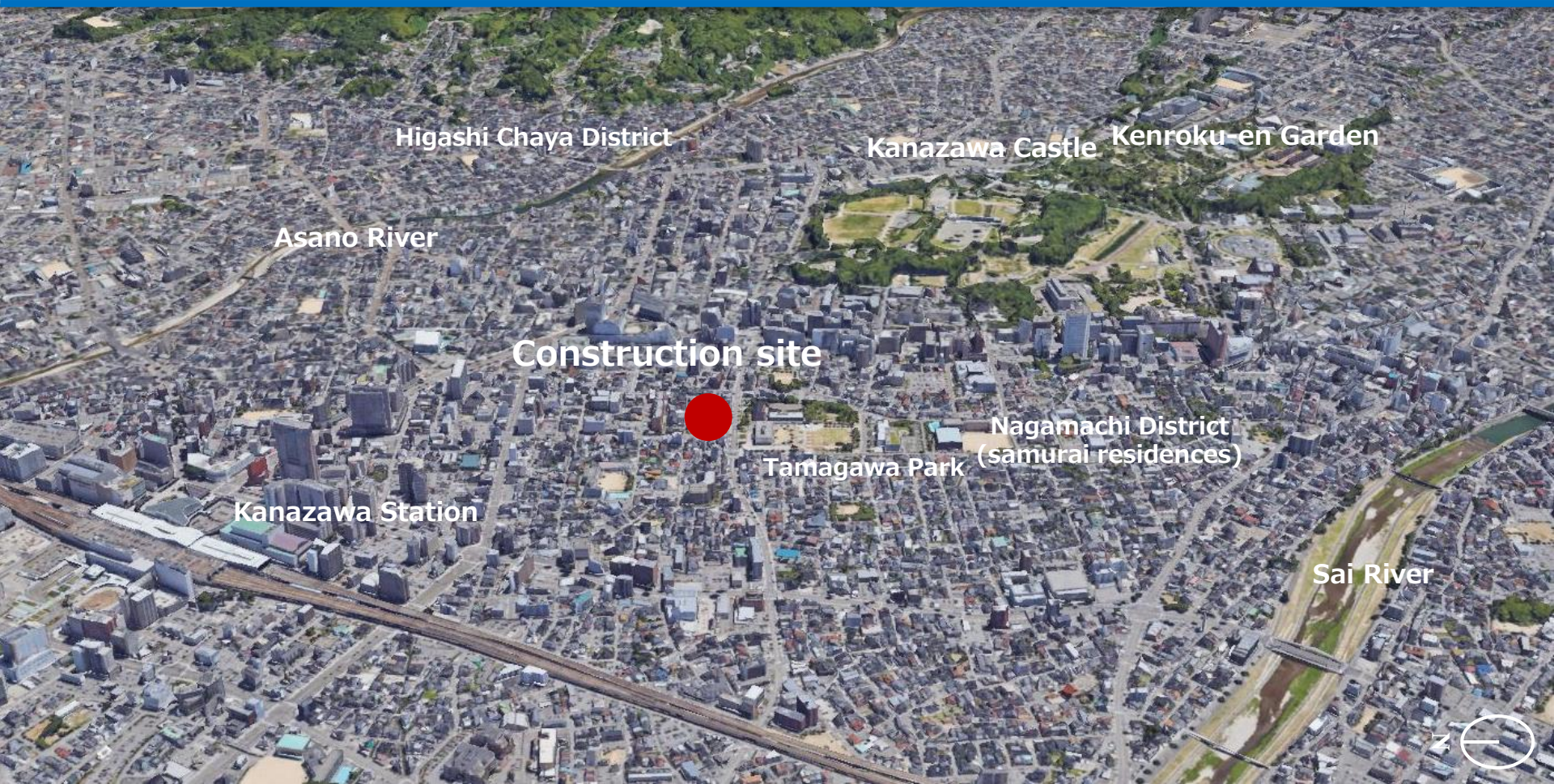
Presentation 2

"Action to Achieve SHIMZ Beyond Zero 2050"

(1) Construction case: Hokuriku Branch, new office bldg.

Koichi Horibe, General Manager, Design Dept.,
Hokuriku Branch

Overview of Planned Site & Building



Construction site: Kanazawa, Ishikawa Prefecture
Lot size: 3,255 m²
Floor area: 4,224 m²

Eave height: 12.910 m
Floors: 1 basement, 3 above ground
Construction period: April 2020 - April 2021

Ultra-Eco-Friendly Offices of the Future, Starting in Hokuriku



Use the office as a showroom to connect with customers

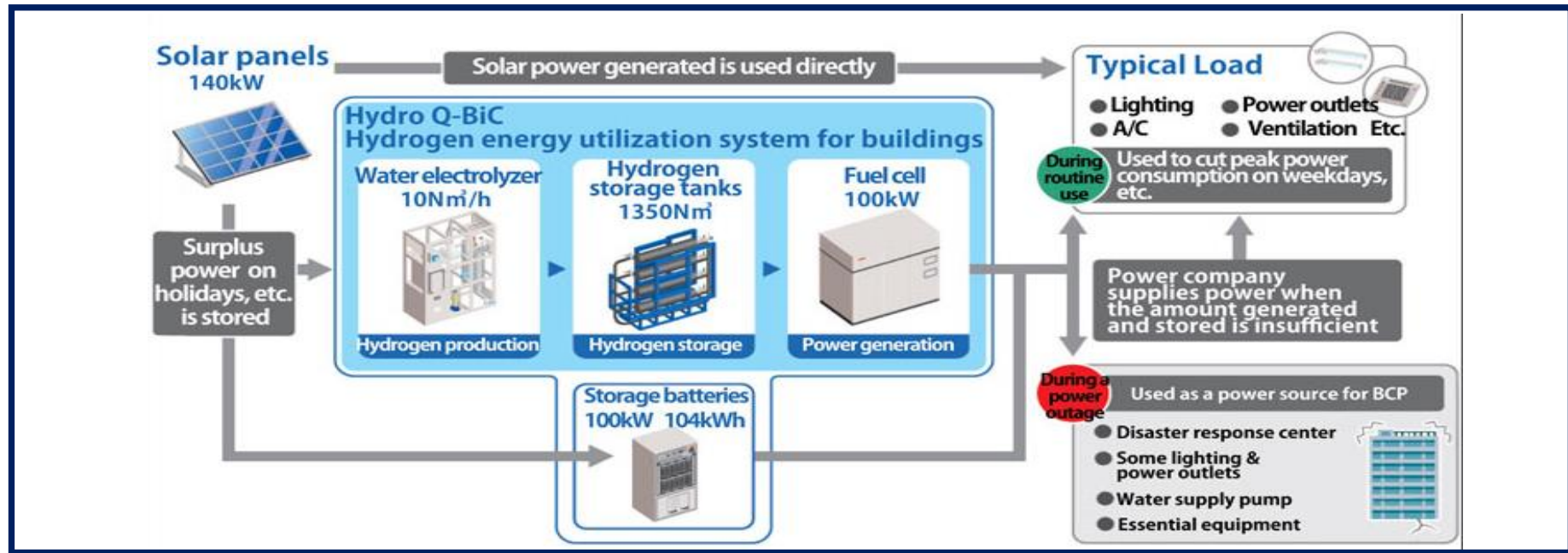
Supplementary Info: Hydro Q-BiC, a Hydrogen System



Uses **surplus solar power** to produce and store hydrogen to generate power whenever needed.

Emits no CO₂ in the process.

Supplementary Info: Hydro Q-BiC, a Hydrogen System

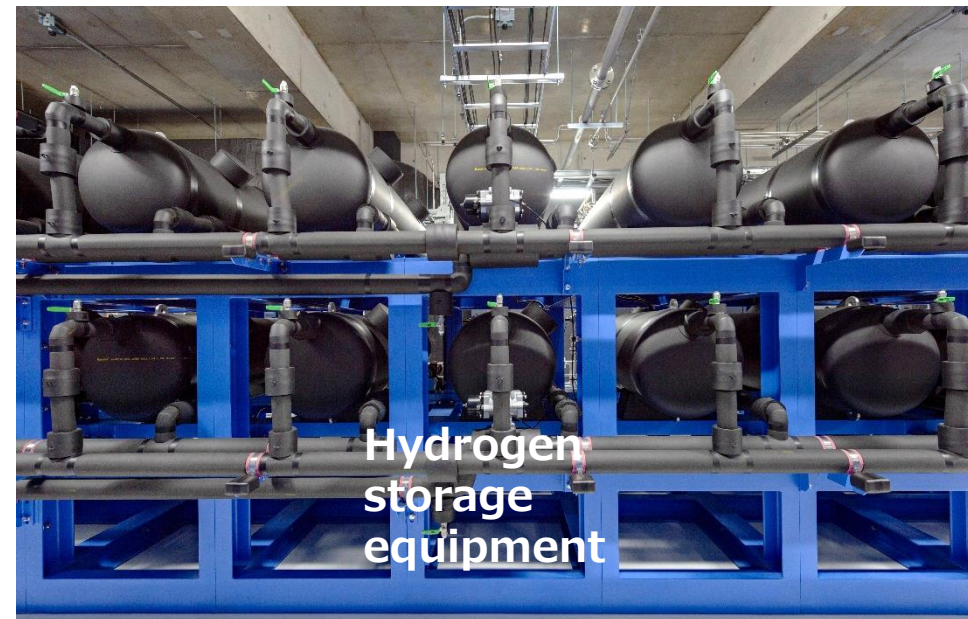
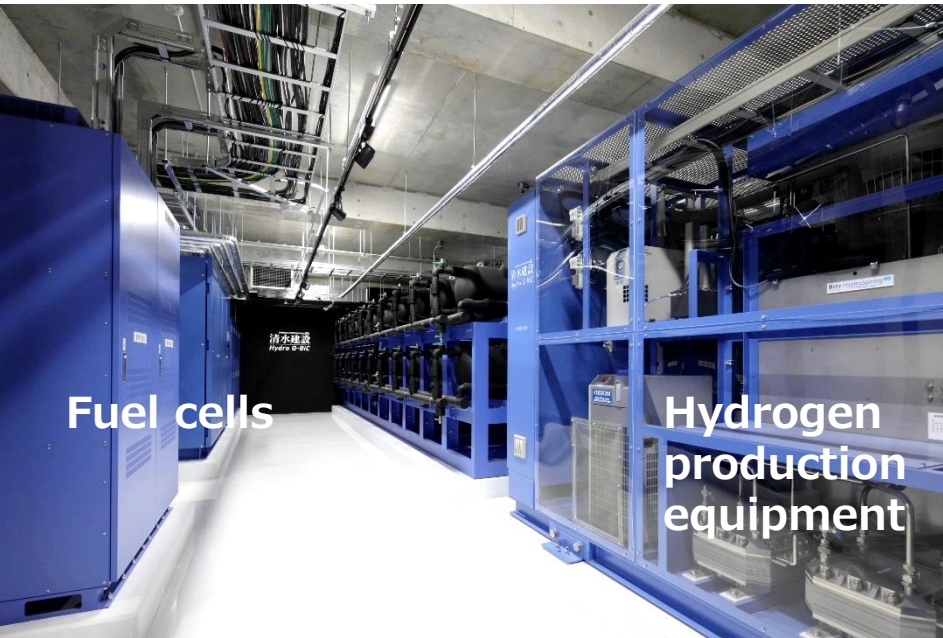


■ Diagram of Hydrogen energy system

1. Uses surplus solar power to produce and store hydrogen to generate power whenever needed.

- Compared to storage batteries, **capable of long-term storage with no discharge loss.**
 - **Stores hydrogen in low-load seasons** during interim periods, not only weekends, to generate power in the winter when solar power is low.
 - **BCP power source**

Supplementary Info: Hydro Q-BiC, a Hydrogen System



2. Compact, safe hydrogen system suited for installation in a building

- 1) **Compact: 1/1000 capacity for hydrogen gas** under normal temperature and pressure
- 2) **Safety: stored as an occluded alloy** instead of hydrogen gas
- 3) Occluded alloys are **nonflammable and are not hazardous materials under the Fire Service Act**



Presentation 2

"Action to Achieve SHIMZ Beyond Zero 2050"

(2) Civil engineering case: Green Infrastructure + (PLUS)

Jun Hashimoto, General Manager, Green Infrastructure
Promotion Dept., Environmental Strategy Office

What is Green Infrastructure?



「グリーンインフラ」とは？ (2:52)



What is Green Infrastructure? (2:52)

<https://www.shimz.co.jp/greeninfraplus/>

Green Infrastructure+ Points of Emphasis

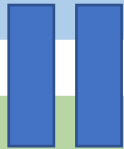
Green infrastructure

An approach that wisely utilizing nature's diverse capabilities to address social issues and build sustainable cities, regions and communities



Shimizu Corporation

Respect for local areas' unique natural ecosystems; technology and knowledge to plan, design, and construct for the conservation and restoration of the natural environment and biodiversity



Green Infrastructure+

Do more to conserve and restore natural ecosystems, while **restoring rich benefits of nature to cities and regions**

Green Infrastructure+ and SDGs Affinity

SDGs wedding cake model

【ECONOMY】

ECONOMY



【SOCIETY】

SOCIETY



【BIOSPHERE】

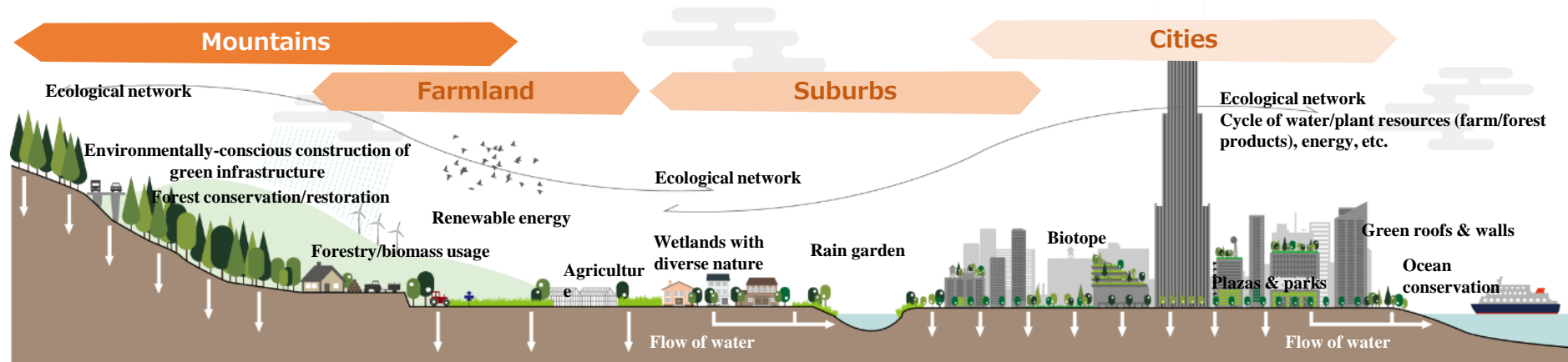
BIOSPHERE



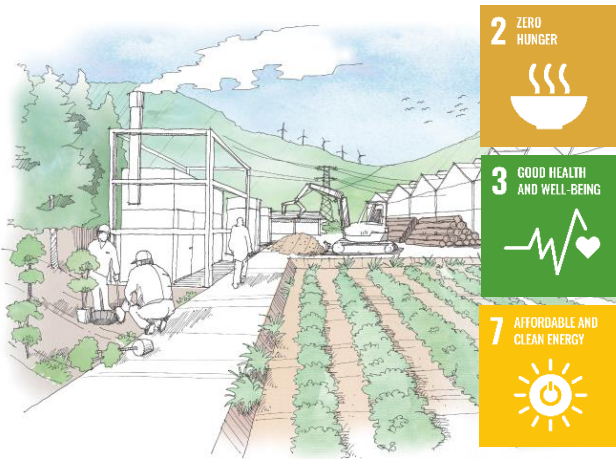
Credit: Azote for Stockholm Resilience
Centre, Stockholm University

**Environment is the foundation of society and economy
=GI+ can be a main actor to build the foundation**

Green Infrastructure+ SDGs



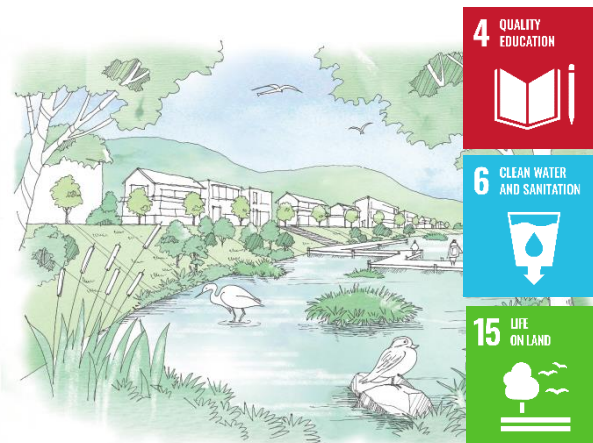
Mountains - Farmland



sustainable farming, forestry, and infrastructure revitalization



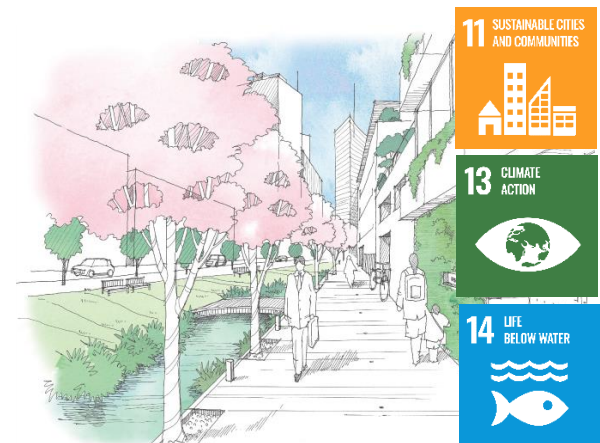
Suburbs



Housing development with open space with abundant greenery and waterscape



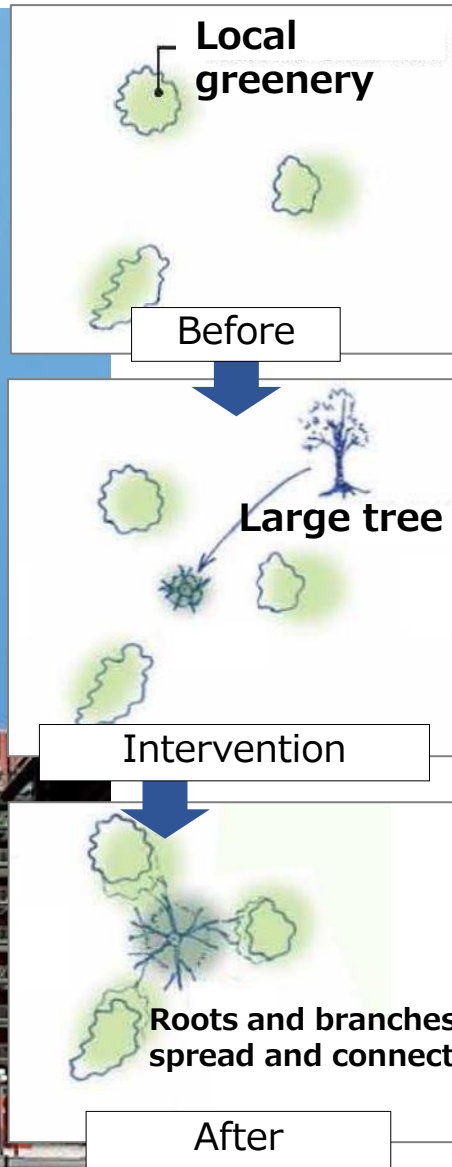
Cities



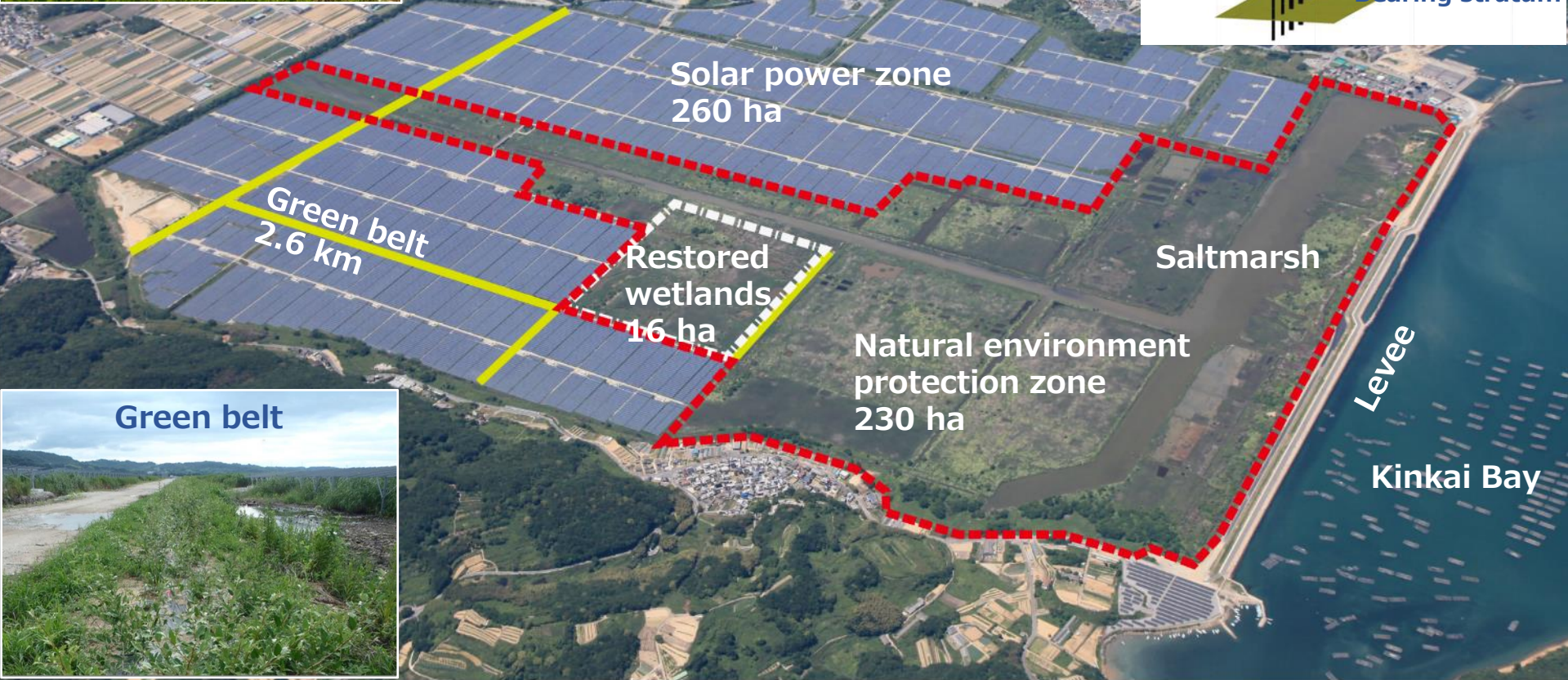
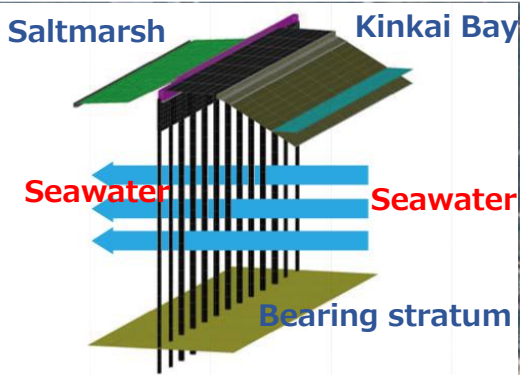
Reduce heat island effect and control stormwater runoff with greenery around buildings, on roofs and walls, etc.



Case : G-BASE Tamachi



Case : Setouchi Kirei Mega Solar Power Plant



Case : Yatsubori no shimizu yatsu



We have participated in various environmental activities with NPO Earthwatch Japan, guided by the former Global Environment Office. (Examples: Japanese pond turtle census, plant survey at Mt. Fuji's base)



Going beyond CSR activities, we partner with Tomisato city, Chiba Prefecture aiming to develop technology and cultivate knowledge for design and construction practices . By restoring wetlands in fallow fields, we are addressing social issues in a suburb type of GI model case.

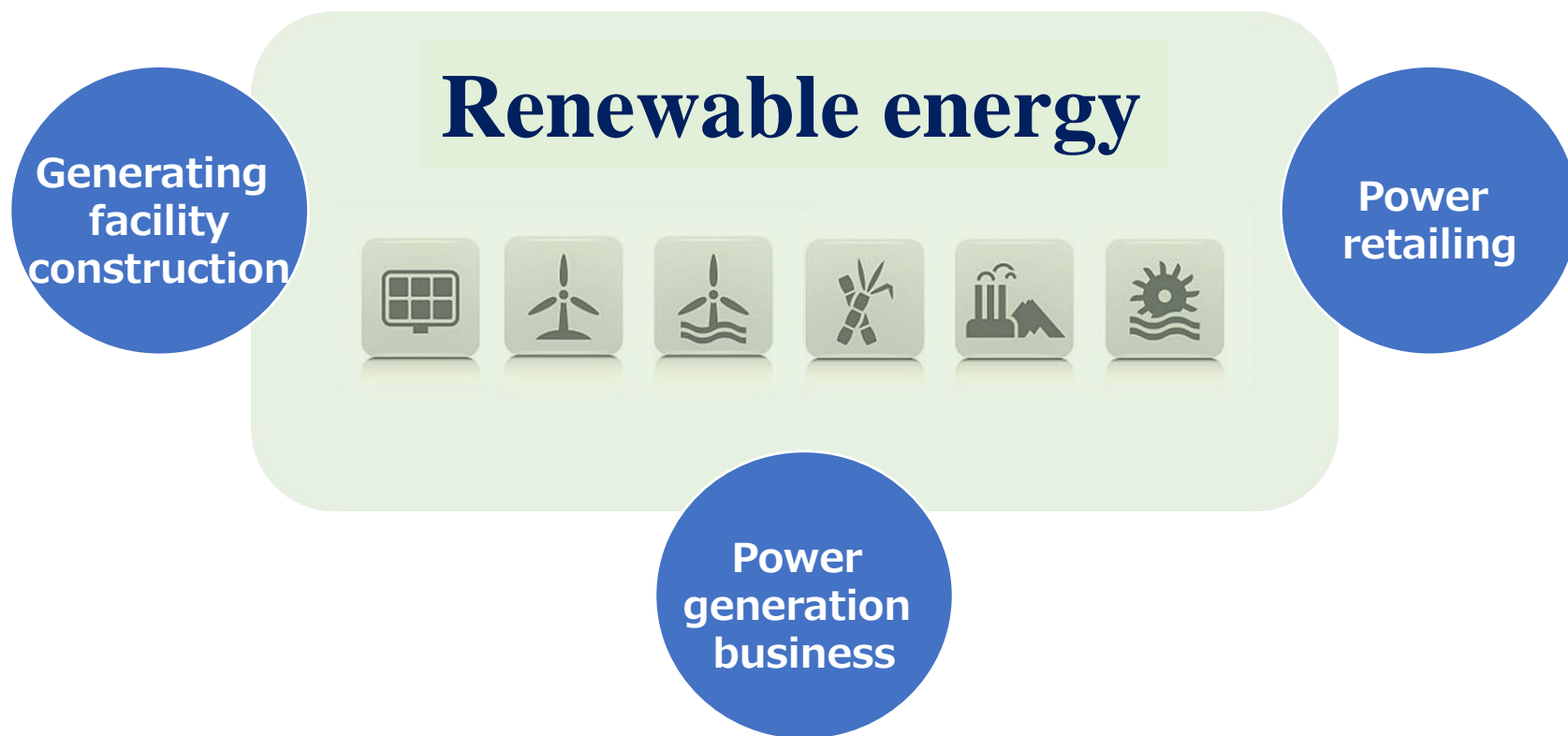
- NPO Earthwatch Japan
- National Institute for Environmental Studies (Chief Nishihiro)
- Local NPOs (Tomisato no Hotaru, Oshidori no Kai)
- City of Tomisato (registered citizen activities at citizen activities section)

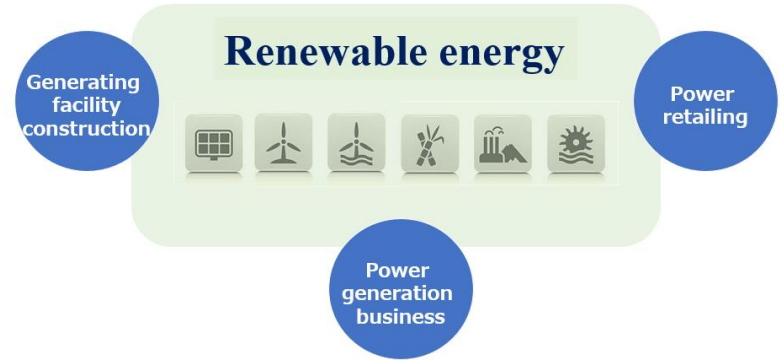
Presentation 2

"Action to Achieve SHIMZ Beyond Zero 2050"

(3) Non-construction business case: Shimizu's renewable energy business

Toru Yamaji, Executive Vice President and Director, General Manager,
LCV Headquarters, in charge of Engineering Business,
Emerging Frontiers, and New Business Development





● Solar Power Plant



JPS 20 Osaki City Sanbongi Solar Power Plant

12,000 kW generating capacity, 54,000 photovoltaic panels

Results (generating capacity)

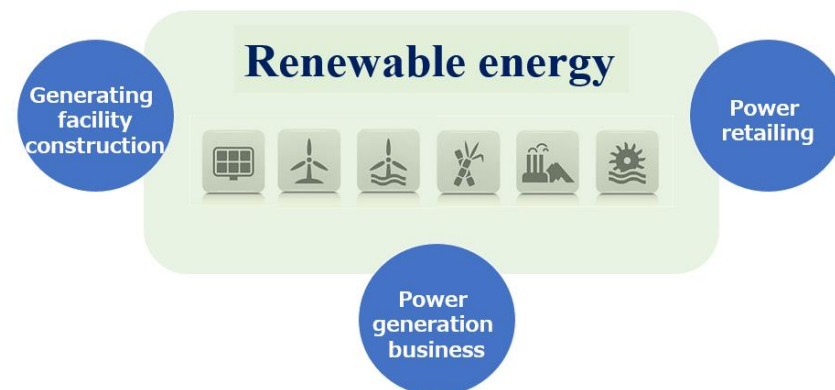
392,489 kW

Installations in Japan (housing & non-housing total)

51,818,000 kW

Shimizu's share

0.8%



● Wind Farm

Construction: generating capacity of **1.22 million kW** (of which 600,000 kW under construction)



	Total capacity (kW)	Total (turbines)
Shimizu	1,220,000	509
All Japan	4,380,000	2,547
Shimizu's share	27.8%	20.0%

Onshore wind power plant | Under construction

Vena Energy Nakadomari wind farm

- Construction period
2019.11 - 2021.12
- Scale
46.8MW (13wind turbines with a power of 3.6MW)

JRE Oritsumedake minami wind farm no.1

- Construction period
2020.4 - 2023.3
- Scale
46.8MW (13wind turbines with a power of 3.6MW)

Fukushima Reconstruction Wind power Abukuma wind farm

- Construction period
2022.4 - 2025.3
- Scale
147.2MW (46wind turbines
with a power of 3.2MW)

Japan Wind Development Co.LTD. Hirado minami wind farm

- Construction period
2020.8 - 2022.4
- Scale
39.6MW (11wind turbines with a power of 3.6MW)

Eurus Energy Holdings Corporation Ashikawa wind farm

- Construction period
2020.5 - 2024.6
- Scale
133.3MW (31wind turbines with a
power of 4.3 MW)

Noheji wind power development Noheji mutsuwan wind farm

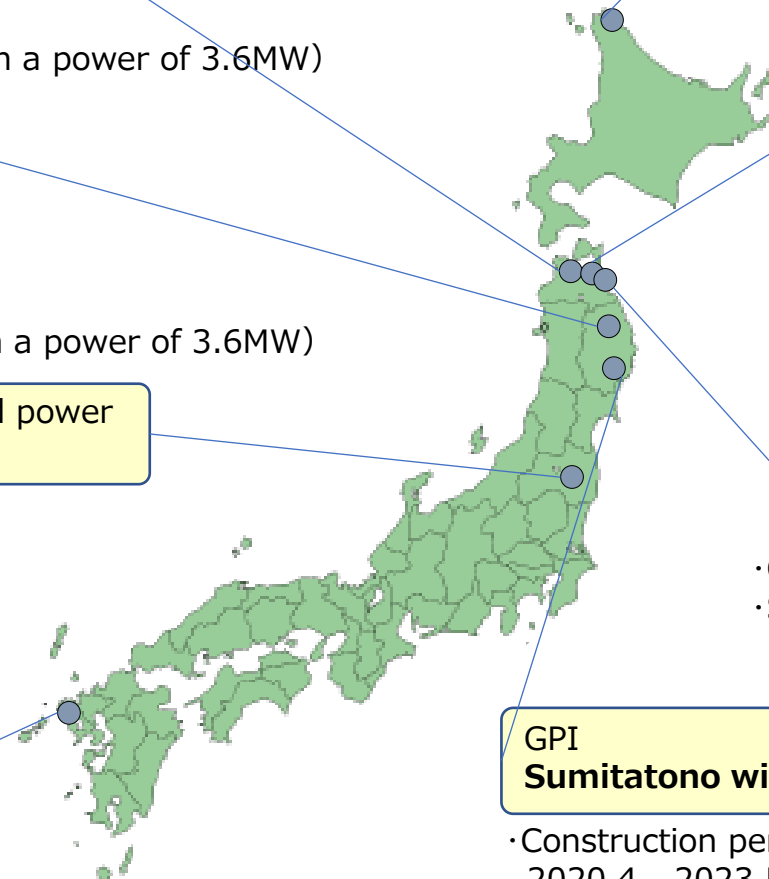
- Construction period
2020.5 - 2022.3
- Scale
39.6MW (11wind turbines with a
power of 3.6 MW)

Chitose wind power development Rokkashomura Chitose wind farm

- Construction period 2020.3 - 2022.3
- Scale
36MW (10wind turbines with a power
of 3.6 MW)

GPI Sumitatono wind farm

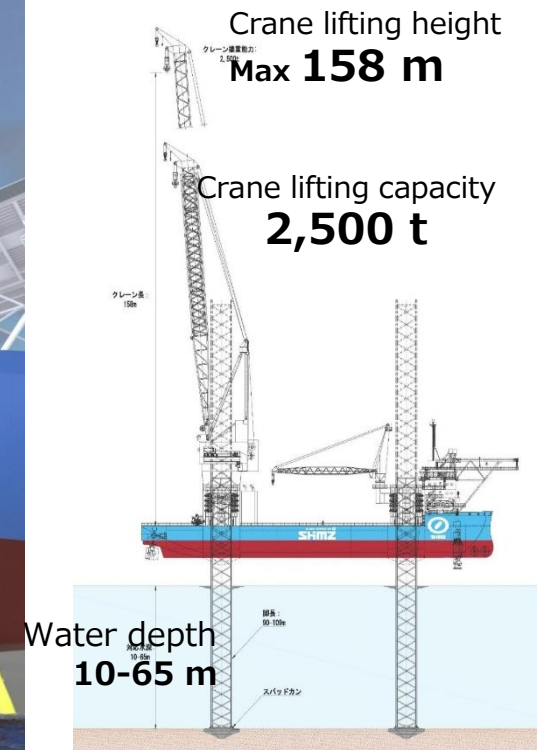
- Construction period
2020.4 - 2023.5
- Scale
113.4MW (27wind turbines with a power of 4.2MW)



Action for Offshore Wind Power | SEP Ship Construction

Built a SEP ship* for a large offshore wind power construction

*SEP ship: Self-Elevating Platform ship



Action for Offshore Wind Power | SEP Ship Construction

Built a SEP ship* for a large offshore wind power construction

*SEP ship: Self-Elevating Platform ship

- ◆Crane with world-class carrying capacity and crane capabilities can steadily, efficiently build large wind turbines (8 to 15-MW class)

Carry all materials for 7 8-MW turbines and 3 12-MW turbines

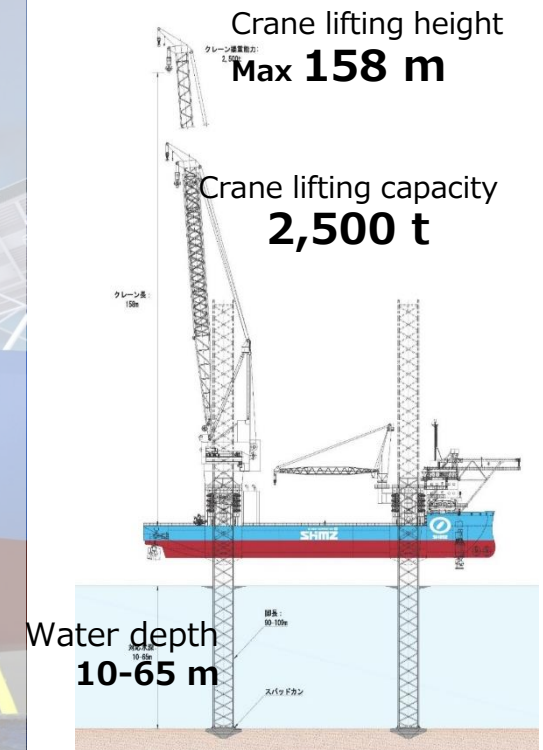
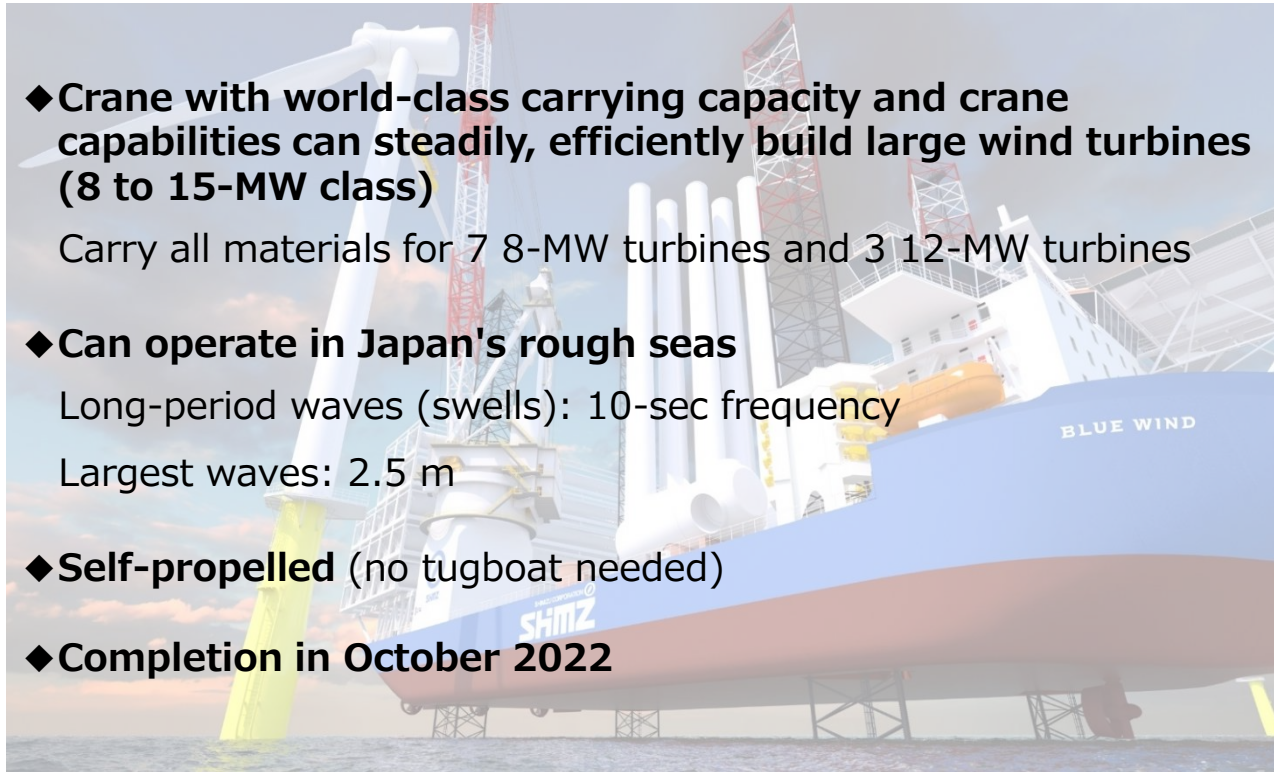
- ◆Can operate in Japan's rough seas

Long-period waves (swells): 10-sec frequency

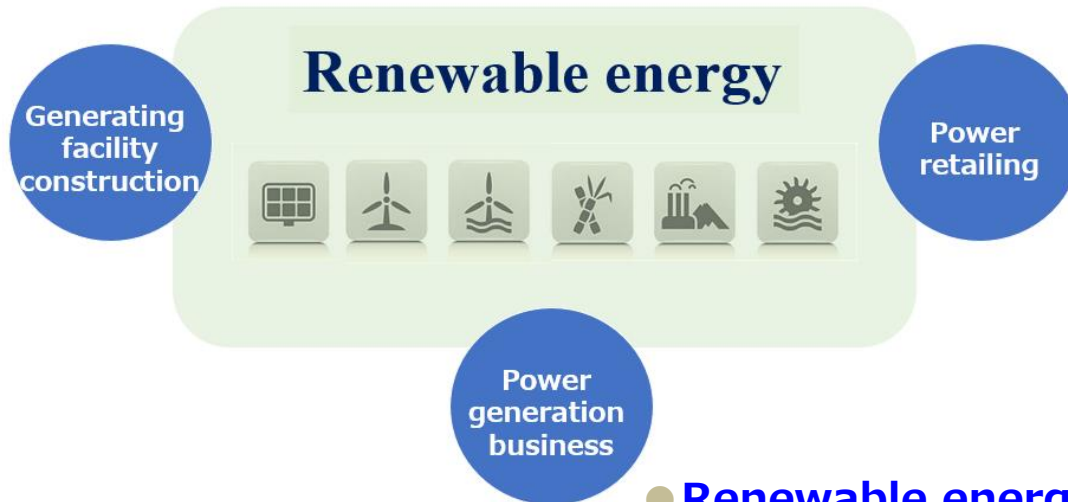
Largest waves: 2.5 m

- ◆Self-propelled (no tugboat needed)

- ◆Completion in October 2022



Shimizu's renewable energy business | Plant business



● Renewable energy plant

2 2 facilities

Electricity generation capacity 8 4 MW
(Including under construction)

Solar power plants



Farming solar power at Tsukuba
(Generation capacity 20MW)



Farming solar power at Okido, Chiba
(Generation capacity 50kW)

Biomass power plant



Shinshu Wood Power
(Generation capacity 2MW)

Small Hydroelectric Power plant



Water country electrical Power
(Generation capacity 1 MW)

Biomass Power Business

Shinshu Wood Power

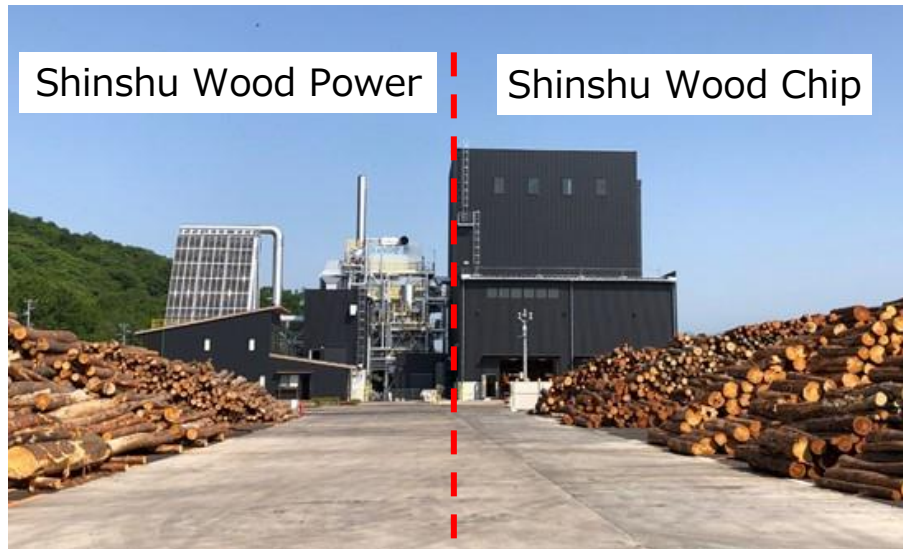
Wood biomass power (Shinshu Wood Power Co., Ltd.)

- Power output: 1,990 kW (2-MW class)
- Fuel: wood chips from thinnings, other scrap lumber
- Generation method: boiler and steam turbine
- Power sales: feed-in tariffs (FIT)
- Stakeholders: Shimizu Corporation, Nagano Toyota Motor Sales Group (Toyota U Group)

Wood chip production (Shinshu Wood

Power & Chip Co., Ltd.)

- Unprocessed timber: larch, Japanese red pine, cedar, etc.
- Chip type: cut chips
- Production machinery: disc chipper
- Production volume: 30,000 t/year
(all for Shinshu WP)



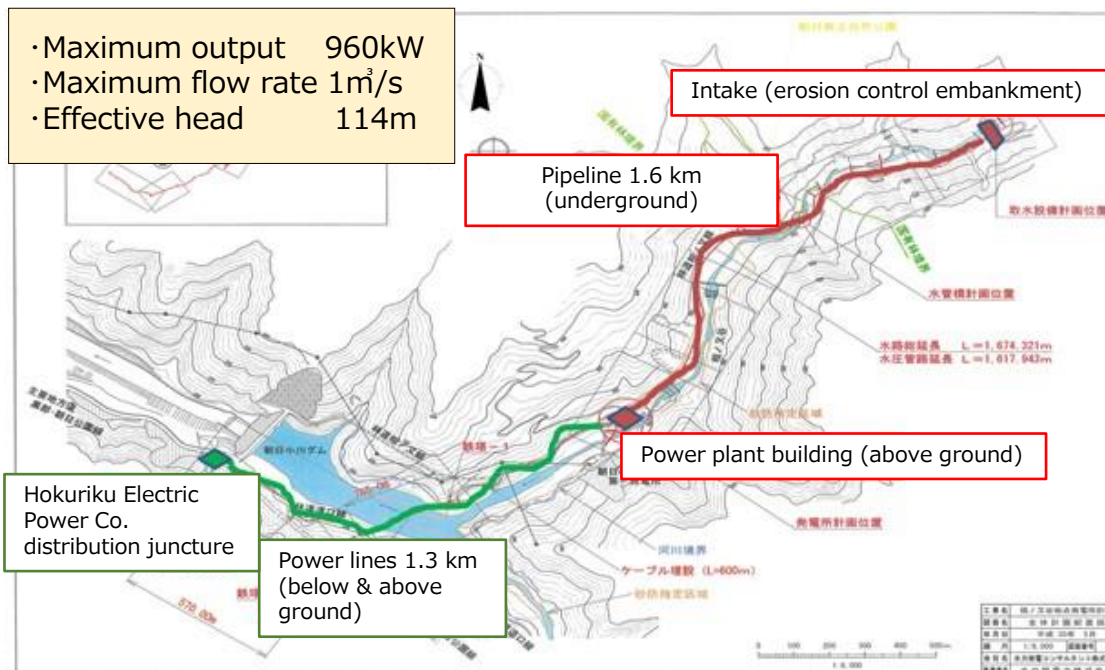
United community stimulates local economy, promotes forestry, creates jobs, etc.

- Purchasing fuel from the Toshin region returns funds to the mountains and encourages local energy production and consumption
- Also use wood damaged by pine weevils
- ~6,500 tons of annual CO₂ reductions
- Help create local jobs

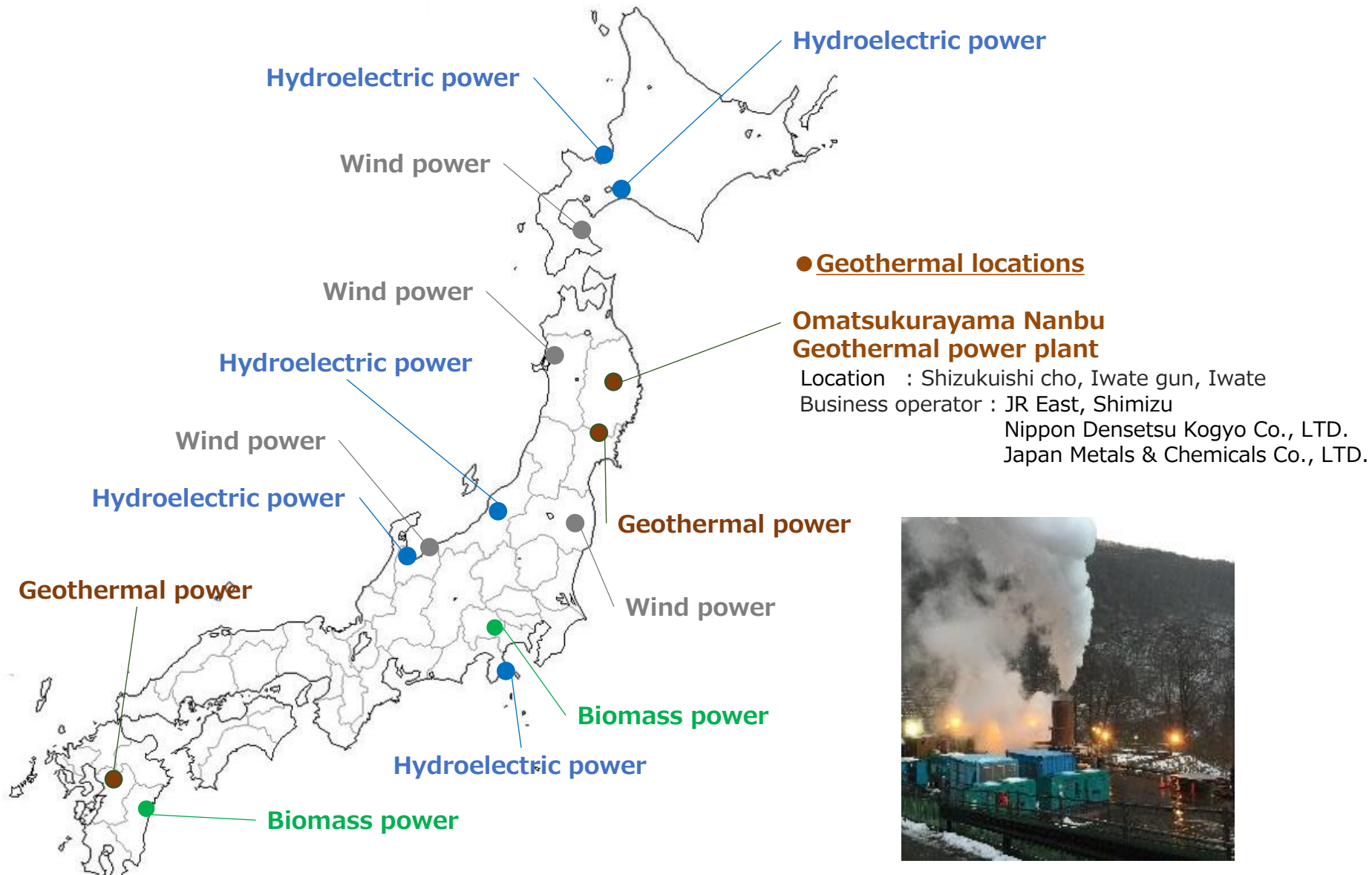
Small Hydroelectric Power Business

Water country
electrical power

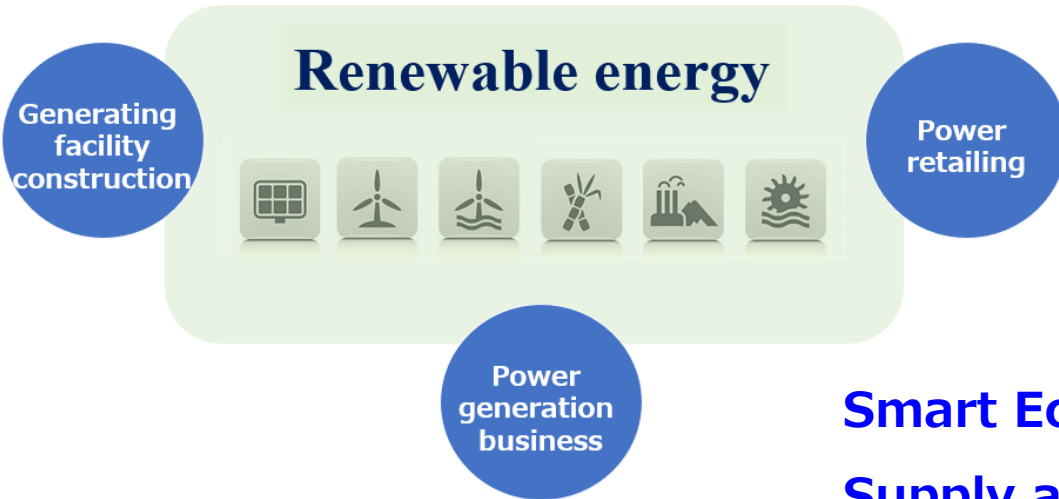
- Business operator **Water Country Electrical Power Co., Ltd.**
(Shimizu 51%、Japan Small Hydropower Co., Ltd. 45%、NES 4%)
- Location Asahimachi, Shimokawagun, Toyama(Ainomata)
- Maximum output 961kW (Flowrate 1m³/s,
Effective head 114m)
- Opertion start 1st,March,2021



Renewable Energy Plant | Various renewable energy (Under planning)



Shimizu's renewable energy business | Power retailing business



SEE.
SMART ECO ENERGY

Smart Eco Energy : Established in Nov.2018

Supply area : Tokyo・Chubu・Tohoku・Chugoku・
Kyushu

Contracts : Total 25,000kW

Supplied to **156 facilities**

**使っています
実質再エネ電力100%!**

この現場の電力は再生エネルギー・CO₂排出量ゼロの
環境価値を利用しています。

この活動を通してSDGsへの貢献

7 気候変動に適切な対応
13 気候変動対策
環境価値の活用

清水建設株式会社の再生可能エネルギー発電所の開発実績

再生可能エネルギー100%・RE100/ECOPAC/CDP/RE100の要件を満たす再生可能エネルギー
由来の電力が100%となるように11社に電力供給。この再生可能エネルギー由来の電力は、
電力の第三セクターによる証明書のいすゞも再生可能エネルギー属性を有する証明書類を使用
することで、実質再生可能エネルギー100%を実現します。

SEE. 清水建設

**使っています
カーボンフリー電力!**

この現場はJ-クレジット制度[※]を
活用しています

J-クレジット制度

※J-クレジット制度とは、再生エネルギー発電の導入や森林整備などの取組
による、CO₂などの温室効果ガスの排出削減量や吸収量を「クレジット」
として譲渡する制度です。

この活動を通してSDGsへの貢献

7 気候変動に適切な対応
13 気候変動対策
環境価値の活用

清水建設株式会社の再生可能エネルギー発電所の開発実績

再生可能エネルギー100%・RE100/ECOPAC/CDP/RE100の要件を満たす再生可能エネルギー
由来の電力が100%となるように11社に電力供給。この再生可能エネルギー由来の電力は、
電力の第三セクターによる証明書のいすゞも再生可能エネルギー属性を有する証明書類を使用
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SEE. 清水建設

Ecology

**Zero
CO₂**

Deliver **zero-
carbon electricity**

Economy

**low-cost,
low-carbon power**

Deliver **low-cost,
low-carbon power**

Ecologygreen

**RE
100** **CDP
RECOGNITION**

Deliver **renewable
electricity meeting
global standards**

Renewable energy

Green hydrogen initiative



Generating
facility
construction

Renewable energy



Power
retailing

Power
generation
business

Eco^{logy}

Zero
CO₂

Eco^{nom}y

SEE.
SMART ECO ENERGY



Eco^{logy}green

RE
100

CDP
CLIMATE
LEADER



Green
hydrogen
production

Zero-energy buildings
ZEB

Green
hydrogen
used in
buildings

Green Hydrogen Production

Hydrogen production from
Geothermal heat, Biomass

FY2020 Low Carbon Technology Research and Development Program (by Ministry of the Environment)

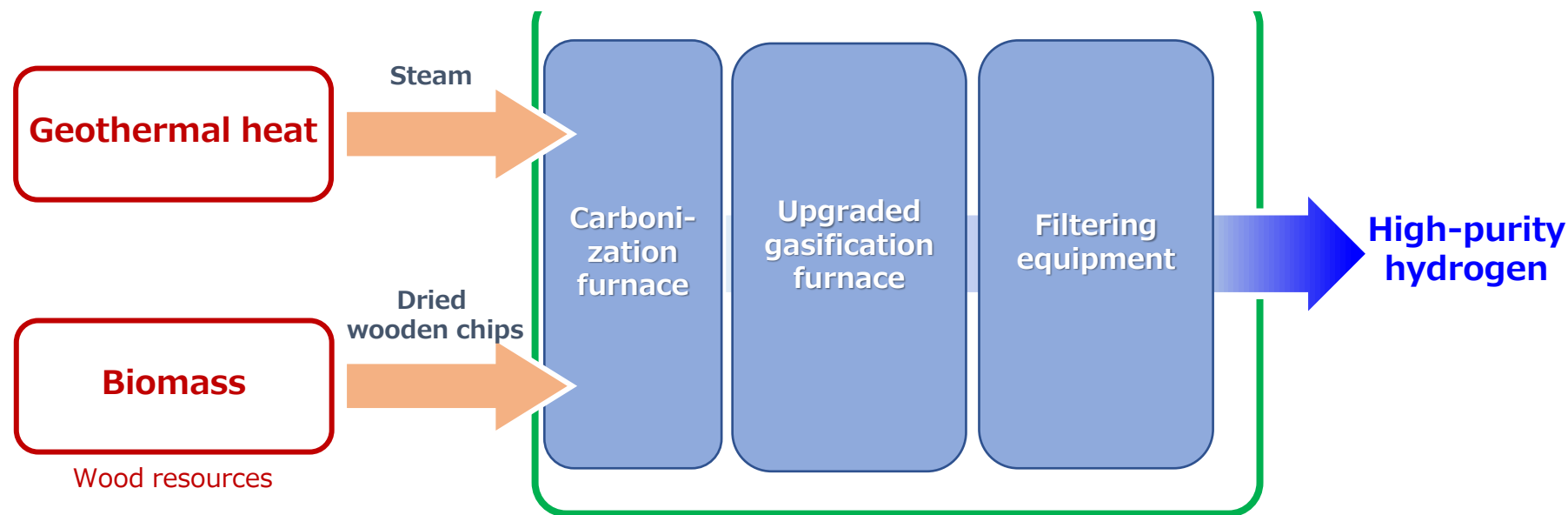
Develop and trial green hydrogen production using local wood biomass and geothermal heat

Pilot project period: April 2021 - March 2023

Kokonoe, Oita Pref.

Use of local renewable energy sources

Hydrogen production demonstration plant*



*Plant construction: Starting October 2021,
Target date for completion March 2022

Green Hydrogen Production

Hydrogen production from
Geothermal heat, Biomass

