



June 21, 2022

The Okinawa Electric Power Company, Incorporated

Tsubame BHB Co., Ltd.

Kawasaki Heavy Industries, Ltd.

FY2022 Okinawa Clean Energy Introduction Promotion Research Program
“Research Program on Onsite Production for Local Consumption of Clean Fuel
Ammonia in Okinawa”

The Okinawa Electric Power Company, Incorporated (OEPC), Tsubame BHB Co., Ltd. (Tsubame BHB), and Kawasaki Heavy Industries, Ltd. (Kawasaki) jointly applied for the FY2022 Okinawa Clean Energy Introduction Promotion Research Program, which was publicly solicited by Okinawa General Bureau, Cabinet Office of Japan, and our proposal, “Research Program on Onsite Production for Local Consumption of Clean Fuel Ammonia in Okinawa,” was accepted.

There is a strong need to reduce CO₂ emissions from thermal power sources in Okinawa, and ammonia co-firing in coal-fired power plants is expected to be an effective means of decarbonization. In this research, we will investigate the feasibility and business viability of onsite production for local consumption of clean fuel ammonia, namely ammonia production (“Onsite Production”) utilizing electricity derived from renewable energy and ammonia co-firing in coal-fired power plants (“Local Consumption”).

Specifically, we will conduct and complete the following studies in fiscal 2022:

1. Research on the possibility of ammonia co-firing in Gushikawa Thermal Power Plant (Onsite Production for Local Consumption)
2. Research on ammonia production and supply (Onsite Production)
3. Research on modification of ammonia co-firing equipment in Gushikawa Thermal Power Plant

Through this research, OEPC, the largest electric utility in Okinawa, Tsubame BHB, which has ammonia catalyst technology and is developing a distributed ammonia production system, and Kawasaki, a comprehensive heavy industry manufacturer that supplies energy-related equipment, transportation equipment, etc. and is developing ammonia co-firing technology for coal-fired boilers, are committed to contributing to society by achieving a stable supply of energy and tackling global warming.

Attachment: Outline of this Research

Company Profiles

- ◆ The Okinawa Electric Power Company, Incorporated
 - Representative : Hiroyuki Motonaga, President
 - Incorporated : 1972
 - Head Office : Urasoe City, Okinawa Prefecture
 - Business Description : Integrated energy business through power and gas supply

- ◆ Tsubame BHB Co., Ltd.
 - Representative : Masahiro Watanabe, Representative Director and Chief Executive Officer
 - Incorporated : 2017
 - Head Office : Chuo-ku, Tokyo
 - Business Description : R&D and manufacturing involving on-site ammonia production system and catalysts

- ◆ Kawasaki Heavy Industries, Ltd.
 - Representative : Yasuhiko Hashimoto, Representative Director, President and Chief Executive Officer
 - Incorporated : 1896
 - Head Offices : Minato-ku, Tokyo
Kobe City, Hyogo Prefecture
 - Business Description : Manufacturing and sales of land, sea and air transportation systems, energy and environmental plants, robots and industrial equipment, etc.

Outline of this research ① Overview

Investigation of feasibility and business viability of introducing clean fuel ammonia through the following studies.

Implementation Structure and Main Roles

Okinawa General Bureau, Cabinet Office



Joint Implementation

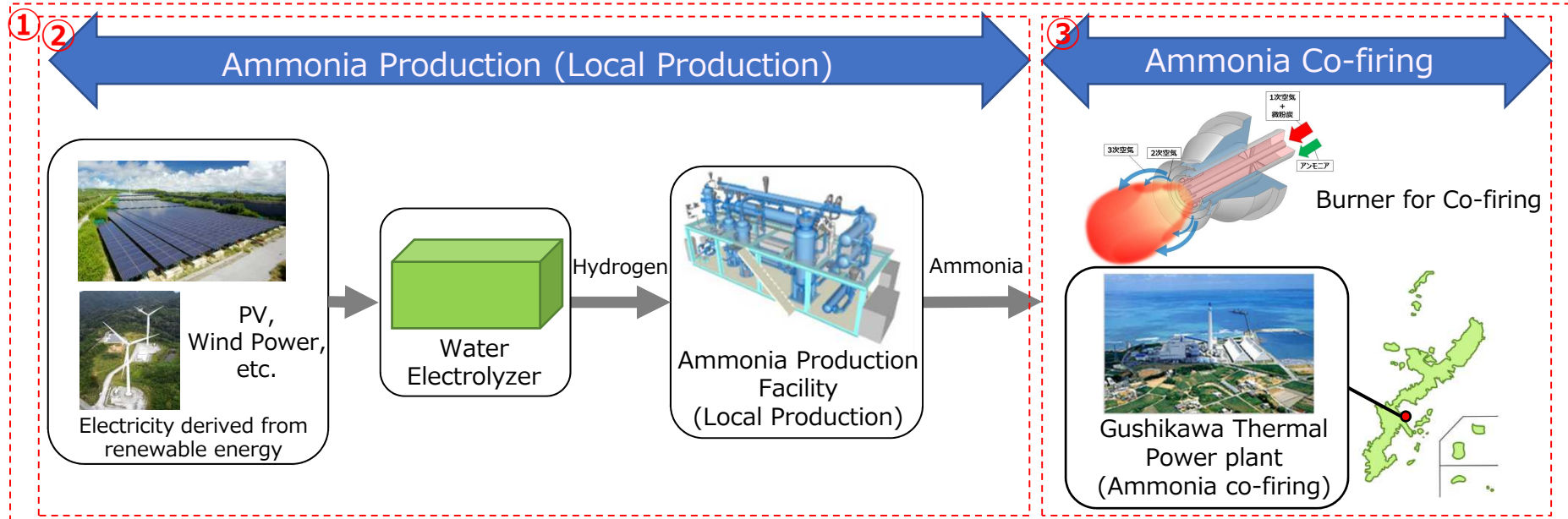
Energy Supplier in Okinawa
OEPC (Leader)

Ammonia Production Business Operator
Tsubame BHB

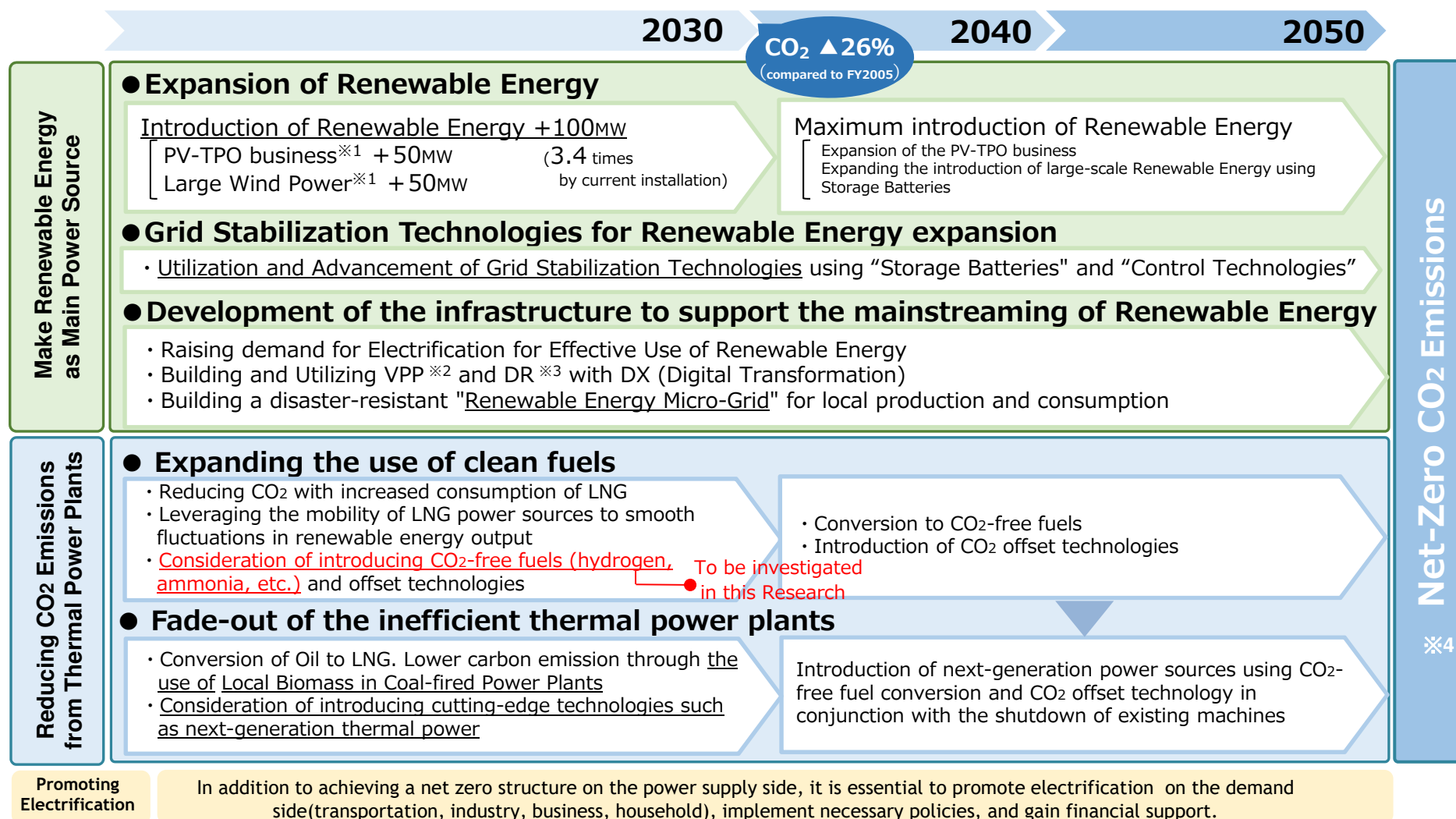
Power Plant Equipment Supplier
Kawasaki

- ① Research on the possibility of ammonia co-firing in Gushikawa Thermal Power Plant (Local Production for Local Consumption)
- ② Research on ammonia production and supply (Local Production)
- ③ Research on modification of ammonia co-firing equipment in Gushikawa Thermal Power Plant

Overview



Outline of this research ②OEPC Net-Zero CO₂ Emissions Roadmap



※1 Service in which PV and storage batteries are installed free of charge and the electricity generated is sold to customers. Both PV-TPO and large wind power are scheduled to be built and managed by our affiliated companies.
 ※2 Virtual Power Plant (VPP) refers to the collective control and management of a number of small-scale renewable energy power plants, etc., to make them function as a single power plant.
 ※3 Demand Response (DR), according to the Ministry of Economy, Trade and Industry (METI), is defined as "an act of changing the consumption pattern of electricity for consumers to curb their use of electricity in response to the setting of electricity prices or the payment of incentives when wholesale market prices rise or when grid reliability declines."
 ※4 We aim to Net-Zero CO₂ Emissions by combining renewable energy power sources with thermal power sources that incorporate CO₂-free fuels and CO₂ offset technologies.
 ※This requires the establishment of necessary technologies along with economic feasibility. We will earnestly work to achieve these conditions. Further, policy and financial support are necessary for the development and introduction of advanced technologies.