

Press Release



New Energy and Industrial Technology
Development Organization

<http://www.nedo.go.jp/english/index.html.jp>

November 2, 2011

Participants Selected for a Smart Grid Demonstration Project in Hawaii – Commencement of a Japan-U.S. Collaborative Demonstration Project for World-leading Remote Island Smart Grids –

The New Energy and Industrial Technology Development Organization (NEDO) has selected a consortium of three companies, Hitachi, Ltd., Mizuho Corporate Bank, Ltd., and Cyber Defense Institute, Inc., led by Hitachi, Ltd. to participate in its Smart Grid Project to be carried out in the State of Hawaii of the United States.

The project, which aims to establish a system model for the integration of clean energy on the island of Maui, will be conducted collaboratively by NEDO, the State of Hawaii, the County of Maui, Hawaiian Electric Company, the University of Hawaii., and other participating entities, including a number of other Japanese and U.S. companies.

NEDO selected the three-company consortium based on the results of a feasibility study beginning since May, 2011.

Project Overview

- Will receive an estimated \$37 million in financial support from NEDO, plus additional contributing funds from other Japan and U.S. companies to develop and install smart utility system controls in Kihei, Maui to improve adoption and full-integration of solar and wind power, and electric vehicles on Maui's electric system.
- Will connect advanced electric vehicle charging management systems to the electric utility system controls, allowing utility operators to manage electric vehicle charging to balance generation and power demand.

The project is part of the Hawaii-Okinawa Partnership on Clean and Efficient Energy Development and Deployment, which was signed by the U.S. Department of Energy, Ministry of Economy, Trade and Industry of Japan, State of Hawaii and Prefecture of Okinawa in June 2010.

The Hawaii-Okinawa partnership is intended to foster the development of clean and energy efficient technologies needed to solve global energy security and climate change challenges. Japan and the United States designated Hawaii and Okinawa, leaders in clean energy and energy efficiency, as premiere demonstration areas to test technologies and new programs.

The demonstration project is scheduled to start in 2013 and be completed in 2014. The duration and details of each project activity are described below.

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Japan-U.S. Smart Grid Demonstration Project in Hawaii

(Selection of Japanese Participants)

Supplemental Explanatory Material

Smart Community Department
New Energy and Industrial Technology Development Organization

Japan-U.S. Collaborative Demonstration Project for World-leading Remote Island Smart Grids in Hawaii

Project Overview

Japan and the U.S. will collaboratively conduct a demonstration project on world-leading remote island smart grids that can absorb the fluctuating output of renewable energy. Use of the smart grids will be promoted for other islands as well as subtropical areas.

Project activities

- Demonstration of smart grids using fragile island grids
- Demonstration of technologies for improving distribution systems

Objectives

- The objectives of the project are to establish a world-leading remote island low-carbon society using renewable energy as well as EVs, and to promote it as a showcase throughout the world.
- The project also aims to symbolize cooperation between the U.S. and Japan by collaborating with other smart grid projects that are currently being carried out on the island.

Background

The project will be carried out based on the Japan-U.S. Clean Energy Technologies Action Plan agreed to during discussions held at the Japan-U.S. summit meeting in November 2009.

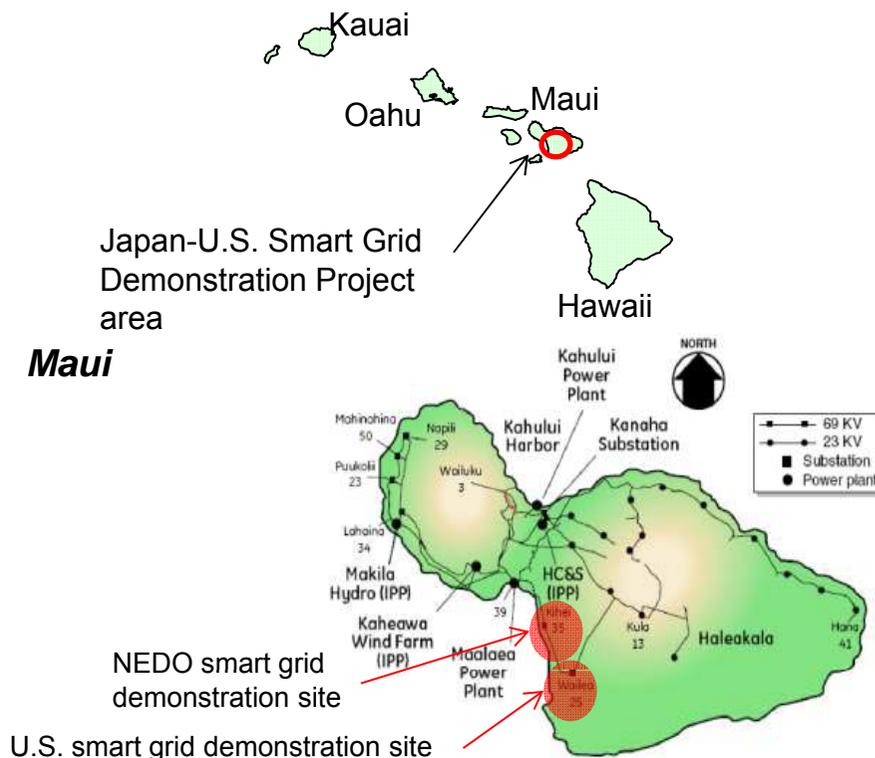
Budget and Period

Project budget: Up to US\$ 375,000 (feasibility study) (¥80=\$1,00) Approximately US\$ 37.5 million (demonstration project)

Feasibility study period: First quarter of FY2011 (tentative)

Project duration: FY2011-FY2014 (approximately 4 years)

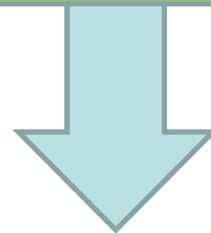
Project Sites



Energy Issues Seen on Islands Around the World

High Dependency on Fossil Fuel

- Energy Security Issues
- Economic Issues (Energy cost is high)
- Environmental Issues



Solutions

As a way to address these issues,
expectations for renewable energy use are higher on islands than in other areas.

Background (2/2)

The State of Hawaii is carrying out activities to realize a low carbon society. In particular, it is actively introducing renewable energy.

On Maui and Hawaii, large-scale renewable energy has already been introduced.

■ Issues

- Surplus power
- Influence on frequency

In addition, as PV systems have been steadily installed at residential houses, the influence on distribution line voltage also needs to be considered.



This demonstration project is designed to address a growing number of issues due to the high penetration of renewable energy by means of the effective use of technology elements.

■ Technological elements

Smart PCS for PV systems

EV and PHEV charging control

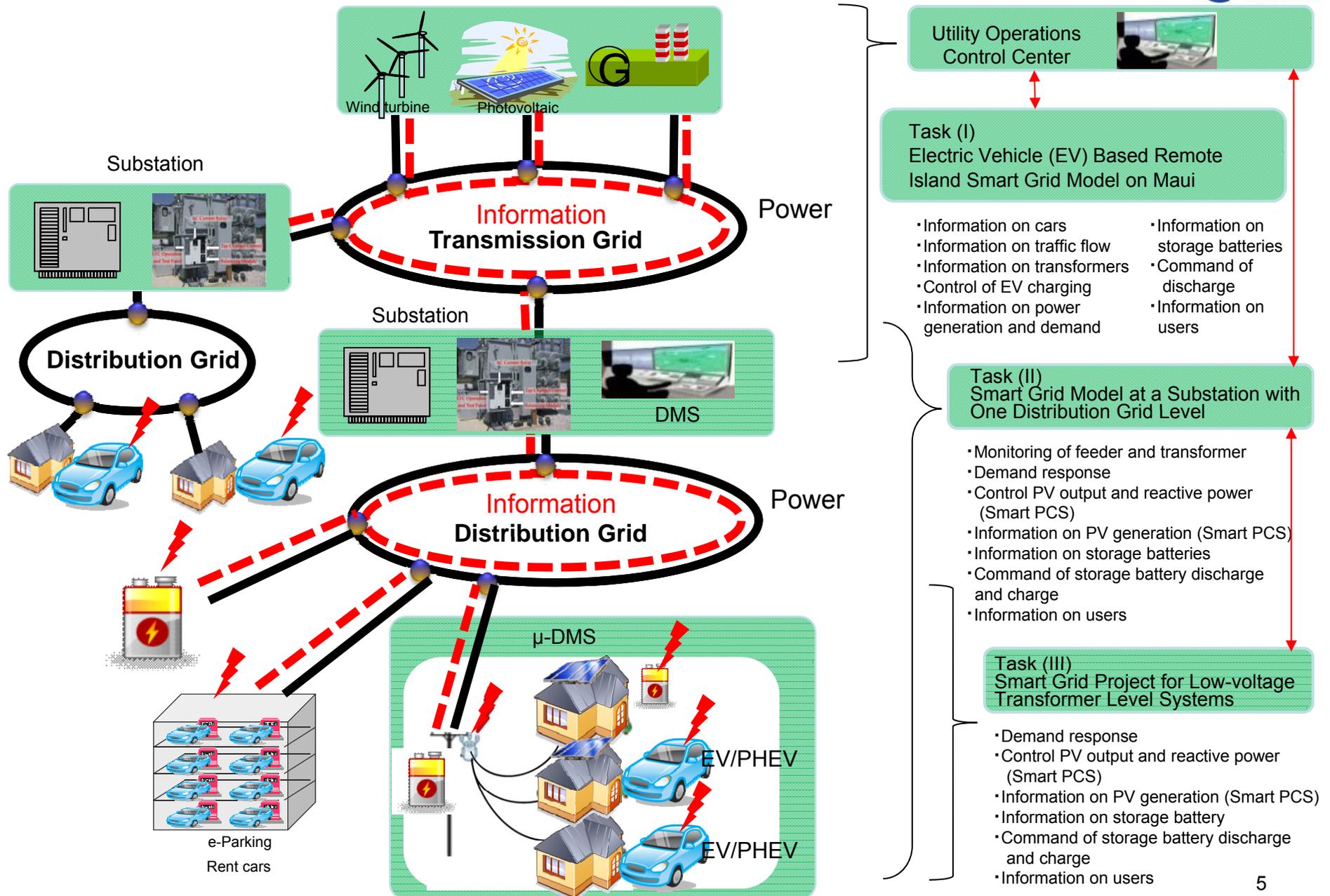
Electricity storage battery control

PV generation forecast

Demand response

Information and communications technologies

Project Concept



Project Overview



(I) EV Based Remote Island Smart Grid Model on Maui

- In order to mitigate adverse effects on power grids, including the impact of significant changes in power frequencies caused by the fluctuating output of renewable energy, an EV management system (EVMS) using information communication technologies will be established to control EV charging (30-200 stands) and storage batteries (500 KW-1 MW) for power grids that serve as a substitute for storage batteries for EVs.
- The EVMS will be established to achieve an EV charging management system that does not cause effects (voltage and low-voltage transformers overload) on the distribution system by charging EVs.

(II) Smart Grid Model at a Substation with One Distribution Grid Level in Kihei

- A distribution management system (DMS) using information and communications technologies will be established in order to control EV charging, storage batteries for grids, FACTS devices, smart PCSs for PV as well as electric hot water heaters. The effectiveness of the DMS in solving issues such as reverse power flow from PV systems connected to the end of a distribution grid and overload on low-voltage transformers, which occurs when charging multiple EVs simultaneously, will be demonstrated.
- The DMS compatible with higher systems is expected to stabilize the frequency and optimize energy management in the entire grid system.

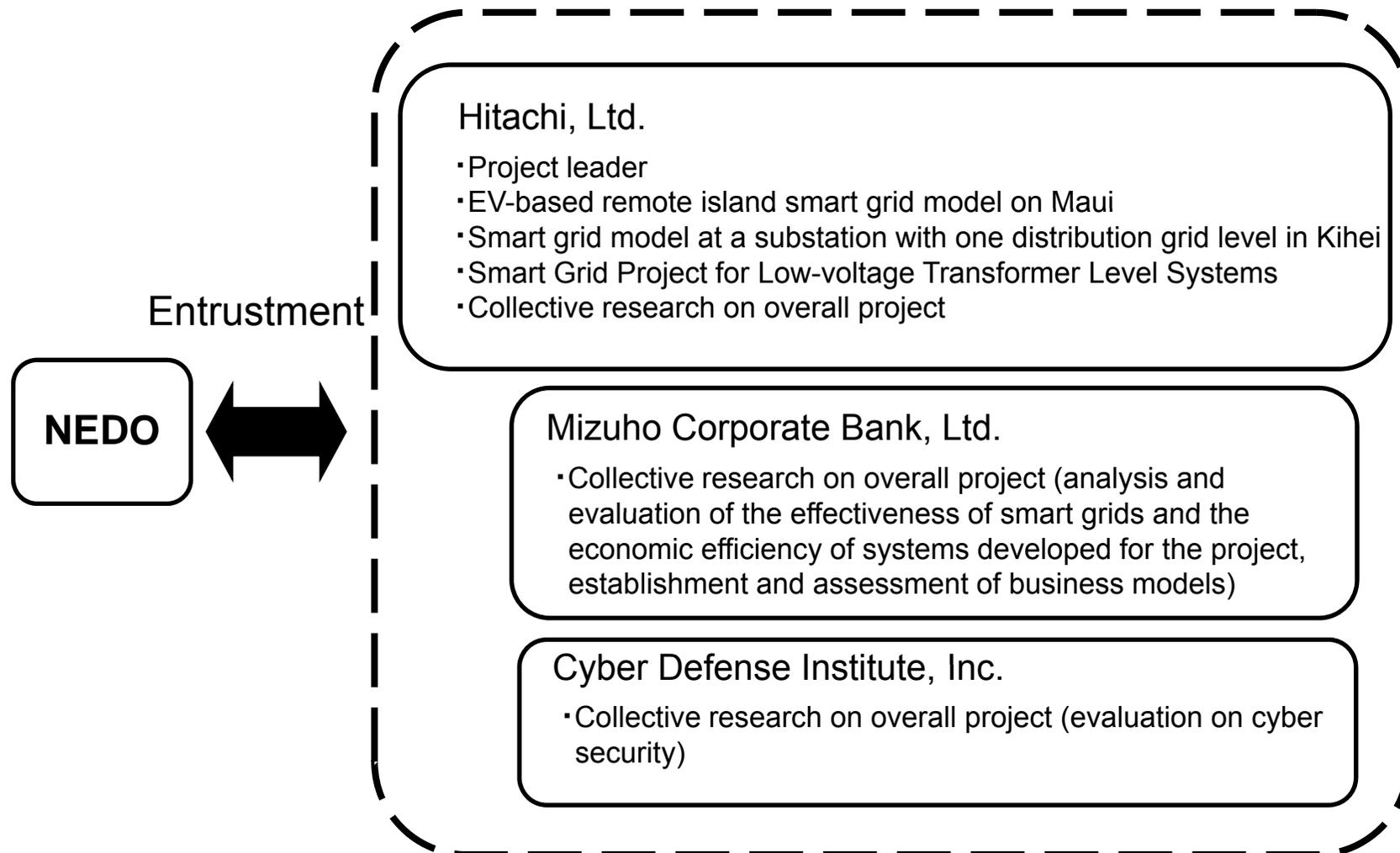
(III) Smart Grid Project for Low-voltage Transformer Level Systems

- A μ -DMS using information and communications technologies will be established at the low-voltage transformer level in order to control EV charging, storage batteries, smart PCSs for PV and electric water heaters.
- The effectiveness of the μ -DMS compatible with DMS in solving issues such as reverse power flow from PV systems connected to general users and overload on low-voltage transformers, which occurs when charging multiple EVs simultaneously, will be demonstrated.

(IV) Comprehensive Research

- The effectiveness of smart grids developed for this collaborative project will be analyzed and evaluated.
- Cyber security activities will be evaluated.
- The economic efficiency of systems developed for the project will be evaluated.
- Business models for establishing a low-carbon society on a remote island will be established and assessed.

Project Framework (Japanese Side)



Project Schedule

