**Building Science Education Solution Center – External Resources**

Proficiency Level 1: Remember

**Learning Objective 1.1:**

* What other resources are available for information and learning?

**Lecture Notes 1.1:**

The Building Science Education Solution Center (BSESC) website is a valuable source of training tools and information on heat pump water heaters (HPWHs). However, for those seeking further knowledge and additional information on HPWHs, a selection of external resources is listed below.

The inclusion of any external resource in the list below does not imply a preference or endorsement by PNNL. The list is provided solely for the purpose of offering additional options for continued learning and supplemental information on HPWHs. Users are encouraged to explore these resources at their own discretion and in no particular order.

**Introduction to HPWHs**

* **Love Electric, Hot Water**

<https://loveelectric.org/hot-water/>

***Key topics:*** *Benefits of a heat pump water heater, comparison of water heater costs, considerations for installing a HPWH*

***Target audience:*** *Homeowners and building owners interested in installing a heat pump water heater*

This website provides information on the benefits and considerations of heat pump water heaters (HPWHs) as an energy-efficient and environmentally friendly option for heating water. They can reduce hot water-energy consumption, costs, and carbon dioxide emissions by 60-70%, compared to standard electric and propane water heaters. The resource also highlights considerations to take into account before installing a HPWH, such as the need for an adequate year-round temperature, access to a drain, sufficient space, and potential electrical panel upgrades.

* **Building America Solution Center, Guides A-Z**

<https://basc.pnnl.gov/resource-guides/heat-pump-water-heaters>

***Key topics:*** *Description of HPWH use and installation, related codes and standards, training, and sales*

***Target audience:*** *HPWH installers, building designers, and others making decisions about water heating for new construction*

This guide includes information on heat pump water heaters (HPWHs) as an energy-efficient and lower-emissions alternative to electric-resistance or gas water heaters. HPWHs operate as hybrid devices, utilizing a heat pump whenever possible but switching to conventional resistance heating during high hot water demand. The guide highlights the additional design considerations and special space and clearance requirements that HPWHs have compared to traditional storage water heaters.

**Pricing**

* **Efficiency Maine**

<https://www.efficiencymaine.com/about-heat-pump-water-heaters/>

***Key topics:*** *Efficiency Maine's HPWH program, information and resources on water heating*

***Target audience:*** *Low-income individuals or households interested in HPWHs, plumbers or other professionals interested in becoming installers*

This website lists resources for Efficiency Maine's Heat Pump Water Heaters (HPWHs) program, which offers low-income households the opportunity to have a HPWH installed at no cost. The website includes a savings calculator, rebates, a directory to find installers, and a claim form for an $850 mail-in rebate for new units installed in the state of Maine. It also provides user tips, a guide to water heating, myths and facts brochure, and testimonials from plumbers.

**Qualified Products**

* **Heat Pump Water Heater Qualified Products List, NEEA**

<https://neea.org/img/documents/residential-HPWH-qualified-products-list.pdf>

***Key topics:*** *NEEA Residential HPWH Qualified Product List*

***Target audience:*** *Residential homeowners, commercial and industrial property owners or managers*

This resource provides a list of qualified residential heat pump water heaters (HPWHs) that meet the Advanced Water Heating Specification. The list includes information such as brand, model, volume, recommended maximum household size, cool climate efficiency, uniform energy factor, CTA-2045 compliant communications port (EcoPort) compatibility, and eligibility for the 2023 tax credit. The specification was updated in Version 7 to include the Cool Climate Efficiency (CCE) procedure, and the EcoPort requirement for Tier 3 and higher. The resource also provides a link to more information on efficiency requirements for the 2023 tax credit.

* **Energy Star Certified Heat Pump Water Heaters, EPA Energy Star**

<https://www.energystar.gov/productfinder/product/certified-water-heaters/results>

***Key topics:*** *Energy Star certified water heaters, rebates and tax credits for HPWHs*

***Target audience:*** *Residential homeowners*

This resource provides information on ENERGY STAR certified water heaters, which use gas, solar, or electric heat pump technology to heat water with much less energy compared to standard models. These water heaters can save consumers up to $3500 over the unit's lifetime of 10 to 15 years. Additionally, the federal government offers a tax credit on the purchase and installation of heat pump water heaters, with restrictions and details available on their website.

* **Hybrid Water Heater Buyer’s Guide, NEEA**

<https://hotwatersolutionsnw.org/buyers-guide>

***Key topics:*** *Benefits of upgrading to a high-efficiency HPWH, factors to consider before purchasing a HPWH*

***Target audience:*** *Residential homeowners*

This guide provides information to buyers on high-efficiency water heaters, specifically focusing on heat pump water heaters (HPWHs). The guide discusses the benefits of upgrading to an efficient water heater, considerations before purchasing, such as fuel source and tank capacity, and compares HPWHs to other types of water heaters. It also provides information on the recovery rate, Uniform Energy Factor (UEF) rating, cost, and warranty of HPWHs.

**Workforce Training and Development**

* **Bureau of Labor Statistics, Occupational Outlook Handbook**

<https://www.bls.gov/ooh/construction-and-extraction/plumbers-pipefitters-and-steamfitters.htm>

***Key topics:*** *Summary of the occupation of plumbers, facts and statistics about the occupation*

***Target audience:*** *Students or individuals interested in pursuing a career as a plumber, pipefitter, or steamfitter*

This website provides information on the occupation of plumbers, pipefitters, and steamfitters. These professionals install and repair piping fixtures and systems in various settings such as factories, homes, and businesses. The website also shows information on the job outlook, median pay, and the process most plumbers, pipefitters, and steamfitters learn through with apprenticeships, on-the-job training, and licensing.