

# Technology Assessment - Hawaii Hydrogen Power Park

SAND2008-2207C



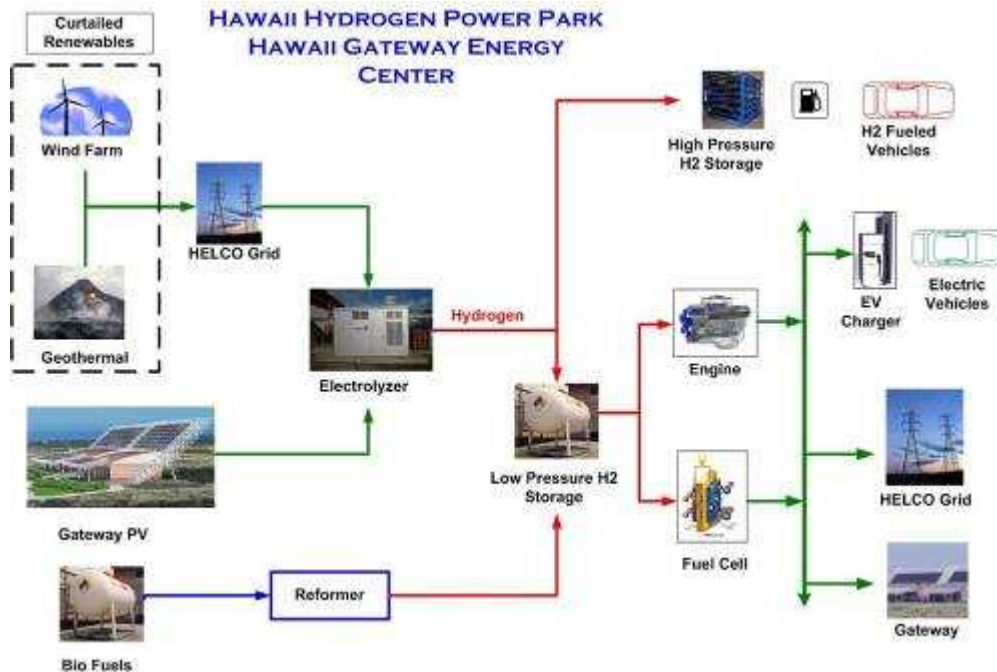
- Kahua Ranch
- PGV/VNP
- Bishop Museum

**Sandia National**  
**Laboratories**  
**California**  
**Emma Stewart**  
**Andy Lutz**



**HNEI**  
**Rick Rocheleau**  
**Mitch Ewan**  
**Severine Busquet**

# Hydrogen Power Park Overview



- Test bed for integration and validation of hydrogen generation, storage, and use in a real world environment
- One-to-one cost share by partners including DBEDT, PGV, Hydrogenics, HECO, HELCO, Gas Company
- Education and outreach opportunities

Phase 1 Integrated electrolyzer-storage-fuel cell system operated at HFCTF  
Phase 2 Integrated Wind-PV-electrolysis system at Kahua Ranch  
Phase 3 Renewable hydrogen fueling infrastructure to provide hydrogen fuel for vehicles at Volcanoes National Park.

# Big Island Hydrogen Sites

## 1. Kahua Ranch –

### **PV-Wind-Hydrogen Test Bed**

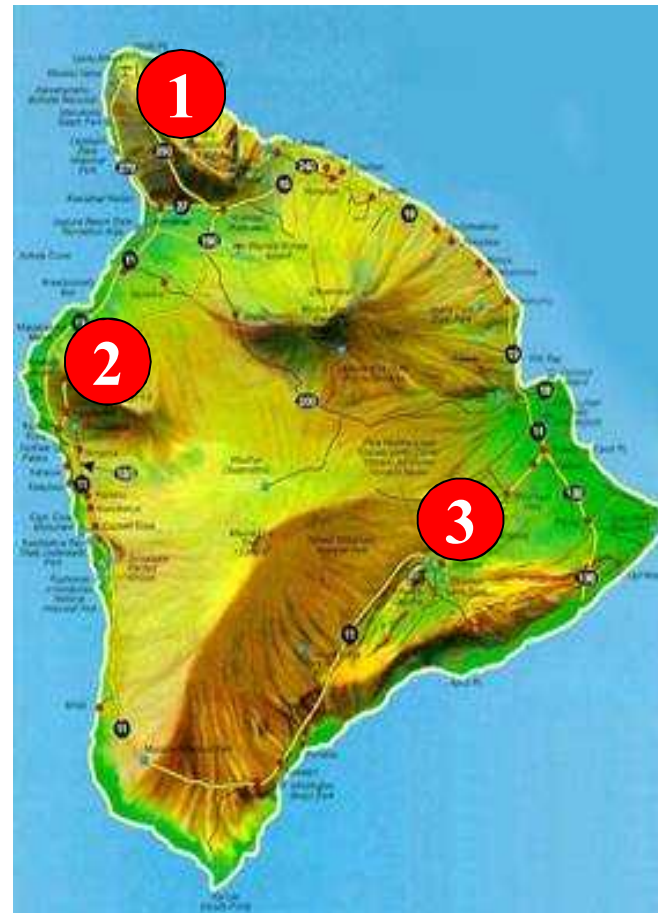
10 kW wind turbine + 10 kW PV;  
Load-following, pressurized PEM electrolyzer.  
5 kW PEM Fuel Cell

## 2. Hawaii Gateway Energy Center (HGECC)

Rented lab + 4,000 sf pad area  
Micro-grid component testing  
Energy storage testing

## 3. Hawaii Volcanoes National Park (HAVO)

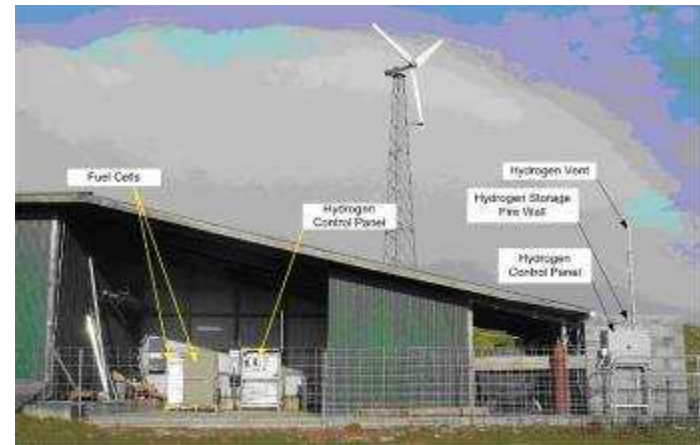
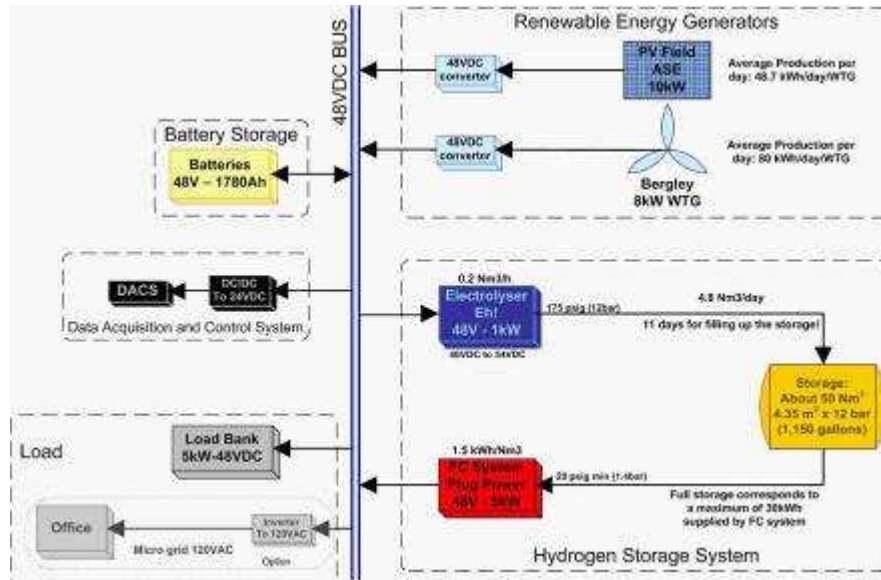
5 hydrogen shuttle buses  
Geothermal hydrogen  
Hydrogen fueling



Sandia  
National  
Laboratories



# Kahua Ranch PV-Wind-Hydrogen System



- Integrates PV, wind, batteries, electrolyzer, and fuel cell with remote operation via internet
- Validates emerging hydrogen and renewable technologies
- Partners include Kahua Ranch, PICHTR, Plug Power, and EH!