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In-House Implementation of Advanced Green ICT

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R&D

Green Reference for Tomorrow

Microgrid Proving Test

Promoting the use of renewable energy to realize a low-carbon society

Green Reference for Tomorrow

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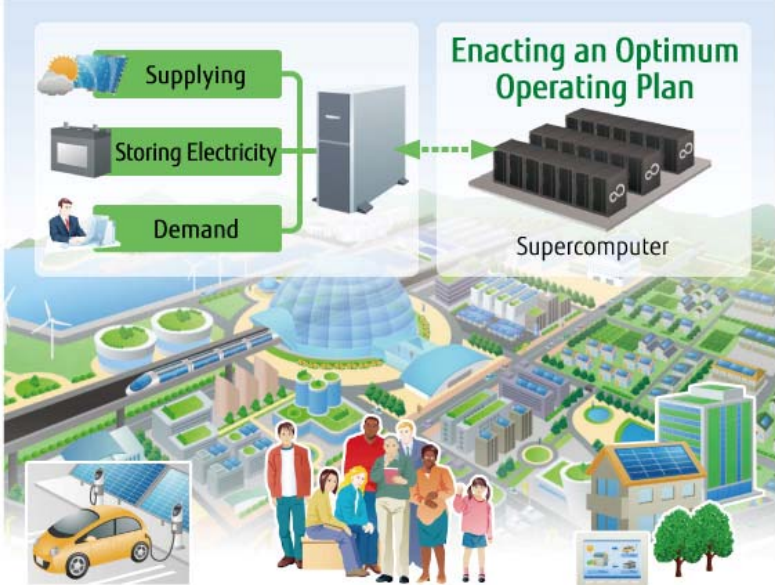
Green IT, Green Policy Innovation



Green Policy Innovation

ENGINEERINGCLOUD

Microgrid Proving Test



Smart Community

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- Proving tests of ICTs for advanced energy management using a microgrid system in a business facility, including photovoltaic panels and storage batteries.
- Aiming to make maximum use of solar energy, large scale simulations are performed with a large number of possible scenarios to optimize operating plans of storage batteries in order to cope with the difficult-to-predict fluctuations of solar energy.

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### Drawing up an optimum storage battery operating plan with 10,000 possible scenarios each day

Significant amount of solar power and other renewable energies must be exploited to realize the low-carbon society. But the weather-dependent instability of renewable energy production makes it difficult for energy management systems to use those types of energies in accordance with varying demands.

To solve this problem, Fujitsu has developed a novel information technology to optimize operating plans for storage batteries in order to cope with the unpredictable change of renewable energy production, and is now conducting proving tests of that technology using a microgrid system at the Fujitsu Kawasaki Research & Manufacturing Facilities, consisting of a photovoltaic (PV) power generator, a storage battery system, and a controller.



"We believe large-scale simulation will be a key technology for coping with the unpredictable nature of renewable energy resources."

**Yoshio Nakao**  
Senior Manager, Application Research and Development Division  
Next Generation Technical Computing

Fujitsu Limited



Photovoltaic Power Generating System



Hybrid Electric Power Generation System

This technology prepares optimal storage battery operating plans as follows: A supercomputer performs large-scale simulations with a large number of supply/demand scenarios, e.g., approximately 10,000 scenarios per day, which are generated probabilistically with past data of electric power use and generation; Based on the results of those simulations, it then determines an optimal operation plan, i.e., optimal control parameters concerning night-time charging and day-time charging/discharging, for each possible situation in consideration of the perspective of the situation changing as to make maximum use of PV generation. For example, on a day when the PV cells probably produce surplus electricity, a smaller quantity of night-time charging is assigned so that the storage batteries can store surplus electricity and discharge in the evening when the quantity generated has declined. On a day when cloudy or rainy conditions are predicted, a larger quantity of night-time charging is assigned so that the storage batteries can reduce the daytime peak power with the electric power stored during the night. Making maximum use of the capacity of the storage batteries in this way can boost their environmental load reduction and cost cutting effects.

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**Contributing to the creation of Smart Communities**

Expectations of the contribution which renewable energies will make to realize the low-carbon society are rising. Fujitsu has developed simulation technologies to be used to optimize the use of renewable energies by applying ICT. This contributes to the establishment of Smart Communities, which need a stable supply of renewable energy.



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