

O-35	Keywords	Y3	equipment or facility	Z4	electricity	S1	smart grid
						E29	electrical machinery

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Community Energy Management System (CEMS)

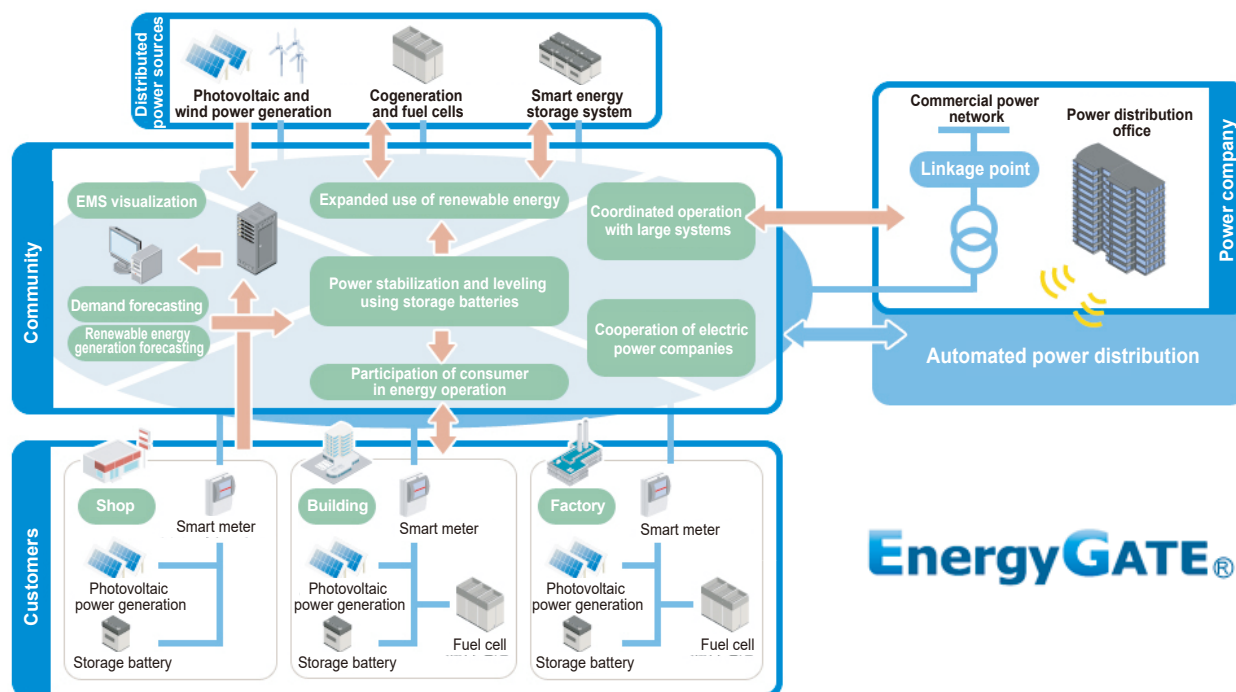
Features

- Optimal operation and CO₂ reduction by adjustment of power demand of community energy
 The Community Energy Management System (CEMS), which is used in an unstable power system with renewable energy (photovoltaic and wind power) generation, realizes optimal operation that minimizes CO₂ emission while solving power quality problems due to supply-demand imbalance and reverse power flow.
- Linkage between EMSs
 Factories, buildings, shops, and condominiums are introducing energy management systems (EMSs) suitable for each of the structures (FEMS, BEMS, REMS, and MEMS) to attain energy optimization and energy saving independently while community energy center manage the energy of the entire community to control it.

Basic Concept or Summary

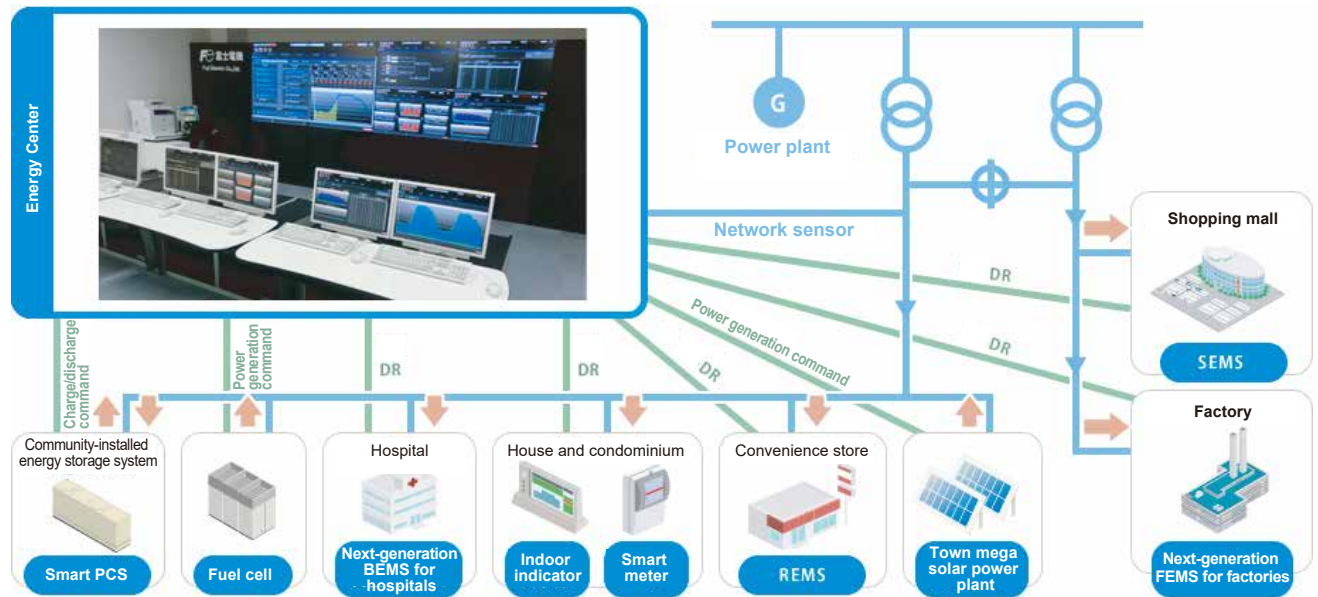
We constructed an integrated EMS platform that includes CEMs and various EMSs that support the community energy system

Various features constructed with EMSs can be applied to various systems, both in and out of Japan. Therefore, each function can be packaged for flexible deployment.



Characteristic features

- ✓ Support of both small and large systems (scalability)
 On a common platform, various operation systems (such as CEMS, BEMS, FEMS, and REMS), large and small, can be constructed.
- ✓ Collection and visualization of energy data
- ✓ Demand forecasting
- ✓ Optimal operation plan
- ✓ Global language support
 The multi-language support (Japanese, English, and Chinese) enables application in various districts and countries.
- ✓ Multi-area management support
 More than one area can be managed with one system. Furthermore, hierarchical management of customers, facilities, etc. is available.
- ✓ System expansion through linkage with other company's systems
 Linkage between CEMS and other company's applications is available via standard interfaces.



Main function

- Renewable energy (photovoltaic and wind power) generation forecasting
- Optimal supply-demand plan, supply-demand control, and frequency control using storage batteries
- Demand response (DR) feature for ensuring load leveling and supply-demand balance

Effects or Remarks

The Dynamic Pricing (DP*) was conducted to verify the technology for balancing and stable control of supply and demand of energy in the community. The electric utility rate during peak hours was changed in five stages from 15 to 150 yen/kWh. As a result, an effect of decreasing the demand by 9 % to 13 % was confirmed (result of social demonstration in the Kitakyushu Smart Community Creation Project).

* DP: Dynamic Pricing

The electric utility rate is changed daily according to changes in the supply-demand circumstances of the community. The power saving actions by customers are promoted by raising the electric utility rate in a time zone when the demand becomes excessive in comparison with a limited supply volume (such as daytime in summer). One of the demand responses (DRs).

Installation in Practice or Schedule

Domestic In addition to the Kitakyushu Smart Community, other projects include the development of the Tohoku Smart Community and the demonstration frequency stabilization for remote islands.

Overseas Working on overseas projects, mainly in Southeast Asian countries, taking advantage of the record of performance cultivated in Japan.

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