NEDO Smart Community Projects

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New Energy and Industrial Technology Development Organization (NEDO)
- an agency of the Ministry of Economy, Trade and Industry, Government of Japan
What is NEDO?

Mission:
- Addressing energy and global environmental problems
- Enhancement of Japan's industrial competitiveness

Organization: Established in 1980; reorganized in 2003 as an incorporated administrative agency under the Ministry of Economy, Trade and Industry of the Government of Japan

Head Office: Kawasaki City, Japan

Personnel: About 800

Budget: Approximately US$1.5 Billion (FY2014)

Chairman: Mr. Kazuo Furukawa
**What is Smart Community?**

- **Basic Components:**
  - New-generation Gas Station
  - Solar Power
  - Wind Power
  - Energy Management System
  - GE Solar Power
  - Storage Battery
  - EVs and PHEVs
  - Enable better Use of Heat in addition to Electricity.
  - Cogeneration
  - Biogas
  - Na-S Battery
  - Wasted Heat

**Construct an Energy System:**
- Mutually Beneficial for Main Grid Operator and Regional Energy Management Provider

**Regional Energy Management Provider**

**Connect BEMS with Regional EMS**

- Zero Emission Buildings

**Construct Charging Stations for EVs.**

**Utilize IT for Peak Cuts**

**Smart Meter:** Visualization of Home Energy Use and Demand Control

**Home Storage Battery**
NEDO’s Projects in Japan 2005 - 2010

- Clusters Photovoltaic Power Generation Systems
  - Ohta city
  - Tokoname city, Kyotango city, Yaichi city

- Mega Solar
  - Wakkanai city, Kita city

- Micro Grid

- Storage of wind generated power
  - Tomakomai city
  - Sendai city

- New power network system
NEDO’s Global Smart Community Demonstration Projects

Lyon (France)
Smart city applications for re-developed urban area

New Mexico (USA)
Energy management for power systems with the large scale PVs

Manchester (U.K.)
Energy switching of heat consumption of households and aggregation of energy storage capability

Java (Indonesia)
Supplying reliable quality electricity to industrial parks

Malaga (Spain)
Navigate EV drivers to charging stations efficiently considering with power system and solve traffic congestions

Maui (USA)
Maximizing the use of renewable energy by managing EV charging
Demonstration Project in Panipat, Haryana State, India

<Feasibility Study>

Demonstration of smart grid-related technologies that could contribute to solving the issues of local power distribution grid in this area, as well as providing Japanese operational know-how concerning power distribution systems to Indian power distribution companies.

<Verification Details>
1: Peak Load Reduction
2: Distribution Line Monitoring and Control
3: Distribution Loss Reduction
4: Providing Japanese Operational Know-how

Japan Side:
Fuji Electric
Sumitomo Electric,
THE Power Grid Solution

India Side:
UHBVN (Uttar Haryana Bijli Vitran Nigam)

Map of India highlighting Panipat.
Japanese Technical Delegation Visit to Andhra Pradesh, India

◆ Delegation of technical experts from Japanese companies
◆ A technical seminar and site visits from March 4 to 6, 2015
◆ Seminar Participant (March 4, 2015):
  ✓ around 100 Japanese experts from 30 companies,
  ✓ More than 200 Indian participants from the Andhra Pradesh government and companies,
Thank you for your attention.
Appendix
Significance of Overseas projects

1. International contribution
2. Unique conditions only available overseas
3. Cooperate on common technical challenges

NEDO’s role in composing a new project

- NEDO
- MOU
- Government
- Request of engagement
- Private company in Japan
- Private company in the partner country
- Cooperative relationships
Solutions for a Large Scale Introduction of PV

Demonstration Project in New Mexico, US

Provide the most appropriate electricity supply with a single distribution line, using battery energy storage systems for grid and implementing DR for commercial buildings and general consumers, as one of solutions for unstable output of PV power generation systems.

<Verification Details>
1. Feeder Level Microgrid Demonstration
2. Smart House Demonstration
3. Smart Building Demonstration
4. Smart Grid Collective Research

Smart Grid Demonstration in Los Alamos

Smart Grid Demonstration in Albuquerque

Participating Companies (Total :19)
Solutions for a Large Scale Introduction of Wind Power

Demonstration Project in Hawaii, US

Manage EV charging timing instantaneously by adjusting EV charging time to night hours with surplus electricity and temporary stopping EV charging when frequency fluctuation occurs.

<Verification Details>
1. Island Smart Grid model using EV
2. Smart Grid model at a substation with one distribution grid level
3. Smart Grid for low voltage transformer level systems
4. Overall integrated study

Participating companies: Hitachi, Mizuho Bank, Cyber Defense Institute
Solutions for a Large Scale Implementation of EV

Demonstration Project in Malaga, Spain

Reduce the load on the power system due to a significant amount of EV charging by making full use of ICT encouraging better behavior for EV users.

<Verification Details>
1. EV Management System
2. Power Management System (Allocate chargers & Automated distribution)
3. Integrated ICT Infrastructure (Application evaluation with CEMS)
4. Integrated services (Navigate EV drivers to available chargers)

Participating Companies: Mitsubishi Heavy Industries, Mitsubishi Electric, Hitachi
Establish a future model of metropolitan by harmonizing the EU environmental target, the sustainable and innovative city planning of Lyon, and Japan’s leading energy technologies.

<Verification Details>
Task1: PEB (Positive Energy Building)
Task2: PV powered EV Charging Management System and Car Sharing
Task3: HEMS (Home Energy Monitoring System)
Task4: CMS (Community Management System)

Participating Companies: Toshiba, Toshiba Solutions
Implement high efficiency heat pumps connected with ICT technology in a housing sector to reduce electricity consumption by direct control of adjusting load timing and absorb surplus electricity. Aggregate reduced electricity and absorb surplus electricity by a housing sector and trade in the electricity market to reduce CO2 emissions and contribute to the continuous development of regional carbonization.

<Verification Details>
1. Heat Pump technology: Low carbonization of a housing sector
2. Aggregation technology: Aggregate nega-watt
3. Electricity transaction (Pseudo): Simulate electricity transactions for wide regional use in the future

Participating Companies:
Hitachi, Daikin, Mizuho Bank