



ADVANCED WATER HEATING INITIATIVE

# 2020 Progress Snapshot

February 2021

## West Coast Advanced Water Heating Initiative (AWHI)

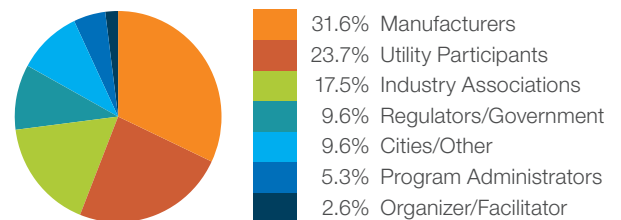
This summary includes highlights from the *AWHI Playbook and 2020 Progress Report*, which can be downloaded [here](#).

### Who and Why?

**The Advanced Water Heating Initiative (AWHI)** is a collaborative market transformation effort to scale the production and adoption of HPWHs. Started in 2019 in California and the Northwest, today over 50 organizations are working to catalyze a rapid transition to high-efficiency, grid-connected HPWHs. AWHI, led by New Buildings Institute (NBI), is seeking to expand to a national program to leverage this model and accelerate HPWHs across the U.S.

2020 was a year of unprecedented storms, crippling drought, and inescapable wildfires—all playing out in the midst of a global pandemic and mounting concerns about social equity. Many energy efficiency and green building advocates are pushing for rapid, coordinated, and sustained actions that result in cheaper energy prices, drastically lower greenhouse gas emissions, and far less air pollution. Water heating is the second largest energy use in U.S. homes. In larger multifamily buildings, it is the top energy use (32%).<sup>1</sup> Heat Pump Water Heaters (HPWHs) are a proven technology that is two to four times more efficient than electric resistance technology and gas-fired water heaters. They provide additional benefits such as thermal storage, and greenhouse gas reductions. Yet HPWHs represent just 2% of market share among water heating technologies.<sup>2</sup>

### COUNT OF ORGANIZATION TYPES



MANUFACTURER MEMBERS	SYSTEMS
Bradford White	unitary
Rheem	unitary
A.O. Smith	unitary
Sanden/Eco2	unitary & central
Nyle	unitary & central
Ariston Thermo USA	unitary
GE	unitary
Colmac	central
Mitsubishi	central

<sup>1</sup> U.S. Energy Information Administration 2015

<sup>2</sup> 84,000 HPWHs shipped in 2019, according to [ENERGY STAR 2019 Unit Shipment and Market Penetration Report](#)

## The Goal

The Initiative’s goal is to have high-efficiency, low-carbon impact, grid-connected HPWHs as 45% of the West Coast’s total water heating stock by 2030. AWHI has now targeted a national initiative to help support this goal.

## Structure and Playbook

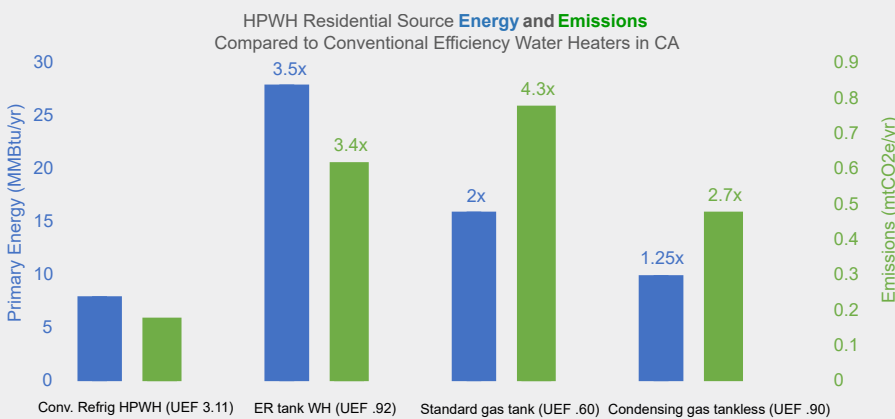
In 2020, AWHI formed the working groups listed below to develop an overall strategy as well as work plans that address high-priority technology and grid connectivity. Unitary technologies are primarily used in residential application while central technologies serve larger sites such as multifamily and institutional.

- AWHI Leadership Group (planning, strategic direction and steering committee)
- Unitary 120V HPWHs
- Unitary 240V HPWHs
- Central 208V+ HPWHs
- Connectivity and Controls

In 2020 AWHI established the structure, strategies and playbook to collectively transform the water heating market, and expanded industry engagement resulting in over 50 AWHI member organizations and new alliances.

The working groups are a part of the AWHI playbook which provides guidance on development, operational structure, initiative management, and decision-making in six key areas: drivers, barriers, market transformation targets and priority pathways, structural strategy, working groups and success metrics. While the *AWHI Playbook and 2020 Progress Report* includes a deeper explanation of the Initiative’s 2020 actions, the following section includes some organizational highlights.

**Industry engagement.** Organized the first dedicated HPWH forum and expo, January 23–24, 2020, at Sacramento Municipal Utility District (SMUD) with over 300 participants and numerous manufacturers. The expo showcased a variety of advanced products and offered invaluable networking opportunities for industry professionals. In 2021, AWHI will collaborate with ENERGY STAR and other organizations, including code entities, to extend and align the Initiative’s work nationally.



**Energy and emissions reduction analysis.** Conducted an analysis to determine the energy and emissions reduction benefits of switching electric resistance and gas-fired water heaters to HPWHs.

**Resources and Workplans.** Established the Initiative’s strategic approach and market transformation logic model and assisted working groups with the creation of their work plans. Created a way for AWHI members to share and access resources such as the technology tracker, examples of programs and policies, and helpful studies.

HPWHs significantly reduce energy and emissions compared to other forms of water heating.

Source: Khanolkar, A. NBI

## 2020 Progress

Progress in 2020 focused on Priming the Market and Technology Advancement and Validation described below.

### Priming the Market

**Building demand for unitary HPWHs study.** The unitary HPWH working group conducted foundational research on successful models for water heating market development that have the ability to build awareness and demand. The *Building Demand for Unitary Heat Pump Water Heaters* report is focused on the market context to inform program and policy moves in support of HPWHs and is due out in Q1 2021.

**Creating a roadmap to achieve 90% adoption in new construction in 5 years for central HPHWs.** The central HPWH working group cast a compelling vision, set an aggressive goal, and laid out an extensive plan to achieve it. The roadmap includes goals related to cost, field testing and advancement of specific products, and market penetration. The group also began research and development of cross-cutting training modules. Subcommittees will continue this work in 2021.

**Launching HPWH marketing campaigns.** The Building Decarbonization Coalition, a founding member of AWHI, developed a statewide consumer campaign on home electrification that launches in California in 2021. The Northwest Energy Efficiency Alliance and the U.S. Department of Energy are both planning major water heating marketing campaigns in 2021.

The Building Demand for Unitary HPWHs report is focused on the market context to inform program and policy moves.

The central HPWH working group set an ambitious goal of 90% adoption in new construction in 5 years and a plan to achieve it.

### Technology Advancement and Validation

**West Coast field testing of emerging 120V HPWHs.** The 120V Working Group coordinated with manufacturers on technology readiness as the focus of 2020, resulting in a field test research plan of technology performance and customer and installer feedback ready for 2021. The consolidated west coast field research will be run by NBI and targets the installation of up to 50 units in a range of home sizes (including multifamily), locations, and climate zones in California and the Pacific Northwest.

**Advocated for California's new demand management requirements for HPWHs.** The connectivity and controls working group supported JA13, California's first demand management standard adopted by Title 24 CA Energy Code, which requires capability for grid-connected and non-connected time-of-use (TOU) demand management.<sup>3</sup> The group worked on a CTA2045-B "Minimum Command Set" and "TOU Prices to Devices" development for HPWH connectivity. The connectivity recommendations for each technology are expected to be published in 2021. The group is collaborating with other organizations to advocate for a national demand management standard that would apply to HPWHs.

**Central HPWH field testing of CO<sub>2</sub> HPWHs for large multifamily.** In 2020 field demonstrations of emerging CO<sub>2</sub>-based larger HPWHs (10+ tons nominal capacity) are underway in California and Washington through AWHI allied organizations (CEC and NEEA). AWHI members have roles in monitoring and market connections that will help validate technology readiness and set up the tools, resources, and market drivers in multifamily, especially in affordable housing.

**Developing tools for new installers, code officials and designers.** By creating a residential product installation flowchart, checklists for plumbers and installers, and permitting guidance for code officials these parties can support quicker market adoption. A new central HPWH system engineering sizing tool (Ecosizer 1.0) allows product designers to size HPWHs with additional storage and analyze the load-shifting potential of new products, reducing the time needed to design multifamily hot water plants.

By creating a residential product installation flowchart, checklists for plumbers and installers, and permitting guidance for code officials these parties can support quicker market adoption.

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<sup>3</sup> [JA13 Qualification Requirements](#)

## Priorities and Plans

West Coast AWHI members, with input from manufacturers, determined five priorities for the AWHI, which will guide each working group's planning for 2021 through 2022.

### AWHI Five Priorities

1

#### **TRANSFORM THE MARKET.**

Advance from an increase in market penetration to market transformation. This includes simplifying and targeting policy and program levers.

2

#### **FOCUS FIRST ON NEW CONSTRUCTION.**

Help establish universal program adoption and policy performance requirements that support HPWHs.

3

#### **BUILD DEMAND.**

Build awareness through a coordinated marketing campaign customized for various audiences to provide inspiration, awareness, confidence, and education.

4

#### **CREATE UNIFORM PROGRAMS AND INCENTIVES.**

Create a consistent statewide approach that results in uniform program design and incentive amounts that include direct-to-consumer rebates and incentives for distributors and retailers.

5

#### **ESTABLISH TRAINING AND TOOLS.**

Provide training and tools to distributors, contractors, and installers.

### Regional and National Expansion

While the AWHI Playbook and 2020 Progress Report focuses on activities and actions completed by the West Coast AWHI members, it is also intended to assist with policy and program development as well as inform design and installation of HPWHs across the U.S. There is a general consensus that no single region can move the national market for HPWHs on its own. Accelerating market adoption of HPWHs requires a coordinated effort. While the Initiative focused its 2020 outreach in the Midwest region, it plans to expand its efforts in 2021 by engaging national organizations to connect with new partners.

In doing so, the AWHI is working to develop a national strategy to align market transformation activities nationwide.

Accelerating market adoption of HPWHs requires a coordinated effort. 2021 includes engaging national organizations.

## Funders



### Join the AWHI.

Contact Amruta Khanolkar, AWHI Manager NBI, at [amruta@newbuildings.org](mailto:amruta@newbuildings.org)



New Buildings Institute (NBI) is a nonprofit organization driving better energy performance in buildings to make them better for people and the environment. We work collaboratively with industry market players—governments, utilities, energy efficiency advocates, and building professionals—to promote advanced design practices, innovative technologies, public policies, and programs that improve energy efficiency. Our Getting to Zero website houses over 300 curated resources including guidance, educational webinars, policy models, research, case studies, and more to help all buildings achieve zero energy. Visit [gettingtozeroleadership.org](http://gettingtozeroleadership.org) to learn more.