



# ENERGY EFFICIENCY AND RENEWABLE ENERGY FOR **NEW HOME CONSTRUCTION IN MAUI**

Photo by Deb Lastowka, NREL 54445

Incorporating renewable energy and energy efficiency measures in design and construction of new buildings can result in long-term cost savings, environmental and health benefits, lower greenhouse gas emissions, and greater household and community resilience. There are numerous federal and state incentives available to lower the installation cost of these technologies.

For residential property owners preparing to rebuild homes in Maui, this fact sheet, produced by the National Renewable Energy Laboratory (NREL), a national laboratory of the U.S. Department of Energy (DOE), provides a brief introduction to the topics of renewable energy and energy efficiency for new residential construction, presents a few high-level considerations and key concepts, and provides a sampling of information on rebates, incentives, certification programs, standards, and relevant policies. This fact sheet is not intended to be comprehensive nor to replace local resources.

## Renewable Energy, Energy Efficiency, and Electrification Considerations and Concepts

Building a new home is an opportunity to incorporate renewable energy and energy efficiency measures during

planning and design. **Renewable energy** is generated from sources that are readily replenished—such as solar, wind, hydropower, marine, and geothermal energy—rather than finite resources.<sup>1</sup> At the residential level, solar photovoltaic (PV) systems, solar water heaters, geothermal heat pumps, and residential wind energy systems are the most common options.<sup>2</sup> Residential solar PV is increasingly paired with battery energy storage to get the most value out of the system. **Energy efficiency** measures can conserve energy, reducing overall demand. The Hawai'i State Energy Office reports that demand reductions resulting from aggressive energy efficiency measures are the most cost-effective measures to reduce emissions.<sup>3</sup>

1 <https://www.nrel.gov/research/learning.html>

2 <https://www.energy.gov/energysaver/residential-renewable-energy>

3 [https://energy.hawaii.gov/wp-content/uploads/2022/10/Act-238\\_HSEO\\_Decarbonization\\_FinalReport\\_2023.pdf](https://energy.hawaii.gov/wp-content/uploads/2022/10/Act-238_HSEO_Decarbonization_FinalReport_2023.pdf)

Considerations and key concepts:

- **Energy-efficient appliances**—such as ENERGY STAR®-certified refrigerators, washers and dryers, water heaters, and air conditioners—use less energy than other models. ENERGY STAR Best Value Finder<sup>4</sup> can help consumers find lower-cost options and rebates. Tips and resources for saving energy and calculating home energy use are available from Hawai'i Energy<sup>5</sup> and DOE.<sup>6</sup>
- **Appliances that run on electricity** rather than non-electric sources of energy such as gas can be powered by renewable energy, which may result in cost savings and reduced greenhouse gas emissions.<sup>7</sup>
- **Passive solar home design<sup>8</sup> with natural ventilation<sup>9</sup>** focuses first on reducing a home's energy need for cooling through energy efficiency measures such as low solar heat gain glazing and reflective roofing, and then meets the remaining energy demand with solar energy. A comparison of cooling and air quality technology options is available from Hawai'i Energy.<sup>10</sup>
- **Solar or renewable energy ready and electric ready homes** are built ready to easily integrate solar and storage and are pre-wired during construction for additional electric appliances and an electric vehicle (EV) charger, generally EV charger, generally with a 200-amp breaker box.<sup>11,12,13</sup>
- **Zero energy ready homes** are designed to produce at least as much energy as they consume on an annual basis.<sup>14,15</sup>



Photo from Thomas Kelsey

- The **Maui Energy Conservation Code** for detached one- and two-family dwellings and townhomes includes guidelines for solar hot water heating, windows, lighting, ventilation, ceiling fans, and other components. Solar water heating systems are required for new single-family residential construction in Hawai'i. Recent updates to the Maui code include requirements for solar PV and EV charging readiness, with some exceptions.<sup>16</sup> More information about the Hawai'i Building Energy Code is available from the Hawai'i State Energy Office.<sup>17,18</sup>
- **Electric vehicles (EVs)** are powered by energy stored in an on-board battery rather than gasoline or diesel. EVs produce zero emissions during operation, and when the EV charger is powered by renewable energy, there are no greenhouse gas emissions associated with charging. More information on EVs is available from DOE,<sup>19</sup> Hawaiian Electric,<sup>20</sup> and Hawai'i Energy.<sup>21</sup>

## Rebates and Incentives

Federal, state, and local programs and incentives are available to lower the cost of adopting renewable energy and energy efficiency technologies.

### Appliances and Home Energy Products

#### Refrigerators, Washers and Dryers, and Dishwashers

This Hawai'i Energy program<sup>22</sup> offers appliance rebates on refrigerators (requires a working refrigerator [14 cu. ft or larger] to trade in), washers and dryers, and dishwashers. Check the Hawai'i Energy web page for updates to appliance rebates for new construction.

#### Heat Pump Water Heaters and Induction Cooktops

The Home Electrification and Appliance Rebate (HEAR)<sup>23</sup> program is expected to start in 2024 with rebates for ENERGY STAR-certified heat pump water heaters and induction cooktops. Participating households must earn less than 150% of the Area Media Income to qualify for the rebate program. These rebates can be combined with Hawai'i Energy rebates given at points of purchase.

4 <https://www.energystar.gov/best-value-finder>

5 <https://hawaiienergy.com/for-homes/tips-to-save-energy/>

6 <https://www.energy.gov/energysaver/estimating-appliance-and-home-electronic-energy-use>

7 <https://www.energy.gov/electricity-insights/what-electrification>

8 <https://www.energy.gov/energysaver/passive-solar-homes>

9 <https://www.energy.gov/energysaver/natural-ventilation>

10 <https://hawaiienergy.com/for-homes/about-cooling-air-quality/>

11 <https://www.energy.gov/eere/solar/solar-energy-guide-homebuilders>

12 [https://www.energystar.gov/partner\\_resources/residential\\_new/related\\_programs/erh](https://www.energystar.gov/partner_resources/residential_new/related_programs/erh)

13 [https://www.energystar.gov/products/energy\\_star\\_home\\_upgrade/make\\_your\\_home\\_electric\\_ready](https://www.energystar.gov/products/energy_star_home_upgrade/make_your_home_electric_ready)

14 <https://www.nrel.gov/research/re-net-zero-buildings.html>

15 <https://www.energy.gov/eere/buildings/zero-energy-ready-home-program>

16 [https://energy.hawaii.gov/wp-content/uploads/2024/04/Checklist-2018-IECC\\_Maui\\_Residential\\_2024-04-20.pdf](https://energy.hawaii.gov/wp-content/uploads/2024/04/Checklist-2018-IECC_Maui_Residential_2024-04-20.pdf)

17 <https://energy.hawaii.gov/what-we-do/energy-efficiency/hawaii-energy-building-code-iecc-updates/>

18 <https://www.mauicounty.gov/DocumentCenter/View/143727/2018-IECC-Ord-5455?bidId=>

19 <https://afdc.energy.gov/vehicles/electric>

20 <https://www.hawaiielectric.com/products-and-services/electric-vehicles>

21 <https://hawaiienergy.com/for-homes/electric-vehicles/>

22 <https://hawaiienergy.com/for-homes/rebates/appliances/>

23 <https://energy.hawaii.gov/what-we-do/financial-assistance-and-grants/financial-assistance-resources/energy-efficiency-programs-rebates-and-solar-initiatives/>

## LED Lightbulbs, High-Efficiency Shower Heads and Faucet Aerators, and Advanced Power Strips

Hawai'i Energy's Energy Smart 4 Homes (ES4H) Program<sup>24</sup> improves the energy and water efficiency of participating residents by providing their homes with free energy-efficient LED lightbulbs, high-efficiency shower heads and faucet aerators, as well as advanced power strips to reduce wasteful energy use.

## Cooling and Air Quality ❄️

### Window Air Conditioners, Mini-Split Air Conditioners, Solar Attic Fans, Whole House Fans, Room Air Purifiers and Cleaners, Dehumidifiers, and Smart Thermostats

Cooling and air quality rebates are available from Hawai'i Energy<sup>25</sup> for ENERGY STAR window air conditioners, mini-split air conditioners with variable refrigerant flow technology, solar attic fans, whole house fans, room air purifiers and cleaners, dehumidifiers, and smart thermostats.

## Electric Vehicle Charging 🔌

### EV Chargers

Enel Way Smart Charge Hawai'i<sup>26</sup> is offering discounts on JuiceBox smart Level 2 EV chargers for residents in Hawaiian Electric's service territory.



Photo by Erik Nelsen, NREL 64276

## Renewable Energy and Storage ⚡

### Battery Energy Storage

In Hawaiian Electric's Bring Your Own Device (BYOD) program<sup>27</sup>, customers receive cash incentives for adding new energy storage to a rooftop solar system. BYOD allows customers to receive incentives for installing a new battery and dispatching during specified time periods.

### Renewable Energy Export and Non-Export Programs

Hawaiian Electric offers Smart Renewable Energy Export<sup>28</sup> and Non-Export<sup>29</sup> programs. In the export program, rooftop solar customers can reduce their monthly electric bill with credits for electricity received by the utility from the customer's renewable energy system. The program allows for all renewable technologies and has no project size limits. In the non-export program, customers can use renewable systems such as rooftop solar that do not export power to the utility grid. These systems can incorporate the

use of energy storage devices like batteries. All power produced by the customer either has to be used as it is produced or stored for later use.

### Renewable Energy Tax Credit

Residential Clean Energy Credit<sup>30</sup> is a tax credit—or dollar-for-dollar reduction in tax owed—that can be claimed on federal income taxes for 30% of the costs of qualifying new clean energy property for the home installed anytime from 2022 through 2032, including solar electric panels, solar water heaters, wind turbines, geothermal heat pumps, fuel cells, and battery storage technology. The credit is nonrefundable, so the credit amount a taxpayer receives can't exceed the amount owed in tax, any excess unused credit can be carried forward and applied to reduce the tax owed in future years.

## Water Heating 🚰

### Heat Pump Water Heaters

Rebates are available from Hawai'i Energy<sup>31</sup> for heat pump water heaters, which can provide additional cooling benefits while reducing electricity used to heat water.<sup>32</sup> While the Hawai'i Energy rebate for solar water heaters is currently not available for new construction because solar hot water heating is required, these systems are eligible for the 30% federal income tax credit listed above.<sup>33</sup> Check with Maui County<sup>34</sup> and Hawai'i Energy<sup>35</sup> for updates to relevant codes and rebates.



Photo from Getty Images 1716060639

## Whole-House Energy Efficiency 🏠

### Federal Tax Credit for Builders of New Energy-Efficient Homes

A federal tax credit<sup>36</sup> may be available to eligible contractors who build or substantially reconstruct qualified new energy-efficient homes. The credit amount is up to \$5,000 based on the applicable program and program requirements under which the home was built (ENERGY STAR<sup>37</sup> or Zero Energy Ready Home<sup>38</sup>), and depends on factors including the type of home, its energy efficiency, and the date when the home is acquired.

24 <https://hawaiienergy.com/for-homes/rebates/appliances/>

25 <https://hawaiienergy.com/for-homes/rebates/hvac/>

26 <https://evcharging.enelx.com/eex-store>

27 <https://www.hawaiianelectric.com/products-and-services/customer-incentive-programs/bring-your-own-device>

28 <https://www.hawaiianelectric.com/products-and-services/smart-renewable-energy-programs/smart-renewable-energy-export>

29 <https://www.hawaiianelectric.com/products-and-services/customer-incentive-programs/bring-your-own-device>

30 <https://www.irs.gov/credits-deductions/residential-clean-energy-credit>

31 <https://hawaiienergy.com/for-homes/rebates/water-heating/>

32 <https://www.energy.gov/energysaver/heat-pump-water-heaters>

33 <https://www.irs.gov/credits-deductions/residential-clean-energy-credit>

34 <https://www.mauicounty.gov/558/Development-Services-Administration>

35 <https://hawaiienergy.com/for-homes/rebates/water-heating/>

36 <https://www.irs.gov/credits-deductions/credit-for-builders-of-energy-efficient-homes#builders>, <https://www.energystar.gov/about/federal-tax-credits/ss-45l-tax-credits-home-builders>

37 [https://www.energystar.gov/partner\\_resources/residential\\_new](https://www.energystar.gov/partner_resources/residential_new)

38 <https://www.energy.gov/eere/buildings/zero-energy-ready-homes>





Photo from Getty Images 1339172520

## Financing Options

### Renewable Energy Installations

#### **Green Energy Money Saver (GEM\$) On-Bill Program**

The Hawai'i Green Infrastructure Authority (HGIA)<sup>39</sup> offers on-bill financing of renewable energy installations for homeowners and renters (homeowner or landlord will own the system). Once approved for the program, the applicant works with an approved contractor to complete the installation, HGIA pays the contractor for the installation, and the charge for paying off the system is included on the applicant's utility bill. Energy improvements that can be financed through the program are solar PV systems, solar thermal water heaters, solar PV water heaters, and heat pump water heaters.

### Water Heating

#### **Maui Solar Roofs Initiative (MSRI) Interest-Free Program for Solar Water Heating Systems**

Hawaiian Electric offers interest-free financing for solar water heating systems through MSRI.<sup>40</sup> Although rebates and inspections for solar water heating systems are now provided by Hawai'i Energy, Hawaiian Electric in partnership with the County of Maui offers this program to qualifying Maui County residents.

<sup>39</sup> <https://gems.hawaii.gov/participate-now/for-homeowners/>

<sup>40</sup> <https://www.hawaiianelectric.com/products-and-services/save-energy-and-money/maui-solar-water-heating-financing>

## Additional Local Resources

- **American Institute of Architects** Maui Fires Recovery,<sup>41</sup> a listing of architects from Maui, Hawai'i, and globally supporting recovery and other resources.
- **Hawaiian Electric** Products & Services for saving energy and money, renewable energy programs, and electric vehicles<sup>42</sup> and Smart Renewable Energy Programs.<sup>43</sup>
- **Hawai'i Energy** Rebates<sup>44</sup> and Clean Energy Allies, local contractors trained to assist residents in navigating Hawai'i Energy's various incentive and rebate programs.<sup>45</sup>
- **Hawai'i State Energy Office** Energy Efficiency Programs, Rebates, And Solar Initiatives.<sup>46</sup>

<sup>41</sup> <https://classic.aia.org/resources/6661536-maui-fires-recovery>

<sup>42</sup> <https://www.hawaiianelectric.com/products-and-services>

<sup>43</sup> <https://www.hawaiianelectric.com/products-and-services/smart-renewable-energy-programs>

<sup>44</sup> <https://hawaiienergy.com/for-homes/rebates/>

<sup>45</sup> <https://hawaiienergy.com/clean-energy-allies/>

<sup>46</sup> <https://energy.hawaii.gov/what-we-do/financial-assistance-and-grants/financial-assistance-resources/energy-efficiency-programs-rebates-and-solar-initiatives/>