Rinnai Group’s Path to Becoming Carbon-Neutral

November 5, 2021

Rinnai Corporation

Rinnai

- Background to Carbon Neutrality
- Initiatives and Direction to Realize Low-Carbon and Decarbonized Society
- Reducing CO_2 Emissions from Business Activities
- Investing in Carbon Neutrality

Background

In response to the growing sense of crisis about global warming around the world, the Japanese government and relevant industries are stepping up efforts to realize a decarbonized society.

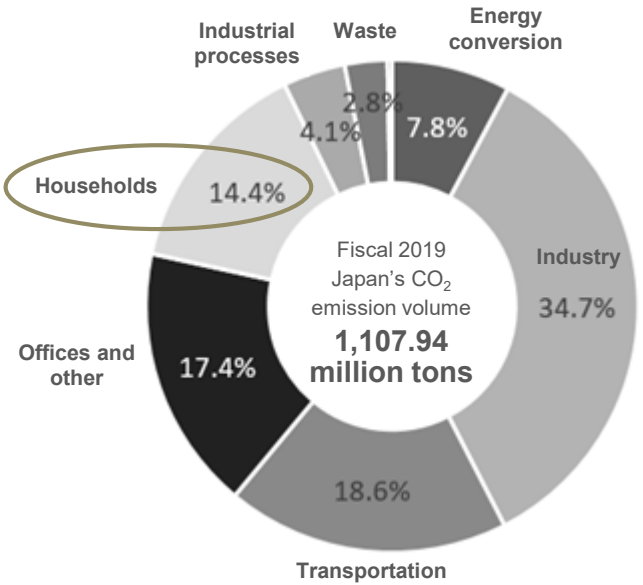
The Rinnai Group, which handles household appliances that mainly use fossil fuels, has also set targets for 2030 and adopted a corporate policy to realize a decarbonized society by 2050.

* Our carbon-neutral initiatives will bear fruit when the energy environment is decarbonized, such as when 100% of the world's energy comes from renewable sources and hydrogen supply infrastructure proliferates.

CO_2 Emissions from Households: Current Situation

Japan

【CO_2 emissions by sector】



Source: Japan Center for Climate Change Actions https://www.jccca.org/

Households account for 14.4% of Japan's total CO_2 emissions (about 160 million tons)

Rinnai's mainstay products are water heaters, room heaters, and kitchen appliances.

Based on market share, we calculate that around 1.5% (16.8 million tons*) of Japan's total emissions (1.1 billion tons) come from the use of Rinnai-brand products.

* Estimate based on the Company's market share as stated by the Japan Industrial Association Of Gas and Kerosene Appliances (domestic water heater and kitchen appliance sectors).

Our efforts to reduce CO_2 emissions will play a major role in reducing Japan's total emissions.

Environmental Impact of Rinnai Products over Their Life Cycle

Japan

The overwhelming majority of CO_2 emissions involving Rinnai come from product use.

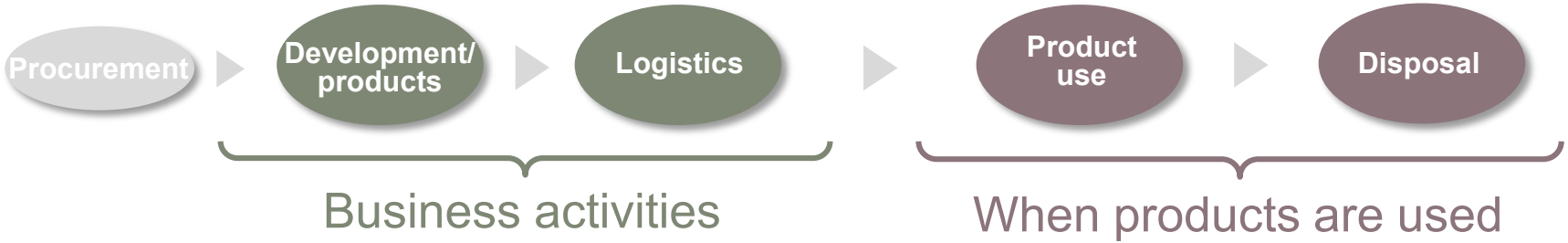
Life cycle of Rinnai products

	Procurement	Development/ products	Logistics	Product use	Disposal
2020					
% of total CO_2 emissions	4.8%	0.1%	0.05%	**95.0%**	0.03%
Amount of CO_2 emissions	850,000 t-CO_2	20,000 t-CO_2	9,000 t-CO_2	16.8 million t-CO_2	6,000 t-CO_2
	CO_2 related to parts procurement	CO_2 emitted by factories/offices	CO_2 emitted in transporting our products	CO_2 emitted when our products are used	CO_2 emitted During the final disposal process

CO_2 Emission Targets

Global

Life cycle of Rinnai products



CO_2 emission targets

	2020	2030	2050	2020	2030	2050
Domestic	30,000 t-CO_2	15,000 t-CO_2	Zero	16.8 million t-CO_2	12.6 million t-CO_2	Zero
Global	100,000 t-CO_2	50,000 t-CO_2	Zero	45 million t-CO_2	—	Zero

(* Figures of overseas products are rough estimates)

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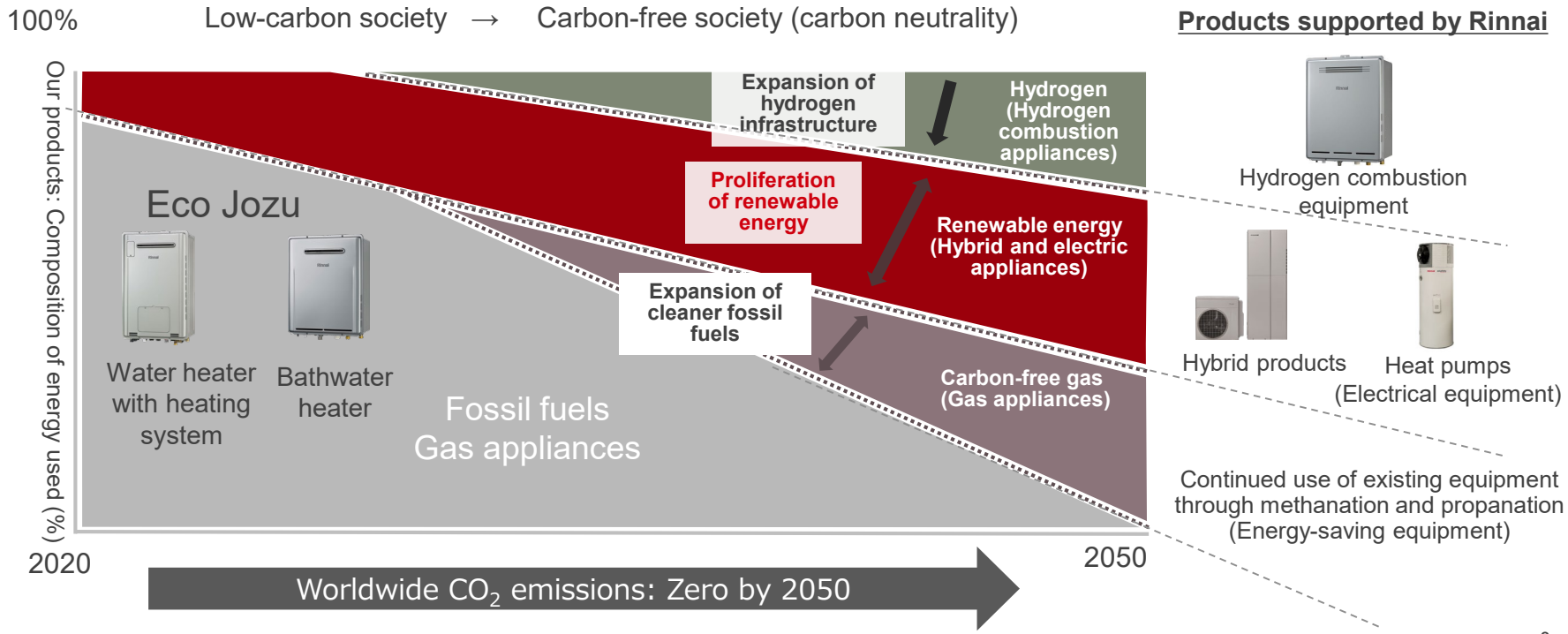
Household Energy for Decarbonization

Global

Changes in energy composition on path to reducing CO_2 emissions during product use



Examples of (Low-Carbon) Measures for 2030

Japan

Aiming for “decarbonization” (net zero) by 2050,
but “low carbon” (energy-efficient) in the medium term (2030)

Increase sales of ECO ONE and Eco Jozu

ECO ONE

Hybrid water heater with heating system

Eco Jozu

Water heaters: CO_2 emission comparison

Non-Eco Jozu	1,507 kg-CO_2/year
Eco Jozu (Mode thermal efficiency 92.5%)	1,270 kg-CO_2/year — Approx. 15% reduction
Heat pump-based water heater (JIS 3.3)	865 kg-CO_2/year — Approx. 43% reduction
Hybrid water heater with heating system (ECO ONE 160-liter model)	707 kg-CO_2/year — Approx. 50% reduction

CO_2 emissions (compared with conventional water heaters)

▶ Approx. 50% reduction

▶ Approx. 15% reduction

Gradually reduce number of non-Eco Jozu units as the ratio of Eco Jozu units increases.

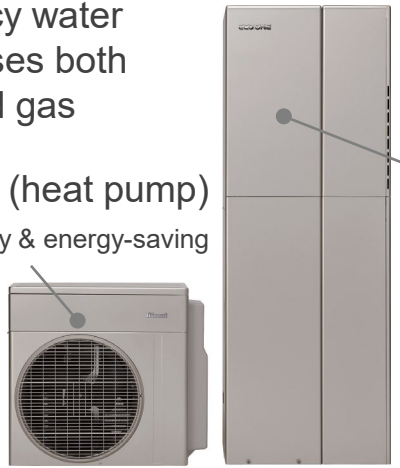
Promoting Spread of ECO ONE

Japan

Aiming to sell **300,000 ECO ONE units** annually by 2030

What is ECO ONE?

High-efficiency water heater that uses both electricity and gas



ECOONE

Electricity (heat pump)

High efficiency & energy-saving

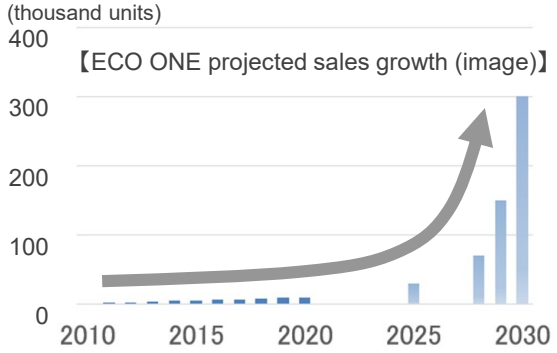
Uses heat from the air to increase energy efficiency

Gas (Eco Jozu)

Powerful & speedy

Instant-heating capability makes it useful when using a lot of hot water or when heating water.

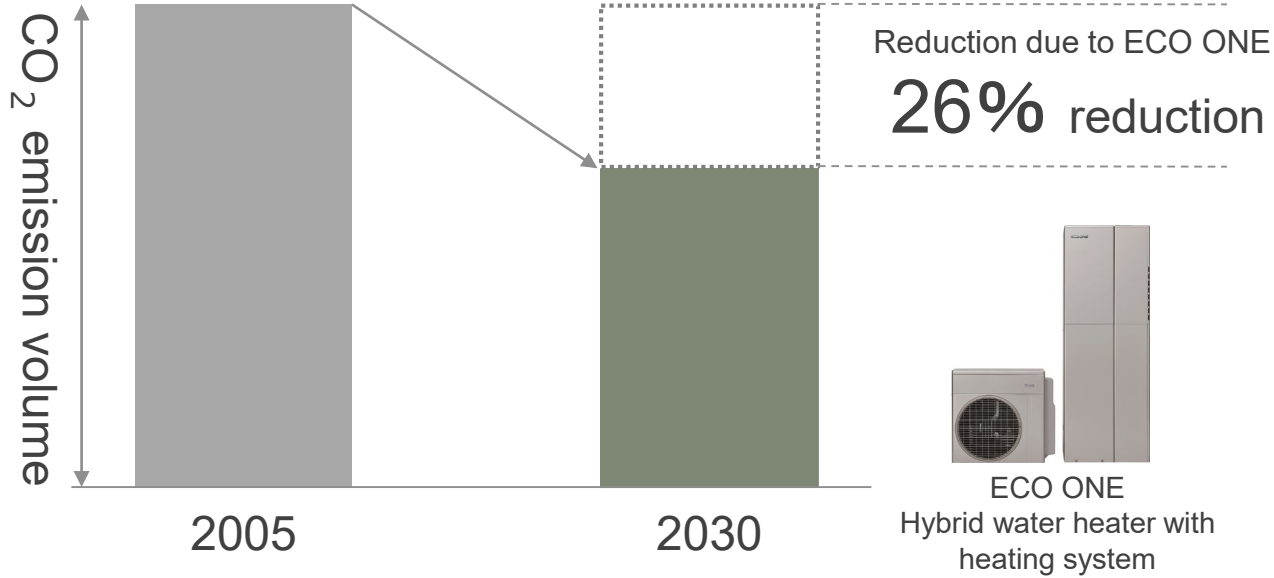
Accelerate sales of ECO ONE by combining it with renewable energy equipment and linking it with energy management systems.



Reducing CO_2 Emissions

Japan

Using ECO ONE for reduce CO_2 emissions

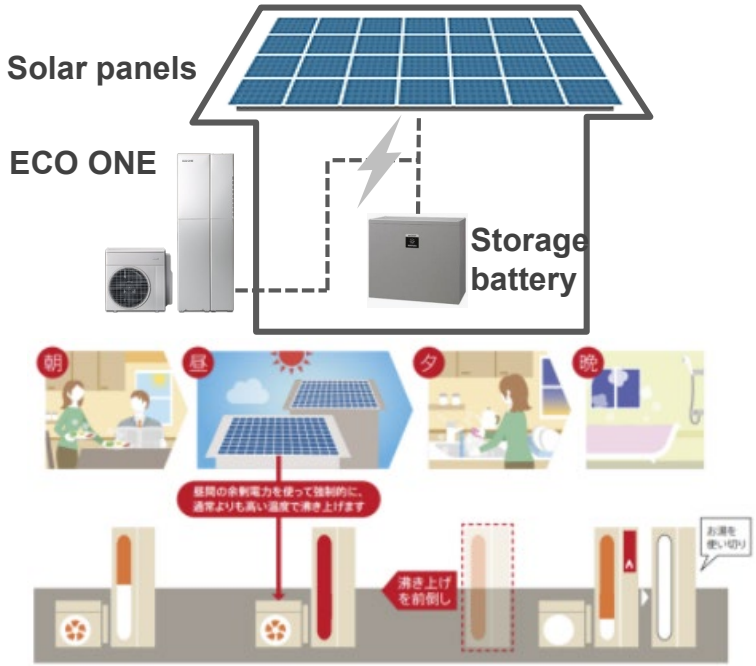


Promote spread of ECO ONE to help reduce CO_2 emissions

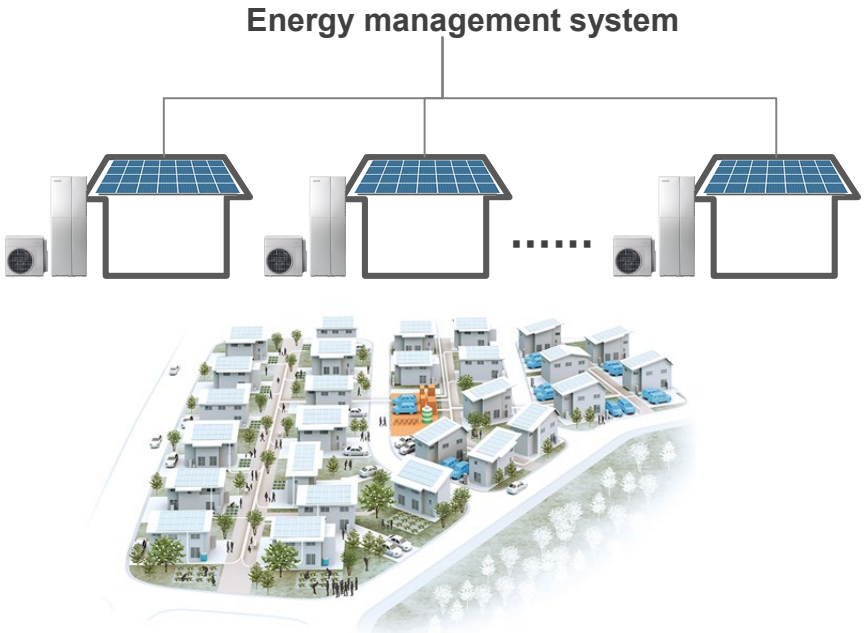
Examples of Decarbonization Measures for 2050

Japan

▸Effectively utilize renewable energy to decarbonize homes, specifically by using power generated from rooftop solar panels to store heat in ECO ONE tanks



▸Contribute to decarbonization by maximizing use of local renewable energy sources in combination with residential energy management systems



Source: E-forest image by Chuo Jutaku Co., Ltd.

Carbon-Neutral Initiatives around the World

Global

Countries where the Rinnai Group is involved: Targets and measures

Country	2030 target	2050 target	Measures
Japan	**46%** GHG reduction (vs 2013)	Total emissions **Zero**	Increase renewable energy rate to 35–38%, focusing on solar and wind power. Use hydrogen mainly in FCVs and power generation facilities.
United States	**50–52%** GHG reduction (vs 2005)		Targeting zero CO_2 emissions from electricity by 2035. California bans the laying of gas pipes in new homes.
Australia	**26–28%** GHG reduction (vs 2005)		Given high potential for renewable energy generation, we are considering converting surplus electricity into hydrogen for export. Field-testing of mixtures of hydrogen and natural gas under way.
United Kingdom	**68%** GHG reduction (vs 1990)		Targeting near-zero emissions from electricity by 2030 and hydrogen-fueled housing in 2023 or later. Demonstration of hydrogen town planned around 2030.
China	**65%** GHG reduction (vs 2005)	* Total emissions (2060) **Zero**	Phasing out thermal power plants without carbon capture and storage facilities. Spearheading use of hydrogen for vehicles and industry.

Activities are accelerating in major countries, all of which have set a target of zero CO_2 emissions. Therefore, the entire Rinnai Group must achieve carbon neutrality.

Long-Term Technological Development (towards 2050)

Global

Development status of hydrogen-related equipment

《Market changes》

The world has already begun to make technological progress using hydrogen as a fuel.

Many countries have begun considering storage and use of hydrogen produced from renewable electricity as a means of adjusting renewable electricity supply-demand balance.

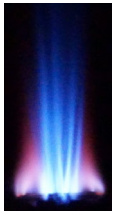
For example, the United Kingdom, Germany, and Australia have started demonstration tests of mixing hydrogen with household gas.

《Rinnai's efforts》

The Rinnai Group is currently conducting combustion tests of existing products (United Kingdom, Oceania, United States, and Italy) in which hydrogen is mixed with household gas.

Rinnai Japan is spearheading development of technology for new products that will support 100% hydrogen combustion in the future, in collaboration with other countries.

Combustion experiment with 20% hydrogen gas mixture



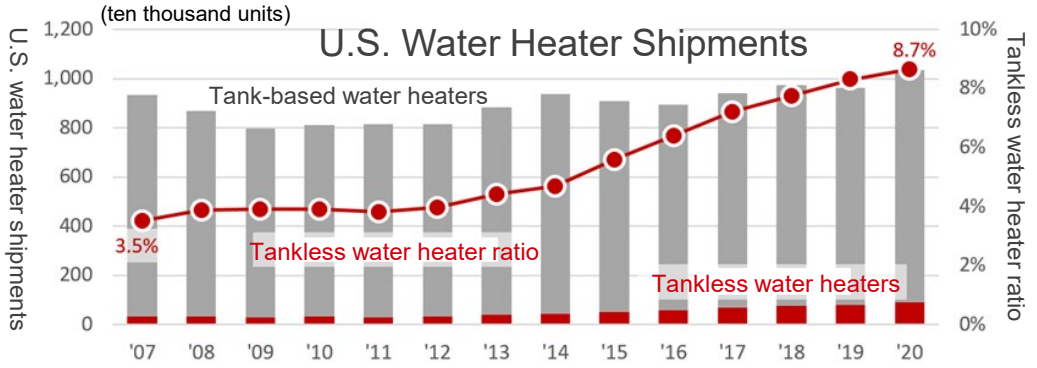
Combustion experiment with 100% hydrogen (small amount of methane mixed with hydrogen since hydrogen is not visible)

Trends in United States

Global

《Market background 》

Around 10 million water heaters shipped annually in the U.S. market, more than 90% of which are tank-based water heaters with low thermal efficiency. The shift to tankless water heaters with higher thermal efficiency is gradually progressing.



Source: Prepared by Rinnai based on Air-Conditioning, Heating, and Refrigeration Institute (AHRI) statistics.

《Rinnai's strategy》

Until around 2035, Rinnai will work to replace tank-based systems with more efficient tankless systems. After that, as the market for renewable energy electricity expands, we will aim to become carbon neutral by promoting heat pumps and other electrified products that utilize renewable energy electricity.

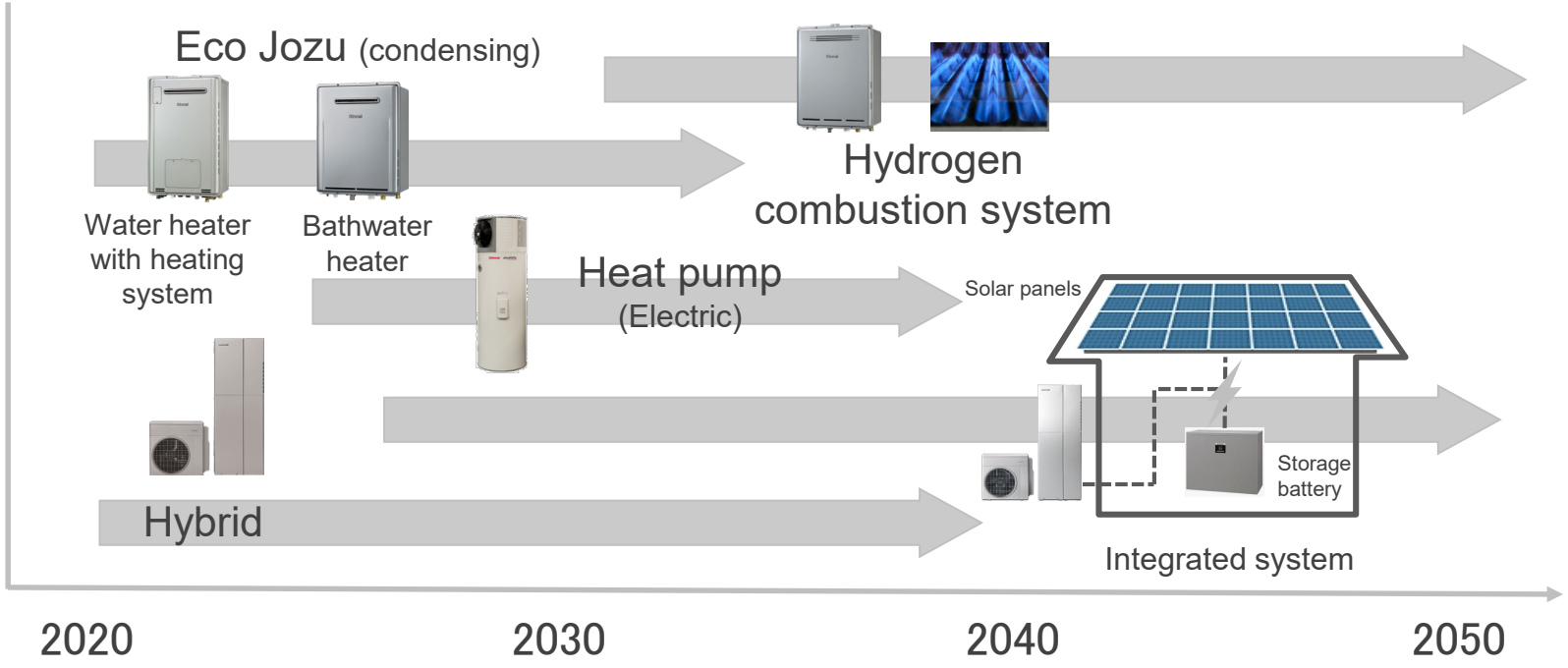
Tank-based water heater
60% heat efficiency

Condensing tankless water heater
92% heat efficiency

Rinnai's Product Development Roadmap

Japan

We will continue entrenching our technologies while monitoring trends in the energy supply system as we move from "low carbon" to "decarbonization."



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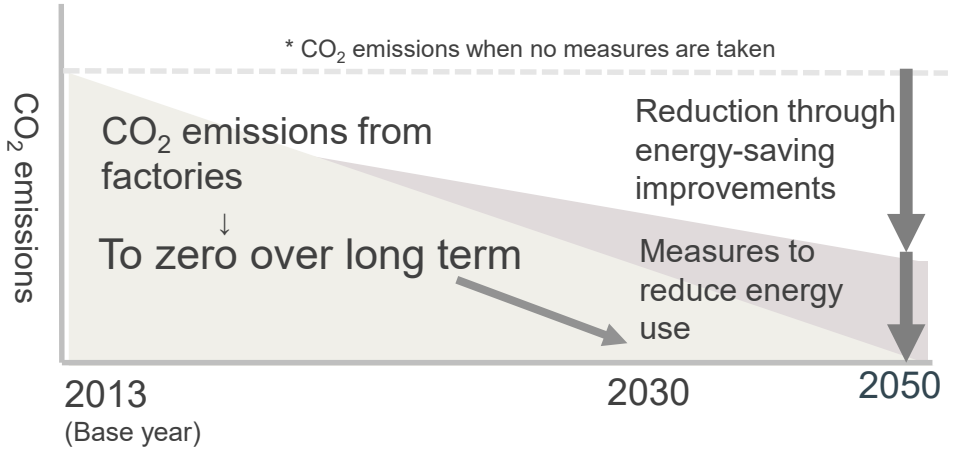
Reducing CO_2 Emissions from Business Activities

Global

CO_2 emissions from factories/offices



Zero CO_2 emissions target

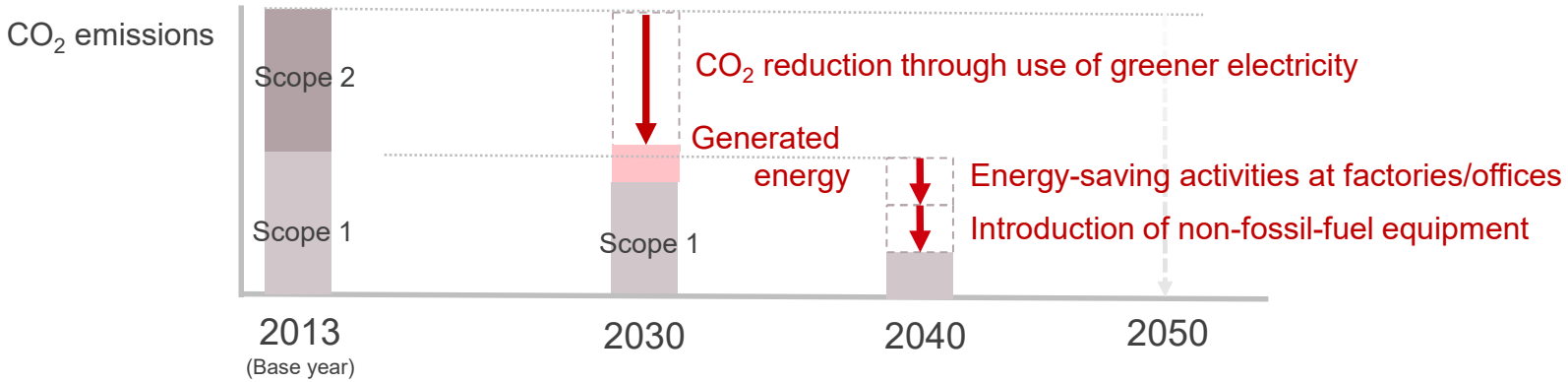
	Japan Factories/offices	Overseas Factories/offices
Scope 1 (Gas/fuel)	By 2050	
Scope 2 (Electricity)	By 2030	By 2050

We will also promote improvements and environmental measures to reduce CO_2 emissions from our business activities, aiming for zero emissions by 2050.

Zero CO_2 emissions Challenge for Factories and Offices

Japan

CO_2 emissions from domestic factories and offices



- Achieve zero Scope 2 emissions by 2030 through purchase of green electricity and energy creation
- Continue efforts to achieve zero Scope 1 emissions by promoting energy conservation activities and introducing non-fossil-fuel equipment at factories and offices

Make proactive environmental investments to switch to renewable energy facilities and non-fossil-fuel facilities

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Investing in Carbon Neutrality

Global

Cash flow scenarios (From fiscal 2022 ending March 31, 2022, to fiscal 2026, ending March 31, 2026)

Inflows	Outflows
Operating CF ¥200 billion	Investment required for basic scenario ¥80 billion
	Growth-oriented investments & strategic expenditures Up to ¥125 billion
Appropriation of cash carried forward ¥65 billion	Shareholder return ¥60 billion or more

Main investments in carbon neutrality

Product development
- Expansion of Innovation Center
- Development of hydrogen combustion equipment
- Development of heat pump equipment

Manufacturing
- Switch to renewable energy and non-fossil-fuel facilities
- Switch to green power

Sales
- ECO ONE sales promotion (Japan)
- Spread of energy-saving water heaters (global)

More than ¥50 billion cumulative investments over 5 years

Accelerate innovation in product development, manufacturing, and sales by investing aggressively to become carbon neutral

Investing in Carbon Neutrality

Global

Main investments in carbon neutrality		Estimated investments (5-year cumulative)
Product development	Expansion of Innovation Center Investment in hydrogen combustion equipment, heat pump equipment, and other next-generation technologies	¥30 billion or more
Manufacturing	Switch to renewable energy and non-fossil-fuel facilities Switch to green power	¥15 billion or more
Sales	ECO ONE sales promotion (Japan) Spread of energy-saving water heaters (global)	¥5 billion or more

Accelerate innovation in development, manufacturing, and sales by investing aggressively to become carbon neutral, with more than ¥50 billion cumulative investments over 5 years estimated

Carbon Neutral Declaration

RIM 2050

Rinnai Innovation Manifesto 2050

(Carbon Neutral Declaration)

Through innovation in product development, manufacturing, and sales, Rinnai aims to “help realize a decarbonized society” by transcending the boundaries of its conventional business domains.

Performance forecasts and other future-oriented predictions contained in these materials are based on the Company's judgments using available information. Actual results may differ from such forecasts and predictions due to changing future circumstances.

Rinnai