

エネルギーと環境を考える

**JANUS**



**The Okinawa Electric Power  
Company, Incorporated**



**SeED Okinawa**



# Challenge of decarbonizing island regions through City-to-City collaboration projects

**National Climate Change Coordinator and Focal Point to the UNFCCC  
Office of Climate Change, Office of the President, The Republic of Palau**

**Japan NUS CO LTD**

**The Okinawa Electric Power Company, Inc.**



# Overview of Palau

## Key Impacts

1. Increased air Temperature
2. Stronger storms and typhoons
3. Ocean changes
4. Increased rainfall
5. Sea level rise

## Mitigation plans and targets

- 1) Transportation
- 2) Solid waste management
- 3) \*Energy Sector



# Palau government's climate change measures

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Palau Climate Change Policy

Nationally Determined Contribution

Moana Pledge

# Efforts and expectations for achieving goals

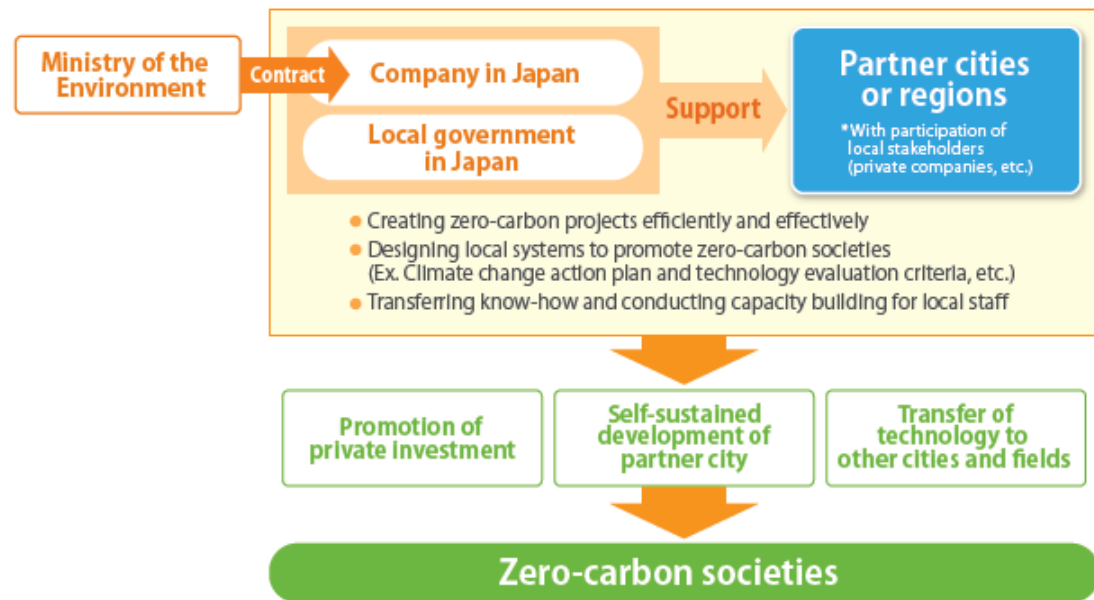
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- 1) Installation of battery storage
- 2) Upgrading the grid system
- 3) Further deployment of renewable technologies through partnerships

# City-to-City collaboration project

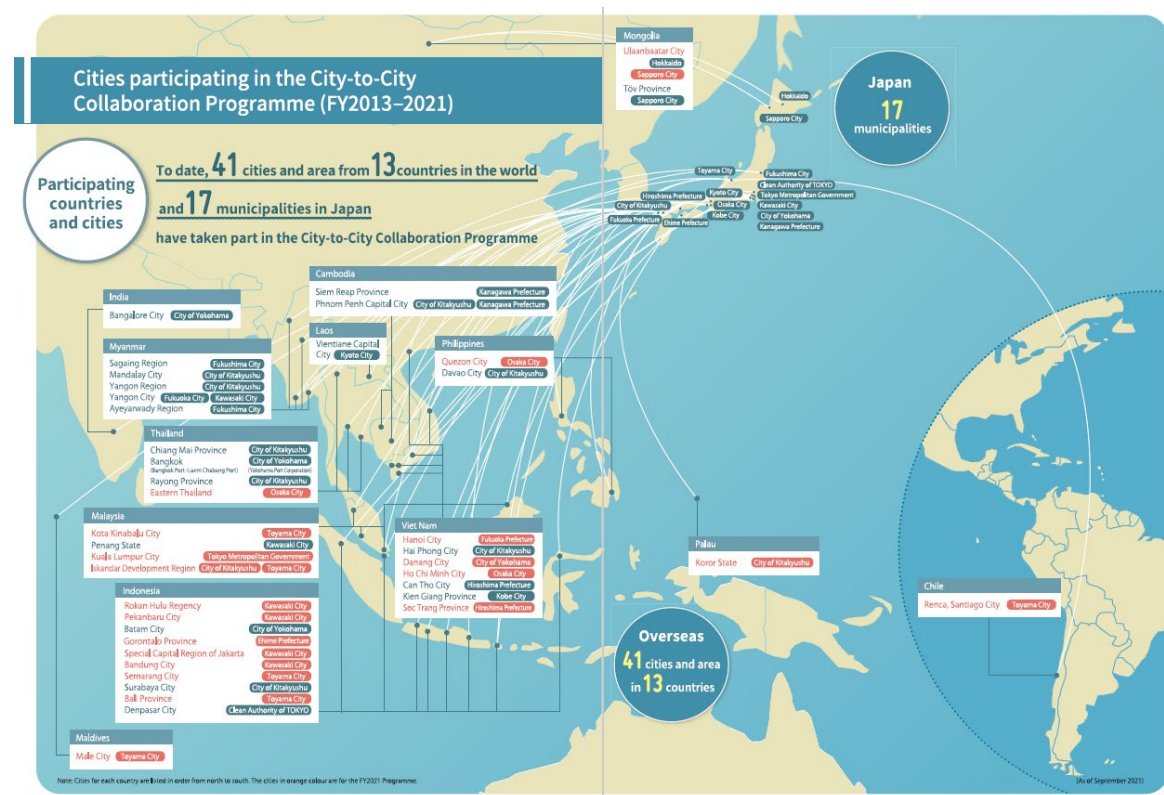
## C2C project aims to implement :

- ✓ Initiatives tailored to the region
- ✓ Multi-stakeholder collaboration
- ✓ Spread of good practices



Conceptual diagram of  
the city-to-city collaboration programme

- • • **As effective efforts towards decarbonization**





# Decarbonization in island regions

- **Challenges**

- Small scale
- High cost
- Resources shortage

- **Potentials**

- It is close to achieving 100% RE, because it is small in scale.
- RE costs can be lower than fossil fuels because fuel is expensive.
- Resolving the human resource shortage with new industries.
- Covering effective renewable energy resources with technology.



# Urasoe, Okinawa JAPAN

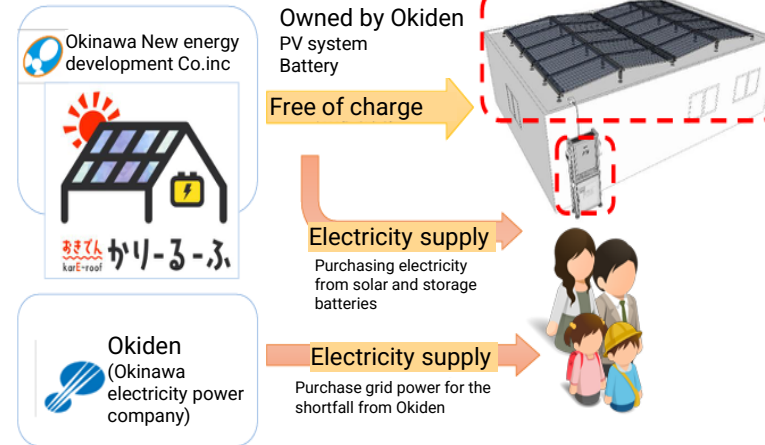
Concluded a comprehensive partnership agreement with The Okinawa Electric Power Co., Inc. to solve regional issues and develop sustainable communities

## Overview of Urasoe City

- Population growth is remarkable, and commerce and industry are active.
- The fourth largest city in Okinawa, with a population of about 116,000.
- More than 14% of the 19.48km<sup>2</sup> area is occupied by US military bases.



## Service outline diagram



Installation results:  
Urasoe Junior High School

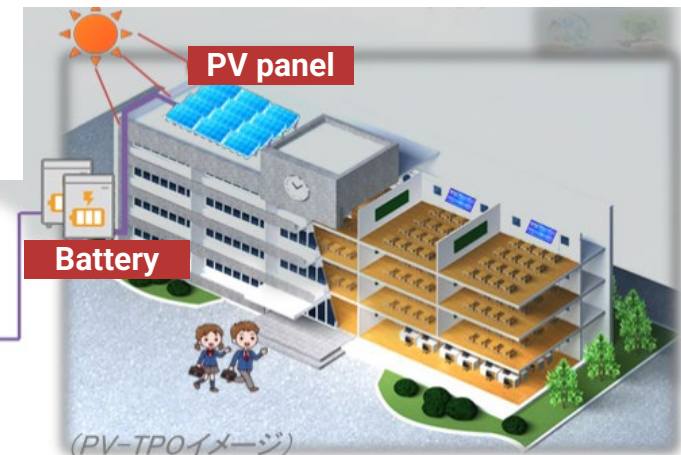
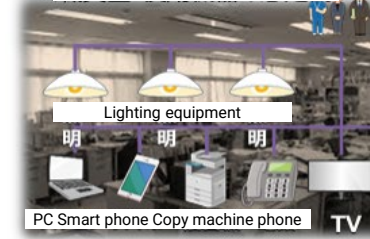
- PV capacity : 65 kW
- Battery capacity 13.5 kWh
- Solar power supply 17% of annual power consumption
- CO2 emission reduction: 73t Same as 8332 trees

Third party ownership model

SUSTAINABLE DEVELOPMENT GOALS

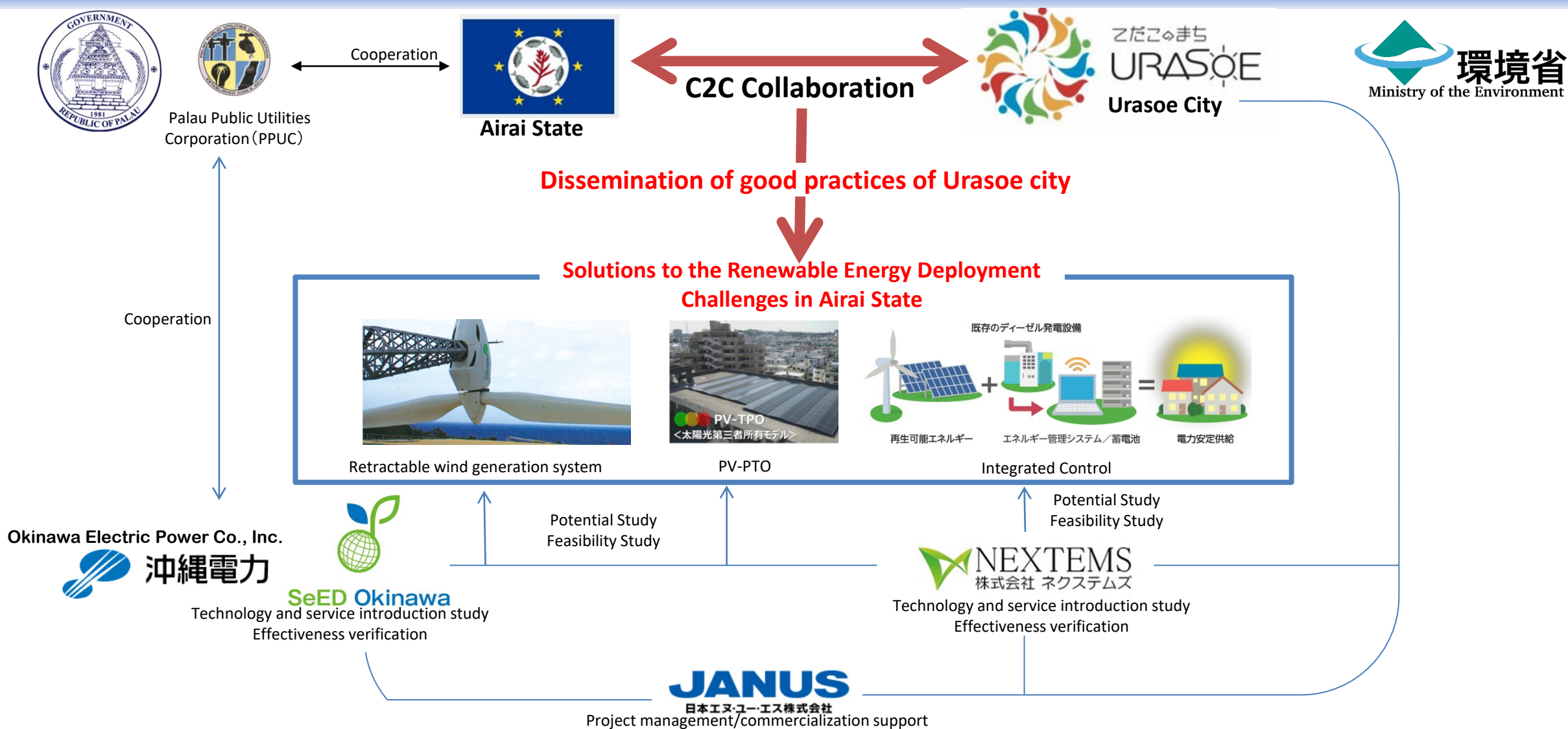


## Examples of electrical equipment





# Collaboration Structure





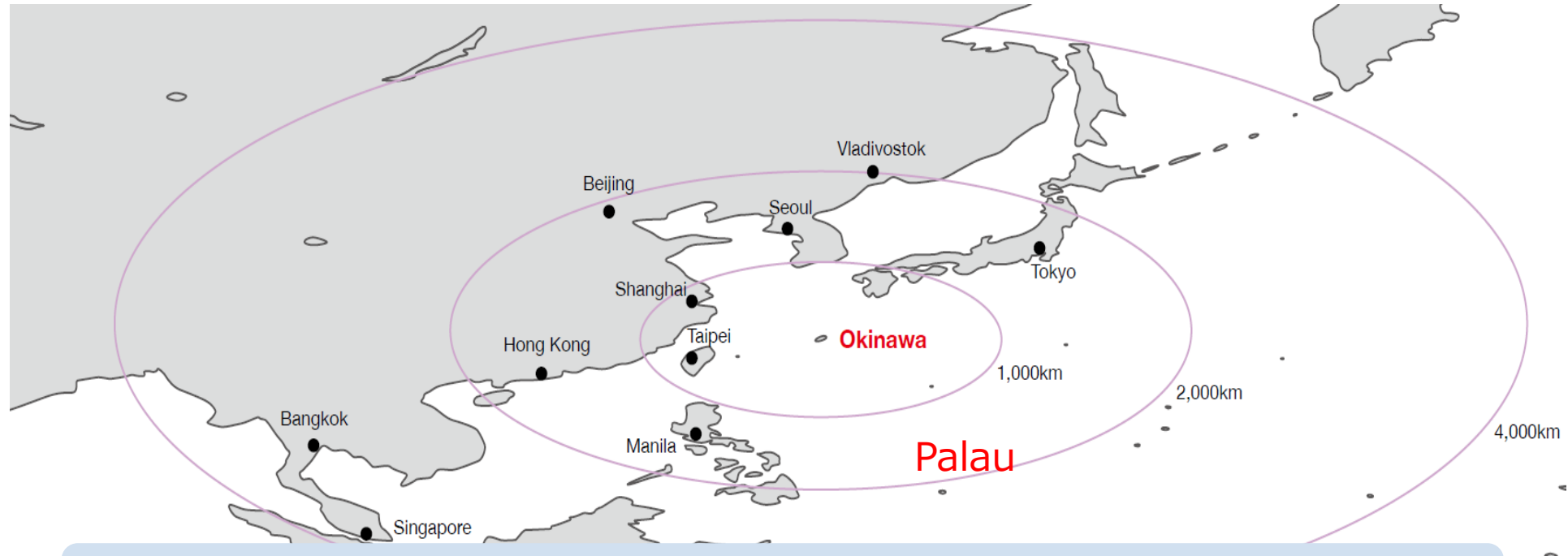


**Renewable Energy Deployment and  
Decarbonization Initiatives in the Republic of Palau**  
December 6, 2023



**SeED Okinawa**

# About Okinawa Electric Power Company (OEPC)



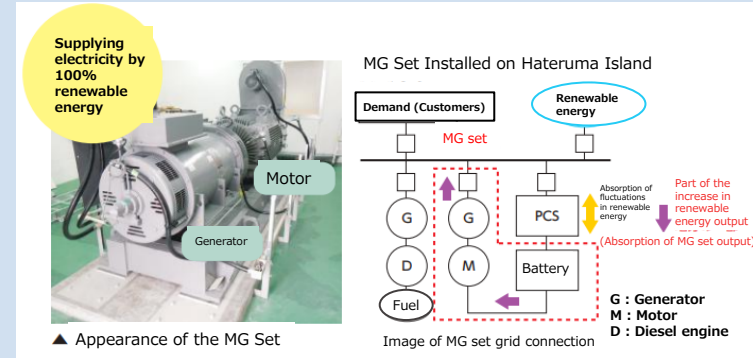
- Supplies electricity to 38 inhabited islands of Okinawa Prefecture situated at the southern tip of Japan, over a distance of 1,000 km from east to west and 400 km from north to south
- Engaged in research, development and operation of hybrid power generation using renewable energy and diesel power for over 30 years given a topography that makes hydropower development difficult
- First electric power company to declare "Zero Emission by 2050" in line with the Government of Japan policy (2020)

# Renewable Energy Development and Operation

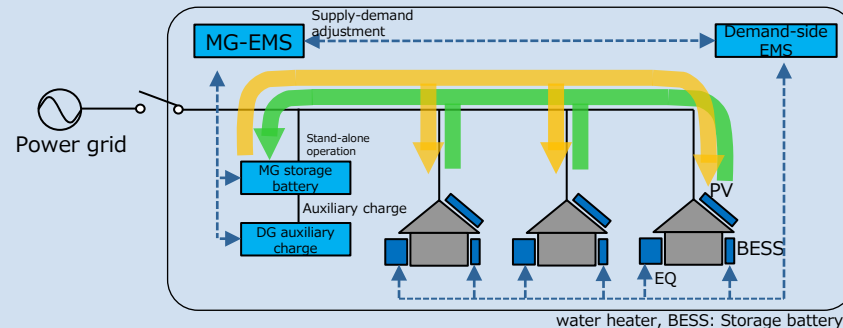
- **Deployment of Tiltable Wind Turbines: First in Japan**  
Tilting prevents damage during typhoons  
OEPC Group installed 5 units in Tonga in 2019 through ODA  
\*First Japanese ODA for wind power deployment



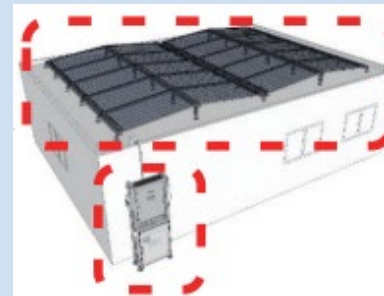
- **Establishment of Grid Stabilization Technology (MG Set)**  
Supplies electricity derived from renewable energy to the grid via storage batteries  
Achieved 100% renewable energy operation on Hateruma Island for approx. 10 days



- **Small Scale Microgrid System (ex. Kurima Island)**  
Leading example of regional energy-sharing using renewable energy and storage batteries  
Capable of supplying electricity to the area independently in the event of a grid failure



- **Free Solar Panel and Storage Battery Installation Service**  
Installation of solar panels and storage batteries with zero initial cost to the customer  
Electricity from solar panels and storage batteries can be used even in times of disaster



Residences: 384 (2.1 MW)  
Businesses: 22 (1.8 MW)

Total installed: 406  
Total output: 3.9MW

As of June 30, 2023

(deployed in the main island  
and major remote islands.)



# Phased Renewable Energy Deployment in the Republic of Palau

## STEP 1 Renewable Energy Source Deployment Phase

Selection of renewable energy sources suited for the site considering land use, natural environment, and other factors  
(Solar (Palau: 13 MW mega solar), Wind turbine, etc.)

## STEP 2 Renewable Energy Utilization Improvement Phase (1)

Initiatives to increase the utilization rate of renewable energy sources deployed by power producers  
(MG sets, grid storage batteries, and technical studies using analytical tools)



Palau is currently at this phase

## STEP 3 Renewable Energy Utilization Improvement Phase (2)

Expanded use of distributed renewable energy on the demand side as an initiative to deploy and increase the use of renewable energy while reducing impacts on the grid  
(DR using controllable load, consumer-side storage batteries, etc.)

## STEP 4 Full-Utilization Phase

Efficient grid operation integrating diesel power generation, renewable energy power sources, and demand-side facilities  
(Area Aggregation)

Seek to achieve renewable energy deployment targets through phased implementation of measures tailored to the local conditions in the Republic of Palau, along with steady capacity building of engineers in each country for enhanced sustainability.



# Palau-style Decarbonization Model (Palau Pacific Resort)

Establish a model case of carbon neutrality (STEPS 1-4) and spread it throughout the Republic of Palau.

**Deploy throughout the Republic of Palau to promote decarbonization**

## Initiatives at Palau Pacific Resort (PPR)

The following initiatives are being studied and implemented for PPR, which is an independent grid that supports its load by small-scale diesel generation.

- Deployment of renewable energy (solar) and grid stabilization using storage batteries
- Establishment of a hybrid power generation system consisting of diesel and renewable energy
- Exhaust heat recovery to use for air conditioning, and control by controllable load



Overview of Palau Pacific Resort  
Establishment : December 1984  
Rooms : 172

