

# Hawai'i Hydrogen Power Park



Hawai'i  
Natural  
Energy  
Institute

The Hawai'i Natural Energy Institute (HNEI) is conducting research to assess the technical performance and economic value of integrated hydrogen energy systems, operating in real-world environments. The Power Park Project is comprised of two major elements – the MCBH “Fast-Fill” Hydrogen Station, and the Hawai'i Volcanoes National Park (HAVO) hydrogen shuttle bus project. The results of these evaluations are being used to identify areas that require further research, development, and validation. The Power Park also increases public awareness of the potential of hydrogen for a variety of transportation applications.



Figure 1: First Fill November 2014

## Challenges & Significance

The major challenge for all hydrogen production and dispensing stations is the cost of hydrogen at the nozzle. In order to displace fossil fuels, hydrogen must be economically competitive with other transportation options. Light-duty vehicles have largely been designed to use high pressure (700 bar) hydrogen storage while heavy-duty vehicles such as the HAVO buses, use a lower pressure (350 bar) system. The primary objective of the MCBH project is to evaluate the technical performance of the system components including the electrolyzer, compressor, storage system, and the refrigeration and dispensing systems and to assess the economic performance of each in terms of the cost of hydrogen delivered at the fueling nozzle for both high and low pressure operation. The HAVO project focuses on the deployment of buses for public transportation. Additionally these buses operate in an environment of significant air quality contaminants that degrade fuel cell performance and durability. The HAVO project provides the opportunity to quantify the effects of air quality contaminants and identify pathways to reduce them to improve operational performance.

## Status & Accomplishments

### MCBH “Fast Fill” Hydrogen Station

- Procured a dual, 350/700 bar hydrogen production/dispensing system.
- Installed and commissioned the fueling station at MCBH meeting all base facility, security, and safety requirements.
- Conducted US DOE Hydrogen Safety Panel and independent third party safety reviews of the equipment and site.

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### Period of Performance:

2008 -2016

### Partner(s):

- [Marine Corps Base Hawai'i](#)
- [Powertech Labs, Inc.](#)
- [Hawai'i Volcanoes National Park](#)
- [HCATT](#)
- [US Hybrid](#)

### Funding:

- [US Department of Energy](#)
- [Office of Naval Research](#)
- [State of Hawai'i](#)

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- Commissioned and operated the first licensed hydrogen transport trailer in Hawai'i to transport hydrogen between bases.
- Developed and installed a high-speed data acquisition system to measure dynamic performance of the system.
- Demonstrated well-controlled, repeatable, 4 minute high-pressure fast fills.

## HAVO Hydrogen Buses

- Supported the purchase and conversion of two FCEV HAVO shuttle buses;
- Developed an environmental sensor system to monitor air filter performance on the HAVO buses in real time.
- Acquired three hydrogen transport trailers to supply hydrogen from a central production site to HAVO.
- Installing a hydrogen dispenser system at HAVO.



*Figure 2. HAVO FCEV Bus*

## Project Detail

Detailed project descriptions of the Power Park MCBH hydrogen station and the HAVO bus elements can be found at the following links:

[MCBH hydrogen station](#)

[HAVO bus project](#)