GREENING MEASURES FOR HAWAII’S HERITAGE HOMES

CLASS 3: ENERGY

MASON ARCHITECTS
HAWAI‘I ENERGY
PONO HOME
A statewide non-profit advocacy organization, Historic Hawai‘i Foundation encourages the preservation of historic buildings, sites and communities relating to the history of Hawai‘i.
Mahalo Sponsors

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HHF Planners
Historic Preservation Education Foundation
Pono Home
Mason Architects
Roth Ecological Design International
Each session qualifies for 1.5 AIA/CES (HSW). AIA Honolulu is the registered provider.
OUTLINE OF TODAY’S CLASS

- Welcome, Overview & Project Drawdown (5 min.)
- Embodied Energy & Character-Defining Features (5 min.)
- State of Hawaii’s Energy, Renewables (10 min.)
- Retrofits & Energy Audits (15 min.)
- Hawai‘i Energy & Efficiency Unlocked (5 min.)
- Residential Incentives with Historic Examples (25 min.)
- Discussion (20 min.)
Joy Davidson
Mason Architects, Inc.

Joy Davidson is an Associate with Mason Architects, Inc. and has worked with the firm since obtaining her Doctor in Architecture degree in 2002. She has 20 years of experience in historic preservation and has focused on preservation plans for historic buildings, both residential and non-residential. Her responsibilities have included research, measured drawings, and report writing as well as construction documents. Her experience and education meet Secretary of the Interior’s Standards for Historical Architect.
PRESENTERS

Tony Kawal
Hawai‘i Energy

Tony Kawal is a program manager in Hawai‘i Energy’s residential programs. He specializes in market transformation initiatives with an emphasis on behavior based efforts in education and hard-to-reach communities. He manages the multifamily direct installation program to provide energy efficiency retrofits to residences in underserved markets. He has a background in environmental engineering and commercial property asset management.
Scott Cooney is the founder and CEO of Pono Home, a home efficiency company that greens homes and small businesses. Under his leadership, the company has gone through the world’s largest clean tech incubator, and has served customers in over 5,000 homes across 5 Hawaiian Islands since 2014, with a 100% customer satisfaction record. Cooney has been a serial eco-entrepreneur since 2003, having started and grown five mission-driven companies. He is a McGraw-Hill published author and former professor in the MBA program at the University of Hawaii at Manoa, where he taught the first sustainable business course in the University of Hawaii system. He serves as the Chairman of the Board for his previous startup, Important Media, which is one of the top five sustainability media companies in the world, with over 4 million monthly readers, and owns the world’s largest renewable energy news site (CleanTechnica).
GOALS OF THE SERIES

- To share measures homeowners can implement to save energy, conserve resources and integrate respectfully with local culture and natural geography in a way that is harmonious and compatible with a property’s historic character and features.

- To help historic homeowners reduce their homes’ carbon footprint while retaining the properties’ historic integrity.

- To provide information and knowledge to help owners preserve the historic property; save energy, money and resources; and contribute to the natural health and vibrancy of their neighborhoods.

- To encourage historic homeowners to approach maintenance of their properties through the lens of sustainability in order to provide affordable and accessible sustainability tools and techniques to incorporate into their preservation maintenance plans.
MAINTENANCE PLANS

Handout for developing a maintenance plan
- Green tips
- Inspection Checklist
- Template for creating lists of:
  - Character-defining features
  - Key actions
  - Timing
- References/Additional Resources
“Project Drawdown is the most comprehensive plan ever proposed to reverse global warming. Our organization did not make or devise the plan—we found the plan because it already exists.

We gathered a qualified and diverse group of researchers from around the world to identify, research, and model the 100 most substantive, existing solutions to address climate change.

What was uncovered is a path forward that can roll back global warming within thirty years.

It shows that humanity has the means at hand. Nothing new needs to be invented. The solutions are in place and in action.

Our work is to accelerate the knowledge and growth of what is possible. We chose the name Drawdown because if we do not name the goal, we are unlikely to achieve it.”
## Solutions by Rank

<table>
<thead>
<tr>
<th>Rank</th>
<th>Solution</th>
<th>Sector</th>
<th>TOTAL ATMOSPHERIC CO2-EQ REDUCTION (GT)</th>
<th>NET COST (BILLIONS US $)</th>
<th>SAVINGS (BILLIONS US $)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Refrigerant Management</td>
<td>Materials</td>
<td>99.74</td>
<td>N/A</td>
<td>-902.77</td>
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<tr>
<td>2</td>
<td>Wind Turbinee (Onshore)</td>
<td>Electricity Generation</td>
<td>84.80</td>
<td>$1,225.37</td>
<td>$7,425.00</td>
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<td>3</td>
<td>Reduced Food Waste</td>
<td>Food</td>
<td>70.53</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td>4</td>
<td>Plant-Rich Diet</td>
<td>Food</td>
<td>66.11</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td>5</td>
<td>Tropical Forests</td>
<td>Land Use</td>
<td>61.23</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td>6</td>
<td>Educating Girls</td>
<td>Woman and Girls</td>
<td>59.80</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td>7</td>
<td>Family Planning</td>
<td>Woman and Girls</td>
<td>59.80</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td>8</td>
<td>Solar Farms</td>
<td>Electricity Generation</td>
<td>36.90</td>
<td>$80.50</td>
<td>$5,023.84</td>
</tr>
<tr>
<td>9</td>
<td>Silvopasture</td>
<td>Food</td>
<td>31.19</td>
<td>$41.59</td>
<td>$609.37</td>
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<tr>
<td>10</td>
<td>Rooftop Solar</td>
<td>Electricity Generation</td>
<td>24.60</td>
<td>$453.14</td>
<td>$3,457.63</td>
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</tbody>
</table>
Embodied Energy

*Embodied energy* is the energy consumed by all of the processes associated with the production of a building, from the mining and processing of natural resources to manufacturing, transport and product delivery.
Existing buildings are a fossil fuel repository

It takes energy to construct a new building. It saves energy to preserve an old one.

![Embodied energy chart for various materials]

Source: CSIRO
Preservation is Conservation

Landfills account for 11% of global methane emission.

60% of landfill waste is made up of construction and demolition waste.
Embody two important goals:

1) the preservation of historic materials and,

2) the preservation of a building's distinguishing character.
Character Defining Features
Character Defining and Energy Conservation
Renewables
Hawaii Today

~90% of our energy money leaves the state

Hawaii 2045

State of Hawaii
100% Renewable Power by 2045
1st US State to mandate 100% renewable goal

100% renewable energy is not a fantasy for someday, but a reality today.
No baseload renewables

Options to get to 100% clean energy:

1. Interisland cable
2. Reduce demand
COST OF HAWAIIAN ENERGY SOURCES

Hawai’i average retail electricity price, June 2015

Cost per kilowatt-hour

Liquefied natural gas
Fuel Oil
Utility-scale renewables
Distributed renewables
Energy efficiency

O’ahu
Maui
Big Island

(2014)

Costs shown in cents per kilowatt-hour
Why is this important?

Hawai‘i has the nation’s highest electricity rates – 2x the national average

Long-term focus on Hawai‘i’s residents, economy and environment

A more resilient island infrastructure
1. Attitude vs Behavior

2. Know-how

3. Motivation
TO-DO List

Nothing
SOLUTION: JUST DO IT FOR PEOPLE
Since 2014

~6000 HOMES RETROFITTED

~100,000 PRODUCTS INSTALLED

100% CUSTOMER SATISFACTION

FUN JOBS CREATED
Free Audit

EDUCATION
POTENTIAL UPGRADES
REBATES & INCENTIVES
POTENTIAL MAINTENANCE
Tangible, achievable savings with no utility involvement, and no challenge to best practices for historic homes.
EXPANSION: FRANCHISING

People Want Turnkey Opportunities and Have Few Good Choices

Without better choices, people may commit their careers to selling fossil fuels or fast food.
Choices

* Money stays in Hawaii
* Locally owned
* Helps achieve 2045 goals
* Reduces cost of living
* Reduces brain drain

* Money leaves Hawaii
* More imported food
* Minimum wage jobs
* More illness and disease
* More public health costs
Residential Solutions
Hawai‘i Energy’s mission is to empower island families and businesses to make smart energy choices.
Our state has made a commitment to achieve 100% clean energy by 2045.

At Hawai‘i Energy, we believe that we can get there faster and cheaper with the help of Hawai‘i’s families and businesses.
Blue Planet Foundation’s fourth annual energy report card presents a big-picture assessment of Hawai‘i’s progress toward energy independence with 100 percent clean energy. By evaluating five key components—transportation, energy efficiency, renewables, smart grid, and economics—and tracking specific factors that influence them, we can identify bright spots and opportunities to improve. These grades reflect our clean energy progress through the end of 2015.
It starts with a nudge...so let’s take a tour of the possibilities in your home
LET’S KAHOOT!!

Go to kahoot.it on your phone
Go to [efficiencyunlocked.org](https://efficiencyunlocked.org)
efficiencyunlocked.org
Residential Offerings
Residential Offerings

High Efficiency Appliances and Devices

* Refrigerator Trade-up - $150 per unit
* Refrigerator/Freezer Rid-A-Fridge - $50/$65 per unit
* Pool VFD Controller Pumps - $125 per unit
* Online Marketplace – Purchase EE products on our Website

Lighting

* LEDs – Upstream retail

Energy Awareness

* Home Energy Report – 237,000 Residential participants
* Energy Unplugged – Energy Efficiency Training
HOW DO WE REACH HAWAI‘I RESIDENTS?

Home Energy Reports

Here’s how you compare to neighbors

<table>
<thead>
<tr>
<th>Neighboring</th>
<th>2016 kWh</th>
<th>2017 kWh</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Neighbors</td>
<td>481 kWh</td>
<td>488 kWh</td>
</tr>
<tr>
<td>Efficient Neighbors</td>
<td>313 kWh</td>
<td>343 kWh</td>
</tr>
<tr>
<td>You</td>
<td>413 kWh</td>
<td>413 kWh</td>
</tr>
</tbody>
</table>

Tips fromefficient neighbors

Unplug your second refrigerator
Save up to $300 per year

Keep your water heater warm
Save up to $45 per year

Track your progress

So far this year, you’ve used 5% more than last year.

Get rid of your old fridge for FREE and we’ll pay you up to $65 for it!

Save money AND receive a check!
Save money on your energy bill by letting us pick up and recycle that old, working refrigerator or freezer for FREE. And we’ll also give you up to $65 for it! Schedule your FREE pick-up today.

Call 808-537-5577 or toll free 1-877-231-8222 HawaiiEnergy.com/Free-A-Fridge

Frequently asked questions

What’s a kWh?
A kWh stands for kilowatt-hour and is a way to measure electricity use. A 100-watt lightbulb uses 1 kWh every 10 hours.

How is my comparison calculated?
Your electricity use is compared to homes with a similar size, building type, and metering system. You can view your home information at HawaiiEnergy.com.

Find a list of rebates and energy-saving products and services you can buy

HawaiiEnergy.com/Rebates

We’re here to help

HomeEnergyReport
HawaiiEnergy@Leidos.com
On O’ahu: 808-537-5577, Neighbor Island: 877-231-8222
Energy Star Appliances
LED Light Fixtures
LED Bulbs
High Efficiency Plumbing

Before 1980
5–7 gallons/flush

1980–1994
3.5 gallons/flush

1994 to present
1.6 gallons/flush
High efficiency period-appropriate modern fixtures
Residential Offerings

**Solar Water Heating**
- **Solar Thermal Rebate**
  - $500 per system
- **Solar PV Rebate (Sun Bandit)**
  - $500 per system
- **Heat Pump Rebate**
  - $300 per system
- **Solar Tune-up**
  - $100 per system

**HVAC / Cooling**
- **Solar Attic Fans**
  - $50 per unit
- **Whole House Fans**
  - $75 per unit
- **Window AC Trade-up**
  - $50 per system
- **A/C Tune-up**
  - $75 per system
Solar Panels - Does this look right?
Solar Panels- How about this?
Solar Panels - yes!
EXPANDED OFFERINGS in 2018

Smart Thermostats - $50

Central Air Conditioning Retrofit

Washers & Dryers
What about A/C?
Mahalo!

Stay Connected:
Oahu: 537-5577 (Residential) 839-8880 (Business)
Neighbor Islands: 1-877-231-8222 toll-free

www.hawaienergy.com
facebook.com/hawaienergy @myhawaienergy
**ADDITIONAL RESOURCES**

Paul Hawken presentation on Project Drawdown: [https://youtu.be/KYvKv0lM-A](https://youtu.be/KYvKv0lM-A)
Green Living Ideas for your Pono Home – Book
Home Energy Tips: [https://efficiencyunlocked.org/](https://efficiencyunlocked.org/)
DISCUSSION
GREENING MEASURES FOR HERITAGE HOME SERIES 2018

- April 9: SIGNIFICANCE & SUSTAINABILITY: What makes your historic home unique & sustainable measures to green it
- April 23: WATER: Water conservation, storm-water management and on-site water reuse
- May 7: ENERGY: Renewable energy & conservation: solar, wind, lighting, appliances, energy incentives
- MAY 21: WINDOWS: Sustainability measures to maintain/restore your historic windows
- JUNE 4: LANDSCAPE: Creating a sustainable & culturally-sensitive landscape