

UH Maui College will generate 100 percent of its energy from on-site solar coupled with battery distributed energy storage. Photo by University of Hawai'i

University of Hawai'i Campus Can Go 100% Renewable with Johnson Controls Distributed Energy Storage

By Jeremy Niederjohn, Johnson Controls



WHEN ITS NEW SOLAR + STORAGE SYSTEM IS OPERATIONAL IN 2019, UH MAUI COLLEGE WILL BE CAPABLE OF ELIMINATING THE CAMPUS' FOSSIL FUEL-BASED ENERGY USE—16 YEARS AHEAD OF SCHEDULE.



Johnson Controls is helping the University of Hawai'i Maui College move toward being one of the first U.S. campuses to generate 100 percent renewable energy on site, from solar + distributed energy battery storage. Four more UH community college campuses on O'ahu will also significantly reduce fossil fuel consumption.

More than \$79 million in savings will be generated across all campuses over 20 years, guaranteed. Energy efficiency upgrades will also reduce the deferred maintenance backlog at these campuses by approximately \$20 million.

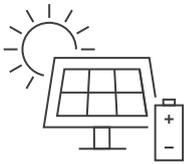
The photovoltaic solar + storage systems will be developed by Johnson Controls and owned by Hawai'i-based Pacific Current.

Distributed energy storage from Johnson Controls brings together the company's expertise in batteries and buildings to create advanced energy storage solutions, using lithium-ion batteries in modular systems for easy scaling. These systems support multiple applications, are driven by intelligent and adaptive controls, and easily integrate with existing building automation systems for holistic, efficient energy management.

In 2015, Hawai'i became the first U.S. state to commit to achieving 100 percent renewable energy by 2045. The state legislature and UH together set a goal for the university system to be "net-zero" by January 1, 2035, meaning the system would produce as much renewable energy as it consumes across its campuses.

When its new solar + storage system is operational in 2019, UH Maui College will be capable of eliminating the campus' fossil fuel-based energy use—16 years ahead of schedule. On O'ahu, through a combination of solar shade canopies, distributed energy storage and energy efficiency measures, Leeward Community College, Honolulu Community College, Kapi'olani Community College and Windward Community College will reduce their use of fossil fuel for energy by 98 percent, 97 percent, 74 percent and 70 percent, respectively.

The project will have the following solar PV and distributed energy storage capacity:

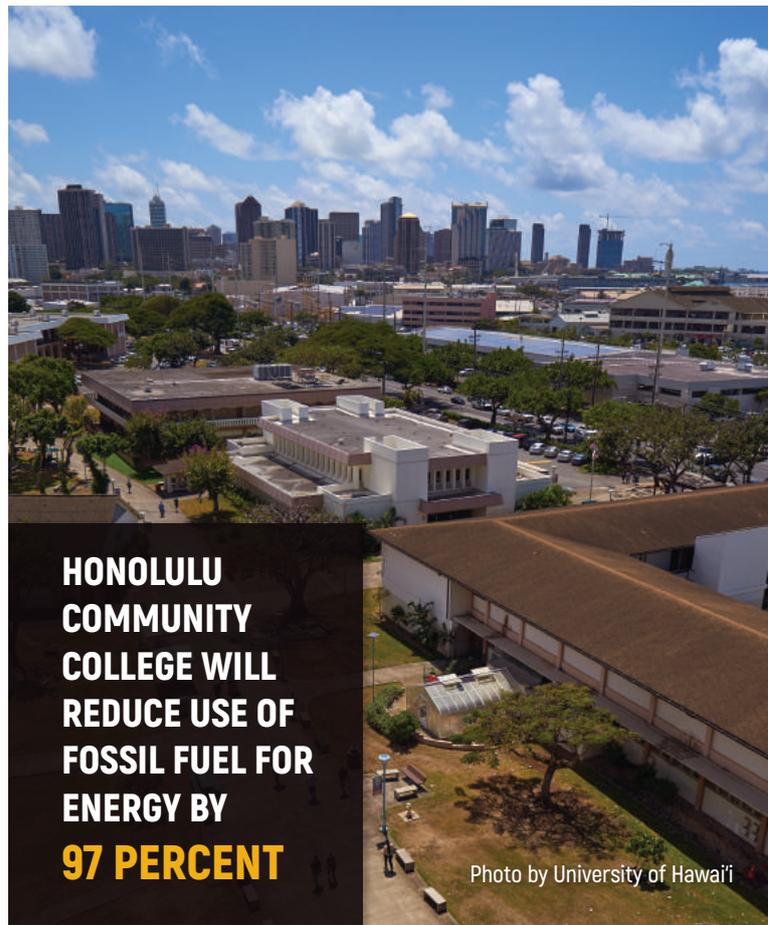


SOLAR PV (10.5 MW)

Total on-site capacity
 Maui: 2.8 MW of solar PV
 O'ahu: 7.7 MW of solar PV

DISTRIBUTED ENERGY STORAGE (41.8 MWH)

Total on-site capacity
 Maui: 13.2 MWh of battery distributed energy storage
 O'ahu: 28.6 MWh of battery distributed energy storage



**HONOLULU
 COMMUNITY
 COLLEGE WILL
 REDUCE USE OF
 FOSSIL FUEL FOR
 ENERGY BY
 97 PERCENT**

Photo by University of Hawai'i

Since 2010, Johnson Controls has worked with the university system to increase energy efficiency and sustainability through performance contracting. The partnership between UH, Johnson Controls and Pacific Current is the second phase of this project, which also includes educational programs for faculty and students.

Advancing toward 100 percent renewable energy

By 2019, the University of Hawai'i (UH) Maui College will be capable of producing as much energy as it consumes. A total of five UH Community College campuses will cut their fossil fuel energy consumption by the following:



MAUI
 CAMPUS



LEEWARD
 CAMPUS



HONOLULU
 CAMPUS



KAPI'OLANI
 CAMPUS



WINDWARD
 CAMPUS

Here's how UH is partnering with Johnson Controls to increase energy resiliency and self-sufficiency.



Energy Performance Contract

More than \$79 million in savings over 20 years, guaranteed



Solar + Storage

On-site capacity: 2.8 MW of solar PV and 13.2 MWh of battery distributed energy storage at UH Maui College, and 7.7 MW of solar PV and 28.6 MWh of battery distributed energy storage at the O'ahu UH Community College campuses



Smart Controls

Automation to maximize comfort, control and reliability



LED Lighting

Interior upgrades at all campuses



HVAC Enhancements

Replace and upgrade chillers and related equipment



Other Enhancements

Window film installation and new interior transformers at all campuses



Deferred Maintenance

\$20 million reduction across two phases, through efficiency projects and savings



Hands-On Learning

Furthers sustainability education

Johnson Controls building and energy solutions promote sustainability and growth for our customers and our world. See what we can do for your facility, enterprise and community at johnsoncontrols.com.



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Photo by University of Hawai'i

**KAPI'OLANI COMMUNITY COLLEGE
WILL REDUCE USE OF FOSSIL FUEL
FOR ENERGY BY 74 PERCENT**



Johnson Controls is a global diversified technology and multi-industrial leader serving a wide range of customers in more than 150 countries. It has more than 120,000 employees creating intelligent buildings, efficient energy solutions, integrated infrastructure and next generation transportation systems that work seamlessly together to deliver on the promise of smart cities and communities. Johnson Controls' commitment to sustainability dates back to its roots in 1885, with the invention of the first electric room thermostat. The company is committed to helping its customers win and to creating greater value for all of its stakeholders through a strategic focus on buildings and energy growth platforms.