

# Informational Briefing for

Senate Committee on Education  
House Committee on Education  
Senate Committee on Energy and Environment  
House Committee on Energy and Environmental Protection

March 10, 2014



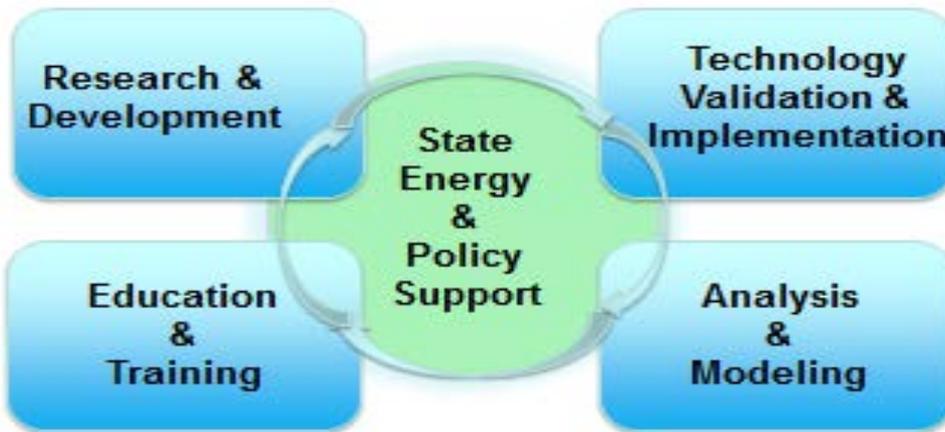
**HNEI**

**Hawai'i Natural Energy Institute**

School of Ocean and Earth Science and Technology  
University of Hawai'i at Mānoa

# Hawaii Natural Energy Institute

- Organized Research Unit in the School of Ocean and Earth Science and Technology
- Established by the Legislature in 2007
- Since 2007, funded by:
  - \$7M Barrel Tax (2010-2013)
  - \$100M+ Federal awards



- Alternate fuels
- Renewable generation
- Fuel cells & batteries
- Energy efficiency
- Grid management & enabling technologies

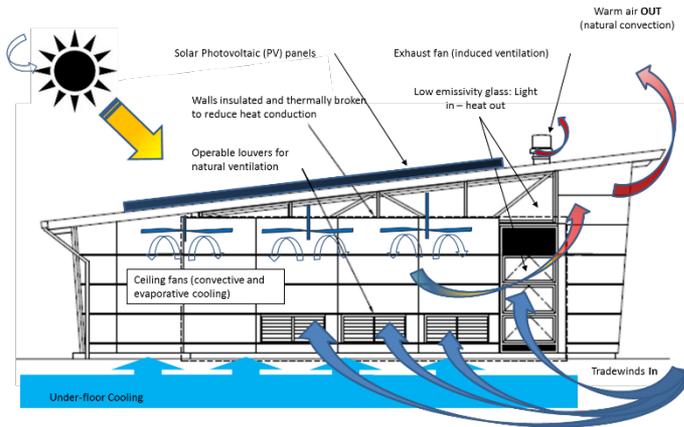
# Select Projects and Programs

- Hawaii Clean Energy Programmatic EIS (\$1.7M) - statewide
  - To help streamline project specific permitting and environmental reviews
- Wave Energy Test Site (\$12M) – MCBH Oahu
  - Partnering with Navy and USDOE for a plug-and-play testing facility
- Battery Energy Storage Systems (>\$6M) – Big Island, Molokai, Oahu
  - Support grid resiliency, PV and wind management, distribution stability
- Grid Integration (>\$30M)
  - Maui Smart Grid project
  - Smart Inverter project - Maui
  - Grid analysis studies (GE) – statewide
  - Molokai microgrid
- PV Test Sites (\$2M) – Kauai, Big Island, Maui, Oahu
  - Evaluate performance and lifetime of PV technologies in various environments
- Energy Efficiency in Buildings – Kauai, Oahu

# HNEI Energy Efficiency Research

## Net Zero Energy buildings installed

- One at Ilima Intermediate, (Ewa)
- Two at Kawaikini Charter, (Kauai)



## Designed to optimize human performance using:

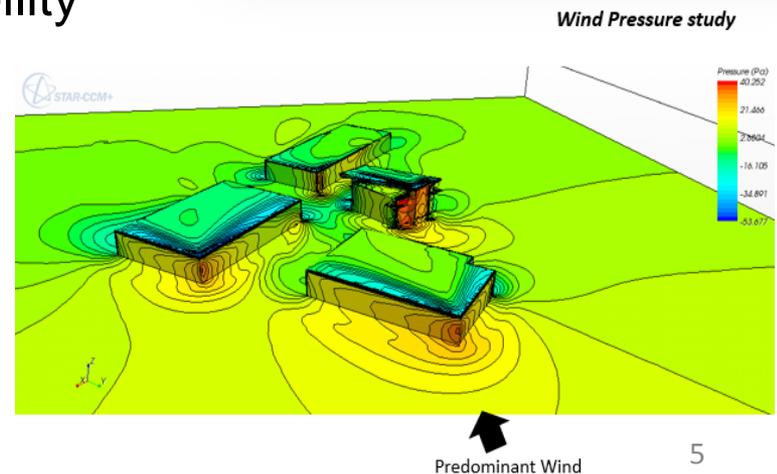
- Efficient lighting and daylighting
- Natural cooling and ventilation
- Advanced energy controls
- Rooftop photovoltaics

- Comparing performance of net-zero structures to other conventional DoE classrooms in Ewa.
- Developing simulation and design tools to inform the design of comfortable, efficient classrooms in different environments
- Monitoring several classrooms in DoE Campbell complex to evaluate comfort/energy/environment

# Dept of Education: Facilities Assessment

***Objective: To develop a facility assessment protocol to guide design of comfortable learning environments with reduced energy consumption.***

- Partnership of HNEI, UH School of Architecture, and MKThink
- Using DoE Campbell complex as test site.
- Comparing performance of different classroom types using measured energy and environmental data
- Comparing Campbell and select other sites to validate models/protocols for applicability to other facilities.
- Develop design guidelines applicable to DoE facilities statewide in future.



# About Hawaii Natural Energy Institute

*An organized research unit of the University of Hawai`i at Manoa's School of Ocean and Earth Science and Technology (SOEST); HNEI is a nationally acknowledged leader in energy research with active programs in alternative fuels, energy efficiency, systems integration/energy security, renewable energy generation, and electrochemical power systems. HNEI has undertaken a pivotal role within the State, working closely with DBEDT, the HPUC, and the utilities to reduce the state's dependence on fossil fuels. HNEI is leading several major public/private partnerships to deploy and demonstrate grid-scale energy systems to address the technical issues associated with high penetration of renewable energy technologies onto the grid. For more information, please visit [www.hnei.hawaii.edu/](http://www.hnei.hawaii.edu/).*