

New Business Activities

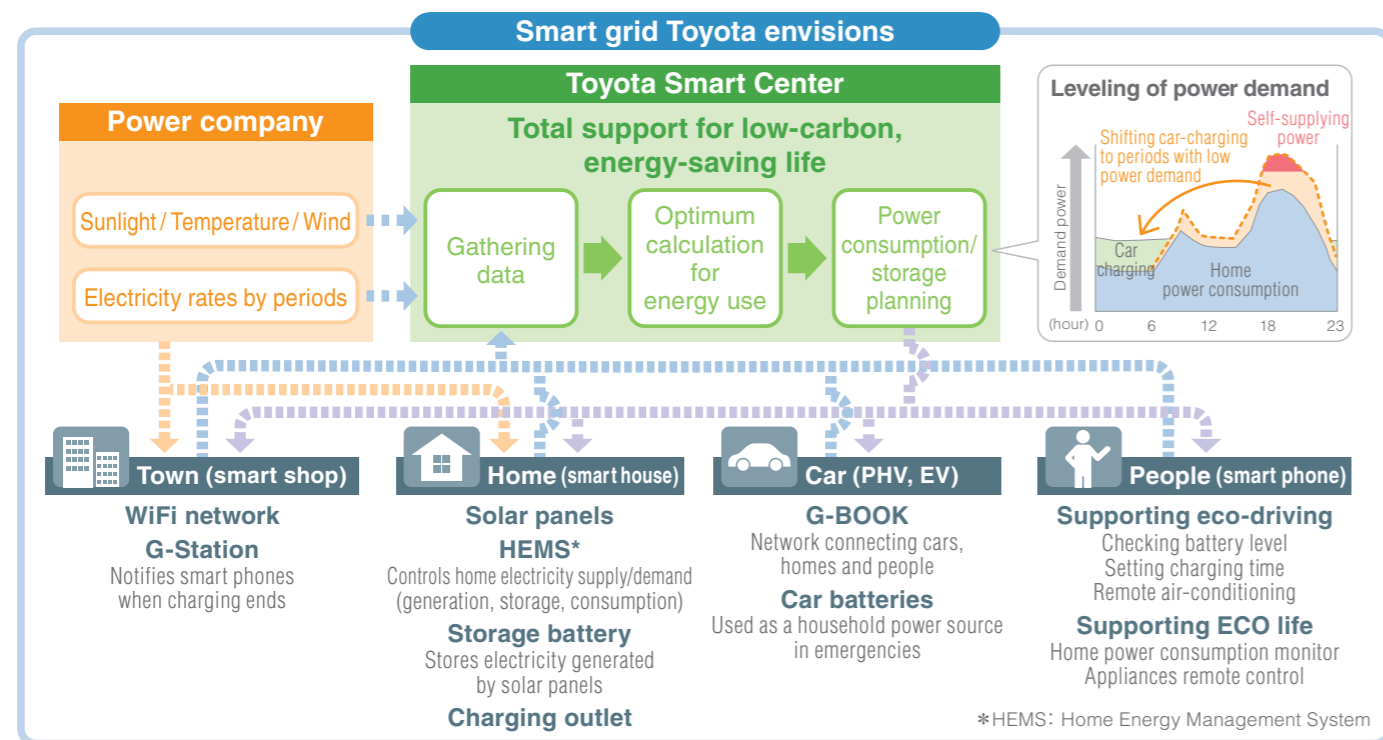
Realization of a our new vision of the “future mobility society” requires the widespread use of next-generation environment-friendly cars as well as an infrastructure that can properly manage electricity demand. Toyota is strengthening our smart grid effort, and that effort includes moving forward with trials and testing in various regions and our active cooperation with other industries.

The Toyota smart grid concept

The Toyota Smart Center optimizes environment-friendly car battery charging and home energy management

The daily power use of environment-friendly cars such as plug-in hybrid vehicles (PHVs) and electric vehicles (EVs) is thought to be equal to 30% of the power consumption of the average home. Achievement of a low-carbon society will require the widespread use of environment-friendly cars, so optimal management of battery charging and home energy is essential. To meet this aim we have developed our Toyota Smart Center, a system that uses smart-grid technology to link homes, vehicles, and users.

The smart grid envisioned by Toyota is centered on the Smart Center, and manages the power supply to “smart houses” developed by Toyota Housing while monitoring the power use status of each home through a data center. This enables it to reduce the CO₂ emissions of the entire region while minimizing costs. It does so by monitoring both the remaining battery power data transmitted by the car and the power consumption data from the home, and then proceeds to make a comprehensive determination about how to optimize power use by also taking into account factors such as weather conditions and power company fee schedules. Car batteries can then be charged during times of day when the grid power load is low, and the home’s own power supply from solar panels and storage batteries can be used efficiently. The goal is to create “smart communities” that optimize the power usage of the entire residential area.



Efforts to make smart grids a reality

Participation in trials worldwide

Toyota is conducting trials in Japan and a number of countries, such as the United States, China, and France, in cooperation with national and local governments, so as to popularize smart grids and environment-friendly cars.

China
Tianjin
Joint project with CATARC (China Automotive Technology and Research Center) to evaluate PHV usability and charging performance.

America
Boulder, Colorado
First city-level project to evaluate PHV usability and charging performance and conduct trials of home/PHV links.

Japan
Rokkasho Village, Aomori Prefecture
Trials involving powering homes and PHVs using only natural (wind + solar) energy
EV/PHV Towns
Project with the Ministry of Economy, Trade, and Industry (METI) conducting regional public relations with local governments in 18 designated model prefectures nationwide including, encouraging the use of environment-friendly cars as public service vehicles.
Kitakyushu City, Fukuoka Prefecture
Project with METI that conducts trials in plant energy management, which is of particular interest because of Kitakyushu's status as an industrial city.
Toyota City, Aichi Prefecture
Project conducted in cooperation with METI that involves the sale of 67 Toyota Housing demonstration houses and is aimed at optimizing energy use from a consumer perspective. Four thousand production-model PHVs and EVs were introduced as part of the effort to construct a low-carbon transportation system.

France
INES* project
Project in cooperation with the French government to build a power management system utilizing solar power.
* Institut National de l'Energie Solaire
Strasbourg
Project conducted in cooperation with EDF (French power company), consisting of introducing 70 PHVs, confirming vehicle/infrastructure performance and assessing battery charging.

Cooperation with other industries to speed up smart grid development

Use of the latest IT technology and the expanding data infrastructure

Toyota actively seeks cooperation with other industries.

In April of this year, Toyota teamed up with Microsoft to establish Windows Azure cloud service as the IT platform for operating Toyota's own data center, with the goal of reducing costs and achieving systems expandability. The two companies will work together to build a global cloud platform by 2015 to develop the Toyota Smart Center worldwide, with the goal of early achievement of a low-carbon, energy efficient society.

Also in April, Toyota teamed up with WiTricity to develop wireless, “non-contact charging” that charges up batteries simply by bringing them into proximity with chargers embedded in homes or parking spaces. In May, Toyota and Salesforce.com formed a strategic alliance to build “Toyota Friend,” a private social network for connecting people, cars, dealers and manufacturers.



Alliances with Microsoft (top photo) and Salesforce.com (bottom photo)