



The 4th Kitakyushu SDGs Training

Kitakyushu's Initiatives for Green Growth

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Today's Topics

1

Green Growth Initiatives

2

Selection of Decarbonisation Leading Areas

Green Growth Initiatives

Moves by the Japanese Government

2020: Japan declares intent to become carbon neutral by 2050

Apr 2021: **New greenhouse gas reduction targets by 2030 announced**
Aiming at a 46% reduction by 2030 with aspirations of reaching 50%


May 2021: **Act on Promotion of Global Warming Countermeasures revised**

Jun 2021: **Regional decarbonisation roadmap formulated**
Create at least 100 “decarbonisation leading areas” by 2030

Aug 2021: **Global Warming Action Plan (comprehensive government plan) revised**

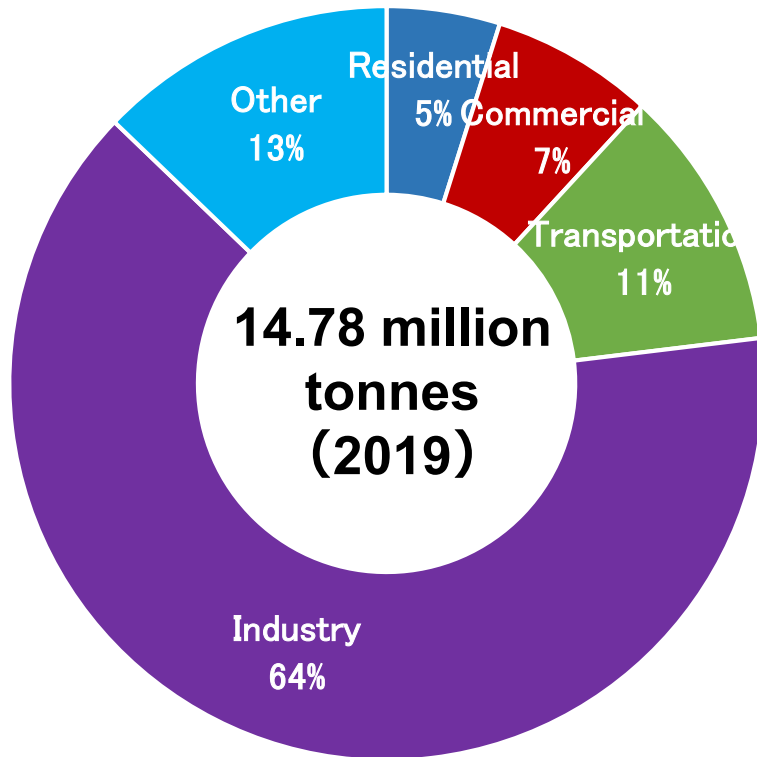
Oct 2021: **6th Strategic Energy Plan formulated**
Intensively promote and introduce **renewable energy as a key source of power**, focusing on renewable energy as a top priority

Kitakyushu City's Steps Along the Path to Becoming a Zero-Carbon City

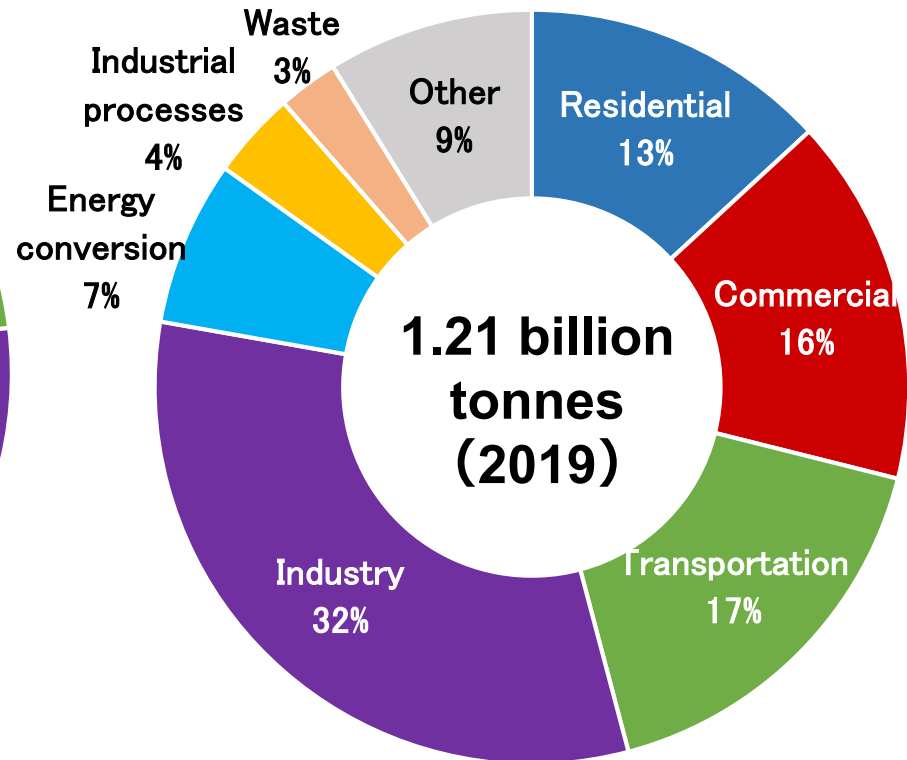
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- 2008: Selected as an Eco-Model City and SDGs FutureCity in 2018
 - Oct 2020: **Declaration** of intent to become a **Zero-Carbon City**
 - Jun 2021: **Declaration of climate emergency**
 - Aug 2021: **“Kitakyushu City Action Plan for Global Warming Countermeasures”** revised
Reduce GHG emissions by at least 47% by 2030
(from FY 2013 levels)
 - Feb 2022: **“Kitakyushu City Green Growth Strategy”** formulated
 - Apr 2022: Kitakyushu selected as **“Decarbonisation Leading Area”**

GHG Emissions in Kitakyushu (% by sector)

Kitakyushu City



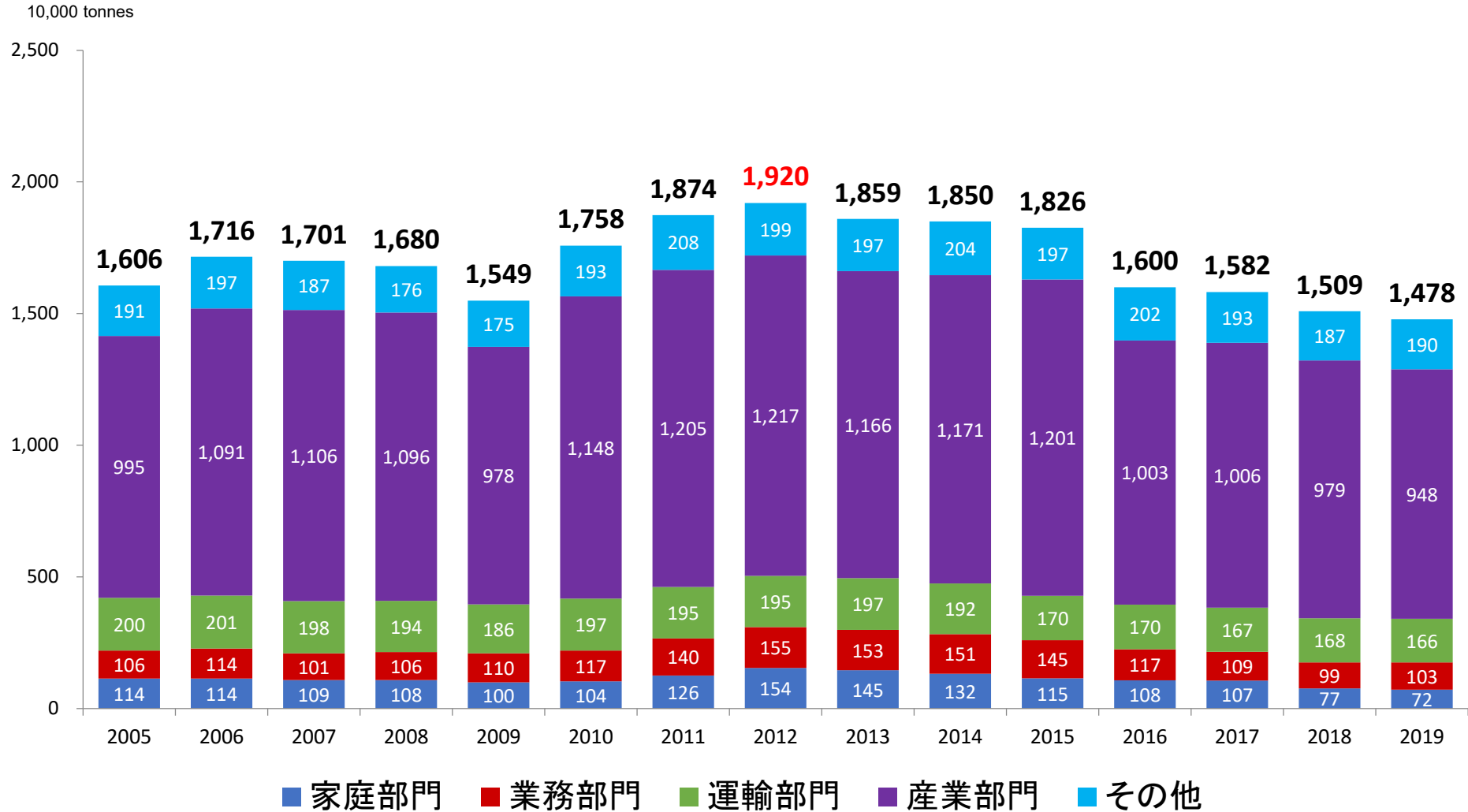
Japan (Reference)



(*) "Other" = Total GHG emissions from energy conversion, waste, and industrial process sectors, as well as methane, nitrous oxide, and chlorofluorocarbon gas in Kitakyushu City

(Source: National Institute for Environmental Studies website)

GHG Emissions in Kitakyushu (Change over time)



(*) "Other" = Total GHG emissions from the energy conversion sector (self-consumption at power stations, gas plants, refineries, etc.), waste sector (emissions from waste incineration, etc.), industrial process sector (generated with the production of cement), methane, nitrous oxide, and CFCs in Kitakyushu City.

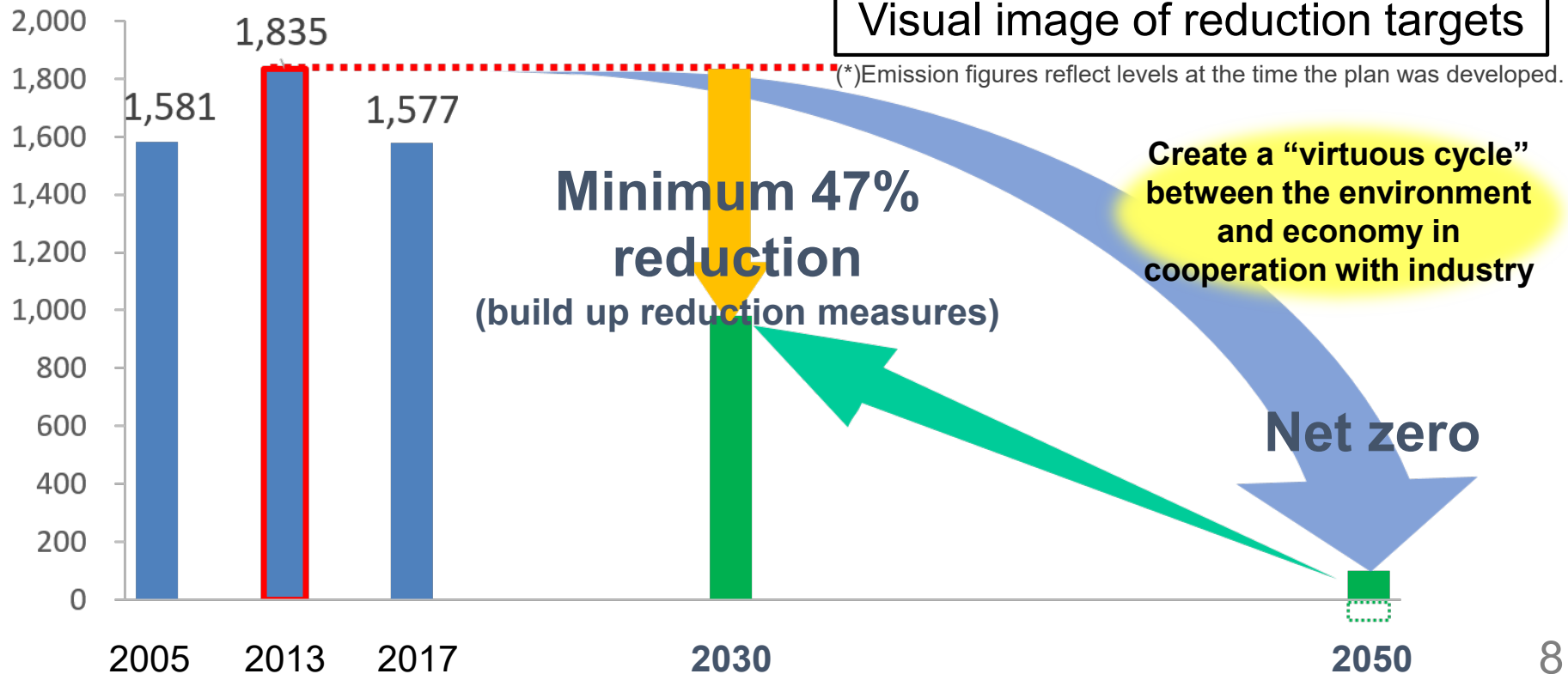
GHG Reduction Targets in Kitakyushu

2050 (Goals)

Aim to achieve net-zero GHG emissions in the city

FY 2030 (Targets)

Reduce emissions by at least 47% from FY 2013 levels



Kitakyushu Green Growth Strategy: Basic Strategy

- Action plan for the strategic **promotion of energy decarbonisation and innovation** aiming at Kitakyushu's goal of becoming a Zero-Carbon City by 2050 through a **"virtuous cycle between the environment and economy"**.

① Decarbonise existing industries and create new industries through the stable supply and use of economically viable decarbonised energy

Core urban area promoting decarbonised power

Core urban area for hydrogen supply and use

Promote the decarbonisation of the power sector and electrification of non-electric sectors, while also promoting the supply and use of hydrogen in areas that are difficult to electrify.

② Support companies to drive innovation

③ Develop pleasant and decarbonised cities through urban improvement and transport policies

④ Expand into overseas markets, with a focus on Asia, where future expansion is anticipated

Effects	Direct investment	CO ₂ reduction effect
	Approx. JPY 590 to 680 billion	Approx. 930,000 tonnes

Kitakyushu Green Growth Strategy: Actions to FY 2023

Core urban area promoting decarbonised power

- Introduce PVs, EVs and storage batteries through a third-party ownership model and expand the use of decarbonised power
- Create industries to reuse and recycle PVs and storage batteries
- Promote the introduction of wind power and development of a comprehensive base for wind power industries

<FY 2030 forecast>

**Installed renewable energy:
1,302 to 1,402MW**

Core urban area for hydrogen supply and use

- **Develop a cooperative framework to expand the use of hydrogen**
 - Create a hydrogen platform
- **Conduct demonstrations and studies on establishing hydrogen supply systems**
 - Inject hydrogen-based synthetic methane into city gas pipelines
 - Conduct studies on the potential of supplying hydrogen on a wide scale in the future
- **Stimulate demand and matching using hydrogen within the city**

<FY 2030 forecast>

**Hydrogen demand:
5,700 tons/year**

Support for companies to drive innovation

- **Develop platforms** that will lead to the creation of decarbonised businesses
- **Provide guided support to companies on how to effectively use public funds and obtain financing from the private sector**
- **Set up programs to train and acquire human resources** to promote the development of a decarbonised society

Conversion of Public Facilities to 100% Renewable Energy by FY 2025

Fastest conversion of public facilities to 100% locally produced and locally consumed renewable energy by any prefecture or designated city in Japan

Switch to electricity generated by renewable energy sources



City hall, schools, other

260 facilities already converted to RE

600 facilities



Solar power, wind power

Switch complete in 2,000 facilities

2021

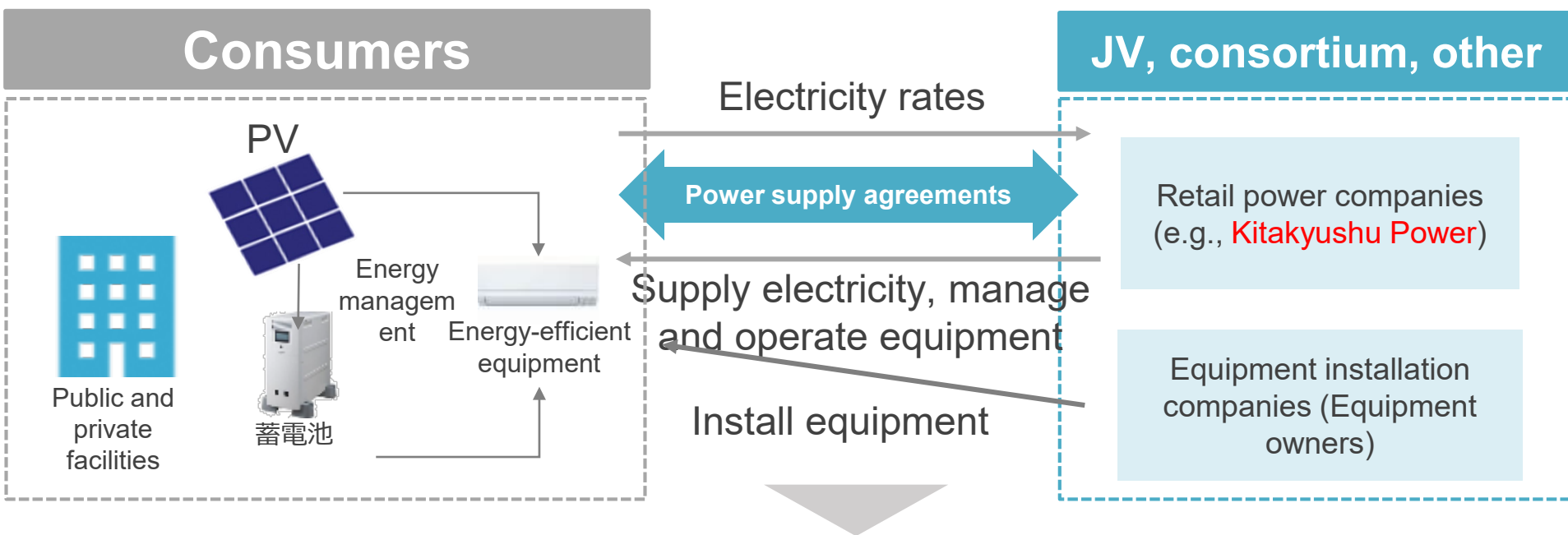
2022~2023

2025

Installing PV Panels and Other Equipment Using the Third-Party Ownership Scheme

Installation of PV panels, storage batteries and other equipment through a third-party ownership scheme in facilities where PV panels can be installed by FY 2025 (approximately 290 facilities)

Diagram of third-party ownership scheme



Decarbonisation leading area

Group of public facilities in 18 cities and towns in the Kitakyushu area and recycling companies in Kitakyushu Eco-Town

Targets and Direction for Introducing Electric Vehicles for Public Use

【Objective】

Introduce electric vehicles, such as electric cars, for all official vehicles for public use **by FY 2030** (approximately 800 vehicles)

■ Significance, challenges and direction for the introduction of electric vehicles

Significance	<ul style="list-style-type: none">✓ Reduces CO₂ emissions✓ When used as storage batteries, EVs can be instrumental in promoting the effective use of renewable energy (in uneventful times) and strengthening resilience (in a disaster).
Challenges	<ul style="list-style-type: none">✓ Introductory costs are high.

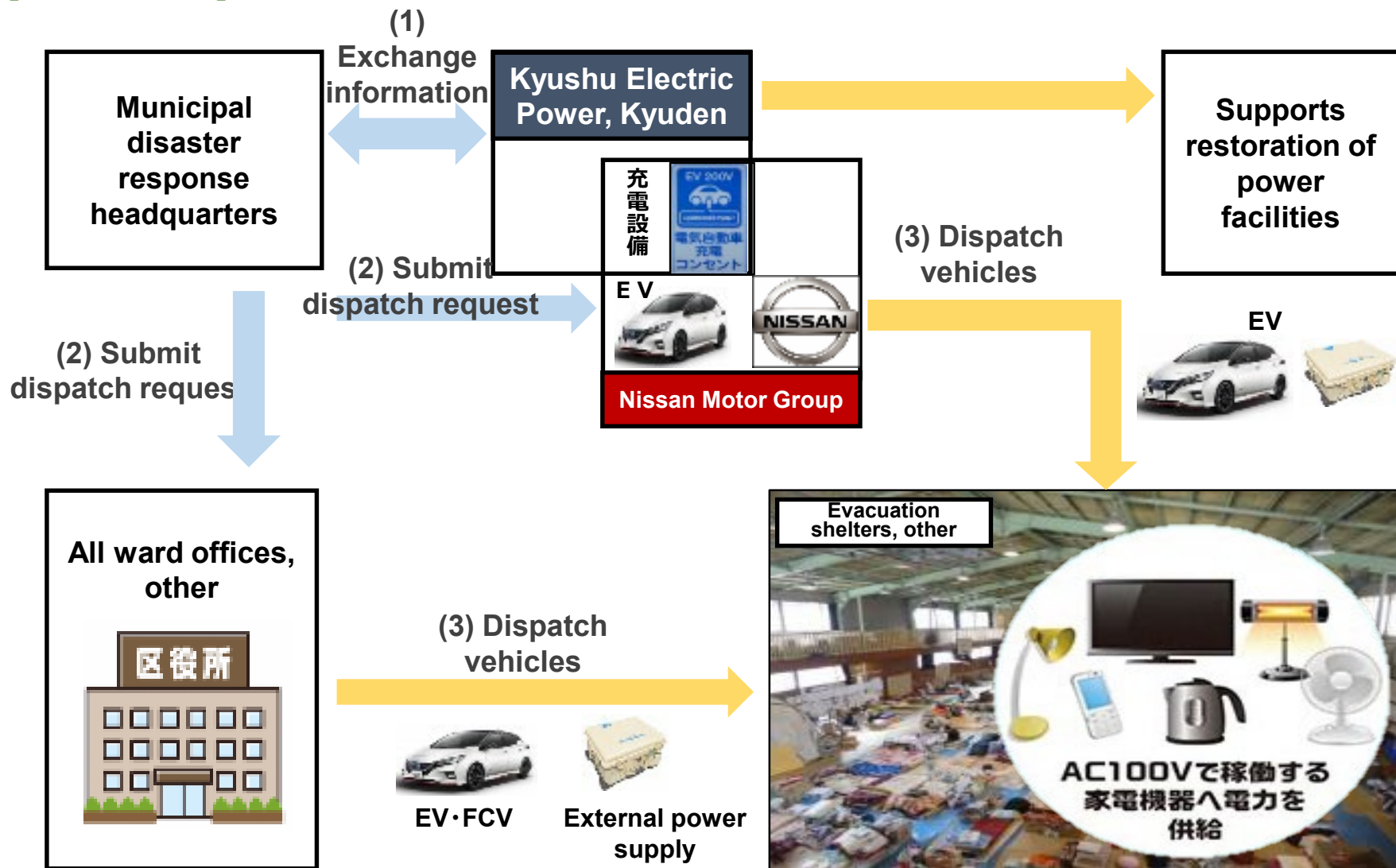


Direction	<ul style="list-style-type: none">✓ Promote electrification and reduce the cost of introducing EVs by addressing the following issues together with the introduction of EVs.<ul style="list-style-type: none">• Introduce a new vehicle management system (DX) and centralise the management and sharing of public vehicles to improve utilisation rates and reduce the number of vehicles in use (at this time, the target is to reduce the number of vehicles by about 100 in three to four years).• Reduce electricity charges and promote the effective use of renewable energy in city hall through the use of storage batteries in EVs.
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Enhancing Disaster Response Capabilities with EVs (Feb 2020 to present)

Kyuden Group × Nissan Motor Group × Kitakyushu City

[In a disaster]



EV-Sharing Demos Between Private Companies and Local Authorities (October 2022 to present)

Objective

- ✓ Reduce costs for introducing EVs by improving utilisation rates through EV sharing schemes for official and company vehicles.
- ✓ Provide opportunities for employees to ride/drive EVs.
- ✓ Develop models for sharing EVs between companies, as well as expanding its use in other sectors

Overview

- ✓ Local companies and sharing service providers are collaborating with Kitakyushu City to promote a system of sharing company and official city vehicles through the use of a car sharing system.
- ✓ Demonstrates improved utilisation rates, verifiable cost effectiveness and cost sharing.

Car sharing (4 EVs)



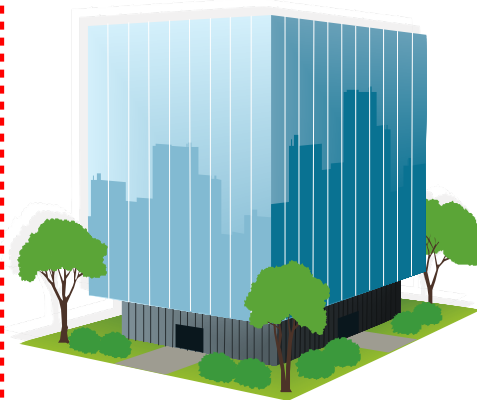
Reservation system

- ✓ Reservations taken 24 hours a day from anywhere via the cloud



Kitakyushu

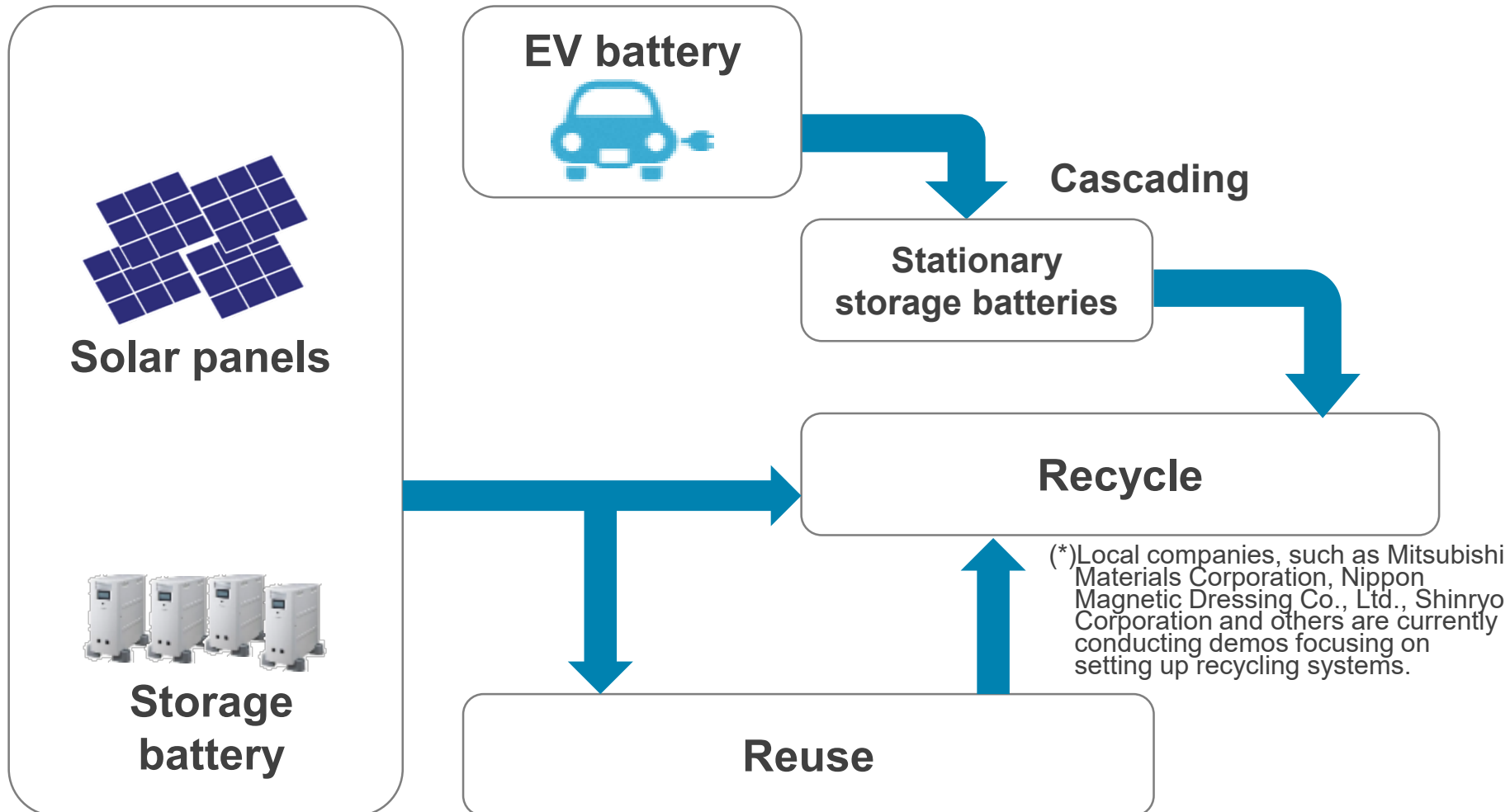
Sharing service provider
(Nissan Motor Co.)



Izutsuya

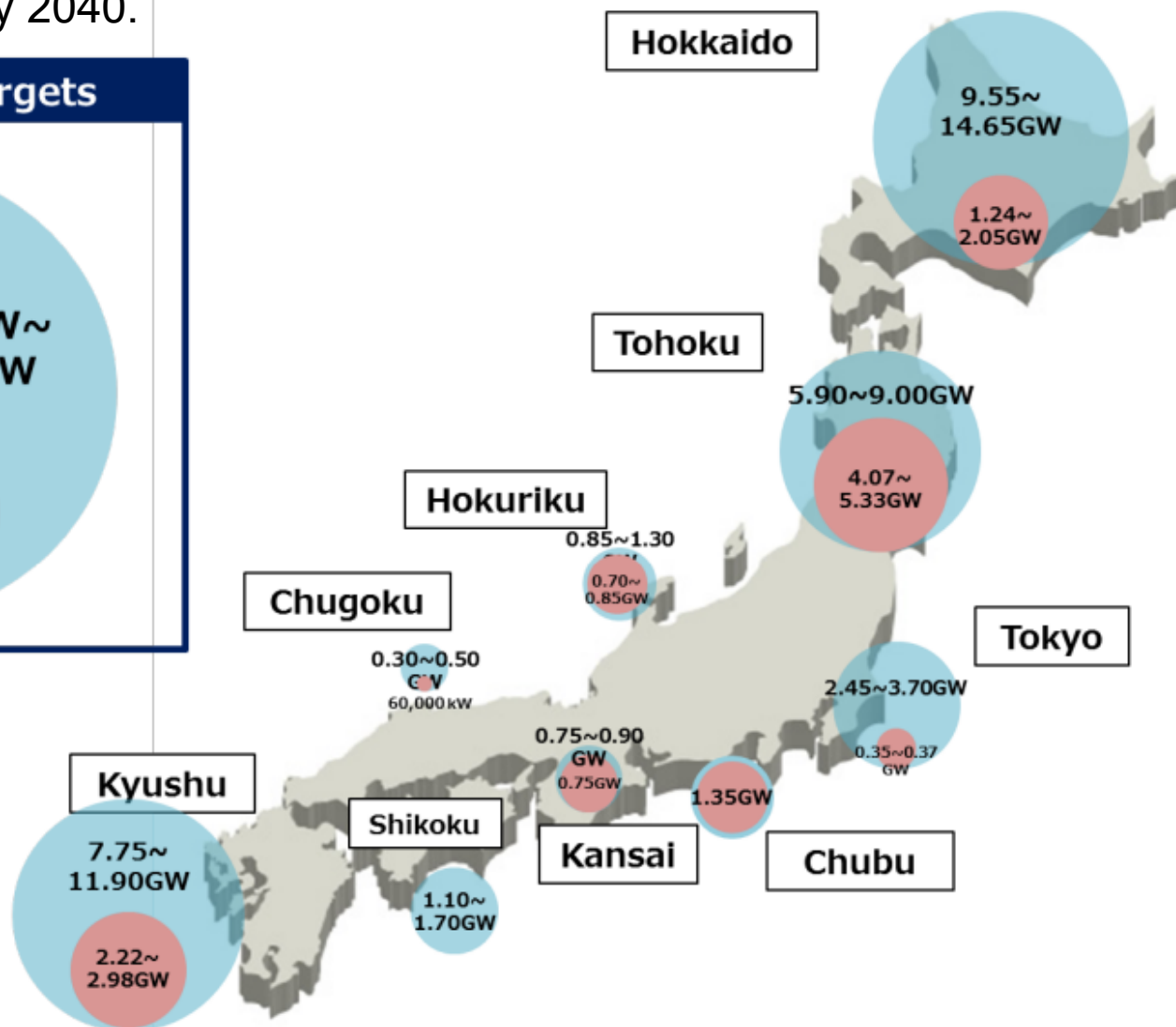
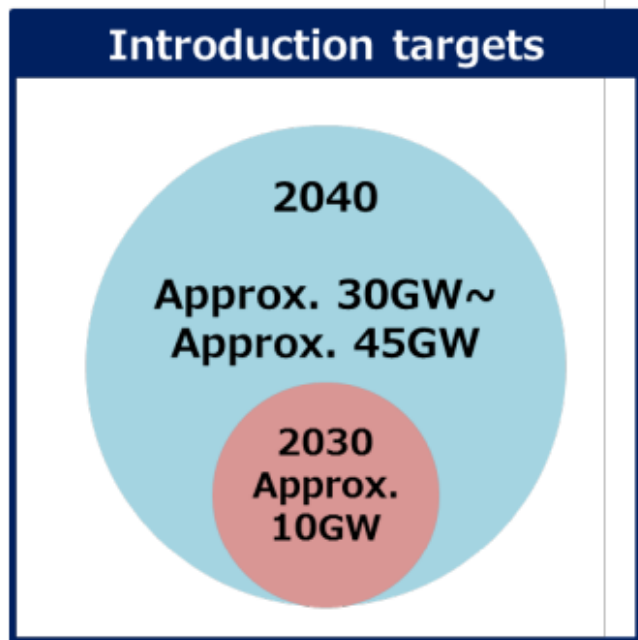
Reuse and Recycling of Solar Panels and Storage Batteries

Establishment of reuse markets
Promotion of recycling oriented around eco-towns



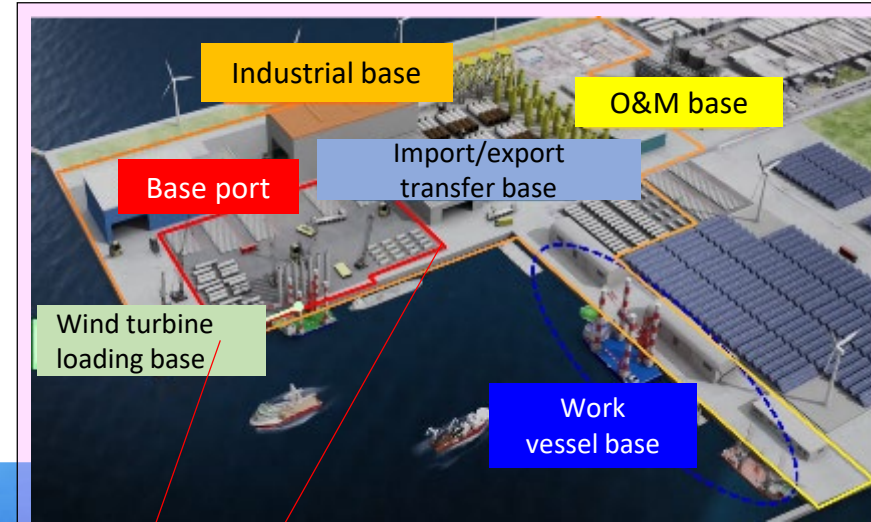
Scale of Offshore Wind Power Bases

- Japan's installation target for offshore wind power is 10 million kW by 2030 and 30 to 45 million kW by 2040.



Creation of a Comprehensive Base for the Wind Power Industry

- Formation of a **comprehensive, four-function base**.
- Only port in western Japan designated as a **base port for offshore wind power** under the Port and Harbour Act.
- Collaborate with the prefecture to **designate general sea areas as promotion zones** for the development of wind power facilities, in addition to port and harbour areas, **based on the Act on Promoting the Utilization of Sea Areas for the Development of Marine Renewable Energy Power Generation Facilities**.



- | | |
|--------------------------------|---|
| 1. Wind turbine loading base | Functions as the final loading and unloading station for parts to wind turbine installation sites |
| 2. Import/export transfer base | Functions as a base for the import, export and transfer of wind turbine parts |
| 3. O&M base | Functions as a base for the operation and maintenance of wind turbines |
| 4. Industrial base | Functions as an industrial base with a concentration of wind turbine-related industries in back lying areas |



Becoming a Base City Engaged in the Supply and Use of Hydrogen

Higashida

Technical demonstration with the use of hydrogen pipelines

Supports and promotes demonstrations of company technologies using infrastructure, such as hydrogen pipelines and fuel cells, with local cooperative systems.

◆ No. demonstration projects: 9, number of companies: 10

Higashida District



Hibikinada

Demonstration on the production and supply of CO₂-free hydrogen

Implementation of demonstrations on the production and supply of CO₂-free hydrogen, taking advantage of Kitakyushu's strengths, such as its concentration of energy-related facilities.

◆ Implementation of the Ministry of the Environment's demonstration project in Hibikinada (FY2020 to FY2022), "Project to demonstrate green hydrogen production and supply using local renewable energy in Kitakyushu City".

Hibikinada District



Other

Expanding the use of fuel cell vehicles and hydrogen stations

Promoting the expanded use of FCVs and development of hydrogen stations in order to broaden applications for hydrogen and improve people's understanding.

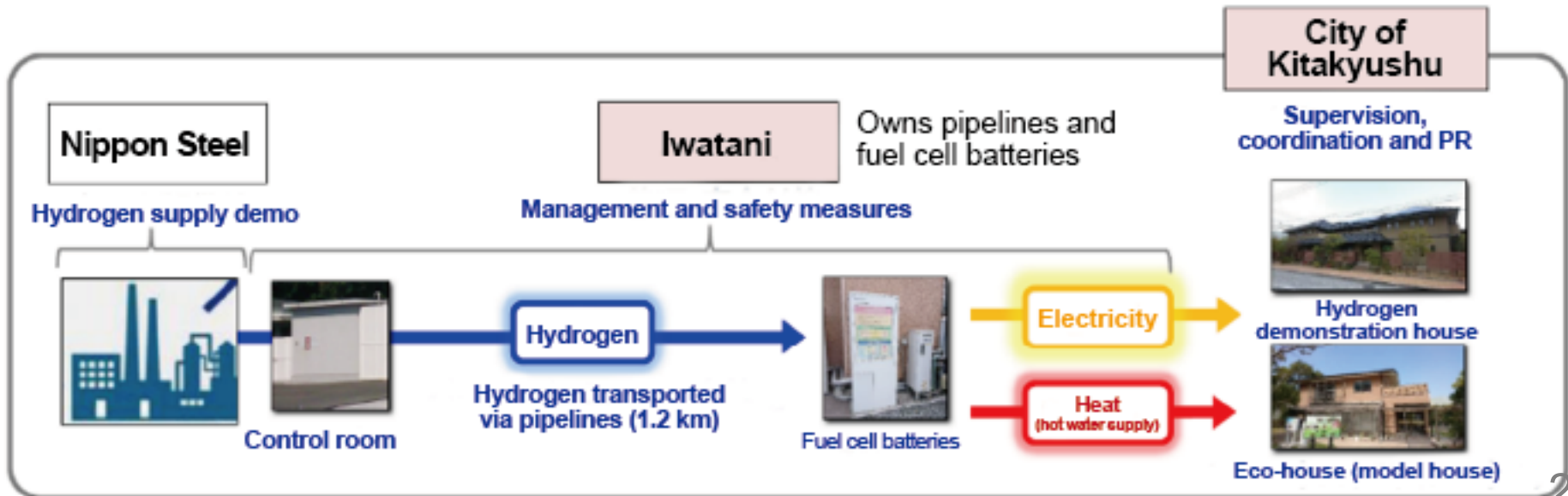
◆ Hydrogen stations in the city (2 locations), introduction of FCVs in official vehicle fleet (four vehicles)



Technical Demonstration Using Hydrogen (Kitakyushu Hydrogen Town)

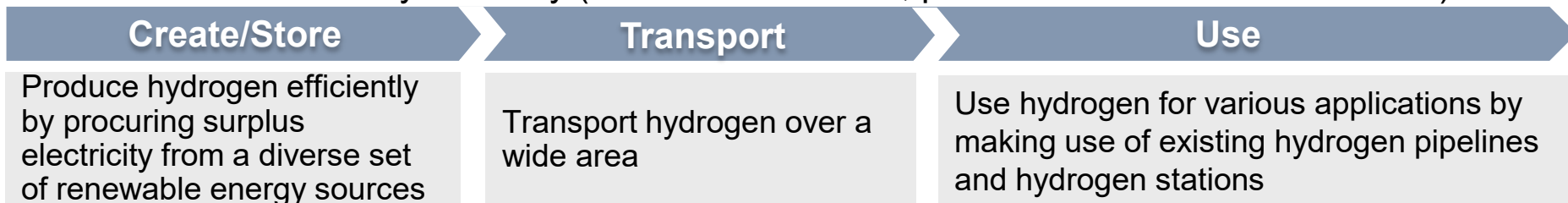


- ✓ Use of a hydrogen pipeline (1.2 km) to provide companies with **demonstration fields** and support demo projects.
- ✓ No. demos: **9** (No. companies: 10)
 - Development of leak monitoring system using hydrogen sensors
 - Demonstration project on analysing impurities in hydrogen gas, etc.

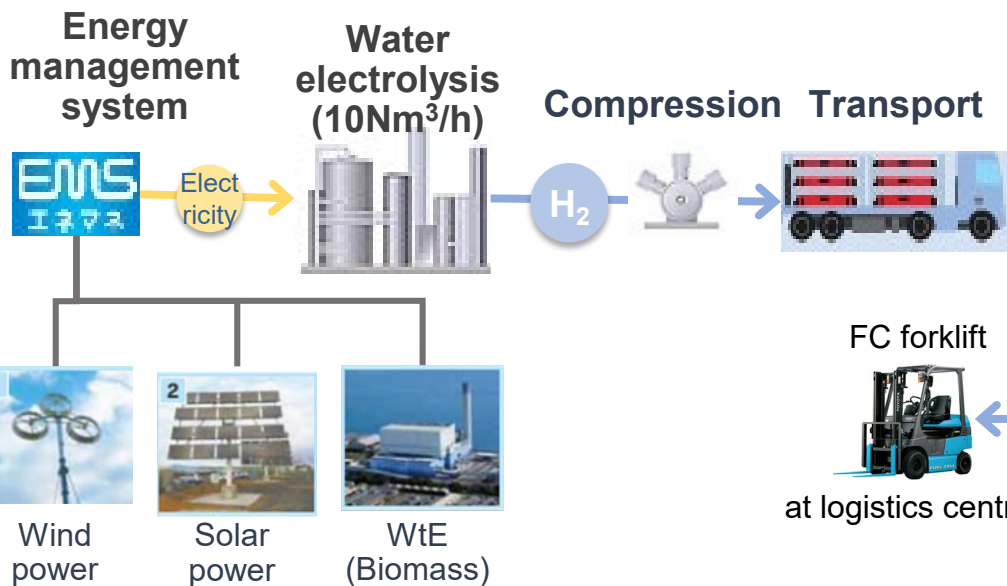


Demonstration Project on the Production and Supply of CO₂-free hydrogen (FY2020-2022)

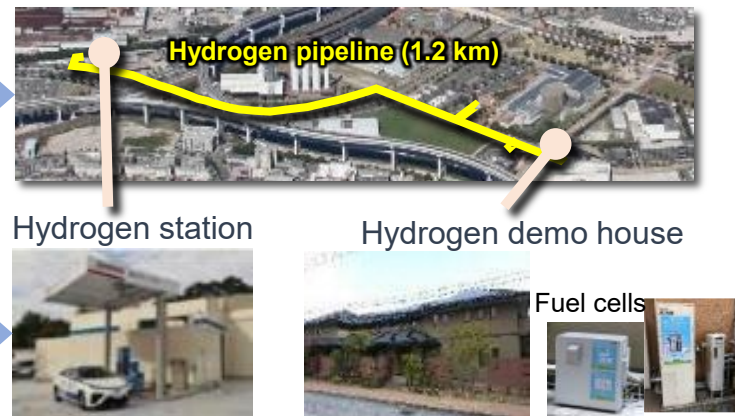
- Ministry of the Environment demonstration project on producing and supplying CO₂-free hydrogen using surplus renewable energy in the city.
- Project partners: Kitakyushu Power (lead), IHI (hydrogen production and energy management system development), Fukuoka Oxygen (hydrogen compression and transport), ENEOS (use of hydrogen in hydrogen STs, supply to hydrogen pipelines), Fukuoka Prefecture and Kitakyushu City (overall coordination, provision of demonstration fields).



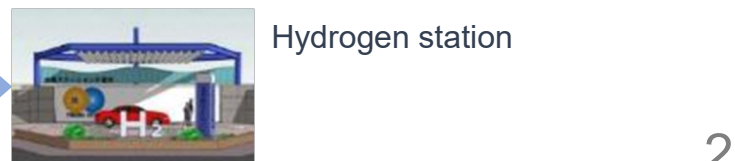
Hibikinada District



Higashida District (Kitakyushu Hydrogen Town)



Fukuoka City and Kurume City



Selection of Decarbonisation Leading Areas

Overview of Kitakyushu's Proposal

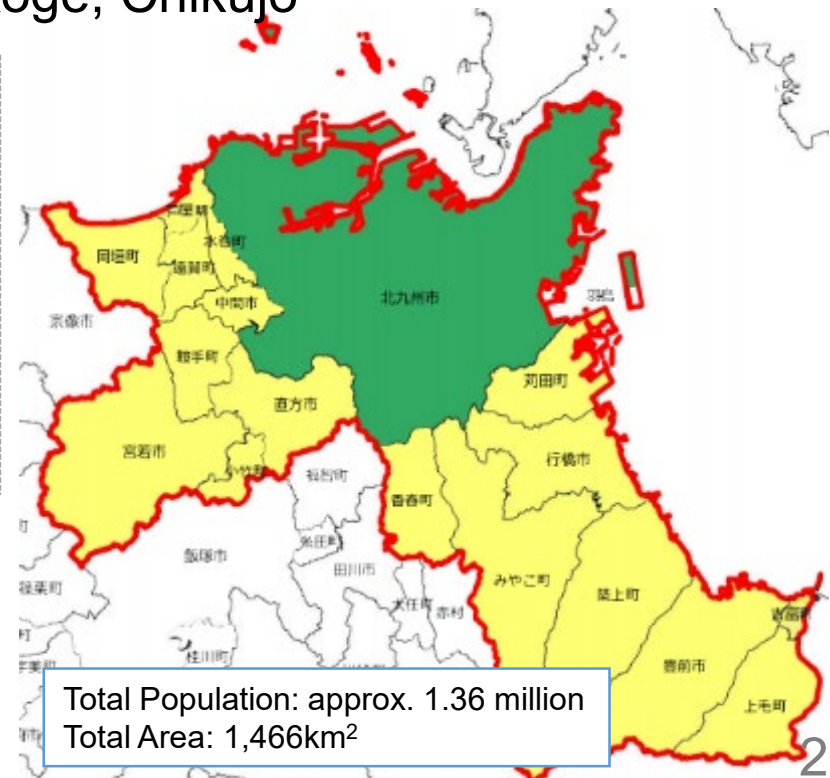
Enhance the competitiveness of local industries with the development of models for maximum installation and optimal operation of renewable energy in public facilities and other locations.

Proposer: City of Kitakyushu

Partners: Cities of Nogata, Yukuhashi, Buzen, Nakama, Miyawaka; towns of Ashiya, Mizumaki, Okagaki, Onga, Kotake, Kurate, Kawara, Kanda, Miyako, Yoshitomi, Koge, Chikujo

Targets as a decarbonised leading area

- **Group of public facilities in 18 cities and towns in the Kitakyushu area (approx. 3,600).**
- **Group of recycling companies in Kitakyushu Eco-Town**



Proposal Details (1): Aim by 2030

- **Develop a low-cost, third-party ownership model for PV/EVs/storage batteries** in decarbonised areas. **Deploy this model to small- and medium-sized companies**, as well as to cities and locations overseas to promote the development of decarbonised cities and communities and international environmental business.
- **Form a decarbonised energy base** that includes wind and hydrogen power, and **create new industries** in line with the increased introduction of renewable energy.
- Aim to **introduce approximately 1,400 MW of renewable energy** (in Kitakyushu) by FY2030 (approximately three times the current level).

Local challenges

- Strengthen competitiveness of manufacturing industries and SMEs
- Redevelop aging office buildings in the city center

Aim by 2030

Strengthen the competitiveness of industries and appeal of cities through the creation of **decarbonised energy hubs**

Initiatives in leading areas

Electricity in consumer sector

Establish low-cost, third-party ownership model for PV/EVs/storage batteries (groups of public facilities and recycling companies)

Model development

SMEs, etc.

Cities

Overseas

Electricity outside of consumer sector

Supports **decarbonisation and improving productivity**

Promotes the **development** of appealing, comfortable, disaster-resilient and **decarbonised cities**

Promotes **international environmental business**

Development of decarbonised energy bases and new industries, including wind power and hydrogen

Proposal Details (2): Decarbonisation of electricity in the consumer sector

- Decarbonise **groups of public facilities in the Kitakyushu metropolitan area** (approx. 3,600) and **groups of recycling companies in Eco-Town** through the application of a **low-cost, third-party ownership model** for PV/EVs/storage batteries to create a low-cost PPA model.
- **Reduce costs even further** by creating a **cascading system for used PV panels and EV batteries** in collaboration with companies in Eco-Town and car manufacturers.
- **Promote the effective use of renewable energy** through **local energy management** and **integrated energy management** for groups of public facilities with the **installation of large-scale storage batteries**.

Groups of public facilities and recycling companies

Introduction with third-party ownership system + energy management (PV/EVs/storage batteries, energy efficient equipment)



Energy management

Release Storage



Renewable energy power plants in the urban area

WtE
 Large-scale PV power generation
 Biomass power generation
 Wind power, etc.

Installed RE (New)

37MW

No. PV systems installed in public facilities

Kitakyushu: ~290 locations
 17 nearby cities/towns: ~130 locations

% of electricity generated from RE

100%

Total project cost: JPY 9.7 billion (including use of private sector financing)

Building Systems for Collaborating with Local Companies and Other Stakeholders (1/2)

Izutsuya Co., Ltd.

- ✓ Implementation of EV car sharing demonstration project
- ✓ Widespread application of “zero-carbon driving” and reduced CO₂ emissions with the expanded introduction of renewable energy sources

Kyushu Electric Power Co., Inc.

- ✓ Increased application and introduction of renewable energy through the use of storage batteries, etc.
- ✓ Transition of energy towards decarbonisation
- ✓ Promotion of decarbonisation initiatives in the Kitakyushu metropolitan area

Toyota Motor Kyushu, Inc.

- ✓ Promotion of 3R (reduce, reuse, recycle) initiatives for EV batteries
- ✓ Creation of information sharing and collaboration systems with a view to utilising hydrogen

Kyushu Institute of Technology

- ✓ Implementation of demonstration projects aiming at the practical applications of next-generation solar cells
- ✓ Development of decarbonisation technologies with the use of bamboo as a resource
- ✓ Establishment of control techniques for large-scale storage batteries and implementation of demonstration projects aiming at practical applications

Building Systems for Collaborating with Local Companies and Other Stakeholders (2/2)

Saibu Gas Co., Ltd.

- ✓ Low-carbonisation and decarbonisation of heat demand, including promoting the use of methanation technologies
- ✓ Optimisation of energy use
- ✓ Promotion of food loss and waste reduction measures
- ✓ Raising awareness through education on the environment and energy

Daikin Industries, Ltd.

- ✓ Promotion the introduction of high-efficiency air-conditioning systems through third-party ownership systems and regional energy management using air-conditioning equipment
- ✓ Installation and use of recycled coolants

Denso Kyushu Co., Ltd.

- ✓ Support for SMEs in improving the efficiency of production lines
- ✓ Promotion of expanded applications of EVs, PHEVs and V2X through demonstrations on charging / discharging equipment and chargers

Yanekara Co., Ltd.

- ✓ Promotion of practical applications for charging/discharging equipment* that can efficiently charge vehicles from solar panels.
- ✓ Creation of mechanisms that will contribute to the optimal use of renewable energy through the control of charging/discharging devices

(*) When electricity generated by solar panels is used to charge EVs, it is typically converted from DC to AC, generating heat and resulting in energy loss. Yanekara's charging/discharging equipment uses electricity generated by solar panels as is without converting the current to AC, which reduces energy loss and allows renewable energy to be used effectively.

**Thank you for your
kind attention.**