DAVID Y. IGE
GOVERNOR

DR. CHRISTINA M. KISHIMOTO
SUPERINTENDENT

STATE OF HAWAI`I
DEPARTMENT OF EDUCATION
P.O. BOX 2360
HONOLULU, HAWAI`I 96804

OFFICE OF THE SUPERINTENDENT

November 8, 2018

The Honorable Ronald D. Kouchi, President
and Members of the Senate
State Capitol, Room 409
Honolulu, Hawaii 96813

The Honorable Scott K. Saiki, Speaker
and Members of the House of Representatives
State Capitol, Room 431
Honolulu, Hawaii 96813

Dear President Kouchi, Speaker Saiki, and Members of the Legislature:

For your information and consideration, I am transmitting a copy of the Sustainable Schools Initiative, pursuant to Section 302A – 1510, Hawaii Revised Statutes (HRS). In accordance with Section 93-16, HRS, I am also informing you that the report may be viewed electronically at: http://bit.ly/DOELegReports.

Sincerely,

Dr. Christina M. Kishimoto
Superintendent

CMK:at
Enclosure

c: Legislative Reference Bureau
Office of School Facilities and Support Services

State of Hawaii
Department of Education

Annual Report on the Department of Education's Sustainable Schools Initiative 2019

November 2018

Act 176, SLH 2016, established Section 302A-1510, Hawaii Revised Statutes (HRS), Sustainable Schools Initiative. The purpose of the Act was to accelerate the goals of the Department of Education (DOE) to cool Hawaii's schools, reduce energy costs, meet Hawaii's clean energy goals, and provide all students with better classrooms in which to learn. Act 176 also requires DOE to report annually on the following: 1) The overall progress toward the net-zero energy goal set forth in Section 302A-1510(a), HRS; 2) Its plans and recommendations to advance the net-zero goal set forth in Section 302A-1510(a), HRS; and 3) Any challenges or barriers encountered or anticipated by the DOE in meeting the net-zero energy goal set forth in Section 302A-1510(a), HRS.

Annual Report on the Department of Education's Sustainable Schools Initiative 2019

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(1) OVERALL PROGRESS TOWARD THE NET-ZERO ENERGY GOAL SET FORTH IN SECTION 302A-1510(a), HRS:

Hawaii School Facilities Energy Report Comparison of FY 2017 & FY 2018				
	FY 2017		FY 2018	
School Facilities Energy	kWh	$	kWh	$
Utility Energy [1]	130,325,145	$ 35,186,086	118,248,059	$ 35,135,492
Renewable Energy	12,617,154	$ 2,751,253	22,137,936	$ 4,781,844
Total Energy	**142,942,299**	**$ 37,937,339**	**140,385,995**	**$ 39,917,336**

[1] Utility Energy includes Hawaiian Electric Company, Hawaii Electric Light Company, Kauai Island Utility Cooperative, and Maui Electric Company.

The year-over-year (YOY) percentage changes and the percent of total energy are provided in the tables below:

	YOY Change (%)		Percent of Total Energy (kWh)	
School Facilities Energy	kWh	$	FY 2017	FY 2018
Utility Energy	-9%	0%	91%	84%
Renewable Energy	75%	74%	9%	16%
Total Energy	-2%	5%	100%	100%

In the first quarter of FY 2019, total electricity consumption across all public campuses statewide was down 7% from the first quarter of FY 2018. Compared to the first quarter of the base year, FY 2016, total consumption was down 12%.

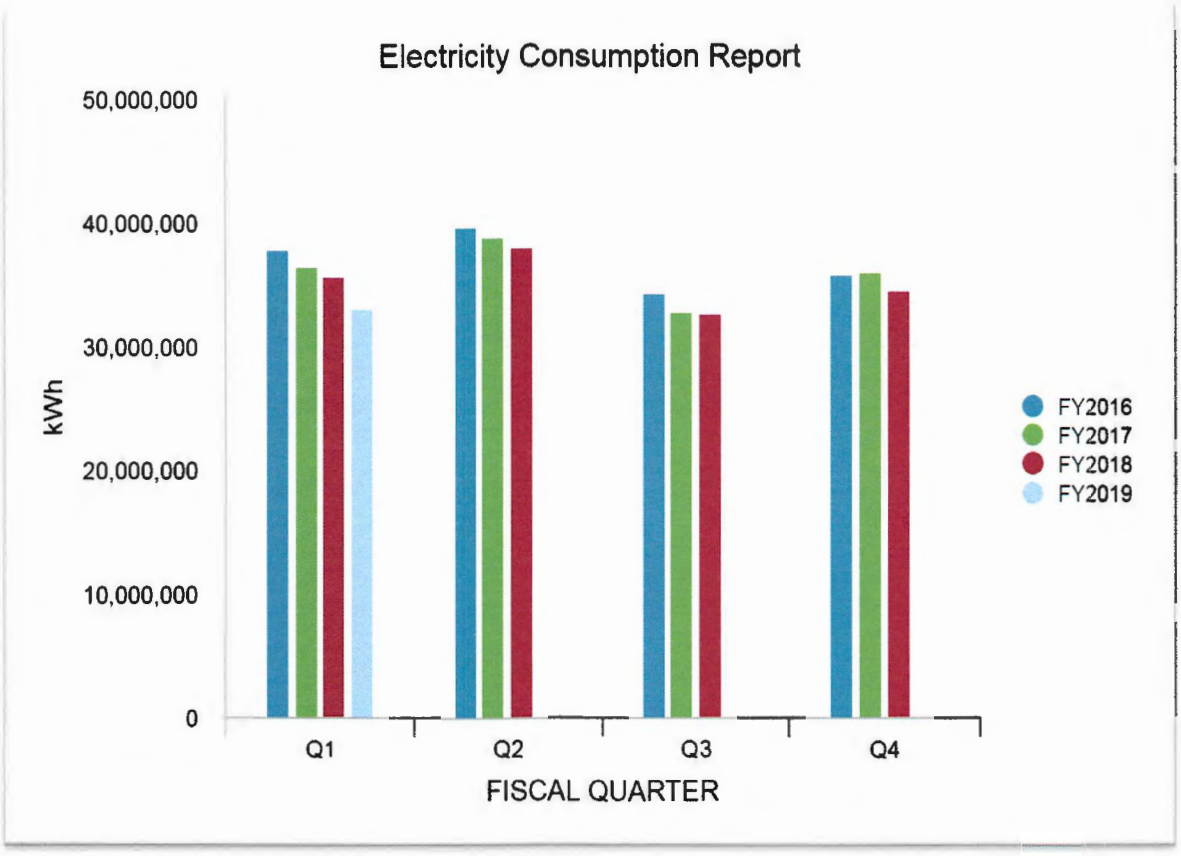


Figure 1 - Total Electricity Consumption by FQ

For Oahu schools, where implementation of the Light-Emitting Diode (LED) Replacement Program has been most fully implemented (see description next page), total electricity consumption was down 8.9% YOY in the first quarter of FY 2019. Compared to the first quarter of the base year, FY 2016, total consumption in the first quarter of FY 2018 was down 14.5%

Oahu

Row Labels	Net Grid KWH	PV KWH	TOTAL KWH
FY2016	**99,902,619**	**5,033,507**	**104,936,126**
Q1	25,810,660	1,220,610	27,031,270
Q2	27,109,379	1,022,781	28,132,160
Q3	22,902,415	1,258,250	24,160,665
Q4	24,080,165	1,531,866	25,612,031
FY2017	**92,819,833**	**9,495,307**	**102,315,140**
Q1	24,280,538	1,968,998	26,249,536
Q2	25,722,505	1,786,840	27,509,345
Q3	20,721,431	2,337,173	23,058,604
Q4	22,095,359	3,402,296	25,497,655
FY2018	**79,362,342**	**18,493,256**	**97,855,598**
Q1	20,173,362	5,209,405	25,382,767
Q2	22,552,030	3,989,928	26,541,958
Q3	18,111,371	4,127,801	22,239,172
Q4	18,525,579	5,166,122	23,691,701
FY2019	**18,006,811**	**5,114,921**	**23,121,731**
Q1	18,006,811	5,114,921	23,121,731
Grand Total	**290,091,605**	**38,136,990**	**328,228,595**

In FY 2018, renewable energy production increased 75% YOY over FY 2017. Compared to the base year, FY 2016, alternate energy production has increased 200%.

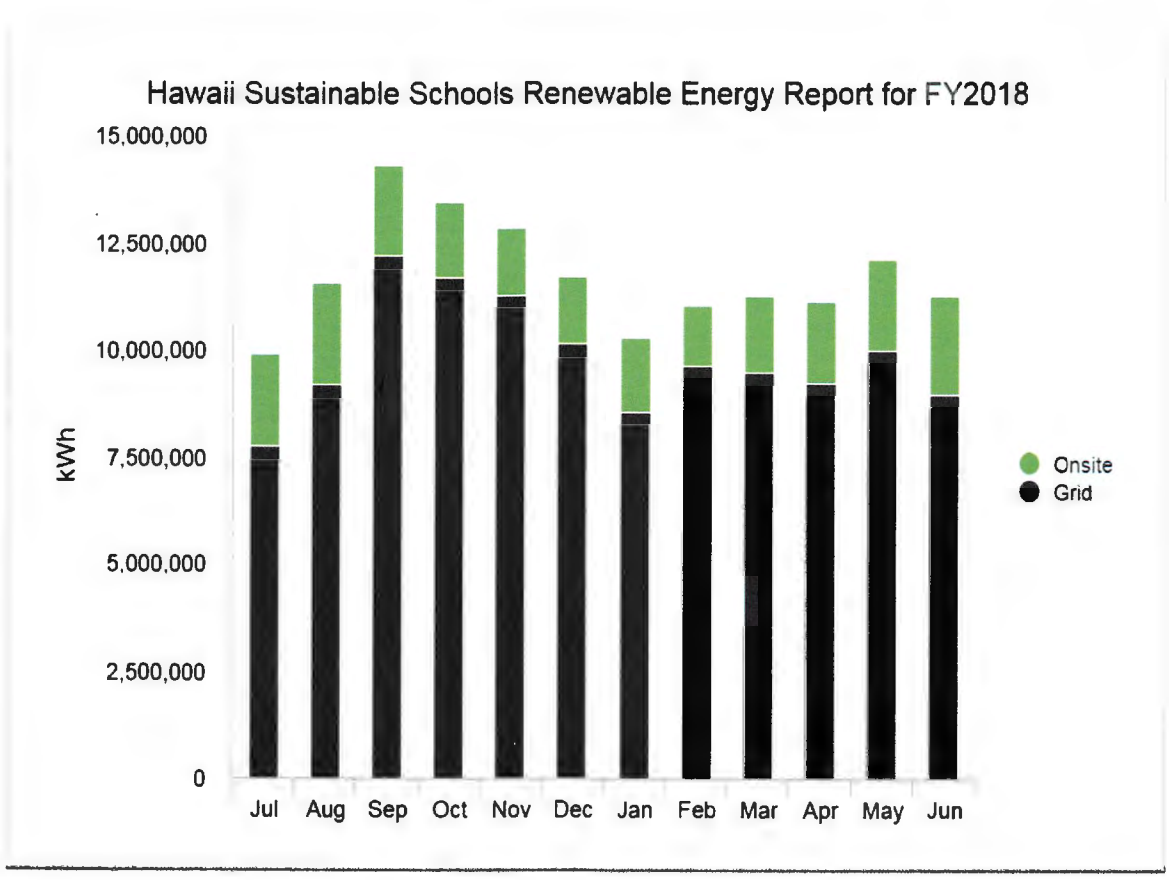


Figure 2 - Renewable Energy Production for FY 2018

DOE Facilities Portal

The DOE has developed school energy usage reporting software applications to provide energy usage information to the schools. This will empower DOE personnel to manage energy consumption and costs. School facility electricity usage data can be accessed at the DOE portal at https://www.hidoefacilities.org.

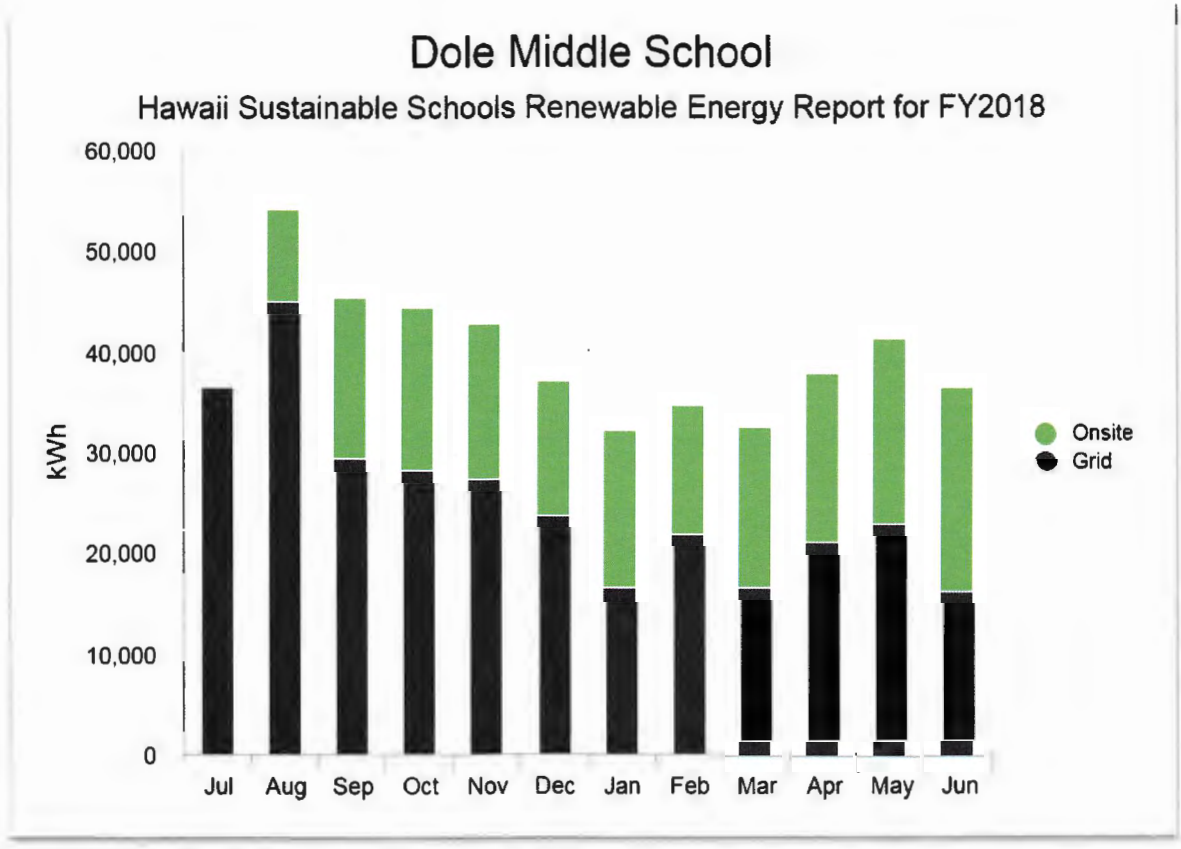


Figure 3 - Information on PV and Utility billed usage available at HIDOEFacilities.org portal

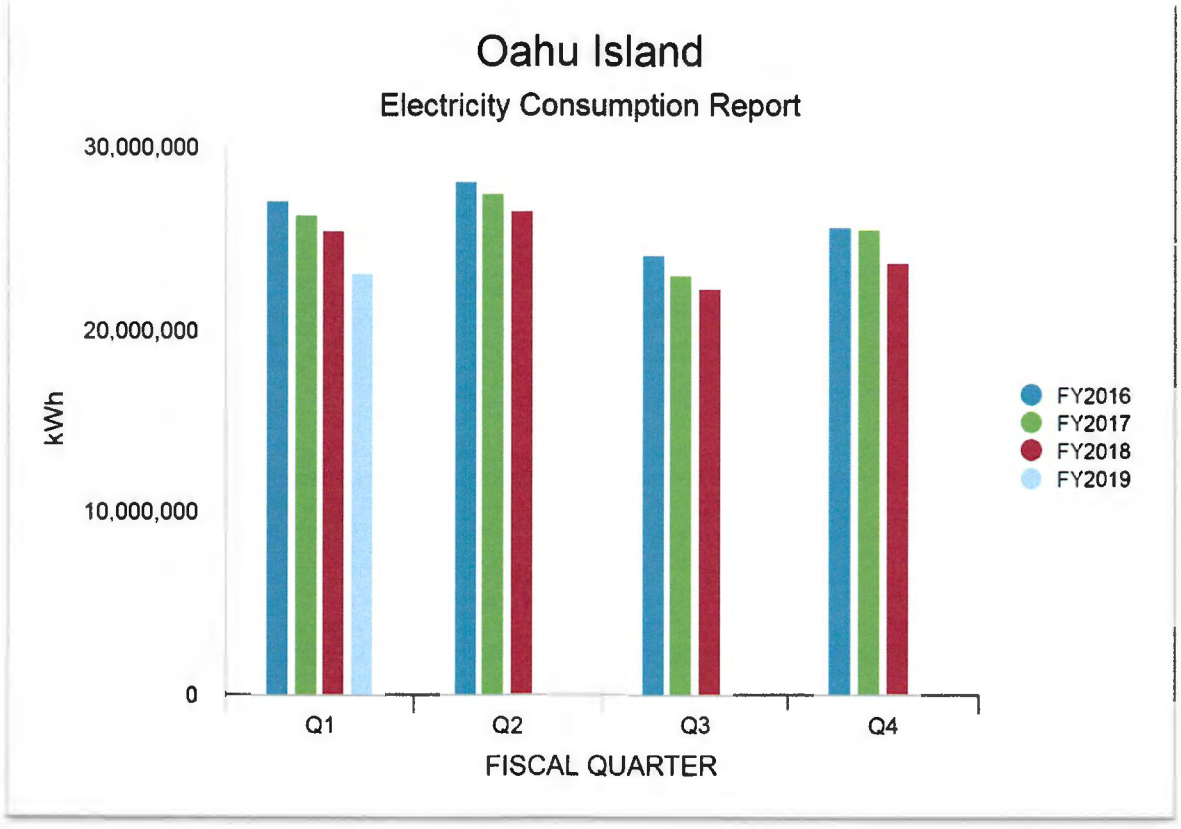
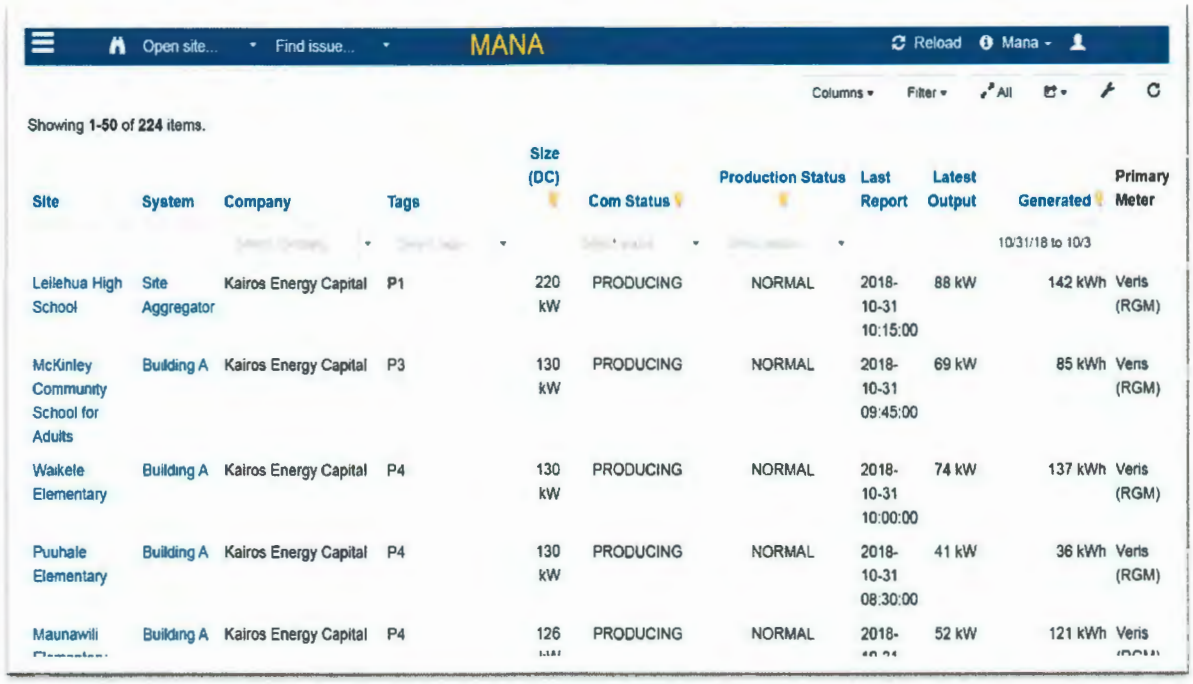


Figure 4 - Historical information on total electricity usage available at HIDOEFacilities.org portal

On-Site Solar Power Production Monitoring Program

Working with Mana Monitoring, an innovative asset and resource management company, the DOE has acquired the ability to monitor, in real time, all the solar production sites installed on its system. The data is available on line and will provide an additional learning resource for STEM programs.



Site	System	Company	Tags	Size (DC)	Com Status	Production Status	Last Report	Latest Output	Generated	Primary Meter
									10/31/18 to 10/3	
Leilehua High School	Site Aggregator	Kairos Energy Capital	P1	220 kW	PRODUCING	NORMAL	2018-10-31 10:15:00	88 kW	142 kWh	Veris (RGM)
McKinley Community School for Adults	Building A	Kairos Energy Capital	P3	130 kW	PRODUCING	NORMAL	2018-10-31 09:45:00	69 kW	85 kWh	Veris (RGM)
Waikele Elementary	Building A	Kairos Energy Capital	P4	130 kW	PRODUCING	NORMAL	2018-10-31 10:00:00	74 kW	137 kWh	Veris (RGM)
Puuhale Elementary	Building A	Kairos Energy Capital	P4	130 kW	PRODUCING	NORMAL	2018-10-31 08:30:00	41 kW	36 kWh	Veris (RGM)
Maunawili	Building A	Kairos Energy Capital	P4	126	PRODUCING	NORMAL	2018-	52 kW	121 kWh	Veris

Figure 5 - Real-time PV production information available at the Mana Monitoring portal

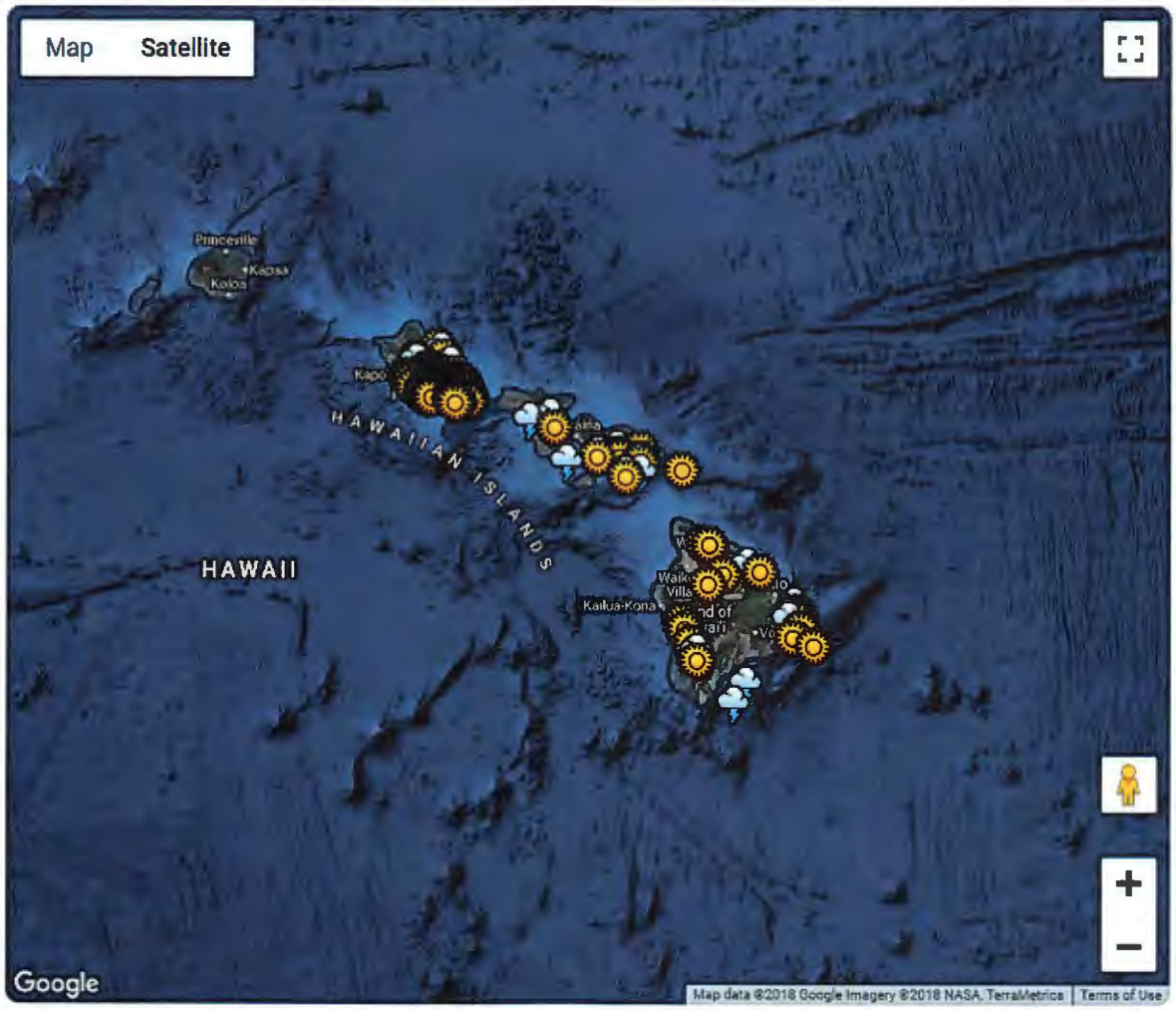


Figure 6 - Real-time PV production map available at the Mana Monitoring portal

Light-Emitting Diode (LED) Replacement Program

As described in last year's report, the DOE has embarked on two programs designed to reduce energy consumption by 38 million kWh, with electric bill savings over $10 million. The first program is well on its way to completion and has replaced virtually all lighting at Oahu public schools with LED bulbs. Hawaii and Maui Districts will be completed as manpower resources become available. Total electricity consumption at Oahu schools dropped 4.4% from FY 2017 to FY 2018.

Air Conditioning Replacement Programs

The second program to replace many of the oldest and least efficient air conditioning systems with higher efficiency systems will move ahead during the current fiscal year.

Agile Project Processes

The DOE is continuing to develop streamlined project management, construction tracking and payment processing software that will enable the reducing the time and cost of infrastructure repair and improvement projects.

(2) PLANS AND RECOMMENDATIONS TO ADVANCE THE NET-ZERO ENERGY GOAL SET FORTH IN SECTION 302A-1510(a), HRS:

PLANS FOR FUTURE NET-ZERO ENERGY CAMPUS DEVELOPMENT

Accelerating Solar Photovoltaics (PV) Installation in FY 2019

DOE intends to accelerate the installation of solar PV at Hawaii public school campuses. As petroleum prices continue to increase, the most effective way to control the cost of electricity is the replacement of utility rates with Power Purchase Agreement rates, at a difference of something on the order of -$0.10 per kWh.

Moreover, the imminent phase out of the federal tax credit on solar investment is a powerful incentive to ramp up these installations over FY 2019.

Advancing Heat Abatement with Emerging Technology

Heat abatement continues to be an issue at public schools across Hawaii. In order to assist schools in advancing the installation of cooling and air conditioning technology, the DOE is in the process of implementing a new School-Led Heat Abatement Program that promotes the expedited installation of room air conditioning systems utilizing Efficient Variable Output (EVO) technology.

In conjunction with reductions in current electrical loads accruing from the LED replacement project, judicious electrical upgrades and application of high efficiency, emerging technology, the School-Led Heat Abatement program will lead to cooler, yet more efficient, schools.

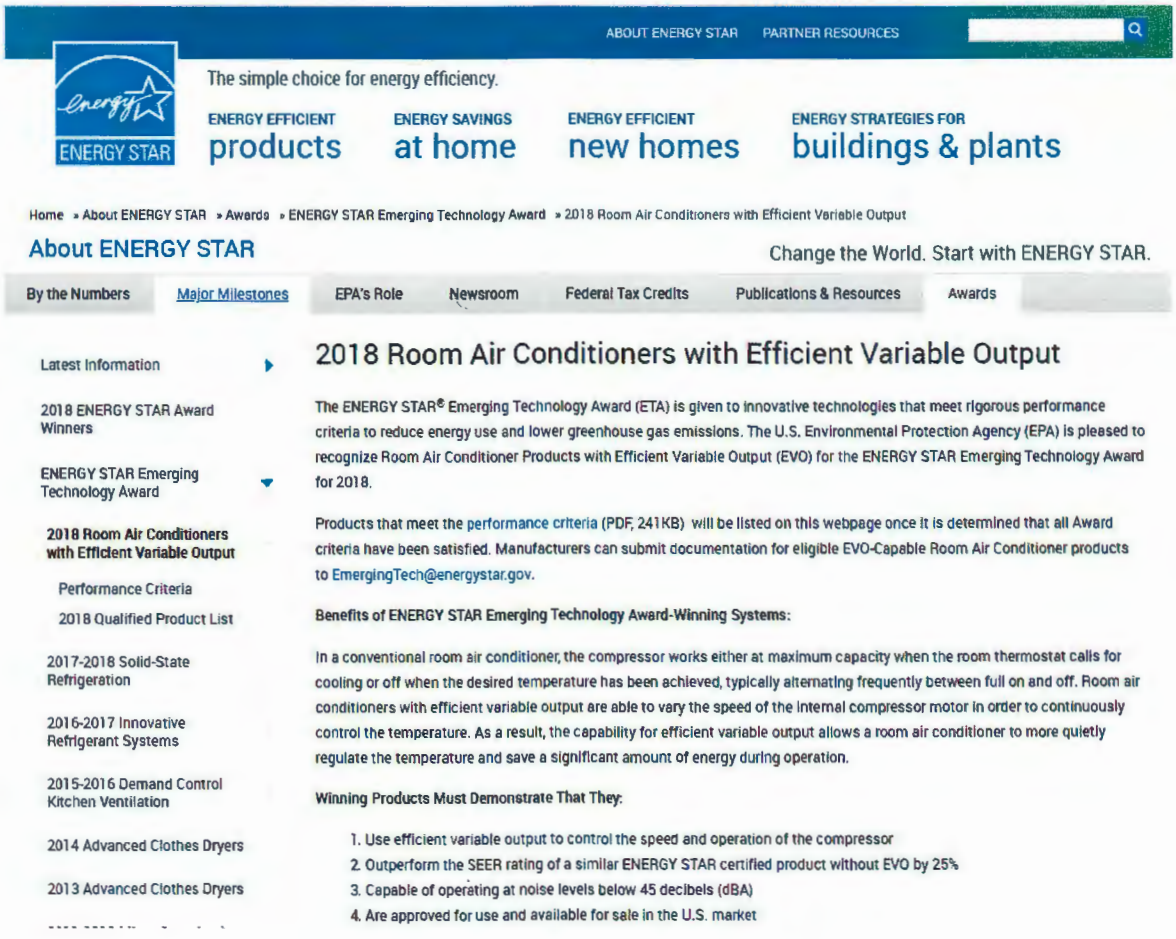


Figure 7 - Emerging EVO technology will revolutionize room air conditioning products

(3) CHALLENGES OR BARRIERS ENCOUNTERED OR ANTICIPATED IN MEETING THE NET-ZERO ENERGY GOAL SET FORTH IN SECTION 302A-1510(a), HRS:

CHALLENGES AND BARRIERS

Need to Expand Cooling and Air Conditioning Service

The continuing need to cool and air condition classrooms and other facilities at all campuses while reducing other loads is a serious challenge. The adoption of new, more efficient technology is the primary means of meeting this challenge. This may include measures that utilize Internet of Things based control technology. It is also a well-recognized theme that changing human nature is a relevant approach that can produce significant energy savings.

Emerging Technology Availability

EVO-Capable Room Air Conditioner products are not yet readily available in Hawaii. Although nationwide retailers such as Walmart, Sam's Club, Sears and Home Depot list these products in their online catalogs, they cannot be found in the local stores or purchased online. DOE intends to work with these retailers to obtain quantities for purchase by our public schools.

Figure 8 - EVO Room Air Conditioner