



STATE OF HAWAII
DEPARTMENT OF EDUCATION
P.O. BOX 2360
HONOLULU, HAWAII 96804

OFFICE OF THE SUPERINTENDENT

September 15, 2015

TO: The Honorable Grant Chun
Chairperson, Finance and Infrastructure Committee

FROM:  Kathryn S. Matayoshi
Superintendent

SUBJECT: **Update on Department of Education's Sustainable/Energy
Efficiency Master Plan, "Ka Hei"**

1 DESCRIPTION

Presentation on the progress and on-going efforts of the Ka Hei program.

2 UPDATE OR PRESENTATION

Presentation on the progress and metrics of Ka Hei Phase 1; six month look ahead of upcoming plans and construction activities.

KSM:kb
Attachment

c: Office of School Facilities and Support Services



Ka Hei Update Board of Education September 15, 2015

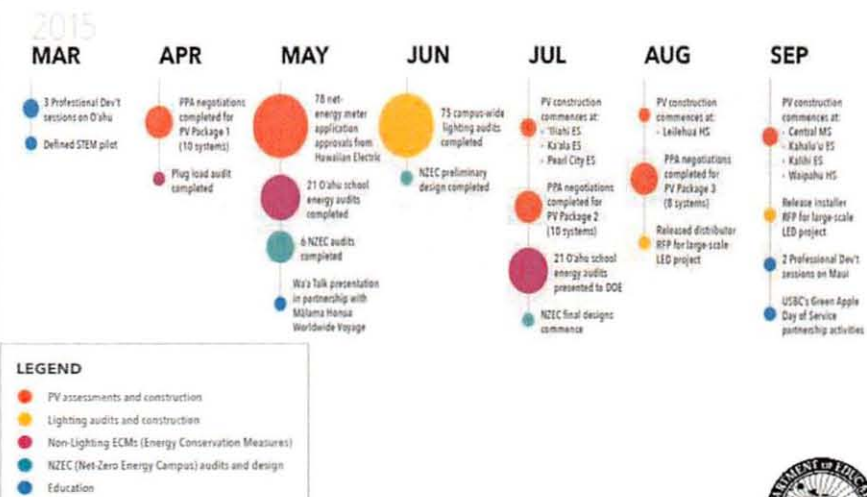


HAWAII STATE DEPARTMENT OF EDUCATION
HawaiiPublicSchools.org



1

Progress Since Last Update



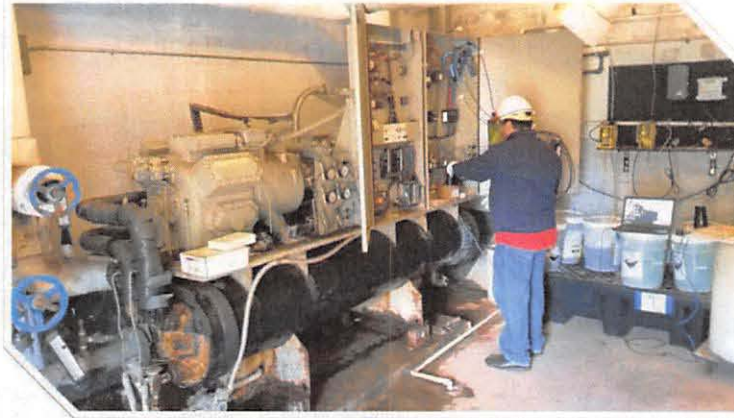
HAWAII STATE DEPARTMENT OF EDUCATION
HawaiiPublicSchools.org



2

Phase 1 Audits Complete

26 Audits across elementary, middle, and high schools



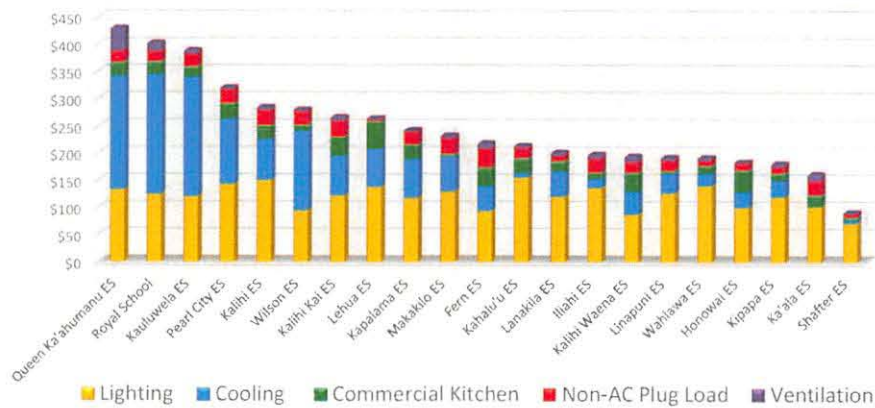
HAWAII STATE DEPARTMENT OF EDUCATION
HawaiiPublicSchools.org



3

Electricity Cost Per Student

Audit Data from Phase 1 Elementary Schools



HAWAII STATE DEPARTMENT OF EDUCATION
HawaiiPublicSchools.org



4

Phase 1 Metrics – Update vs Goals

Phase 1 Goals	Phase 1 Outcomes
2 megawatts (MW) of renewable energy produced	2.8MW under construction
\$1 million in energy cost reduction	With LED lighting retrofits, estimated \$2 million in energy cost reduction.
5 megawatt hours (MWh) of energy use reduction through energy efficiency	247,000 kilowatt hours (KWh) from pilot LED project at Kapalama and Kauluwela Elementary. Full implementation of the 30 schools in Phase 1 would provide 5 to 6 MWh annually.
40 schools participating in Ka Hei (facilities or education)	103 schools participating
31 teachers receiving Ka Hei Professional Development	55 teachers received Ka Hei PD training and additional 177 Teachers have participated in Ka Hei related activities
800 students participating in the program	1,736 students
35 lesson plans implemented	70 lesson plans implemented

HAWAII STATE DEPARTMENT OF EDUCATION

HawaiiPublicSchools.org



5

Solar PV



○77 Net Energy Metered (NEM) systems have been approved by Hawaiian Electric.

○28 systems across 23 schools are in various phases of construction

○Design in process for Phase 2 schools for construction in 2016

○Roofing upgrades on PV roofs include cool roof coatings for heat abatement

HAWAII STATE DEPARTMENT OF EDUCATION

HawaiiPublicSchools.org



6

PPA Rate Comparison

Agency	Size kW _{DC}	Year 1 Rate	Escalator	Year 20 Rate	Year Execute d	Developer
Dept. of Transportation	779	\$.32 - \$.38	2-3%	\$.47 - .67	2008	Hoku Solar
DOE Oahu Pilot	400	\$.20	2.8%	\$.33	2010	Hawaii Pacific Solar
County of Hawai'i	293	\$.20	3%	\$.35	2011	REC Solar
County of Maui	1,900	\$.15	2.5%	\$.24	2011	Bosch Solar
DOE Kaua'i Pilot	2,400	\$.17	2.7%	\$.28	2012	Hawaii Pacific Solar
UH Maui College	565	\$.23	3.5%	\$.45	2013	Johnson Controls
Ka Hei Package 1	1,137	\$.20	1%	\$.24	2015	OpTerra
Ka Hei Package 2*	1,117	\$.191	1%	\$.23	2015	OpTerra
Ka Hei Package 3*	972	\$.196	1%	\$.24	2015	OpTerra

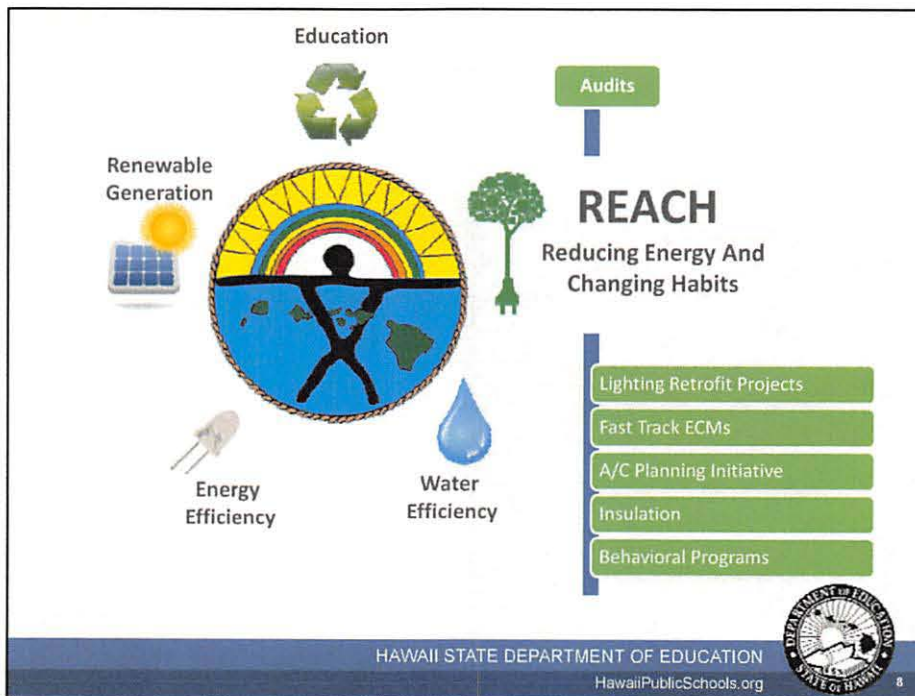
*Schools placed in service in 2015 will receive a slightly lower rate. This is the worst case scenario

HAWAII STATE DEPARTMENT OF EDUCATION

HawaiiPublicSchools.org



7



Net Zero Microgrid Campuses

Pilot microgrid project at
Kaimuki Middle School



Partnership with HECO,
DBEDT, and other federal
agencies

\$850,000 in potential
grant funding

5 other neighbor island
sites in final engineering

HAWAII STATE DEPARTMENT OF EDUCATION

HawaiiPublicSchools.org



9

Educational component



Year 2 Professional Development
trainings begin this month

Defined STEM available to all
schools aligned with Next
Generation Science Standards

Integration into World Conservation
Congress hosted in Hawaii in 2016

Student energy groups and
behavioral savings program launch

Real world data to be integrated
from solar and energy efficiency
projects



HAWAII STATE DEPARTMENT OF EDUCATION

HawaiiPublicSchools.org



10

PV and Air Conditioning



Commencing study on 3 of the top 5 schools on the A/C priority list

Determine air conditioning requirements

Determine full solar PV buildout sizing

Maximize energy efficiency

HAWAII STATE DEPARTMENT OF EDUCATION
HawaiiPublicSchools.org



11

6 Month Look Ahead

OCT

- PV construction commences at:
 - Farrington HS
 - Kapalama ES
 - Kaula ES
 - Kipapa ES
 - Lanakila ES
 - Linapuni ES
- Release financier RFP for large-scale LED project
- 2 Professional Dev't sessions on O'ahu & Hawaii

NOV

- PV construction commences at:
 - Kaimuki MS
 - Makakilo ES
 - McKinley HS
 - Shafter ES
- Presenting at Schools of the Future Conference
- Large-scale LED project analysis
- Additional O'ahu HS Energy Audits Completed

DEC

- PV construction commences at:
 - Ka'ahumanu ES
 - Lehua ES
 - McKinley CSA
- Launch Reduce Energy and Change Habits (REACH) program

2016
JAN

- PV construction commences at:
 - Royal ES
- NZEC final designs completed

FEB

- PV construction commences at:
 - Honowai ES
 - Wahiawa ES

MAR

- Commence NZEC construction upon receiving proper permits and approvals

LEGEND

- PV assessments and construction
- Lighting audits and construction
- Non-Lighting ECMs (Energy Conservation Measures)
- NZEC (Net-Zero Energy Campus) audits and design
- Education

HAWAII STATE DEPARTMENT OF EDUCATION
HawaiiPublicSchools.org

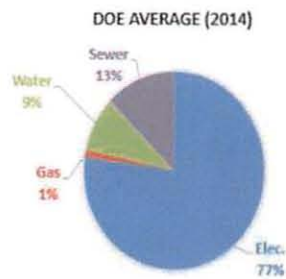


12



Annual DOE Utility Expenditures

Utility	All (255) DOE Schools
Electricity	\$48,242,714
Gas	\$702,500
Water	\$5,755,477
Sewer	\$7,855,983
Totals	\$62,556,674



Thank You!

