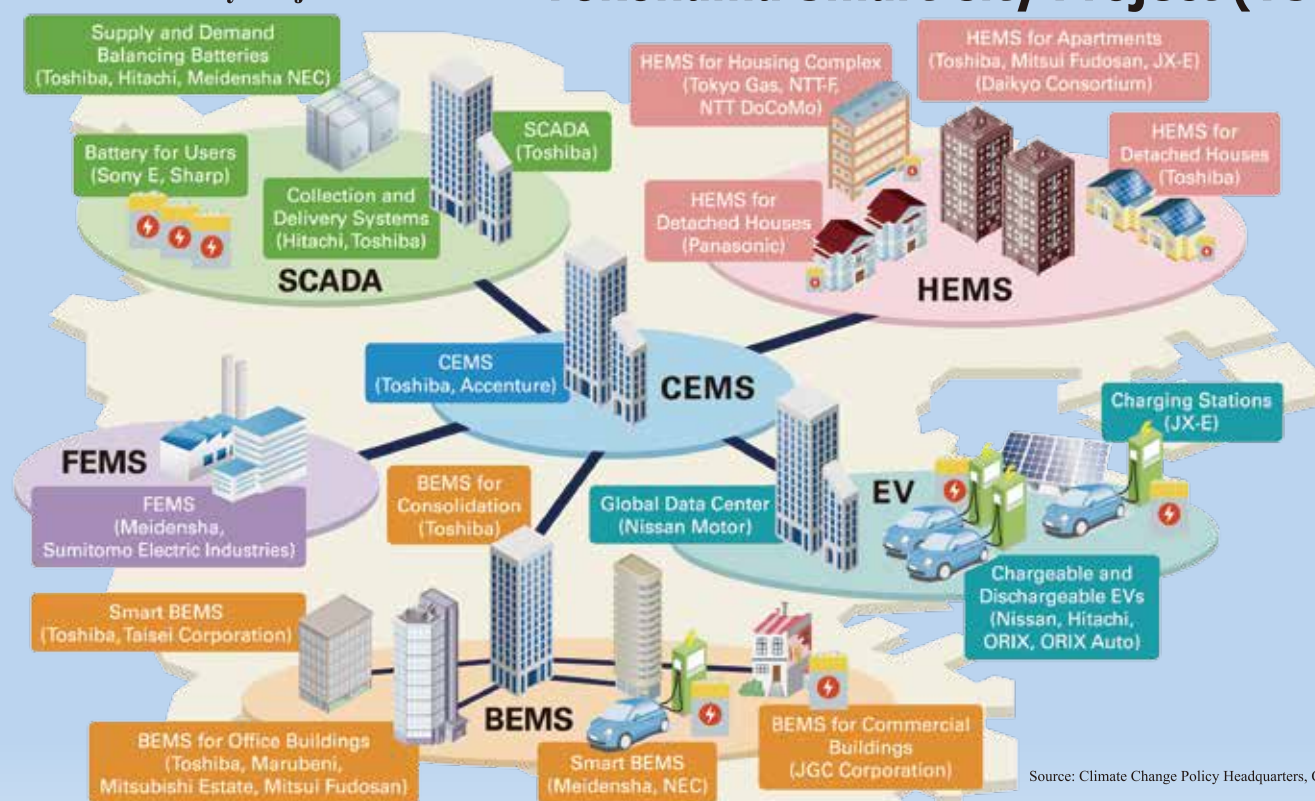


Large Scale Demonstration with Citizens and Firms

Yokohama Smart City Project

- Yokohama Smart City Project (YSCP) -



Continuing pioneering experiments to achieve a Smart City

Project Summary

The New Midterm Four-Year Plan (2010-2013) of Yokohama City proactively revised its target to reduce green house gas (GHG) emissions by 25% and 80% by 2020 and 2050, respectively. To achieve this target, the City is pursuing an Eco-city strategy and is very eager to promote the Yokohama Smart City Project (YSCP).

In April 2010, the smart city project was selected by the Ministry of Economy, Trade and Industry as a "Next Generation Energy Infrastructure and Social System Demonstration Area" to establish overseas expansion of Japan's smart grid.

The City is collaborating with the private sector (including Accenture, Tokyo Gas, Toshiba, Nissan Motor, Panasonic, Meidensha, TEPCO,

etc.) to work on various projects such as introduction of renewable energy, energy management of households, buildings and local communities, and next generation transportation systems.

The project demonstrates a large scale energy management system, demand response (DR) and 2,000 electric vehicles involving houses, residential complexes, buildings and factories. The project has started in three diversified areas within Yokohama City, namely the Kohoku New Town (residential area), Minato Mirai 21 (urban center), and the Yokohama Green Valley (industrial area). With these areas as the core experimental sites, the project is now gradually spreading to other areas in the City.

The energy management system consists of Home Energy Manage-

ment System (HEMS), Building Energy Management System (BEMS), Factory Energy Management System (FEMS), and Community Energy Management System (CEMS) which are typical but indispensable components of a smart city. In this project, HEMS is planned to be installed in 4,000 houses, and BEMS as well as FEMS will be applied to a total area of 1.6 million m² of buildings.

Yokohama Smart City Project

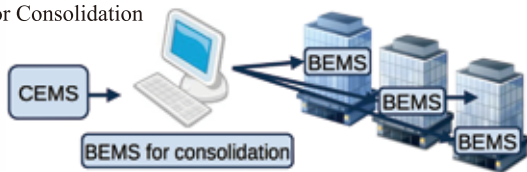
“Make a smarter city through regional energy management”

The city designed and implemented the G30 Plan jointly with the private sector and the citizenry based on the “polluter pays” principle and the concept of extended producer responsibility. The G30 Plan identified the responsibilities of stakeholders, i.e., the citizens, the private sector, and the government, and developed a strategy for collaboration among them in promoting the 3 Rs (reduce, reuse, recycle).

BEMS for Consolidation:

The group management system of various buildings can optimize allocation of energy availability and maximize capability for Demand Response (DR), which results in lower maximum energy demand than energy management systems of respective buildings.

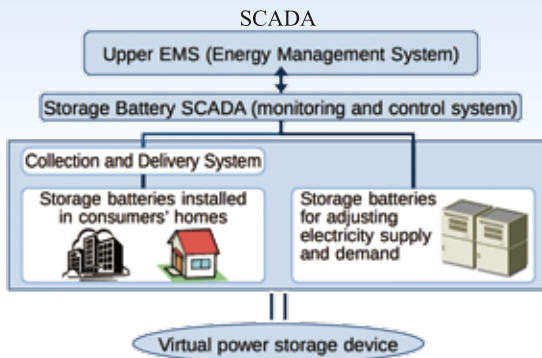
BEMS for Consolidation



Source: JICA Study Team based on information from Climate Change Policy Headquarters, City of Yokohama

SCADA:

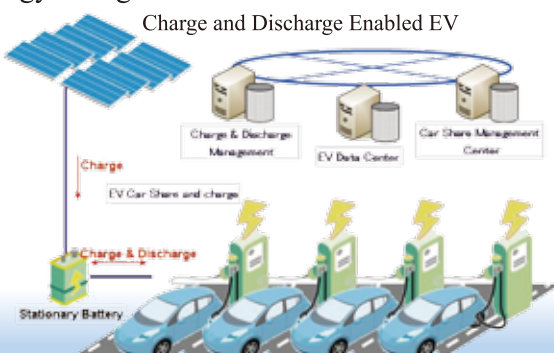
Supervisory Control and Data Acquisition (SCADA) is a unified management system of demand side stored batteries and batteries for demand/supply adjustments in an area. In case adjustment of demand/supply of electricity is required, Upstream EMS, such as CEMS, has SCADA system control charging and discharging of stored batteries. By managing all batteries together, it is possible to utilize all batteries as a huge stored battery.



Source: JICA Study Team based on information from Climate Change Policy Headquarters, City of Yokohama

Charge and Discharge Enabled EV:

“Charge and Discharge enabled EVs” enable to increase the use of solar power and lower well to wheel EV CO₂ footprint and can be leveraged as clean energy storage.

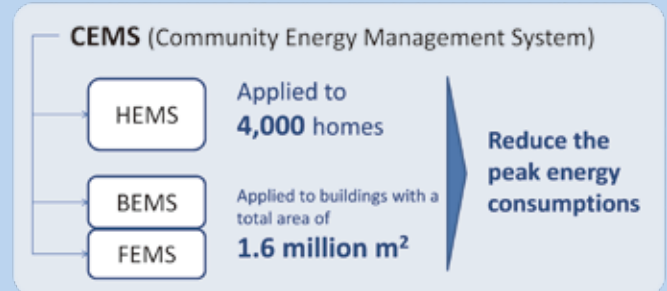


Source: Climate Change Policy Headquarters, City of Yokohama

“Yokohama City aims to effectively reduce CO₂ emissions.”

To reduce CO₂ emissions in the city, YSCP sets a specific goal for each tool of the project, namely: installation of HEMS in 4,000 homes; installation of BEMS in buildings with a total area of 1.6 million m²; and creating infrastructure for supporting 2,000 Electric Vehicles within the city.

Plan Image for Reduction of CO₂ Emission



Other initiatives in this project include:



Introduction of
2,000 EVs

Source: JICA Study Team based on information from Climate Change Policy Headquarters, City of Yokohama

“Maximum 22% peak power reduction achieved with BEMS for Consolidation.”

YSCP tested the effect of DR on six large buildings for a week in winter utilizing BEMS for Consolidation.

Although the goal of the DR was 20%, it achieved a maximum of 22% reduction in peak energy consumption and proved BEMS for Consolidation is effective.

Similarly, the operational experiment of HEMS, which are installed in around 1,900 houses and linked to CEMS, has also started. The experiment aims to reduce the peak energy consumption by about 20%; 10% by visualization of energy usage and 10% by practice of DR.

“Demonstration with citizens and private companies.”

Yokohama City led the YSCP demonstration and facilitated the consortium which consists of 34 private firms. In addition, the City made the project acceptable for citizens through direct communication. Without that, it was not possible to conduct such a large scale experiment. This shows strong ties and collaboration between the local government and private firms and citizens.

The research and development phase of the project commenced in the mid-FY2010 and finished in the mid-FY2012, followed by the second phase of the project in which the demonstration is conducted and will be finalized by the end of FY2014.