

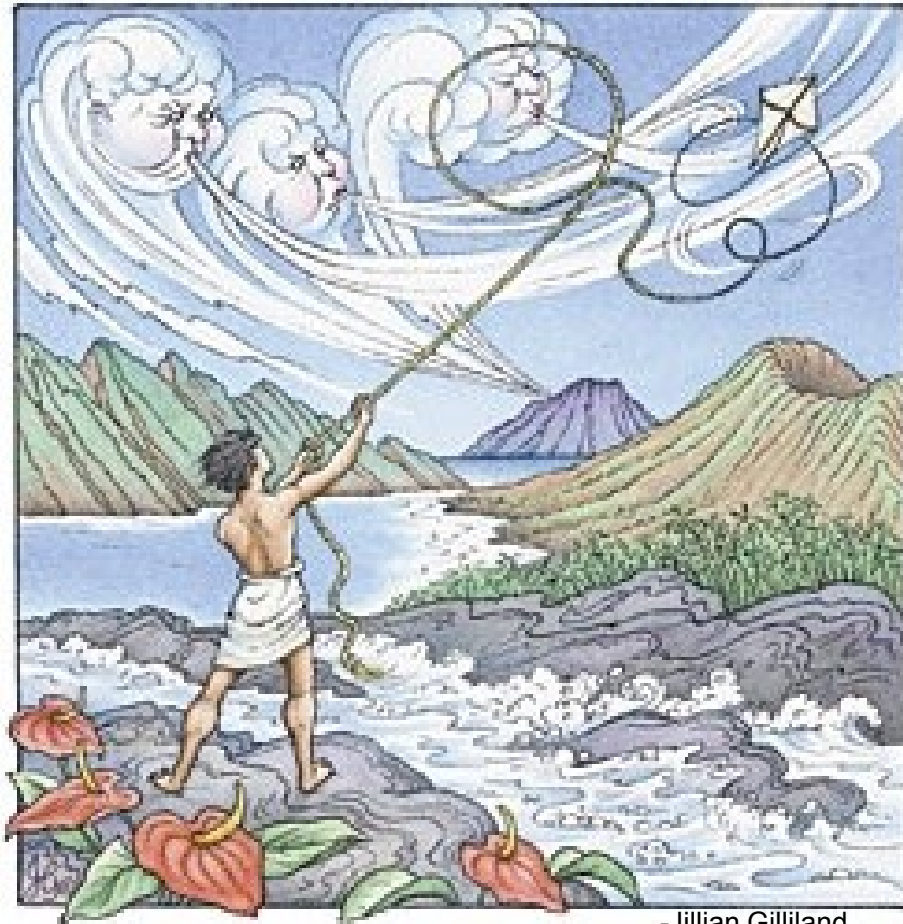
# **Maui**

## **Land of Opportunity**

**(Maui Smart Grid Update)**

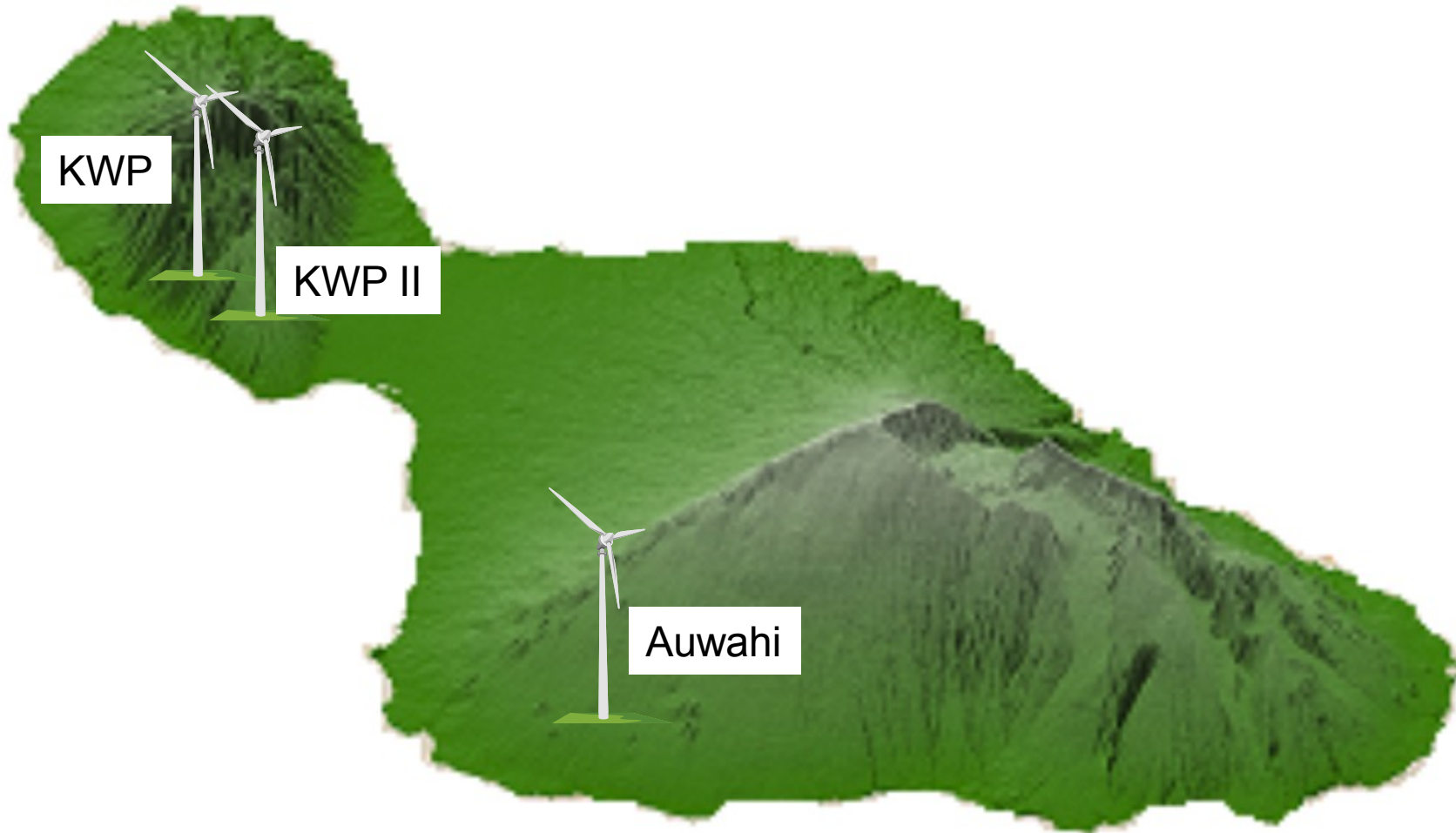
Marc Matsuura  
HCEI Plenary Session  
12/06/2011

# Once upon a time...



-Jillian Gilliland

# The Tale of 3 Wind Farms



# Effectiveness of Mitigation Measures to Increase Wind Energy Delivered

Facility	Percent of available energy delivered	% increase
KWP	99%	2%
Plant 2	84%	17%
Plant 3	45%	67%

## BESS Function

- 10MW / 20MWh
- Manual and AGC Dispatch
- Aggressive Over frequency Response
- Ramp Rate Limit within a limited SOC Range

## MECO Operations

- Include 10MW of BESS in Up Reserve
- Reduce Down Reserve of M14 & M16 by 1.5MW
- Reduced Operation of K1 and K2
- 50MW Up-Reserve Limit

# Now What?

## Enter the Smart Grid Advanced Infrastructure Projects

- DOE RDSI Maui Smart Grid Project
- Japan-US Smart Grid Demonstration
- Hawaii Solar Integration Study
- Maui Electric Vehicle Alliance
- HNEI DOE Sun Shot Initiative Project

# Japan – United States Smart Grid Demonstration Project



New Energy and Industrial Technology  
Development Organization



HITACHI CONSORTIUM



CyberDefense



maui economic development board, inc.



Hawaiian Electric Company

Other supporting partners  
Nissan Motor Co., Ltd.  
Advanced Energy Company  
U.S. Verizon Gr.  
Okinawa Electric Power Company



Maui Electric Company



Hawaii Natural Energy Institute

University of Hawaii at Manoa

# U.S. – Japan Cooperation on Clean Energy Technologies

The White House

Office of the Press Secretary

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For Immediate Release

November 13, 2009

## **FACT SHEET: U.S.-Japan Cooperation on Clean Energy Technologies**

President Obama and Prime Minister Hatoyama met on November 13, 2009 in Tokyo. The two leaders affirmed the intent of the United States and Japan, as the two leading global investors in energy research and development, to expand already strong cooperative activities in technology research and development to provide solutions to the challenges of global energy security and climate change. They announced initial areas for joint activities to strengthen their cooperation that include:

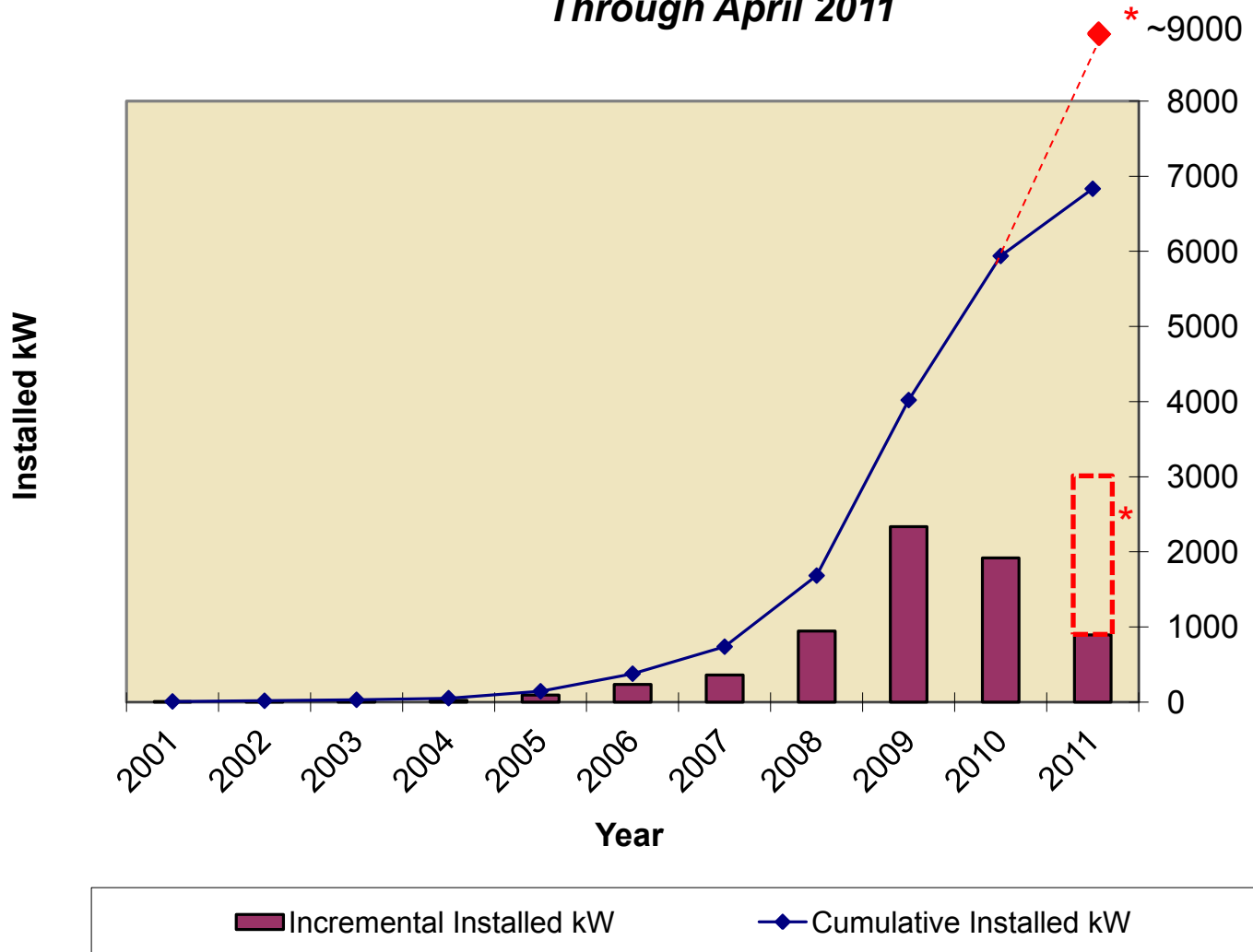
- Establishment of a task force that will evaluate the achievements of existing clean energy projects in Hawaii and Okinawa to enable the islands to be energy independent, including micro-grid projects, and develop activities to help the two islands share experiences and knowledge with each other;

# Okinawa-Hawaii Task Force

## 2. Outline of the Work Program

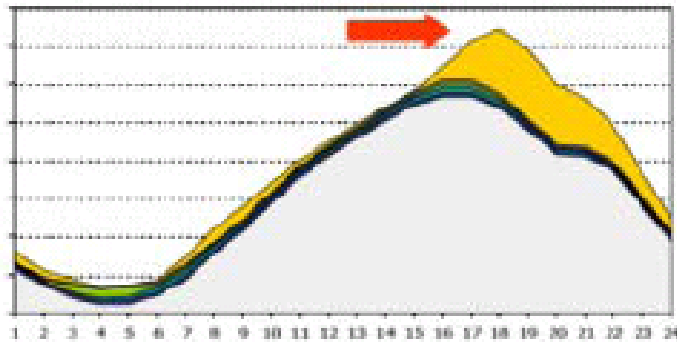
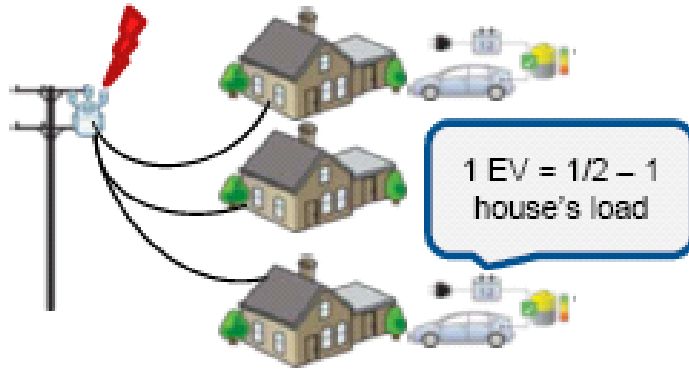
- (1) Energy Efficient Buildings: A bilateral energy expert team composed by U.S. and Japanese experts will evaluate a building in Okinawa and in Hawaii, and reports will be shared.
- (2) Smart Grid: Both the U.S. and Japanese government as well as the Prefecture of Okinawa and the State of Hawaii will promote cooperation through smart grid demonstrations in Miyako, Okinawa and Maui Island, Hawaii.
- (3) Renewables: Promoting information exchange of renewable energy including ocean energy such as Ocean Thermal Energy Conversion (OTEC).
- (4) People-to-People Exchange: The work program includes: the dispatching of staff from Okinawa Prefectural government to Hawaii to nurture expertise on energy efficient buildings, implementing a joint online project on energy efficiency and promoting cooperation among academia as well as utility related companies of Okinawa and Hawaii.

## MECO NEM Installed Capacity Through April 2011



\*as of November 2011

# EV Charging



# Project Thesis

## *Our challenge*

- Rapid growth in distributed PV and potential rapid growth of EV

## *Thesis*

- Distributed PV and EV can be most effectively managed with “smarts” first embedded closest to the resource, then at the distribution feeder and substation level, yielding reduced impacts and aggregated information managed at the utility operations center

# NEDO Solicitation

## Press Release



New Energy and Industrial Technology  
Development Organization

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

February 8, 2011

### **Japan-U.S. Collaborative Demonstration Project for World Leading Remote Island Smart Grids -NEDO Launches a Public Solicitation for a Smart Grid Project in Hawaii-**

NEDO announced on February 8, 2011 that it has started to accept proposal offers for its public solicitation relating to a smart grid demonstration project in the U.S. state of Hawaii. The project will include a feasibility study and demonstration phase. The project's objective is to establish a social model using clean energy on the island of Maui, and will be jointly conducted among NEDO, the State of Hawaii, the Hawaiian Electric Company, the University of Hawaii, and the Pacific Northwest National Laboratory.

# NEDO Selection

## Press Release



New Energy and Industrial Technology  
Development Organization

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

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.



# Memos of Understanding

## Press Release



New Energy and Industrial Technology  
Development Organization

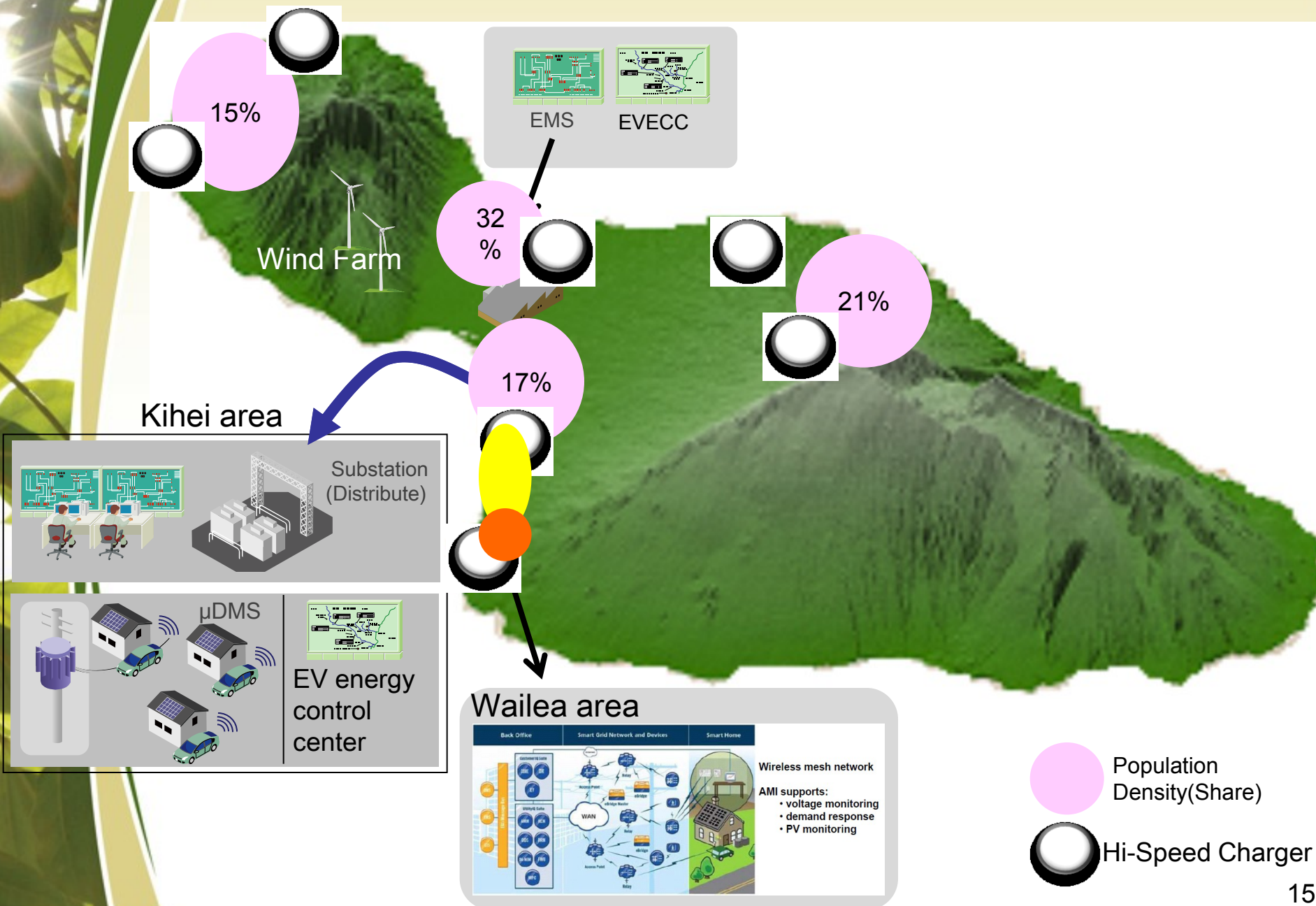
<http://www.nedo.go.jp/english/index.html>

November 24, 2011

### **MOU Concluded for Smart Grid Demonstration Project to be Carried Out on the Island of Maui in Hawaii**

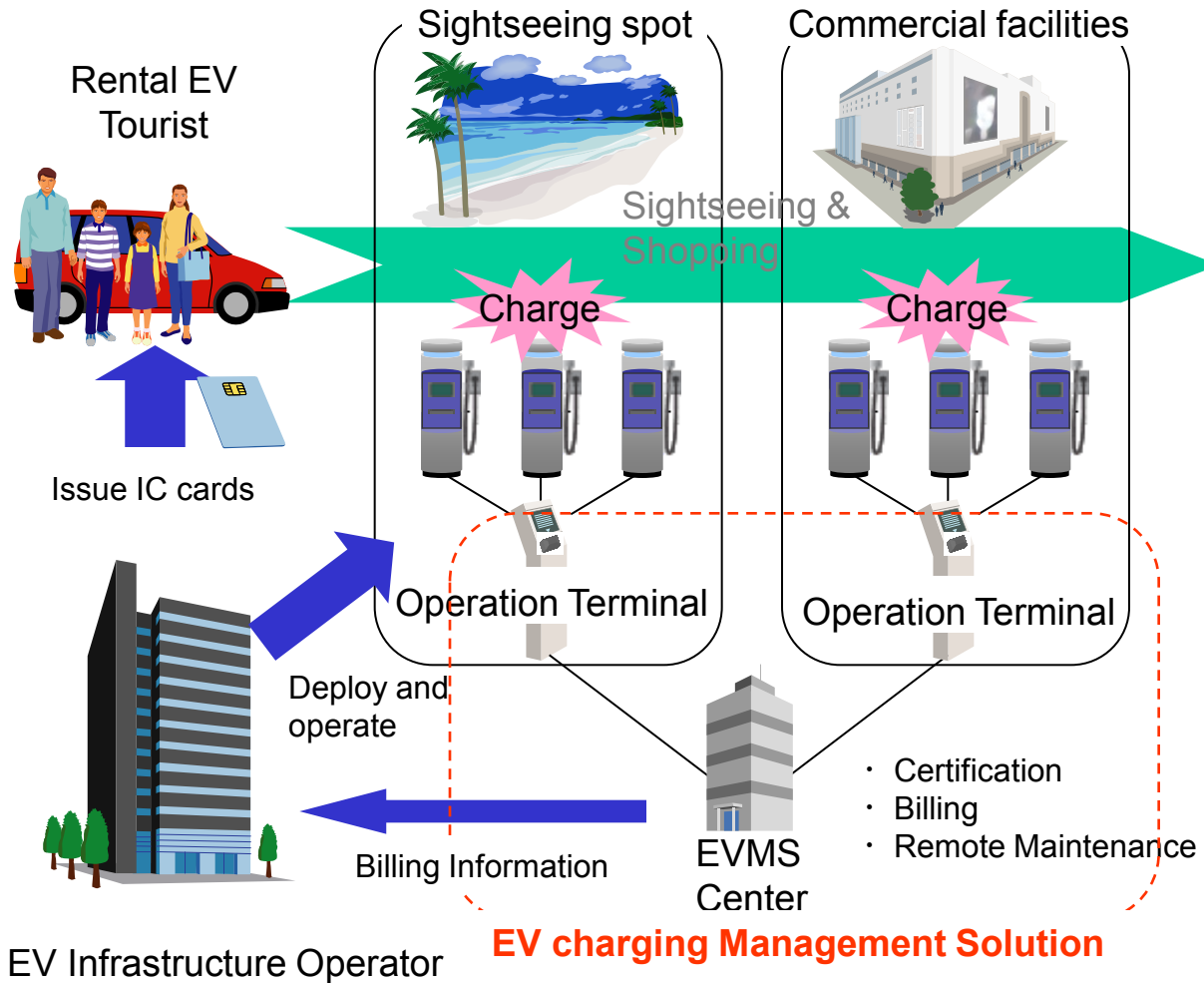
**The New Energy and Industrial Technology Development Organization (NEDO) and the State of Hawaii signed a Memorandum of Understanding on November 22 for a smart grid demonstration project to be carried out on the island of Maui in the State of Hawaii. NEDO selected three companies, Hitachi, Ltd., Mizuho Corporate Bank, Ltd. and Cyber Defense Institute, Inc., to participate in the project, which will be conducted collaboratively by NEDO, the State of Hawaii, Hawaiian Electric Company, Maui Electric Company, the University of Hawaii, Maui County, the Maui Economic Development Board and other participating entities.**

# Geographical Image of the Demonstration



# Business Case in operation -Okinawa

## Rental EV Business model collaborated with tourism



**OKINAWA**  
EV Charging spot

**mauitime**

## Maui Electric Vehicle Alliance (EVA ) Launches



Maui EVA has a \$300,000 grant from the US Department of Energy to prepare Maui for widespread adoption of electronic vehicles.

# Demonstration Schedule

2011	2012	2013	2014
Feasibility Study			
System Design			
	Construction		
		Demonstration	