Project Participants Selected for Smart Community System Demonstration Project in Spain

The New Energy and Industrial Technology Development Organization (NEDO) has selected three companies, Mitsubishi Heavy Industries, Ltd., Mitsubishi Corporation and Hitachi, Ltd., to participate in its Smart Community System Demonstration Project in Spain. In preparation for the large-scale introduction and dissemination of electric vehicles (EVs), this project is designed to demonstrate an infrastructure for EVs (EV chargers and management center) and a power system for stabilizing the power supply for EVs, in coordination with the Malaga Smartcity Project being carried out in Malaga City. The project will be carried out in cooperation with Malaga City, Endesa, a major electric power company, Telephonica, a telecommunication company, and Sadiel, an ICT provider company, as NEDO’s second smart community demonstration project in Europe following Lyon, France.

The three companies will commence the project based on the results of a feasibility study they conducted from March 2011. The duration of the project will be five years from FY2011 to FY2015, and the budget will be five billion yen.
1. **Project Overview**

Spain is currently aiming to achieve the European environmental target (Energy 2020: a 20% cut in greenhouse gas emissions compared with 1990 levels, a 20% increase in the share of renewable energy in the energy mix, and improving energy efficiency by 20% by the year 2020). However, energy consumption in the transportation sector represents about 40% of total energy consumption in Spain, which is rather high, and the primary energy resource is fossil fuel. Therefore, Spain set a goal to introduce 250,000 EVs within the country by the year 2014. In order to diffuse EVs, public spaces for quick EV charging like a gas station are assumed to be necessary because many historic apartment buildings in European cities, including Spain, have no garage and cars are often parked on the street.

However, if quick chargers with a high output are installed in a disorderly manner, power grids will be overloaded and costs for constructing infrastructure on the power company side and installing power grids by charging service companies will increase, and this could lead to lower profitability of stakeholders involved with EV systems. In order to avoid such a problem, NEDO’s project will facilitate functions among the stakeholders by calculating and storing data on behavior patterns such as driving record or charging point guidance. Using the stored data, a new integrated service system will also be demonstrated. Furthermore, the project results are expected to be deployed in other areas of Spain or other countries.

In September 2010, NEDO and the Centre for the Development of Industrial Technology (CDTI) of Spain agreed to foster collaborative projects focusing on smart grid technologies based on the Japan-Spain Innovation Program (JSIP). This demonstration project will be carried out collaboratively by both countries under JSIP. NEDO and Malaga City also agreed on cooperation for the feasibility study of this project on March 18, 2011.

2. **Contact Persons**

Mr. Maede, Mr. Yahata, Mr. Takahashi, Smart Community Department, NEDO
Tel: +81-44-520-5269
Smart Community System Demonstration Project in Spain

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The project aims to establish systems and technologies related to a smart community*, and then to demonstrate the effects of their introduction.

* A smart community is a community that has introduced renewable energy as well as energy conservation and has achieved a comfortable lifestyle by utilizing information communication technologies. Moreover, it is a next-generation community that can control not only electricity use but also other public services such as transportation, communications and water.
NEDO and the Centre for Industrial Technological Development (CDTI) of the Spanish government have established the Japan-Spain Innovation Program (JSIP), which subsidizes international joint technology development projects between companies from Japan and Spain. Through this program, joint research and demonstration in the smart community field will be promoted. The program is being carried out in accordance with the program scheme shown below.
The demonstration project will construct infrastructure such as an EV management system, EV chargers and charger stations, and an information service that will respond to a large-scale introduction and diffusion of EV. In coordination with the Malaga Smartcity Project, service utilizing an EV and power management system will be demonstrated.
European countries have set environmental targets under Energy 2020 (a 20% cut in greenhouse gas emissions compared with 1990 levels, a 20% increase in the share of renewable energy in the energy mix, and improving energy efficiency by 20% by the year 2020).

In Spain, energy consumption in the transportation sector represents about 40% of total energy consumption, which is rather high, and the primary energy resource is fossil fuel.

Spain has a goal to introduce 250,000 EVs within the country by the year 2014.

Construction of infrastructure for EV diffusion

Demonstration of a business model (Technology, system and profitability)

Standardization and global deployment
**Preconditions**

- Public space for quick EV charging is needed because *cars are often parked on the street in Spain.*
- Companies, including gas stations, will enter the EV charging business following *deregulation of the electricity industry.*

**Problems**

- If quick chargers with a high output are installed in a disorderly manner, power grids will be overloaded.
- Too much investment in power grids will lead to lower profitability of stakeholders involved with EV systems because power company and charging service company costs will increase.

**Objective of the demonstration**

Demonstration of the feasibility of a business model that can facilitate functions among the stakeholders involved with EV systems by calculating and storing data on behavior patterns such as driving record or charging point guidance.

**Before start of service introduction**
Advice regarding EV charging site locations and types of chargers will be provided by the Japanese project participants.

**Operation**
- Guidance for EV users
- Adjustment of charging service operation management
- Support for power company by peak shifting and promotion for introducing renewable energy

**Service improvement**
Advice to improve the power grid or install additional chargers based on stored information related to charging will be provided by the Japanese project participants.
**Smart Community System Demonstration Project in Spain**

**Needs**
- **EV user**
  - Quick and full charging
  - Navigation to available charging stations
  - Service that only EV can provide
- **EV charging service company**
  - Advice regarding charging station site locations
  - Efficient operation with no waiting in line or vacant stands
- **Power company**
  - Specific investment plan
  - Balanced demand at peak times
  - Efficient utilization of renewable energy

**Solutions**
- **EV user**
  - Convenience improvement
  - Efficient navigation to a charging stand
  - Reasonable pricing
- **Data collection**
  - Customer responses
  - Appropriate navigation for each user
  - Offer incentive
- **Smart Community System Demonstration Project in Spain**
  - Power demand information
  - Equipment operation status information
  - Operation status information
  - Service information
  - Power supply information
  - Charging point guidance
- **Power company**
  - Minimum investment in grid
  - Promotion for use of renewable energy
- **EV charging service company**
  - Consultation regarding charger installation
  - Operation management
Demonstration themes

1: Demonstration of EV management center and EV infrastructure
2: Demonstration of M:N quick charger
3: Demonstration of power management system
4: Demonstration of integrated ICT infrastructure
5: Demonstration of integrated service system
6: Comprehensive review, global deployment and standardization

Implementation system

Japan

NEDO

Entrustment

Mitsubishi Heavy Industries, Hitachi, Mitsubishi Corporation

Project MOU (PJ-MOU)

Spain

Malaga

Monitoring・cooperation・support

Endesa, Telefonica, Sadiel

Implementation Agreement (IA)