



Right Way Do Right Thing

# 零碳島嶼2017

# Carbon Free Islands

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# Energy Production



Solar

A light blue oval with a dark blue border containing the word "Solar".



Wind

A light blue oval with a dark blue border containing the word "Wind".



Ocean

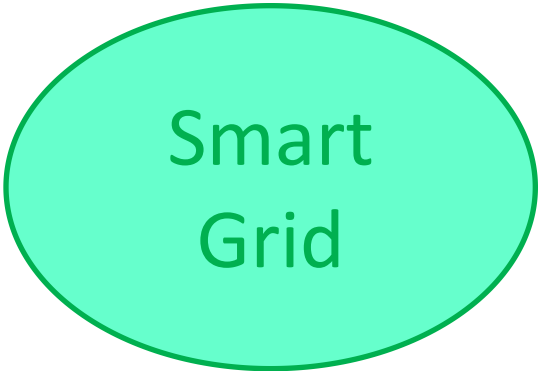
A light blue oval with a dark blue border containing the word "Ocean".

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# Energy Distribution



Micro  
Grid



Smart  
Grid



Mobile  
Storage

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# Energy Consumption



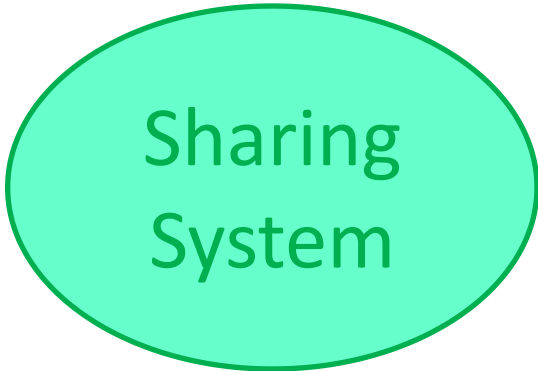
EVs

Railways

House  
Hold

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# Energy Storage



Sharing  
System



Hydrogen



Energy  
Recovery

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# Energy Trade



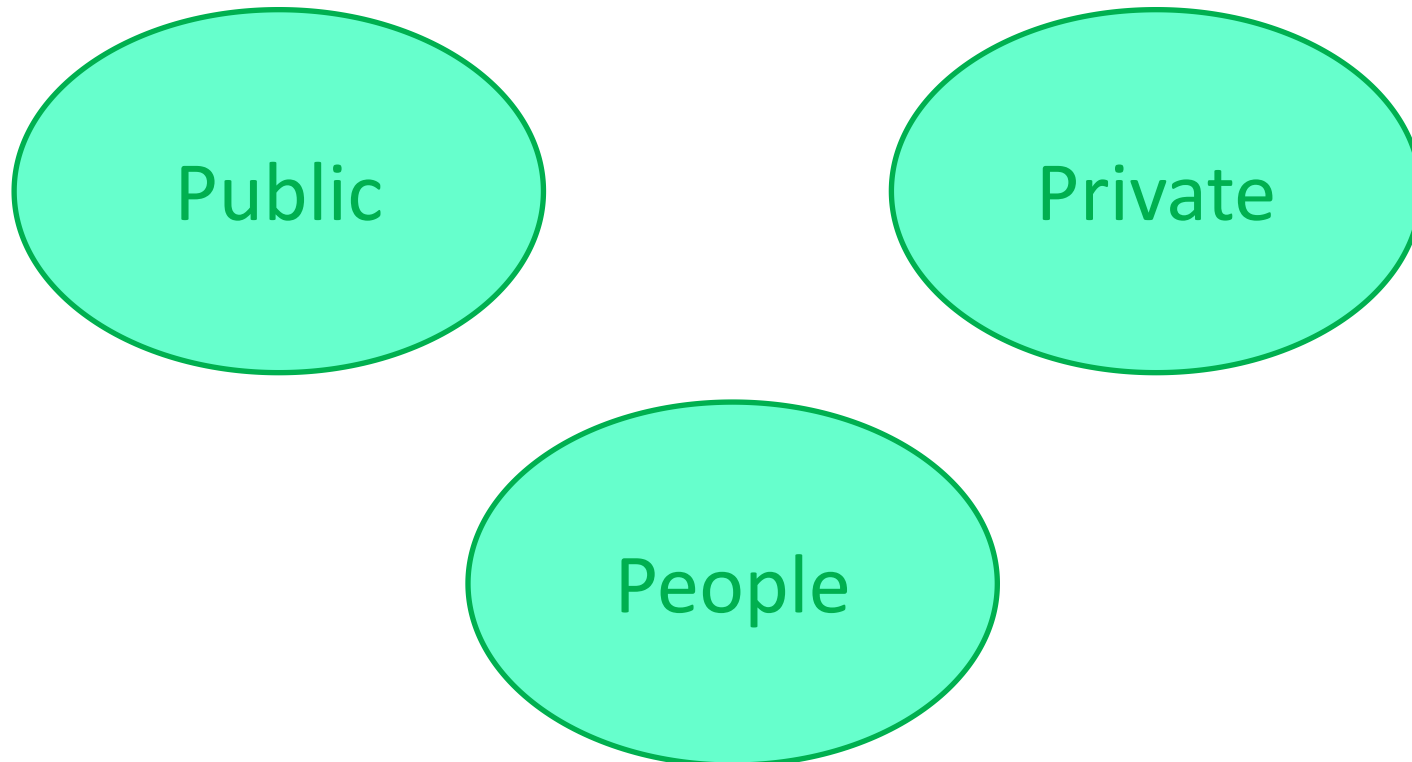
Citizen JV



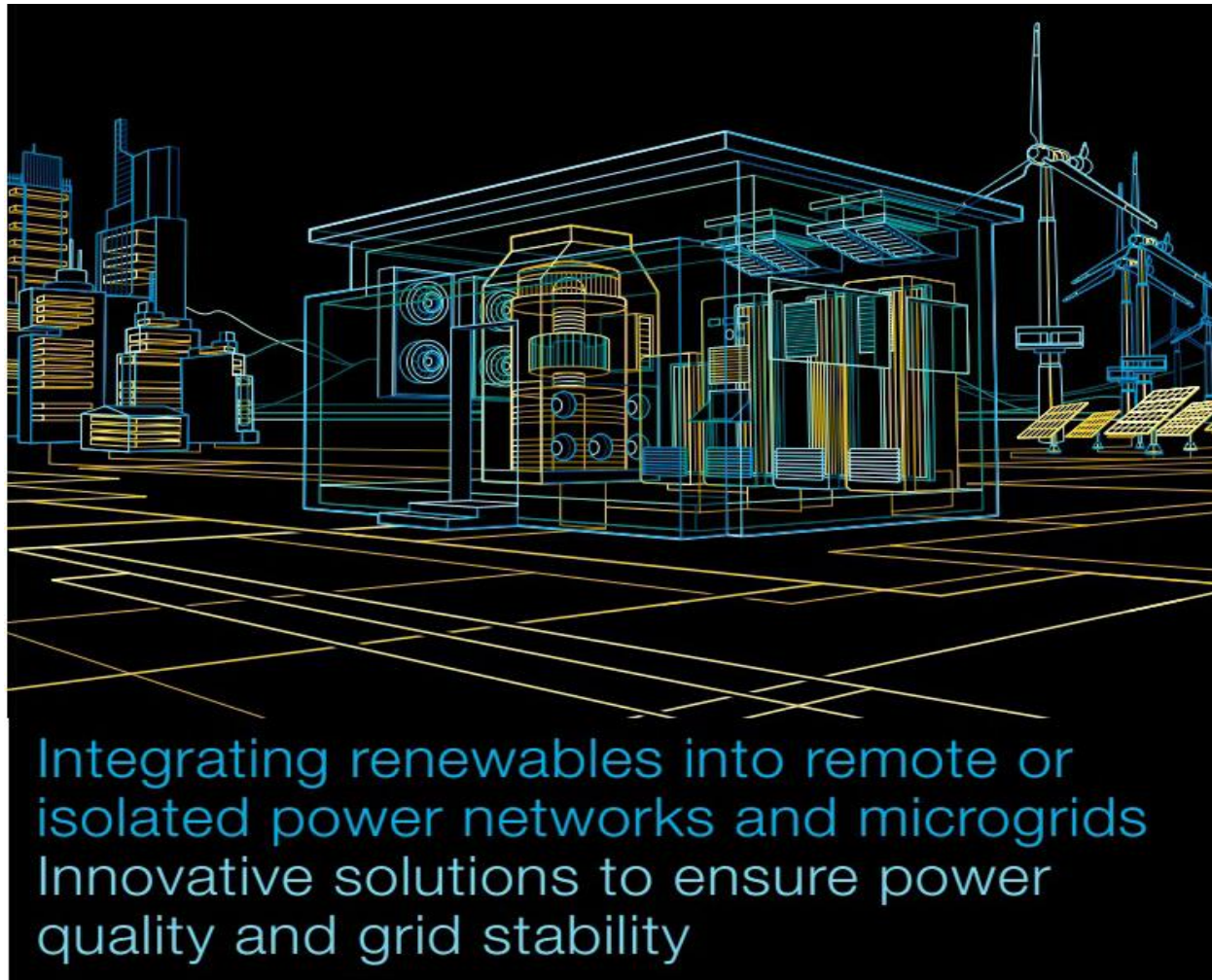
Green  
Finance

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# PPP



# Micro Grid



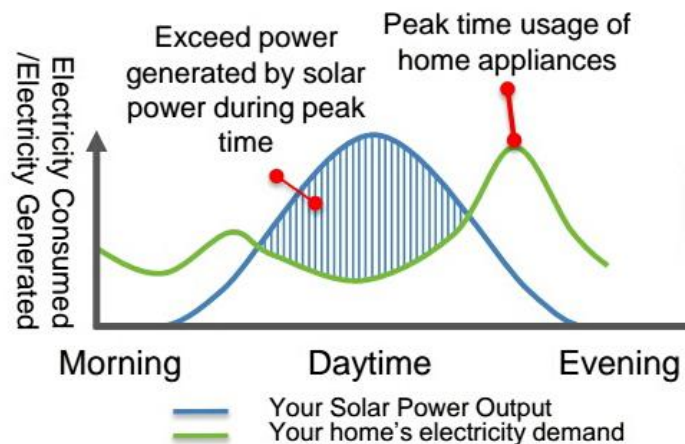


# Fuel Cell/Hydrogen

## Combination with Renewable Energy (as a Energy Storage )

### Advantage:

- Expandable power reservation
- Reliable & stable power output
- Regulate the power fluctuation
- Cross-season Mitigation capability
- Less space required

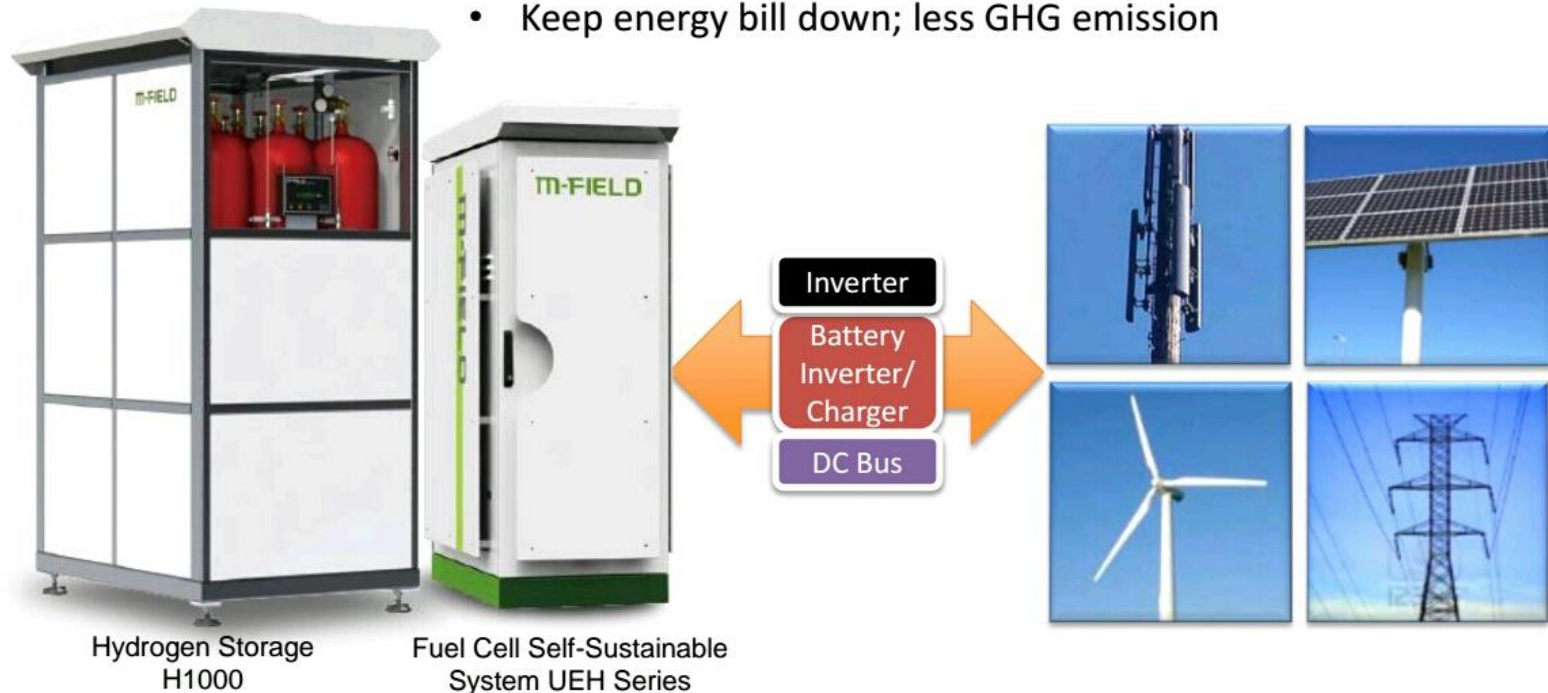


Fuel Cell Self-Sustainable System UEH Series

Hydrogen Storage H-Cube

# Micro Grid + Fuel Cell

- Self energy refill, no fuel transportation
- Minimum maintenance design, once per year.
- Ideal for city, rooftop & remote areas.
- Good for remote area; wider environmental condition tolerance
- Keep energy bill down; less GHG emission



# Cases Study



## Coral Bay

Coral Bay is the gateway to the Ningaloo Reef World Heritage Area in Northwestern Australia, where power demand increases significantly during the tourist season. A PowerStore grid-stabilizing system and Microgrid Plus System power management solution oversees the town's power supply, which consists of seven 320 kilowatt (kW) low-load diesel generation units combined with three 200 kW wind turbines. PowerStore's 500 kW flywheel technology enables the wind turbines to supply up to 95 percent of Coral Bay's energy supply at times, with a total annual wind penetration of 45 percent, while maintaining city grid standards of power stability and quality. Power station data indicates more than 80 percent of Coral Bay's power is wind generated for one-third of the year. The data also shows that for nearly 900 hours per year, wind provides more than 90 percent of Coral Bay's power supply. PowerStore maximizes an environmentally friendly solution.



## Marble Bar

The world's first high penetration, solar photovoltaic diesel power stations were commissioned in 2010 in the towns of Nullagine and Marble Bar, in Western Australia. The projects include more than 2,000 solar modules and a solar tracking system that follows the path of the sun throughout the day. When the sun is shining, PowerStore grid-stabilizing technology and Microgrid Plus System power management solution ensures maximum solar energy (100% peak penetration) goes into the network by lowering diesel generation, up to the minimum loading of the generation units. When the sun is obscured, the PowerStore covers the loss of solar power generation as the Microgrid Plus System ramps up the diesel generation, so the network has an uninterrupted energy supply. The solar energy systems generate over 1 gigawatt hour (GWh) of renewable energy per year, supplying 60 percent of the average daytime energy for both towns, saving 405,000 liters of fuel and 1,100 metric tons of greenhouse gas emissions each year.



## Ross Island

New Zealand's Scott Base and America's McMurdo Station in Antarctica are important research bases and home to about 1,200 people in the Antarctic summer. They have always relied completely on fossil fuels for power and heating, until a new system based on wind turbines, the Microgrid Plus System and PowerStore grid-stabilizing technology was commissioned in 2009. The bases still need back-up diesel generators, but three 333 kilowatt (kW) wind turbines reduce the amount of diesel required for power generation by around 463,000 liters, and cut CO<sub>2</sub> emissions by 1,242 metric tons per year, while lowering the risks of transporting and storing liquid fuel in this precious environment. A frequency converter interconnects the Scott and McMurdo bases, which operate at different frequencies – 50 Hz (NZ) and 60 Hz (US), allowing power flow in both directions.

感謝聆聽與指教  
Q&A

Vielen Danke  
Ihre  
Aufmerksamkeit

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