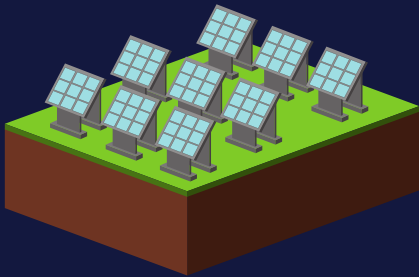


MOBILE RENEWABLE ENERGY UNIT

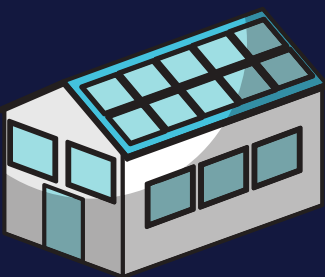
The Mobile Renewable Energy Unit (MREU) was donated to Shoals Marine Laboratory in 2017 by Cornell alum, Sean O'Day. It has since been reconfigured to form its own green microgrid to supply energy to the saltwater pump, to power one of the island's largest loads.

WHAT IS A MREU?



The Mobile Renewable Energy Unit, or MREU for short, is a compact, mobile energy generation and storage system, that was originally designed to be integrated into existing utility grids in permanent military outposts overseas.

HOW IS IT BEING USED?



The MREU has since been reconfigured to form a green microgrid on Kingsbury House, complete with 98 solar arrays (that can generate up to 30 kilowatts of energy) on the roof which feed into 16 Lithium-ion batteries that can collectively store 80 kilowatt hours of energy. It is currently being used to power the saltwater pump during the day...but the system is still in the test phase for carrying the load through the night.

SEI CONTRIBUTIONS:



The 2017 Sustainable Engineering Interns (SEI) made the recommendation to incorporate the MREU system on the island after careful consideration. They thought that if the saltwater pump could be isolated onto this microgrid, it would allow the main green grid to run through the night without reverting to the diesel generator (on an ideal solar day). The 2018 SEI's can now confirm this! In July 2018, SEI's monitored the system overnight for the first time! And... it made it! The MREU did indeed carry the saltwater pump all night and reduce the main green grid load to eliminate diesel fuel dependency on an ideal solar day. This is the first time ever in the history of Shoals Marine Laboratory that this has been achieved!

Thank you to Sean O'Day of Florida Solar Energy, for the generous donation which is now helping to carry Appledore Island through the night on clean energy! We get by with a little help from our friends!

ENERGY HISTORY AT SHOALS

Here's a **timeline** of our recent **energy saving** and **conservation** initiatives!

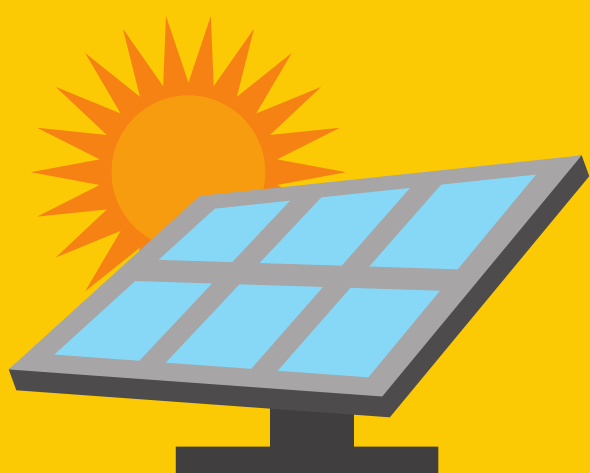
2006

Sustainable Engineering Internship program begins.



2007

First **solar panels** (7.5 kW) are **installed** on Dorms 1 & 2, and 80-ft **Bergey wind turbine** is **erected**.



2011

Water Conservation Building opens. **Composting toilets** and **solar hot water heating system** installed.



2013

Energy Conservation Building ("ECB") **constructed** to house solar and wind-powered battery bank.

2015

29 kW of **solar panels** added thanks to the "**Bringing Energy Conservation to Light!**" Crowdfunding campaign.

2014

26 kW of **solar panels** installed around the ECB. "**Green Grid**" **hub** (batteries, inverters, etc.) **connected** inside the ECB.



2017

Shoals Marine Lab receives the **Mobile Renewable Energy Unit** (MREU) as a donation from Cornell alum, **Sean O'Day**. The **2017 Sustainable Engineering Interns** perform a cost-benefit analysis of the MREU to determine the best means of getting the unit out to Appledore and where the system could be used to best serve the island's energy needs.



JUNE 2018

At the **2017 SEI's recommendation**, the unit is reconfigured to perform as its own **microgrid** to provide **power** to the **saltwater pump**, one of the island's largest energy loads.



JULY 2018



MREU carries the saltwater pump load through the night, **eliminating diesel fuel reliance** for the **entire island** on an **ideal solar day** (the **first time** this has ever been achieved)!