

Initiatives to achieve carbon neutrality

OEPC aims to achieve 2050 Net-zero CO₂ emissions

In December 2020, we established the long-term policy “Zero Emission Initiatives of OEPC” as social demands for global warming countermeasures continue to increase. To achieve Net-zero CO₂ emissions by 2050, presented a roadmap for measures based on the 2 directions of “make renewable energy as the main power supply” and “reduce CO₂ emissions from thermal power supply”, and are promoting initiatives as OEPC group.



Just Transition in the Okinawa area

The government calls on the power industry to play a major role in decarbonization the power industry in its “Green Growth Strategy Through Achieving Carbon Neutrality in 2050” and set an ambitious target for FY 2030 to “Reduce greenhouse gas emissions by 46%, and strive toward the higher goal of 50%”.

The government’s goal of reducing greenhouse gas emissions by 46% is equivalent to a reduction rate of 28% in the case of the Okinawa area, where zero-emission power sources are limited. Reduction rate of 28% is a tough target for the Okinawa area.

Reduction rate of **28%** is an estimate of the reduction rate in the Okinawa area, where zero-emission power is limited, as indicated in the 6th Strategic Energy Plan, because it is difficult to develop nuclear power plants and large-scale hydroelectric power plants due to geographical, topographical and grid-scale constraints, for example the installation of large-scale wind turbines is not possible due to extreme wind speed. Hydropower, wind power, geothermal power and nuclear power, which are difficult to install in this area, are calculated by replacing them with existing thermal power.

For this reason, in FY 2030, it is necessary to move towards carbon neutrality through a unique path that does not have a significant impact on the local economy, that is, “**Just Transition in the Okinawa area**” based on regional characteristics, rather than the uniform national target value.

Taking into account the features of Okinawa area, will continue to cooperate with the government’s goals and further speedup the initiatives towards carbon neutrality, which is based on the condition of a stable supply of electricity.

* For wind power generation facilities of 500 kW or more, it is assumed that the facilities will withstand calculated extreme wind speed of approximately 90 m/s or more. After the review of the examination of the construction plan notification form, windmills that can withstand extreme wind speed and large-scale wind turbines have not been introduced for more than 5 years.

Table 1 Zero-emission power supply that can be introduced in the Okinawa area

6th energy basic plan Power supply configuration		Applicable Zero-emission power supply	
		Japan	Okinawa Area
Renewable energy	About 36-38%		
Hydro power	About 11%	○	×
Wind power	About 5%	○	×
Solar power	About 14-16%	○	○
Geothermal power	About 1%	○	×
Biomass	About 5%	○	○
Nuclear power	About 20-22%	○	×
Hydrogen	About 1%	○	○
Ammonia		○	○
Thermal power	About 41%		
LNG	About 20%		
Coal	About 19%		
Heavy oil	About 2%		
Total	100%	About 57-61%	About 20-22%

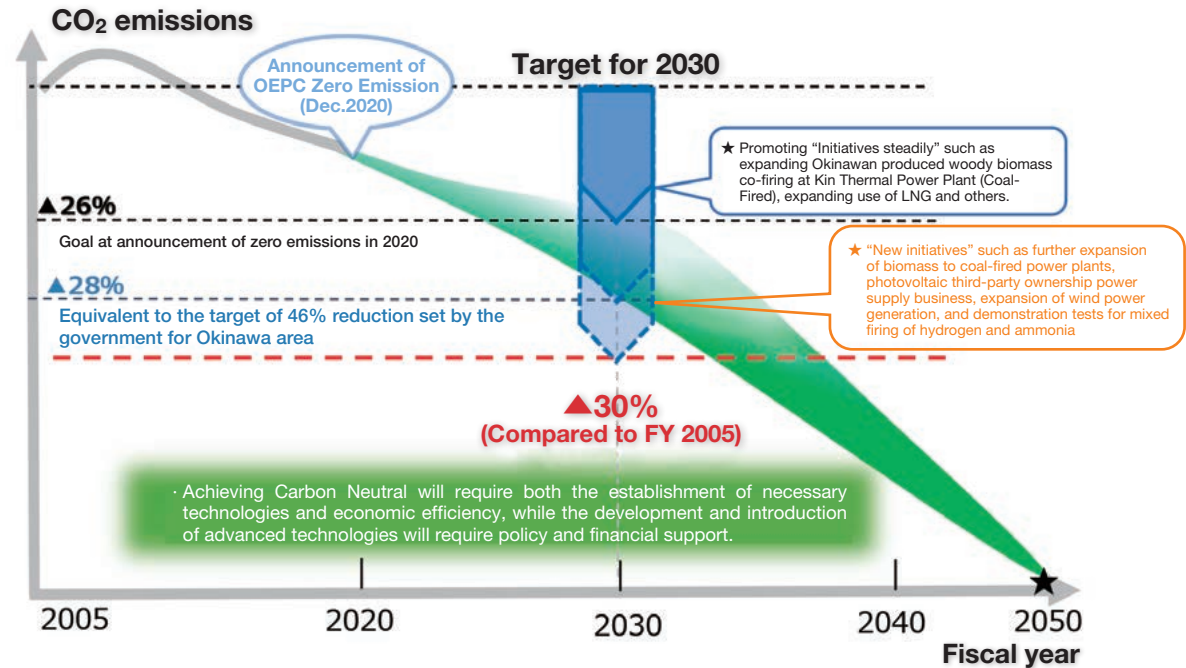
* Since the land surface area is small, there are limitations to development of solar power.

More ambitious goal for FY2030

OEPC has decided to go further than the 28% reduction, which is equivalent to the government’s target to achieve a reduction of 30% in FY 2030 (*compared to FY 2005) as an ambitious goal in “Just Transition in the Okinawa Area”. We will do our utmost to speed up the various carbon neutral measures indicated in the roadmap. In addition, to achieve both an inclusive decarbonized society and economic society in the Okinawa area, it is essential that at least the following business environment be developed with sufficient policy and financial support from the government.

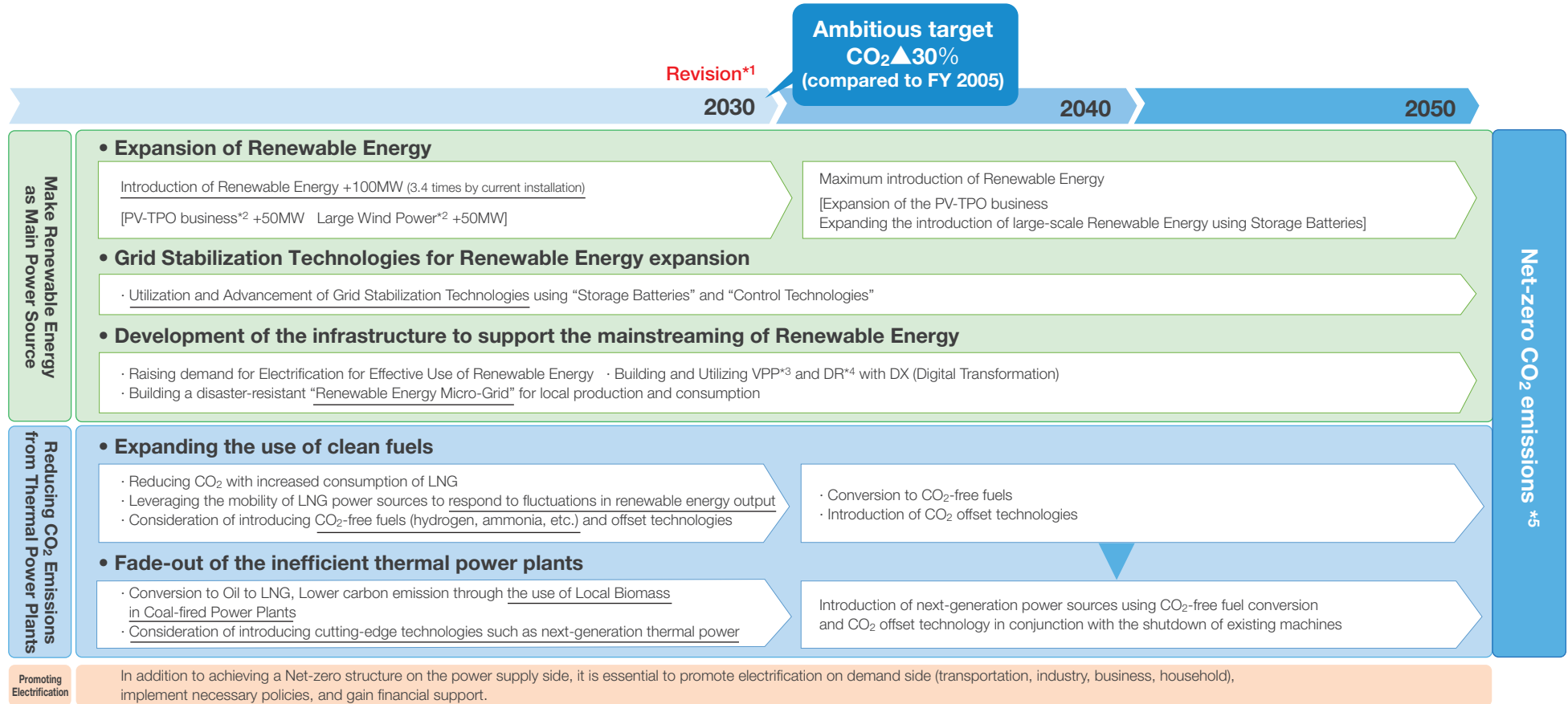
- Technological development that satisfies the installation standards for large-scale wind power generation based on the extreme wind speeds in the Okinawa area, and a business environment that allows for commercial implementation.
- To achieve a balance between securing the capacity of thermal power plants which is necessary for stable supply in the Okinawa area and reducing CO₂ emissions, a business environment that allows Just Transition to low and decarbonized thermal power generation has been established through sufficient support for efforts to reduce and decarbonize existing thermal power plants by co-firing CO₂ free fuels and other measures.
- To maximize the use of renewable energy, establish a good relationship with the local community by reducing the burden on the public through rational environmental regulations and securing suitable sites in a symbiotic manner with the local community.
- To secure the stable supply of necessary resources and fuels, the cost of supplying decarbonized fuels and technologies has been sufficiently reduced by building hydrogen and ammonia fuel supply chains in cooperation with relevant countries, and by promoting integrated initiatives to secure suitable sites for CCS.

Fig. 1 Initiatives to Achieve Carbon Neutrality: Illustration of Achievement



* Since the government’s previous target of 26% reduction compared to 2013 (25.4% reduction compared to 2005) also included the 2005 standard target and we set a target of 26% reduction compared to FY 2005, which is higher than the government target and have been working to achieve the target. Started biomass mixed firing at Gushigawa Thermal Power in 2010 as a countermeasure against global warming, and introduced Yoshinoura Thermal power (LNG) in 2012, which became pillar of the countermeasure, and we continued to use FY 2005 as the base year as this will allow us to properly evaluate our initiatives.

2050 Net-Zero CO₂ Emissions Roadmap Ver.1 (2022.10)



*1 The government's goal of reducing greenhouse gas emissions by 46% is equivalent to a reduction rate of 28% in the case of the Okinawa area, where zero-emission power sources are limited and it is a tough target for the Okinawa area. We have taken a step further by setting a new target of 30% reduction.

The government's previous target included a target for the standard of FY 2005, and as a countermeasure against global warming, we started with biomass mixed firing at Gushikawa Thermal Power Plant in 2010 and introduced Yoshinoura thermal power (LNG) as a pillar of the countermeasure in 2012. We decided to use fiscal 2005 as the base year to clearly evaluate our initiatives.

*2 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-scale wind power are scheduled to be built and managed by our affiliated companies.

*3 Virtual Power Plant (VPP) refers to the collective control and management of a number of small-scale renewable power plants, etc., to make them function as a similar power plant.

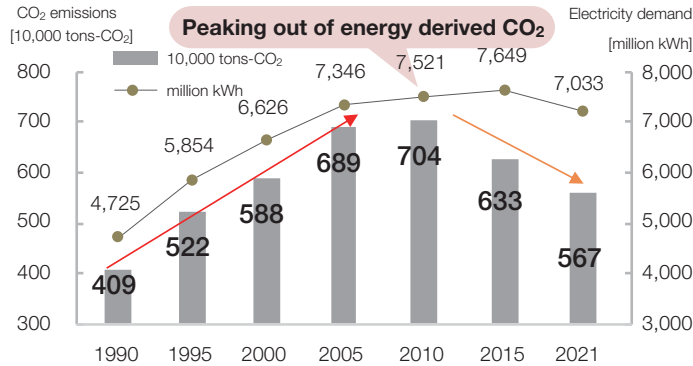
*4 Demand Response (DR), according to the Ministry of Economy, is defined as “an act of changing the consumption pattern of electricity for consumers to curb their use of electricity in response to the setting of electricity prices or the payment of incentives when wholesale market prices or when grid reliability declines.”

*5 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.

Achievement of peaking out energy-derived CO₂ emissions

While Okinawa’s economic development has led to an increase in demand for electricity, we have succeeded in peaking out energy-derived CO₂ by expanding our production capacity and introducing LNG fuel. In addition, the cost increase accompanied is being absorbed through corporate initiatives.



Expanding the introduction of renewable energy

- Introduction of Abu Mega Photovoltaic Generation Demonstration Research Facility
- Introduction of Ogimi Wind Power Generation Demonstration Research Facility
- Introduction of tiltable wind power generators and motor power generators
- Regional micro-grid construction project in Kurima Island, Miyakojima City
- Free photovoltaic power generation and storage battery installation service “KarE-roof” (PV-TPO business)

Initiatives for thermal power generation equipment

Expanding use of LNG

- Introduction of Yoshinoura Thermal Power Plant (Gradual increase in LNG use)
- City gas and satellite supply of LNG fuels (Change of fuels in the industrial sector)
- Deployment of LNG to remote islands (Decision to introduce dual-fuel generators that can use heavy oil and LNG)
- Construction of Makiminato Gas Engine Power Plant

Expanding use of biomass

- Implementation of biomass co-firing at Gushikawa and Kin Thermal Power Plant
- Introduction of the Yoshinoura Multi Gas Turbines (biofuels can be used)

Operational reinforcement

- Reinforcing the operation of thermal power plants to ensure the system stability of natural variability against the introduction of renewable energy (Implementation of daily start stop (DSS) and adjustment of load zones, etc. of power plants)

Comprehensive partnership agreements with municipalities and private companies, etc.

In December 2020, the Company announced its roadmap, and is implementing various measures aimed at achieving Net-zero CO₂ emissions by 2050 from both sides of “Mainstreaming of Renewable Energy” and “Reducing CO₂ Emissions from Thermal Power Plants”. While our initiatives are primarily on the supply side, we also need to work towards carbon neutrality on the demand side, including household, industry and transport sectors. For this reason, through comprehensive partnership agreements with local communities, etc., we will work to achieve sustainable urban development in Okinawa Prefecture and the realization of a decarbonized local society by collaborating and cooperating more closely with industry, academia and government than ever before.

Conclusion of comprehensive partnership agreements: 11

Expected effects of concluding a partnership agreement

By signing this partnership agreement, we will plan to introduce PV-TPO (solar third-party ownership model), which is one of the initiatives to make Mainstreaming of renewable energy and provide an electricity charge menu with CO₂ free value and solve the problem of decarbonization and also to promote initiatives such as joint research and projects aimed at creating new technologies that contribute to society, beach cleaning activities and environmental education.

