

How to design and Develop Smart Grids:

***Technology and Investments by
Case of NEDO projects***

November 26th, 2014

Kazuyuki Takada

**New Energy and Industrial Technology
Development Organization (NEDO)**

Contents



1. Introduction of NEDO

2. Introduction of JUMPSmartMaui in Hawaii

What is NEDO



New Energy and industrial technology Development Organization

NEDO is Japan's largest public R&D management organization. Following the two oil crises of the 1970s, the need for energy diversification increased. Against this backdrop, NEDO was established as a governmental organization in 1980 to promote the development and introduction of new energy technologies.



Personnel	800
Budget	148 billion yen (FY2014)

Basic Research

Technology Development

Demonstration



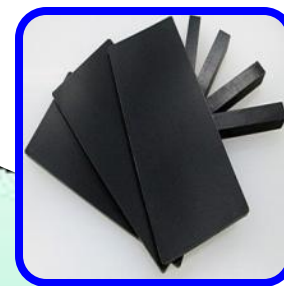
Renewable energy



Energy conservation



Electronics /ICT



Materials/nanotech



Energy storage

Smart community



**Environment/
clean coal**



Robotics



Water treatment



Bio/medical



Demonstration Project in Japan (FY2000-FY2010)

- Established grid integration technologies for high penetration of Renewables.



Clustered PV System (Ota)



**Large-scale PV plant
(Wakkanai)**



**Energy Storage for Wind Power
(Tomamae)**



Microgrid (Hachinohe)



**Multiple Power Quality Microgrid
(Sendai)**

1. Introduction of NEDO

2. Introduction of JUMPSmartMaui in Hawaii

NEDO's Smart Community Projects in Overseas

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



Malaga(Spain)

Navigate EV drivers to charging stations efficiently considering with power system and solve traffic congestions



Java (Indonesia)

Supplying reliable quality electricity to industrial parks



Maui (USA)

Maximizing the use of renewable energy by managing EV charging





HITACHI
Inspire the Next



CyberDefense



JUMPsmartmaui
SMART ENERGY. SMART CARS. SMART GRID.



- ❑ Explore the sustainable way of life for future generations
 - ◆ Integrate high levels of renewable energy
 - ◆ Maintain safe and reliable power.
- ❑ Develop and demonstrate smart tech together
 - ◆ The control of electric vehicle (EV) charging to manage Distributed Energy Resources.

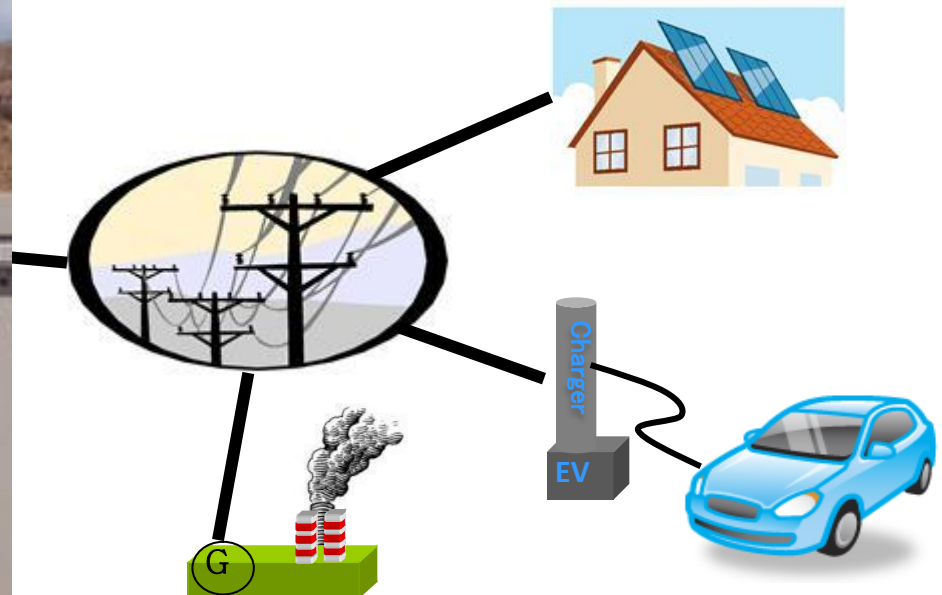


- High cost of energy is driven by variable oil prices.
- Energy security effected by dependence on imported fuel.
- The rapid growth of intermittent renewable generation (wind and solar) negatively impacts grid operations and reliability.
- Advanced smart grid technologies can enhance grid stability and balance demand. Examples include management of electric water heaters, EV chargers and other home appliances.



What the project proposes?

- Renewables (Wind and Solar) friendly EV charging
- Reduce fossil fuel consumption and its dependency
- Mitigate investment cost for absorbing fluctuation by Renewables



Introduction of JUMPSmartMaui



November 26th , 2014

**Smart Energy Solution Division,
Hitachi, Ltd.**

Frank Emura

