# Cost-effectiveness and Evaluation Advisory Committee Meeting

**DATE:** October 28, 2026
**TIME:** 9:00am-12:30pm
**LOCATION:** **Hybrid:** Trillium Conference Room, NEEA Office
700 NE Multnomah Street, Suite 1300,
Portland, Oregon 97232

**Microsoft Teams** Need help?
**Join the meeting now**
Meeting ID: 291 610 332 996 93
Passcode: MP79HX6j

**AGENDA**

| TIME | TOPIC | PRESENTER(S) | Link or Page |
|---|---|---|---|
| **9:00AM** (10 min) | **Welcome/Agenda Review**<br>1. Agenda check<br>2. Introductions<br>3. Announcements | **Jonathan Belais, NEEA Staff** | |
| **9:10** (10 min) | **Annual Reporting Process**<br>Staff will provide an overview of NEEA's annual reporting process, including what to expect January through April and the committee's role and key touchpoints during the process.<br><br>**Objective**: Committee awareness of what to expect in 2027 for annual reporting | **Elizabeth Daykin, NEEA Staff** | |
| **9:20** (5 min) | **Local Programs Survey Announcement**<br>Reminders about the annual local programs survey.<br><br>**Objective**: Prepare committee for annual local programs survey | **Wylie Hampson, NEEA Staff** | |
| **9:25** (55 min) | **Advanced Performance DOAS (Gas) Expansion and Key Assumption Update**<br>Overview of the Advanced Performance DOAS (Gas) Expansion for milestone advancement and key metrics. NEEA Staff will also provide an update on the Advanced Performance DOAS (Gas) baseline.<br><br>**Objective**: Committee awareness of key metrics and baseline assumptions | **Aaron Ingle, Wylie Hampson, and Kirstin Moreno, NEEA Staff** | **3** |
| **10:20** (10 min) | **BREAK** | | |

| TIME | TOPIC | PRESENTER(S) | Link or Page |
|---|---|---|---|
| **10:30** (5 min) | **MRE Update**<br>NEEA staff will provide a brief overview and answer any questions regarding the upcoming market research and evaluation activities outlined in the quarterly newsletter.<br><br>**Objective**: Committee awareness of market research and evaluation activities | **Meghan Bean, NEEA Staff** | **Link** |
| **10:35** (30 min) | **HPWH Baseline Update**<br>NEEA staff will review updates to the heat pump water heater baseline and answer committee questions.<br><br>**Objective**: Provide opportunity for committee to review and advise on methods and assumptions that impact savings reporting | **Tim Runyan, NEEA Staff** | **12** |
| **11:05** (25 min) | **Manufactured Homes Market Diffusion Evaluation**<br>NEEA staff will share key findings from the first Market Diffusion Evaluation of the Manufactured Homes program.<br><br>**Objective**: Committee awareness of market diffusion findings for manufactured homes | **Anu Teja, NEEA Staff** | **Link** |
| **11:30** | **WRAP UP AND LUNCH FOR IN-PERSON ATTENDEES** | | |

# Memorandum

October 21, 2026

TO: Cost-effectiveness and Evaluation Advisory Committee

FROM: Aaron Ingle, Senior Market Analyst
Wylie Hampson, Market Analyst

SUBJECT: Advanced Performance DOAS Gas Expansion

## Purpose

The Northwest Energy Efficiency Alliance (NEEA) is seeking Cost-effectiveness and Evaluation Advisory Committee (CEAC) feedback on the analyses and key assumptions supporting the proposed expansion of the Advanced Performance Dedicated Outdoor Air Systems (AP DOAS) program to include gas-heated system configurations. Specifically, NEEA requests feedback on whether the assumptions, methodologies, and cost-effectiveness analyses are clear, reasonable, and appropriate for use in the advancement into Market Development.

Consistent with CEAC's role, this discussion focuses on the technical and analytical foundations supporting the program expansion, including savings estimates, market sizing, incremental costs, measure life, baseline assumptions, tracking methodology, benefit-cost analysis, and funding allocation. The Committee is not being asked to approve the program advancement itself.

## Program Overview

The Advanced Performance DOAS Program has been in Market Development since 2022. The program promotes a system-based approach to decoupled ventilation and space conditioning, which utilizes a high-efficiency (>= 82% sensible recovery efficiency) energy/heat recovery ventilator (ERV/HRV) paired with decoupled high efficiency heating and cooling equipment which can be sized with consideration of significantly reduced ventilation load resulting from exhaust air energy recovery.

The program originally focused on HVAC systems utilizing decoupled high efficiency ERVs/HRVs together with high-efficiency electric heat pump heating and cooling equipment, for example variable refrigerant flow, to condition building space. The proposed gas expansion mirrors the existing electric approach, using a high-efficiency condensing natural gas boiler and cooling equipment, typically a chiller, which distributes heating and cooling throughout a building using hydronic loops, high-efficiency pumps, and terminal equipment. The proposed program expansion builds on existing program infrastructure, market relationships, technical specifications, and educational resources.

## Market Transformation Goal and Theory

The program's long-term market transformation goal is for Advanced Performance DOAS, or equivalent efficiency levels, to become standard practice and ultimately be incorporated into commercial energy codes and industry practice throughout the Northwest.

The program is based on the premise that adoption of advanced performance DOAS design remains constrained by limited market awareness, complexity, and limited familiarity among key decision makers. NEEA seeks to address these barriers through education, technical resources, specification development, market evidence, and codes and standards activities.

The proposed gas expansion leverages many of the same market actors and intervention strategies as the existing electric program, while broadening applicability to larger hydronic buildings and gas-heated market segments. The proposed expansion also supports a fuel-neutral market message and provides building decision-makers with an option that can reduce energy use in gas-heated buildings while maintaining flexibility to accommodate future technology and fuel choices if desired.

## Third-Party Review

NEEA engaged Cadmus to conduct an independent review of the key assumptions supporting the gas program expansion, including market size, baseline development, measurement methodology, measure life, and incremental cost assumptions. AP DOAS (gas) savings rates were not part of Cadmus' review as they were originally modeled by a third party (A2 Efficiency). The review process was intended to assess the reasonableness of NEEA's methods, assumptions, calculations, and supporting evidence. Feedback received through the review process has been addressed by the program team and incorporated where appropriate into the analyses and assumptions presented below.

Key findings and recommendations from Cadmus are summarized in Table 1.

*Table 1: Third Party Review Findings and NEEA's Actions Taken*

| Key Assumption | Findings and Recommendations | NEEA Response |
|---|---|---|
| Market Size | Cadmus suggested the historical average new construction rates proposed for the market size forecast were optimistic relative to current conditions. | NEEA adjusted near-term new construction forecast to match lower rates as reflected in Dodge Construction Network's new construction forecast. |
| Incremental First Cost | Cadmus suggested a modified calculation for estimating incremental first costs from the acquired source data. | NEEA modified the calculation per the recommendation. |
| Natural Market Baseline | Cadmus agreed that the baseline model structure provides a workable representation of market adoption, and that several key input assumptions are supported by the evidence. Cadmus recommends strengthening the rationale for the timing and degree of natural market adoption growth in the absence of NEEA and partner activities, given the barriers present in the market. | NEEA added rationale to support the natural market baseline analysis as-is. |
| Measure Life and Incremental O&M cost | Cadmus indicated that the 20-year measure life is reasonable given the consideration of potential repair and replacement costs as part of incremental O&M, and recommends NEEA | NEEA specifies that AP DOAS (gas) savings will require continued maintenance and upkeep of system. NEEA is considering additional market education activities related to ERV/HRV |

| Key Assumption | Findings and Recommendations | NEEA Response |
|---|---|---|
| | further support the expectation that regular maintenance, repair, and replacement of system components such as ERVs/HRVs is necessary to maintain savings over the system life. | maintenance. |
| Measurement Methodology | Cadmus suggests exploring additional data sources and continuing to pursue market extrapolation. | NEEA is actively pursuing these improvements. |

The above recommendations were received through ongoing discussions with Cadmus and their preliminary report of the review. The final report for the review will be published in November 2026, and NEEA will update the relevant analyses should there be any additions or updates to Cadmus' final report.

# Key Assumptions

This section provides key assumptions and methodologies for AP DOAS (gas).

## Savings Rates

Savings estimates were modeled by A2 Efficiency in 2026 simulating scenarios across 10 different building types, two climate zones, new and existing building vintages, and multiple HVAC configurations. Energy scenario modeling compared AP DOAS (gas) configurations to baseline HVAC system configurations to estimate incremental gas and electric savings. Baseline HVAC equipment differed for each scenario and was determined based on what is typical for each building type. Baseline equipment originally contained a mix of condensing and non-condensing boilers, however, NEEA later determined that condensing boilers should be considered typical, even in baseline equipment, so savings rates were adjusted accordingly. Savings rates across modeled scenarios range from approximately 0.09 to 0.12 therms per square foot per year. AP DOAS (gas) configurations also use electricity; however, the modeled incremental electricity use is small, ranging from approximately 0.07 and 0.12 kWh per square foot per year.

Additionally, mid-efficiency AP DOAS (gas) systems[1] have been observed in the market and are considered part of the overall market transformation towards full efficiency AP DOAS. Savings rates for mid-efficiency AP DOAS (gas) systems were developed based on NEEA analysis of the modeling results from A2 Efficiency. Savings rates range from 60% to 80% of the savings from the fully compliant AP DOAS.

## Market Size

Market size estimates quantify annual opportunities in new construction and major renovation projects within NEEA's gas-served commercial building market in terms of square footage. The analysis includes only opportunities that are expected to achieve above-code savings while remaining cost effective which includes:

[1] Mid-efficiency AP DOAS systems meet the system criteria except for utilizing a less efficient 60% - 81% sensible recovery efficiency ERV/HRV.

- **Geography:** Oregon and Idaho[2]
- **Building types:** large offices and secondary schools[3]

Project square footage estimates were developed using the Virtual Catalog (CBSA 2025) for stock estimates and Dodge Construction Network's construction starts historical data and forecast for new construction rate estimates. Project applicability was assessed using CBSA 2019 data and factors such as natural gas boiler prevalence, code requirements, electrification trends, and backup heating systems. A major renovation rate was estimated based on analyses of new construction and renovation data (Dodge Construction Network, Bonneville Power Administration 2022 Commercial HVAC Permit Study) and checked for consistency against a stock turnover analysis derived based on CBSA (2019). The resulting market size is estimated at approximately 1.1 million square feet per year.

## Incremental Costs

NEEA contracted to receive two confidential estimates of incremental costs for AP DOAS (gas) from regional construction and engineering firms. The separate studies provided comparison points from different sources and perspectives for a more robust estimate of incremental costs.

AP DOAS (gas) can be configured with various zonal terminal equipment types, most commonly 4-pipe fan coil units, 2-pipe fan coil units, and chilled beams. Savings modeling and first cost studies originally assumed a 4-pipe configuration, which have substantially higher system costs compared to a 2-pipe configuration. A 2-pipe configuration requires less system installation materials and fewer skilled labor hours.[4] A 2-pipe approach can provide control and comfort equivalent to base efficiency HVAC systems with the same energy savings as the 4-pipe approach and at lower cost. Therefore the 2-pipe fan coil configuration was used to estimate incremental costs.

The two estimates of first cost are presented in Table 2 to communicate the range. The benefit-cost analysis uses average values by building type.

*Table 2: Incremental First Cost Estimates for a 2-pipe fan coil AP DOAS (gas) system*

| Building Type | Source A Estimate ($/sf) | Source B Estimate ($/sf) | Average Estimate ($/sf) |
|---|---|---|---|
| Medium office[5] | 18.40 | -2.50 | 7.90 |
| Large office | 3.40 | -2.10 | 0.70 |
| Primary school[6] | 7.50 | Estimate not provided | 7.50 |
| Secondary school | -2.60 | 1.20 | -0.70 |

[2] AP DOAS projects are expected to occur in Washington but will meet code rather than exceed it.
[3] Primary schools and medium-sized offices were also considered but found to unlikely be cost effective.
[4] A 2-pipe system utilizes only one wet-side piping loop to each terminal unit, which can be in either heating or cooling mode. A 4-pipe fan coil system has separate piping loops for heating and cooling to each terminal unit and provides a premium level of zonal control.
[5] The benefit-cost ratio was below 1.0 so this building type was excluded from further analysis
[6] The benefit-cost ratio was below 1.0 so this building type was excluded from further analysis

NEEA also estimated incremental costs for AP DOAS (gas) systems utilizing a mid-efficiency (>= 60% sensible effectiveness) ERV/HRV based on quote data from three manufacturers provided by Source A. For mid-efficiency AP DOAS, incremental costs were $0.40/square foot for large offices and -$1.50/square foot for secondary schools.

Negative incremental costs imply that AP DOAS (gas) is a less expensive alternative to the base efficiency equipment in that scenario. These negative incremental cost values can be attributed to downsizing the condensing boiler and chiller due to the ERV/HRV reducing the heating and cooling load, assuming a 2-pipe fan coil unit configuration.

Sustained energy savings from AP DOAS (gas) require routine maintenance throughout the system's effective useful life (EUL). Additionally, the AP DOAS gas expansion assumes parts of the system can be repaired or replaced without needing to replace the whole system. Therefore, repairs, replacements, and routine maintenance are part of the incremental operations and maintenance (O&M) costs. The incremental O&M costs for AP DOAS (gas) largely come from ERV/HRV recommended maintenance and filter replacement, ERV/HRV equipment repair or replacement, and expected replacement when pumps reach end of life. O&M costs related to other HVAC system equipment, including piping, ductwork, grilles, VAV boxes, fan coil units, controls, and cooling equipment, are assumed to be equivalent for the base efficiency system and AP DOAS (gas) system.

## Measure Life

NEEA has determined the most appropriate measure life for AP DOAS (gas) to be 20 years. This is defined using a system-level effective useful life (EUL) approach which focuses on the EUL of key components (ERV/HRV and natural gas condensing boiler) while considering the context of a full system installation, which includes components with a wide range of lifetimes and assumes repair or replacement of shorter-lived components.

- Natural gas condensing boiler EUL is estimated to be 20-25 years
- ERV/HRV EUL is estimated to be 14-20 years

NEEA balanced these EULs to define the AP DOAS (gas) measure life at 20 years. As shown in Table 3, data for these EUL estimates come from the Regional Technical Forum (RTF), Energy Information Administration (EIA), the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), NEEA's ERV maintenance study, manufacturer data, and other technical resource manuals (TRMs). NEEA's analysis assumes some system components are expected to require repair or replacement during this 20-year measure life. Where repair and replacement needs are expected to be incremental to the base efficiency system, costs are accounted for in the incremental O&M cost estimates, including ERV/HRV repair and replacement for a fraction of systems. Because those repairs, replacements, and associated costs are assumed and accounted for, they are not weighted into the overall EUL estimate. Similarly, regular HVAC system maintenance is assumed as part of the measure life analysis and accounted for in the incremental O&M costs.

*Table 3: AP DOAS (gas) Component EUL Sources*

| Organization | Product | Equipment Useful Life |
|---|---|---|
| Regional Technical Forum | Natural Gas Condensing Boiler | 25 years |
| Energy Information Administration | Natural Gas Condensing Boiler | 25 years |

| Organization | Product | Equipment Useful Life |
|---|---|---|
| Energy Trust of Oregon | Natural Gas Condensing Boiler | 20+ years |
| State of Minnesota and New York TRMs | ERV/HRV | 14-15 years (not based on large published studies) |
| Greenheck Product FAQs | ERV/HRV | 15-20 years |
| American Society of Heating, Refrigerating, and Air-Conditioning Engineers | ERV/HRV | Greater than 10 years (limited data) |

## Natural Market Baseline

A key component of the gas expansion analysis is the development of a natural market baseline forecast for AP DOAS (gas), which estimates the level of market adoption expected to occur in the absence of NEEA's intervention. The baseline forecast serves as the reference point against which NEEA assesses future market adoption in the context of program-induced market transformation.

To develop the naturally occurring baseline forecast, NEEA develops

1. the market condition prior to NEEA's market intervention (the starting point); and
2. the adoption forecast of energy efficient products without intervention by NEEA and its partners, e.g., utilities.

These steps result in a market forecast representing baseline savings.

The market barriers affecting adoption of gas and electric AP DOAS are largely similar, including first cost, information gaps, ownership structures, change resistance, and competition with alternatives. Both also have similar market drivers such as indoor air quality and efficiency goals. Based on the similarity between the gas and electric AP DOAS markets, NEEA contends that its interventions to transform the electric AP DOAS market have also contributed to market transformation in the adjacent gas AP DOAS market. Therefore, the natural market baseline start year for both markets is 2014.

To derive an estimate of the AP DOAS (gas) presence in the market in 2014, NEEA analyzed data from Bonneville Power Administration's 2022 Commercial HVAC Permit Study, which included projects completed between 2015 and 2021[7]. The analysis estimated that AP DOAS (gas) systems were present in a mid-efficiency configuration[8] in approximately 4.5% of the project square footage in the potential AP DOAS (gas) market. The estimated 4.5% market presence serves as the initial market share for the AP DOAS (gas) natural market baseline.

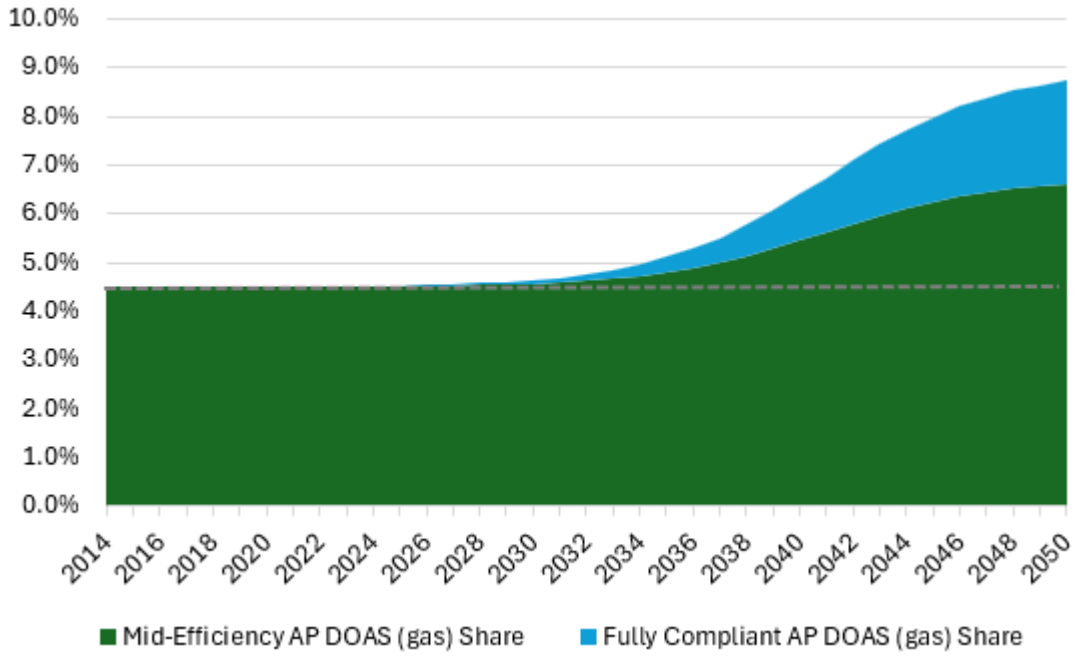
From this initial baseline condition, NEEA reviewed barriers and drivers that would affect how AP DOAS (gas) would naturally be adopted in the market without NEEA's influence. Natural drivers for AP DOAS (gas) systems include indoor-air quality priorities, operating-cost concerns, net-zero and efficiency goals, building performance standards, and evolving energy codes. New refrigerant regulations may also push commercial HVAC systems towards hydronic approaches such as AP

[7] Commercial projects can take a long time from design to completion and therefore designs completed in 2014 prior to NEEA intervention are reflected in the earlier projects in this dataset. Data was limited, and we expect results to be conservative.

[8] These systems use a less efficient 60% - 81% sensible recovery efficiency ERV/HRV.

DOAS (gas). In Figure 1 NEEA estimates that absent NEEA's influence, AP DOAS (gas) would have increased from a 4.5% market share in 2025 to a nearly 9% market share in 2050. Of this additional market share, half is associated with mid-efficiency AP DOAS (gas), while the other half is associated with fully-efficient AP DOAS (gas).

*Figure 1: Natural Market Baseline Market Share of AP DOAS (gas)*




## Tracking and Measurement Methodology

The AP DOAS gas expansion will build on the measurement methodology for electric AP DOAS projects, which uses a project level approach for identifying and tracking compliant projects in construction datasets and permit records, confirming design specifications, and then assigning savings rates to report overall savings. In the coming years as data and analysis are sufficiently developed, NEEA will develop an extrapolation method to reflect full-market activity.

## Benefit-Cost Ratio

NEEA evaluated the proposed gas expansion using established cost-effectiveness methods, incorporating savings, costs, and measure life. The resulting program benefit-cost ratio from a gas utility perspective is 3.1.

NEEA also evaluated cost-effectiveness at a building type level using the incremental cost studies described earlier in this memo. NEEA found that large offices and secondary schools were cost effective (with benefit-cost ratios of 2.0 and 3.4 respectively), while medium-sized offices and primary schools were shown unlikely to be cost effective and were therefore excluded from market sizing and savings potential estimates. Mid-efficiency AP DOAS (gas) systems were found to have slightly higher benefit-cost ratios than fully efficient AP DOAS (gas) systems.

## Funding Share Allocation

During the Q3 CEAC meeting, NEEA presented the proposed cost allocation methodology for Market Transformation programs that are advanced into both the electric and natural gas portfolios. Consistent with that methodology, NEEA calculated the allocation based on the relative

economic present value (PV) of the electric and natural gas savings. The analysis applied fuel-specific avoided costs, weighted by the relevant savings load shapes, to the 20-year technical achievable potential within each funding footprint.

The analysis resulted in a funding allocation of 90 percent electric and 10 percent natural gas, based on a present economic value of the technical achievable potential from electric AP DOAS of $9,655,100[9] and an economic value from gas of $1,081,700. This means that 90 percent of shared AP DOAS program costs will be assigned to the electric portfolio and 10 percent will be assigned to the natural gas portfolio.

The 90/10 allocation is a funding allocation and does not represent the percentage of projects, market activity, or total site energy savings attributable to each fuel. Rather, it reflects each fuel's relative share of the estimated economic value of the long-term regional savings opportunity under the methodology presented to CEAC.

Table 4Table 4 summarizes the key inputs used in the analysis which are largely sourced from the Northwest Power and Conservation Council (NPCC) and, unless otherwise noted, are available on the Regional Technical Forum's (RTF) ProCost website https://rtf.nwcouncil.org/work-products/supporting-documents/procost.

*Table 4. Funding Share Allocation Calculation Key Inputs*

| Input | AP DOAS gas | AP DOAS electric |
|---|---|---|
| NEEA estimate of 20-year technical achievable potential | 1.04 MM Therms | 28.0 aMW |
| Economic Value of Avoided Costs | NPCC commodity price of natural gas<br>NPCC transmission and distribution costs<br>NPCC Social Cost of Carbon[10] | NPCC avoided transmission, distribution, and generation costs<br>NPCC avoided carbon emissions<br>NPCC line losses<br>NPCC avoided transmission, distribution, and generation capacity costs |
| ProCost Savings Shapes | Large Office Heating (22%)<br>K12 Heating (78%) | Retail Heating (27%)<br>Retail Cooling (3%)<br>Office Heating (40%)<br>Office Cooling (4%)<br>K12 Heating (23%)<br>K12 Cooling (3%) |
| Discount rate (ProCost) | 3.75% | 3.75% |

[9] The funding allocation calculation uses annual values for each year from 2026 through 2045, discounted to represent 2026 present value economic benefits.
[10] https://www.nwcouncil.org/2021powerplan_global-assumptions-power-plan/

# Next Steps

NEEA will send the AP DOAS gas expansion materials package to the Natural Gas Advisory Committee (NGAC) on October 22, 2026, for review and feedback. Following review from NGAC and CEAC, NEEA will make any necessary adjustments and finalize the program advancement materials in advance of the final NGAC vote on December 9, 2026.

## Questions for CEAC

NEEA seeks feedback on the following questions:

1. Are the assumptions and methodologies used in the analyses clear and adequately documented?
2. Are the key assumptions reasonable and appropriate for program advancement purposes?
3. Are there any additional risks, sensitivities, or considerations that should be considered before NGAC review and the program advancement vote?




# Memorandum

October 21, 2026

TO: Cost Effectiveness and Evaluation Advisory Committee

FROM: Elizabeth Daykin, Senior Manager, Market Analytics and Planning, I

SUBJECT: Key Inputs and Assumptions Quarterly Update

This is a standing agenda item that is brought to the Cost Effectiveness and Evaluation Advisory Committee (CEAC) every quarter, introducing new and updated assumptions and data sources used for market transformation savings and cost effectiveness calculations.

**Background on this standing agenda item:**

The Cost Effectiveness and Evaluation Advisory Committee (CEAC) primary functions[1] include:

1. Review and advise regarding NEEA cost-effectiveness and savings information to inform annual reporting, and
2. Review and advise regarding market transformation cost and savings measurement and estimation methods.

NEEA staff provide various touchpoints for committee members throughout the year to support the committee in their execution of these charter objectives.

NEEA maintains a system of documentation and communication that includes three primary means for committee members to access documentation: methodology documents posted to a funder portal[2], data provided in funder reports, and meeting materials and presentation content at each quarterly CEAC meeting (Figure 1).

[1] In addition to the two responsibilities listed above there are three more in the charter:

3. Review evaluation findings that affect cost and savings information to inform annual reporting.

4. Work with your organization to provide NEEA staff with relevant incentive data for regional tracking and reporting purposes.

5. Review and advise regarding new market research and evaluation methodologies.

[2] Link to the funder portal: https://neea.sharepoint.com/sites/FunderPortal

Northwest Energy Efficiency Alliance
700 NE Multnomah Street, Suite 1300, Portland, OR 97232
503.688.5400 | Fax 503.688.5447
neea.org | info@neea.org

*Figure 1: System of Documentation for Key Inputs and Assumptions*

| | |
|---|---|
| **CEAC Meeting Materials**<br>*Provided in the meeting invite* | **Key Assumptions Update**<br>*Updated Quarterly*<br>Updates to key inputs and assumptions (baselines, savings rates, units estimate, etc.) along with contact information for follow-up questions |
| | **Annual Summary**<br>*Updated in April*<br>Memo summarizing portfolio savings & cost effectiveness results as well as program updates |
| **Funder Portal**<br>*NEEA SharePoint* | **Energy Savings Report**<br>*Updated Q1/Q2, upon request*<br>**Annual Savings Report**<br>Memo summarizing annual savings results and market updates<br>**Customized Workbook**<br>Workbook with annual savings values, variance summaries, methodology descriptions, measure-level units and other key assumptions specific to the individual funder requests. |
| | **Guidelines and Data Sources**<br>*Updated in April*<br>**Estimation Approaches & Data Sources**<br>List of approaches and data sources NEEA uses to estimate savings & cost effectiveness<br>**NEEA Guidelines**<br>Overview on energy savings & cost effectiveness calculations |
| | **Methodologies**<br>*Updated in April*<br>**Methodology Documentation**<br>Report on energy consumption calculations, data sources and technical assumptions |

**Updates for committee review this quarter**

For the Q4 CEAC meeting, NEEA staff are presenting the following updates for the Committee's consideration:

- Heat Pump Water Heaters (HPWH)
  - NEEA staff updated the measure life from 13 to 15 years, and savings rates for 2026 onward based on Regional Technical Forum (RTF) updates to the HPWH measures.
  - NEEA staff updated the natural market baseline for HPWH based on third-party review.
- XMP Pumps
  - NEEA staff have updated the threshold for apportioning circulators between residential and commercial installations to align with industry market intelligence and RTF methods.

# Heat Pump Water Heaters

The Heat Pump Water Heater (HPWH) program works with water heater manufacturers, distributors, and installers to influence product development and build capability in the supply chain on heat pump technology and quality installation. NEEA's ongoing engagement is crucial for addressing market barriers and preparing the region to adopt and benefit from the 2029 federal standard pertaining to residential water heating. NEEA is supporting the Northwest market by working to strengthen the workforce and engage both regionally and nationally to identify solutions to increase adoption of these water heaters across the region, with particular focus on areas with slower adoption rates.

## Key Assumptions Update

In August 2026, the Regional Technical Forum (RTF) released a measure update for residential and commercial HPWHs under 120 gallons, which included updates to the product measure life and measure unit energy savings (UES) values. NEEA staff have updated key assumptions to align with these updates from the RTF. Additionally, NEEA staff have updated the natural market baseline to align with recommendations outlined in a third-party review, which was published in Q2 2026.

## Savings Rate Update

In 2026, the RTF contracted Larson Energy Research to perform analysis of NEEA's Home Energy Metering Study (HEMS) data to better understand the real-world energy consumption of residential HPWHs. The study determined that approximately 10% of HPWHs in sampled sites were operating in electric resistance mode. Based on the findings from this analysis, the RTF applied an adjustment to unit energy savings (UES) across all measures to account for 10% of HPWHs operating in electric-resistance only mode, in addition to other minor cleaning and streamlining updates to the UES calculations. NEEA staff incorporated these measure adjustments into HPWH model. The net impact attributable to these updates is a 12% reduction in measure savings from 2026 onward.

## Measure Life Update

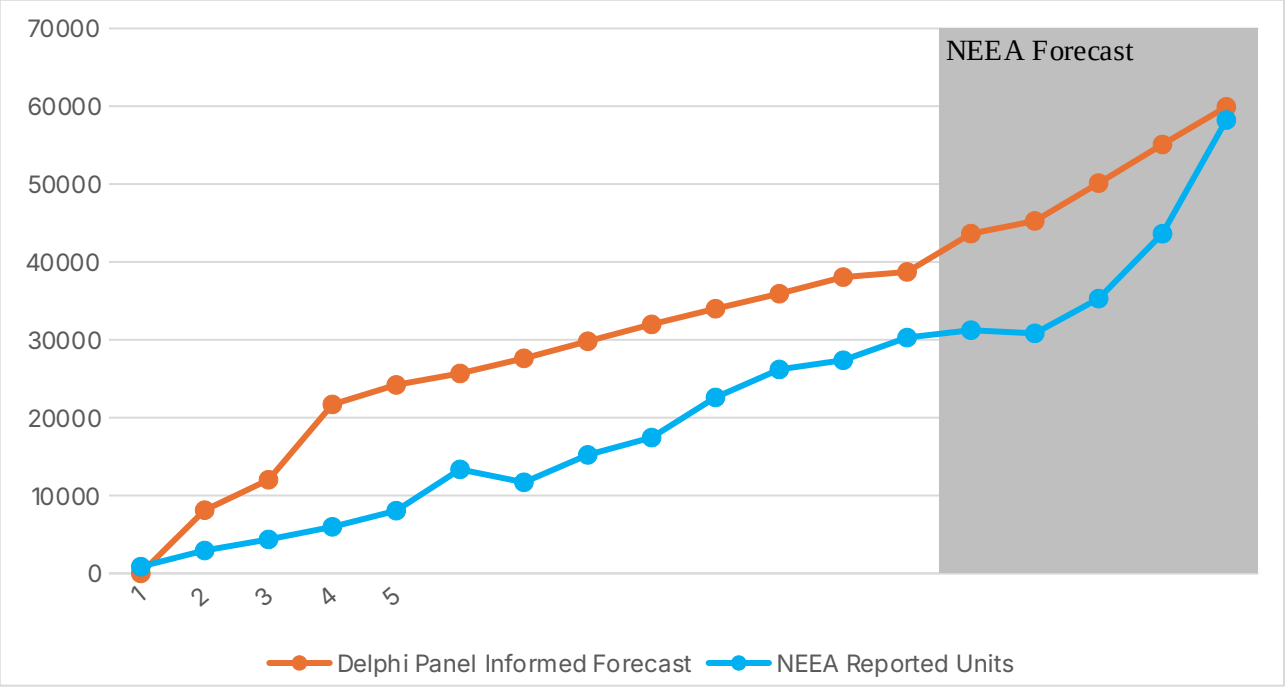
As part of the August measure updates, the RTF increased the measure life for HPWHs from 13 to 15 years to align with the 2024 DOE technical support document[3] for consumer water heaters. Accordingly, NEEA staff have updated the measure life for all HPWH measures to 15 years. This update has no impact on savings rates and has a minimal impact to savings through the end of Cycle 7. Savings forecasts beyond Cycle 7 will see reduced savings from the estimated decrease in maximum annual market size.

## Baseline Update

In Q4 2025, NEEA contracted with Larson Energy Research to conduct a review of the HPWH benefits model. As part of this effort, Larson Energy Research evaluated the current natural market baseline assumptions used for HPWH measures to determine whether the initial baseline assumptions established in 2013 were reasonable based on observed market trends. As a result of the review, Larson Energy Research recommended updating the baseline assumptions to account for a slower rate of market adoption than was anticipated at the start of the program.

Previously, the baseline assumptions for both replacement and new construction measures were based on a Delphi panel forecast created in 2013. Larson Energy Research highlighted that the historical HPWH sales data recorded was consistently lower than the forecasted Delphi panel estimates over the same timeframe (Figure 2) and that the Delphi panel estimates provided an overly optimistic view of adoption that did not accurately reflect actual market sales observed.

*Figure 2: Delphi Panel Informed Forecast Compared with Reported Unit Sales*



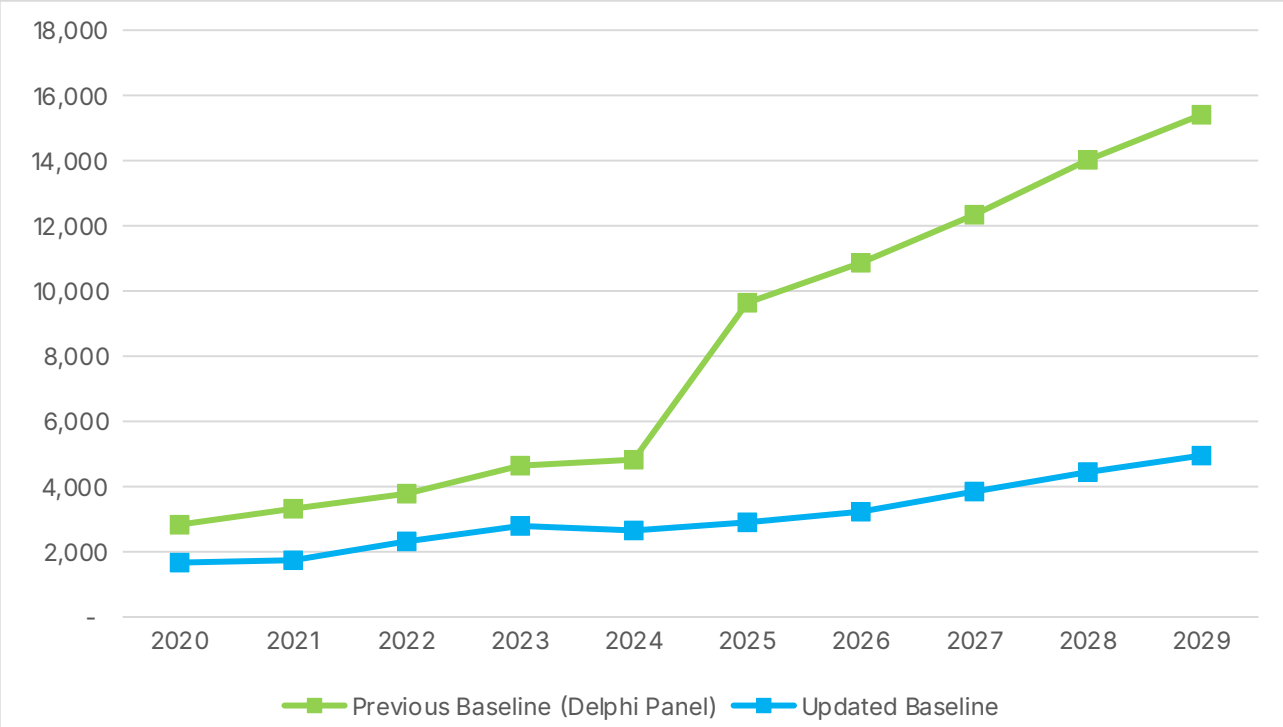

[3] DOE, Technical Support Document for Consumer Water Heaters, 2024 https://downloads.regulations.gov/EERE-2017-BT-STD-0019-1416/content.pdf

As an alternative to the initial baseline methodology, Larson Energy Research recommended examining national market share data, adjusted for the influence of state-level incentive data in the national HPWH sales data. Larson Energy Research recommended using 50% of the national market share as a basis for an updated natural market baseline.

NEEA staff used annual HPWH market sales data reported through ENERGY STAR® for the years 2012 through 2023 divided by the annual electric water heater shipment data reported through the Air-Conditioning, Heating, and Refrigeration Institute (AHRI) to arrive at annual HPWH market shares nationally. Those annual shares were then divided in half to account for national energy-efficiency program influence. An exponential curve was applied to forecast a baseline estimate for years 2024 through 2029.

Figure 3 compares the previous Delphi panel baseline with the updated baseline using this methodology. The revised methodology shows slower HWPH market adoption, with the largest differences emerging after 2024.

*Figure 3: Comparison of Delphi Panel Baseline to Updated Baseline*




Larson Energy Research also recommended NEEA reassess the assumptions for the natural market baseline after the 2029 federal standard takes effect.

**For more detail, see the full report on NEEA.org: 2025 Heat Pump Water Heater Baseline and Key Assumption Review**

*For more information contact Tim Runyan, Senior Market Analyst, at trunyan@neea.org.*

# XMP Pumps

The XMP Pumps program engages with manufacturers, distributors, and trade associations to increase adoption of energy efficient motor-driven products through improving product differentiation and increasing market awareness. As awareness increases and the identification of efficient products becomes more apparent, market adoption will increase. Ultimately, NEEA will utilize its experience as well as data it collects to support businesses and homeowners in choosing products that perform well and save energy.

## Key Assumptions Update

As the circulator market has become more efficient, NEEA's industry partners have noted that lower horsepower circulators have been able to meet the technical requirements of a growing number of commercial applications. To better estimate the XMP Pumps program's regional impact NEEA is updating the criteria by which it apportions the overall circulator market between residential and commercial installations. Previously, circulators above 1/2 horsepower were classified as commercial installations. Beginning with 2026 annual reporting, circulators greater than 1/16 horsepower will be classified as commercial installations. This change will bring our method into alignment with the RTF methodology for distinguishing between residential and commercial installations.

*For more information contact Evan Hatteberg, Senior Technical Market Analyst, at ehatteberg@neea.org.*