

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

## Community Energy Management System (CEMS)

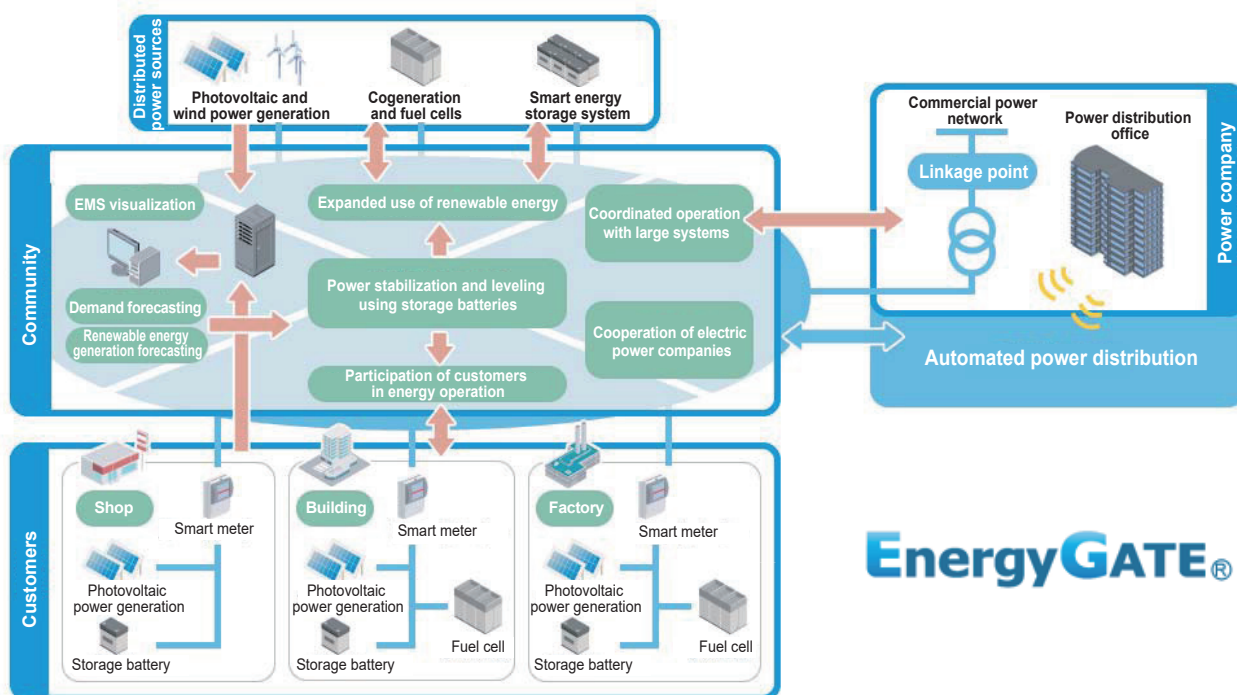
### Features

- Optimal operation and CO<sub>2</sub> reduction by adjustment of power demand of community energy  
 The Community Energy Management System (CEMS), which is used in an unstable system based on renewable energy (photovoltaic and wind power) generation, realizes optimal operation that minimizes CO<sub>2</sub> 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 power saving stations manage the energy of the entire community to control it.

### Basic Concept or Summary

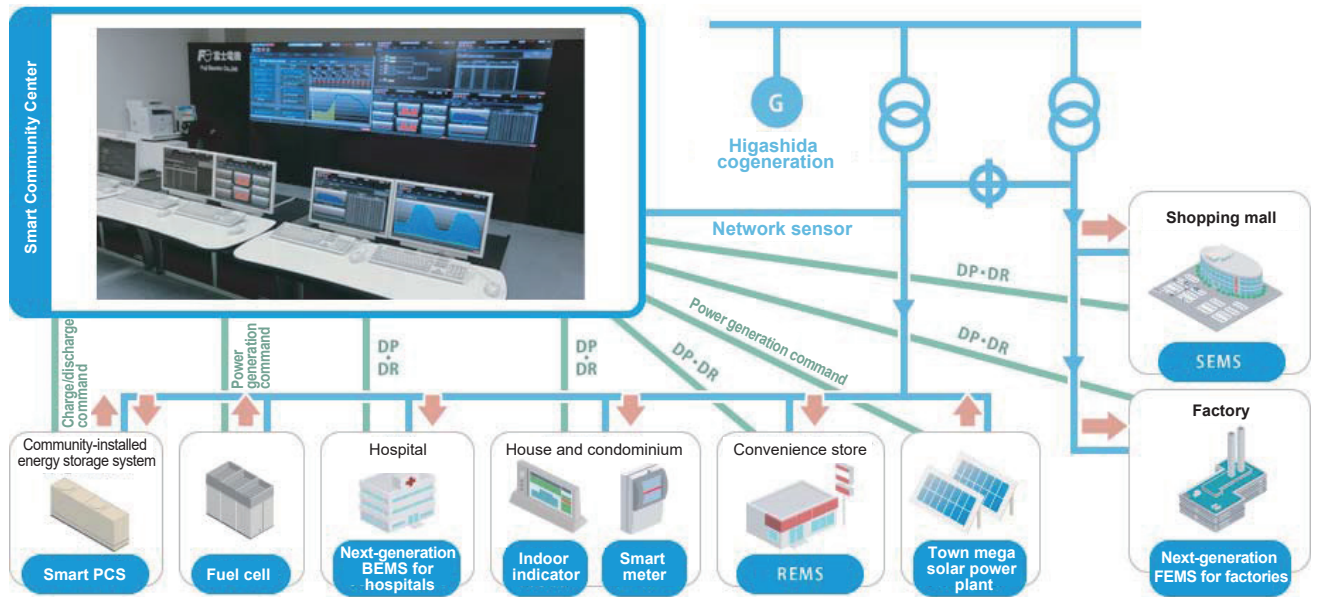
Construction of an integrated EMS platform that includes CEMSs and various EMSs that support the community energy system

Various features constructed with EMSs can be applied to various systems, both in and out of Japan. Therefore, each feature 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 features

- Renewable energy (photovoltaic and wind power) generation forecasting feature
- 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 (Incentive-type DR · DP\*)
- Use of smart meter linkage for bidirectional communication with customers and contract capacity change feature

\* 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).

### 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).

### 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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