Expert Conference on Development of Island's Sustainable Societies
Okinawa, Japan (June/29-30/2014)

Sectional Meeting 2: Mitigation of Climate Change (Jun. 29)

Policies and Strategies for

Aiming for Independence of Energy Supply in Isolated Islands

like the Ryukyus

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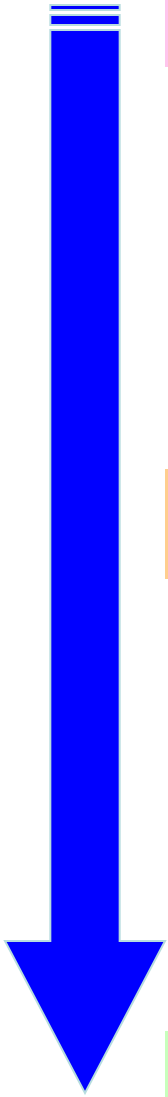
Scope of this Session



Mitigation of Climate Change (Global Warming)

Reduction in CO_2 Emission (Green House Gas)

Energy Savings and Energy Management System

Renewable Energy
(Carbon Free Energy, Carbon Neutral Energy)

Renewable Energy and Energy Management

Renewable Energy <= Local Energy Resources

Local Energy Resources = Self Supply Energy

Energy Management and Saving System

Local Energy Management => Open Energy System

Independence of Energy Supply

Special Situations in Islands

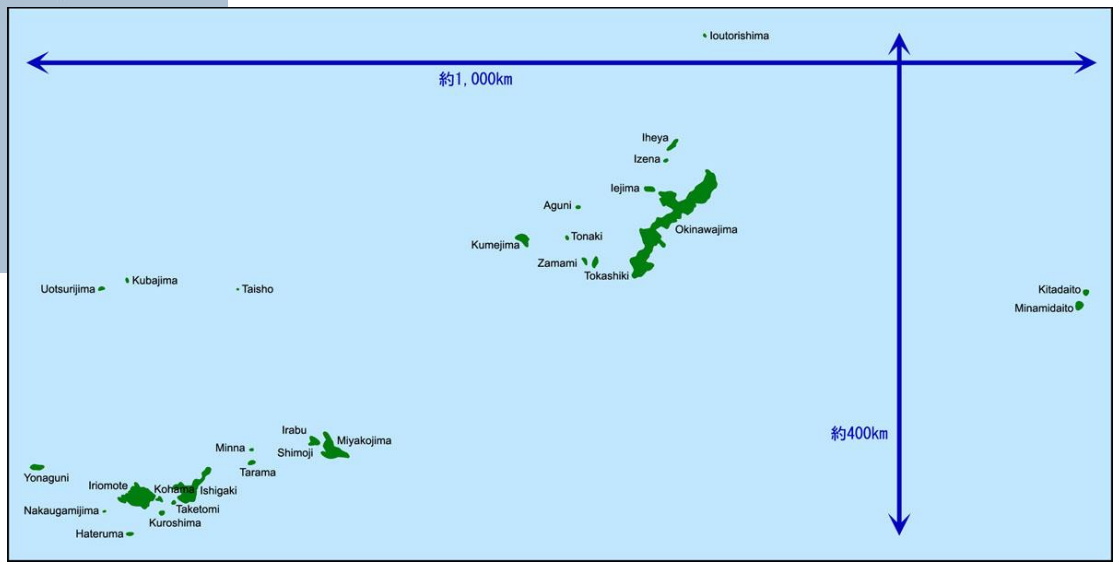
Import of Energy (Fossil Fuel)
- Difficulty of transport
- Small amount
- Stormy weather
- Irregular cargo
- Detour

Electric Power Supply
- Small-scale power plant with limited fuels
- Changeable power demand
- No connection of power grid with other regions

Importance of Self-Support
- Local energy resources
- Energy storage system
- Energy savings

Final Goal =
Independence of Energy Supply

Outline of the Ryukyus



- Total land area is about 2,266km^2, it is 0.6% of total Japan.
- Total population is about 1.4 millions, it is 1.2% of total Japan.
- Over 50% of the total area and over 90%of the population in Okinawa is.

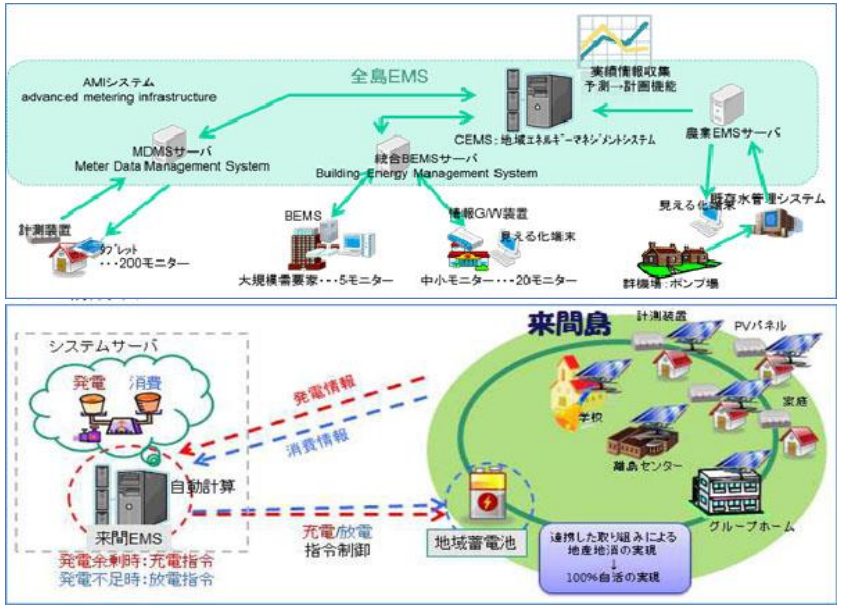
Smart Energy Island Project

- Smart Energy Houses for Warm-Humid Region
  Energy saving design of residential houses fit for life style in warm-humid area
- Energy Management of a Chain of Retailing Stores
  Energy management of a series of chain stores covered by energy saving law amended in 2010
- System Interconnection of Natural Energy
  Increase and stabilization of interconnection of solar and wind energy to an existing power grid
- Leveling System of Natural Energy
  Leveling the fluctuation of natural energy with other demand
- Development of Electric Bus (already finished)
  Conversion from diesel buses to electric buses
- Three Energy Sub-projects in Miyako Island
  Energy management system of whole island
  Large scale solar power on rented roofs of all houses in Kurima Is.
  Development of small size electric vehicles

Samples of Smart Energy

Smart Energy House

EV Bus

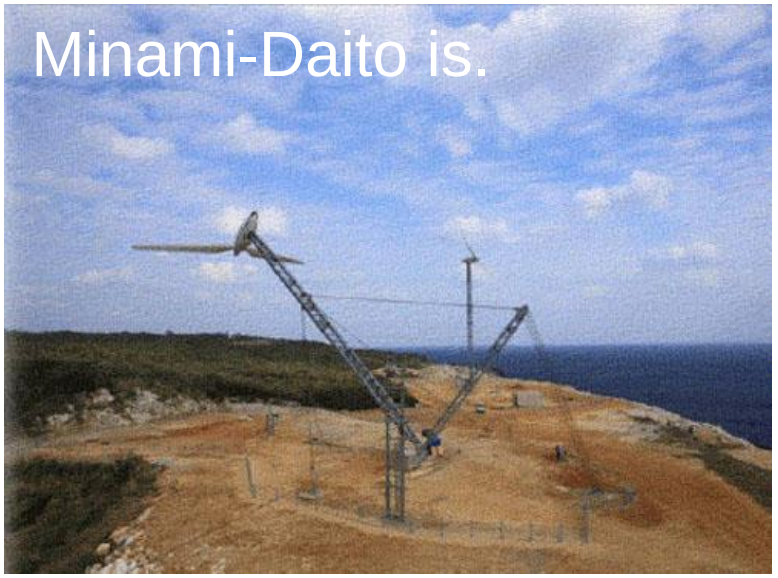


Promotion of EMS by
"MIERUKA"
(Visualization)

EMS of Whole Miyako Island

Mega Solar and New Wind Power

Mega Solar Field in Miyako Is.



Tiltable Wind Turbines
in Minami-Daito is.
and Hateruma Is.

Biomass (Recycle) Energy

Waste Water Purification Center in Naha, Okinawa Is.

- Digested gas from organic sludge
- Power generator by methane

Waste Management Center in Ishigaki Is.

- CO from imperfect combustion of waste wooden materials
- Power generator by CO

Important Remarks about Islands

- **Geographical Characteristics of Okinawa**

  Okinawa is regarded as a suitable place for small-scale smart grids with clean energy technologies, because it is an isolated archipelagic area rich with people, culture and social infra structures.

- **Not Test Field But Living Environment**

  However, Okinawa is not only a test field, but an actual living environment for 1.4 millions residential people and 6 millions tourists to apply the advanced technologies.

- **Environmental Impacts of New Technologies**

  To estimate the impacts of new technologies and further developments on the limited valuable subtropical natural and living environments in Okinawa is essential.