

Shimizu Carbon Management Approach -----from Microgrid to Smartgrid-----

A DECK

NiMH 400kWh

PV 10kW

Energy Center

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Shimizu carbon management roadmap



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*METI's Committee on Realization and Deployment of Zero Emission Buildings

Curent state of building energy



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Microgrid in ZEB



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What is the purpose of microgrid ?

Microgrid in Urban Area

Power supply system as BCP in case of emergency

- Medical center
- Industrial park or essential production facilities
- IT data center or traffic control center...



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Penetration promotion of intermittent renewable energy, or biomass energy

- Solar park or wind farm
- Unelectrified villages in developing countries
- Isolate islands
- Key technology for CDM/JI



Shimizu microgrid in urban area



Renewable energy and microgrid



mega-scale renewable energy and utility power line

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Microgrid system in SIT





Microgrid layout in SIT







Cascade control system in islanded mode



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Microgrid installation effect in SIT

Efficiency

- Primary Energy consumption : ▲10.3%
 Summer : total efficiency : 49% (heat recovery 22% of cooling load)
 - Winter : total efficiency : 66% (heat recovery 65% of heating load)

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Emission

• $CO_2Emission$: $\blacktriangle 10.5\%$







International Cooperative Demonstration Project for Stabilized and Advanced Grid-connection PV Systems (NEDO)

Demonstration Study of Stabilized and Advanced Grid-Connection PV Systems for Micro-Grid (High Quality Power Supply) System



Demonstration site: Hangzhou Dianzi University, Zhejiang, China

Microgrid system architecture



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Site Layout







Linked mode test results





Islanded mode test results





Full-scale smartgrids and microgrids – scheme –



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- Stabilization of distribution line by power flow control at the PCC
- High reliable and stable power supply by the BEMS in islanding mode
- Examination of DSM targeted the air-conditioning system
- Examination of high function PCS for PV (FRT/LVRT)



Power flow control image with DR/DSM



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