Cost-effectiveness & Evaluation Advisory Committee (CEAC)

Northwest Energy Efficiency Alliance

August 26, 2026



CLASSIFICATION LEVEL: PUBLIC

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Agenda

TIME	TOPIC	PRESENTER(S)
9:00	Welcome, Agenda Review	Jonathan Belais
9:10	Energy Use Studies 101	Mike Psaris
9:50	HPWH MPER #8 Findings Overview	Meghan Bean
10:30	Market Research and Evaluation Update	Meghan Bean
10:40	Break	
10:50	Key Assumptions and Fans Baseline	Elizabeth Daykin, Evan Hatteberg
11:20	Funding Allocation Method for Dual-Fuel Funded Market Transformation Programs	Elizabeth Daykin
11:50	Wrap Up	Jonathan Belais

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Introductions & Ice Breaker

- Name
- Organization
- Question(s) for today
- Best thing you watched or read recently?



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LEADERSHIP IN ENERGY EFFICIENCY AWARDS

Help us honor the innovators and collaborators driving energy efficiency across the Northwest and beyond. NEEA will recognize individuals and teams for their exemplary dedication and performance in the industry from 9-11 a.m. on the second day of the NEEA Annual Board Meeting on December 4.

Nominations can be made in the following categories:

- **Rising Star**
- **Innovative Collaboration**
- **Lifetime Achievement**

Nominations

Aug 03
Through
Sept 18

Event

Dec 04



To nominate go to:
neea.org/leadershipawards

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2026 Stakeholder Satisfaction Survey

- ***Goals:***
  - Solicit feedback on stakeholders' experience working with NEEA staff; participating in NEEA forums
  - Build understanding of stakeholder needs
- ***Timeframe:***
  - Sept 28 - October 27, 2026



Conducted approx. every 2 years with all board and committee members

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Upcoming poll: Q4 CEAC in-person?

For the end of today's meeting:

Are you interested and available for an in-person meeting in Q4?

Currently scheduled for October 28.



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Energy Use Studies 101

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Introduction

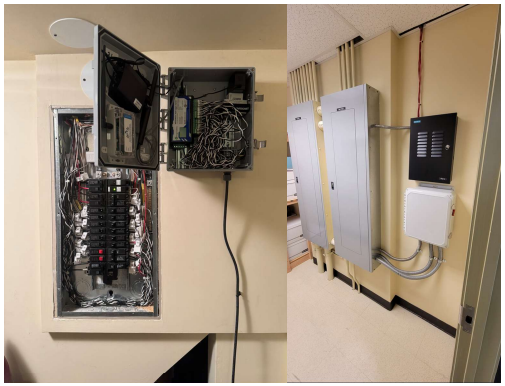
Commercial Building Stock Assessment (CBSA)



Motor-Driven Systems Stock Assessment (MSSA)



End-Use Load Research (EULR)

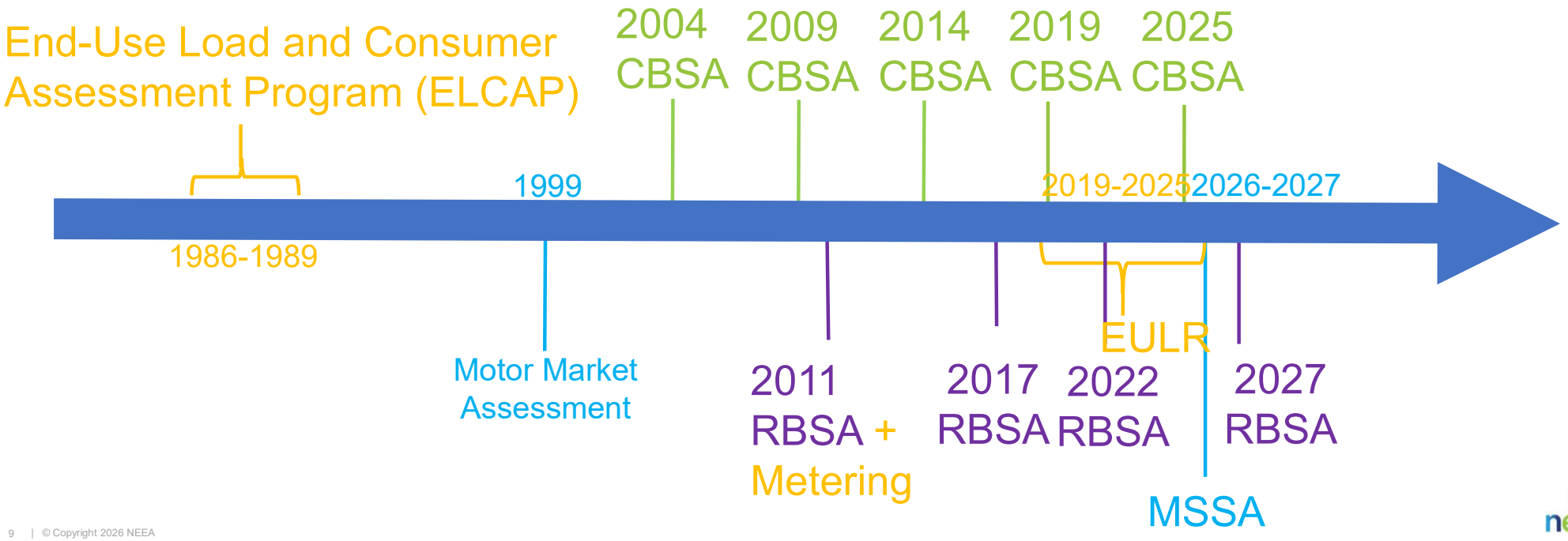


Residential Building Stock Assessment (RBSA)



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Over 20 Years of Data Collection



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Use Cases



MEASURE DEVELOPMENT



OPPORTUNITY IDENTIFICATION AND MARKET SIZING



POWER PLANNING



PROGRAM STRATEGY



SAVINGS MODELS AND FORECASTS

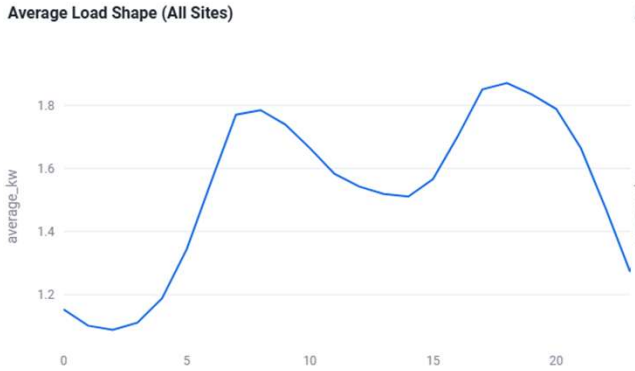
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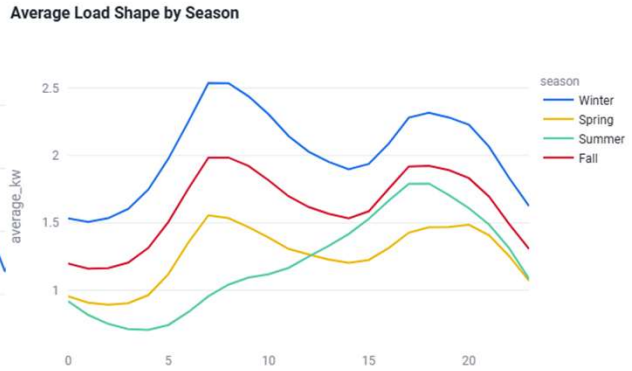
Study Overviews

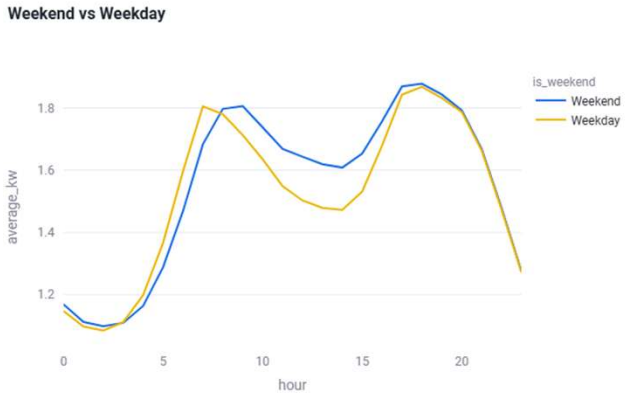
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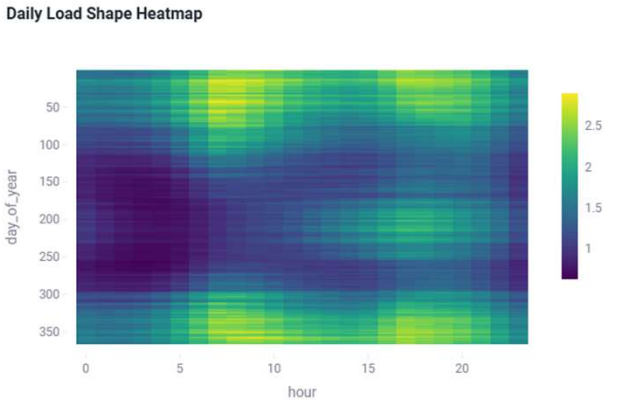
Residential Building Stock Assessment

- **Program Manager:** Neil Yetz
- **Scope**: Single-family (including manufactured homes) and multi-family units.
- **Design**: Most accurate for regional, state, and heating zone estimates. Over 1,000 residential units.
- **Data Collected**: HVAC, lighting, water heating, appliances, electronics, insulation levels, duct conditions, duct and envelope air leakage levels, monthly energy consumption. ***2027 RBSA is planning to collect AMI data.***
- **Timeline:** Data collection in 2027. Publication in 2028.





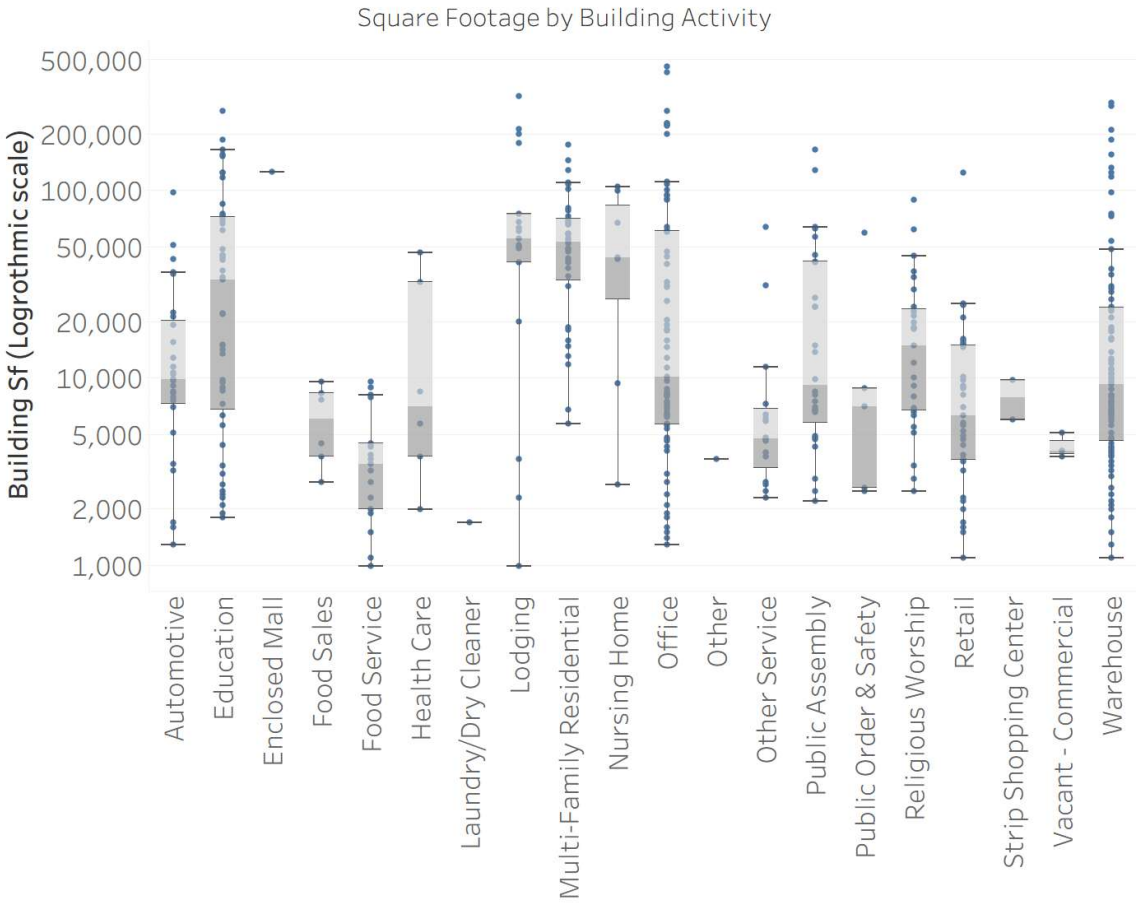




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Commercial Building Stock Assessment

- **Program Manager:** Mike Psaris
- **Scope**: All buildings that are not residential, agricultural, or industrial. Latest CBSA also includes multi-family buildings.
- **Design**: Most accurate for regional estimates given diversity of buildings, and the relatively small sample size (568).
- **Data Collected**: HVAC, lighting, pumps, water heating, on-site energy generation and storage, monthly energy consumption data.
- **Limitations**: Analyses by state and building type.
- **Timeline:** Complete! Webinar presenting results on **September 10th**.



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Motor System Stock Assessment

Table 1. Estimated MOEs with 90 percent confidence by industry for the 2027 MSSA					
Industry	**NAICS code(s)**	**Frame total**	**Completed site visits**	**MOE total motors**	**MOE proportions**
Water Supply and Wastewater	221310, 221320	950	45	17%	12%
Wood Product Manufacturing	321	640	45	25%	12%
Food Manufacturing	311	1,095	45	25%	12%
Computer and Electronics Manufacturing	334	475	45	15%	12%

- **Program Manager:** Ben Spearing
- **Scope**: Four industrial facility types.
- **Design**: Most accurate for regional estimates by industrial NAICS codes.
- **Data Collected**: Stand-alone motor inventory with key attributes like control strategy, hours of operations, and rated horsepower across a number of different end use equipment types.
- **Timeline**: Data Collection from June 2026 to February 2027. Final reports posted by Q3 2027.

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End Use Load Research (EULR)

Special Funding

- **Program Manager:** Ben Spearing
- **Analyst:** Aaron James
- **Current study:** 2018 – 2025
- **Analysis**: 2026 - 2028
- **Past Studies:** 2011 RBSA, 1987 – 1989 ELCAP*



Home Energy Metering Study

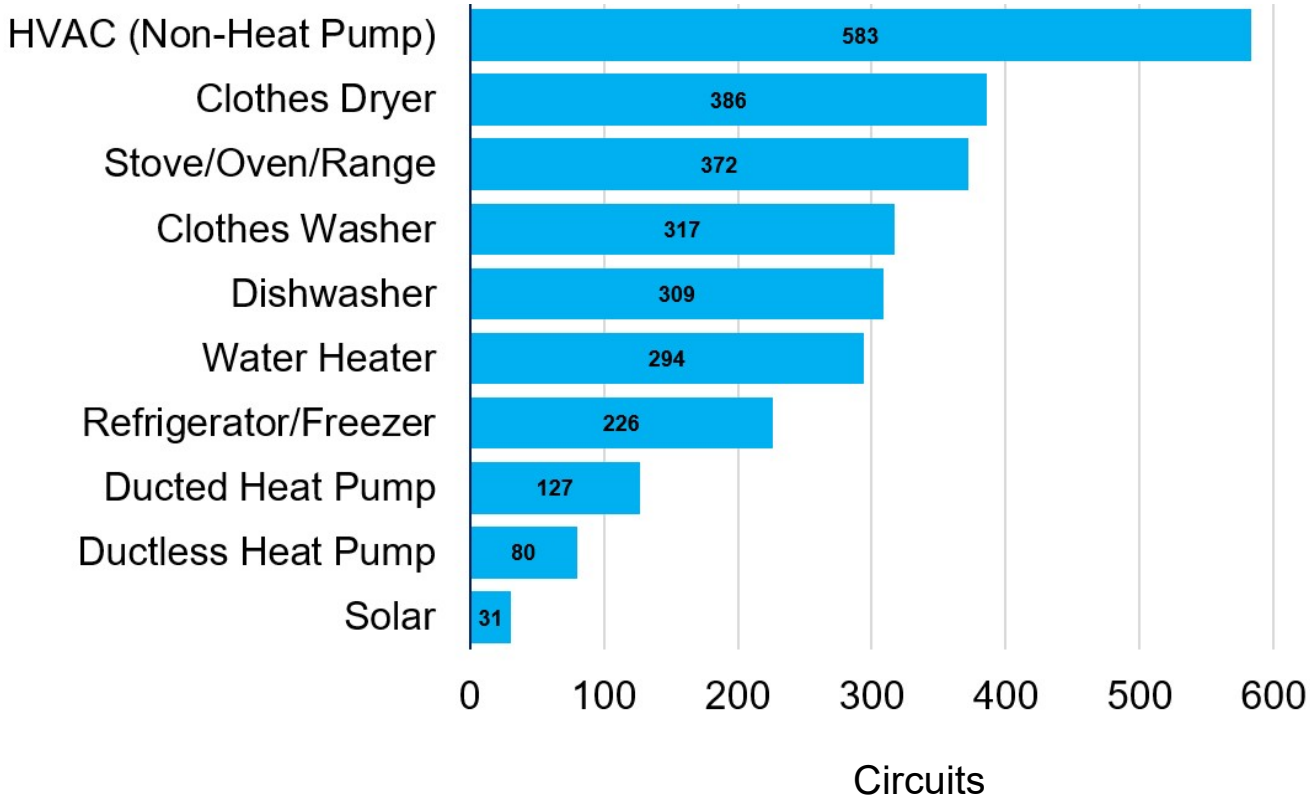


Commercial Energy Metering Study

*End Use Load and Consumer Assessment Program



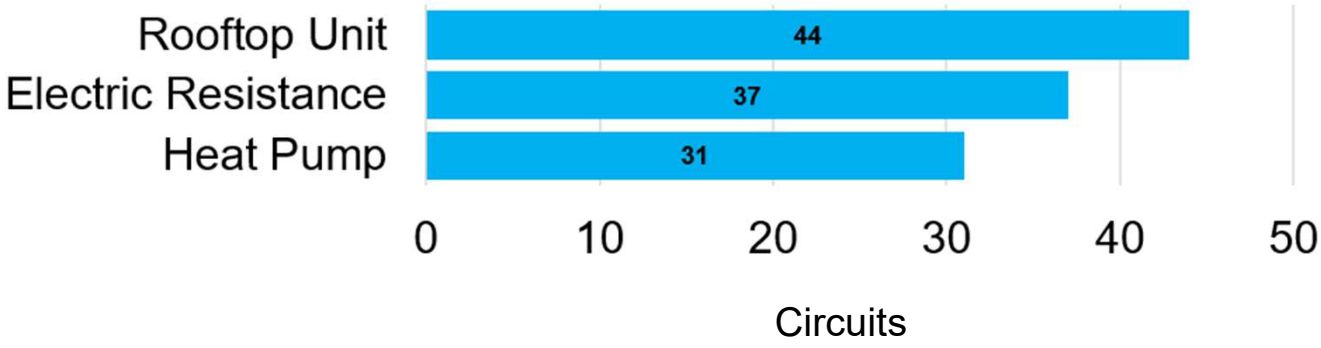
HEMS End Uses



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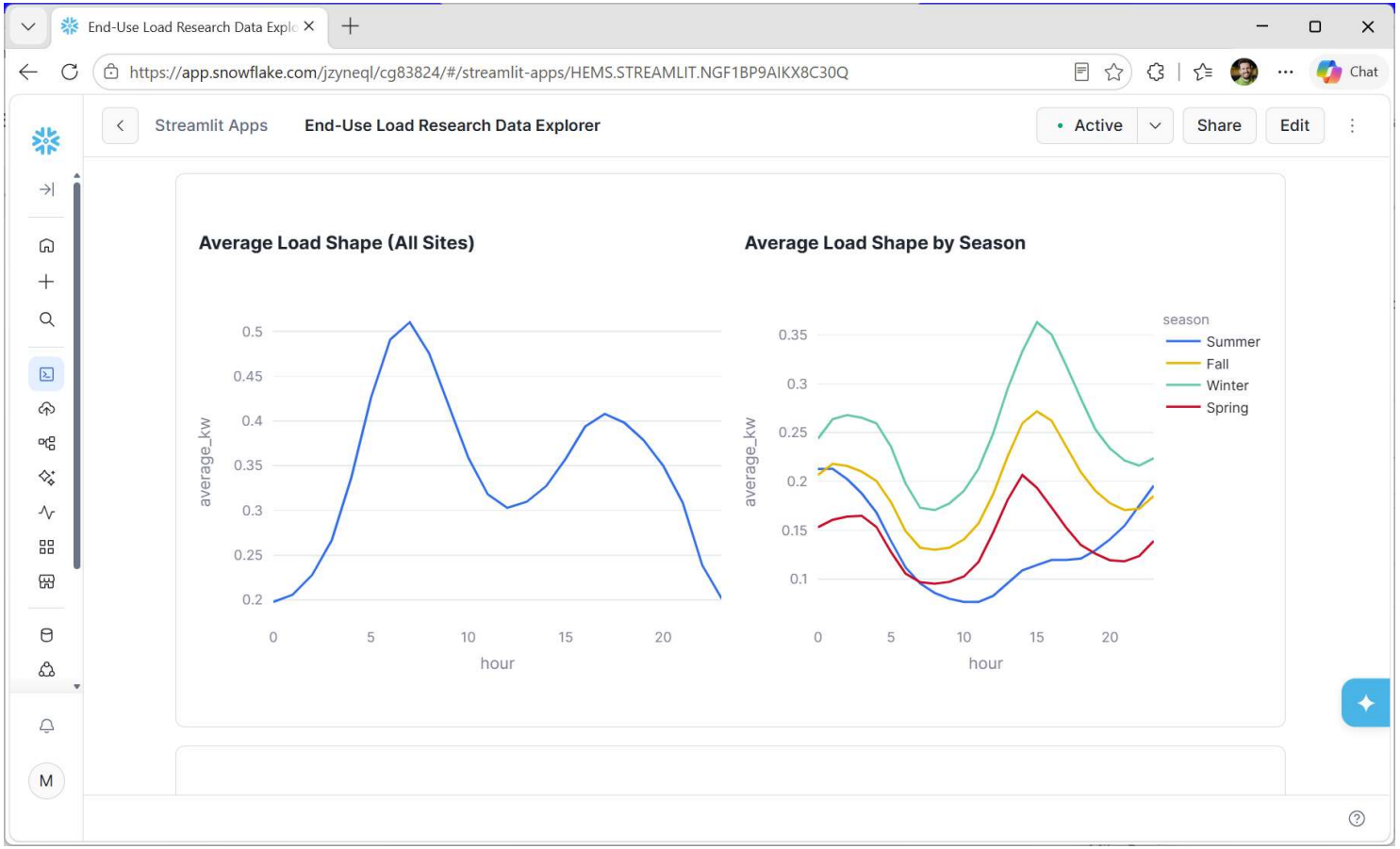


CEMS End Uses



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EULR App Demo



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NEEA Use Cases

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Market Sizing

- NEEA Market Analysts estimate market size to inform
  - Program strategy
  - Savings potential
- CBSA and RBSA are cornerstones to market sizing
- Examples:
  - Residential Dual-Fuel Heat Pumps
  - Gas Advanced Performance DOAS

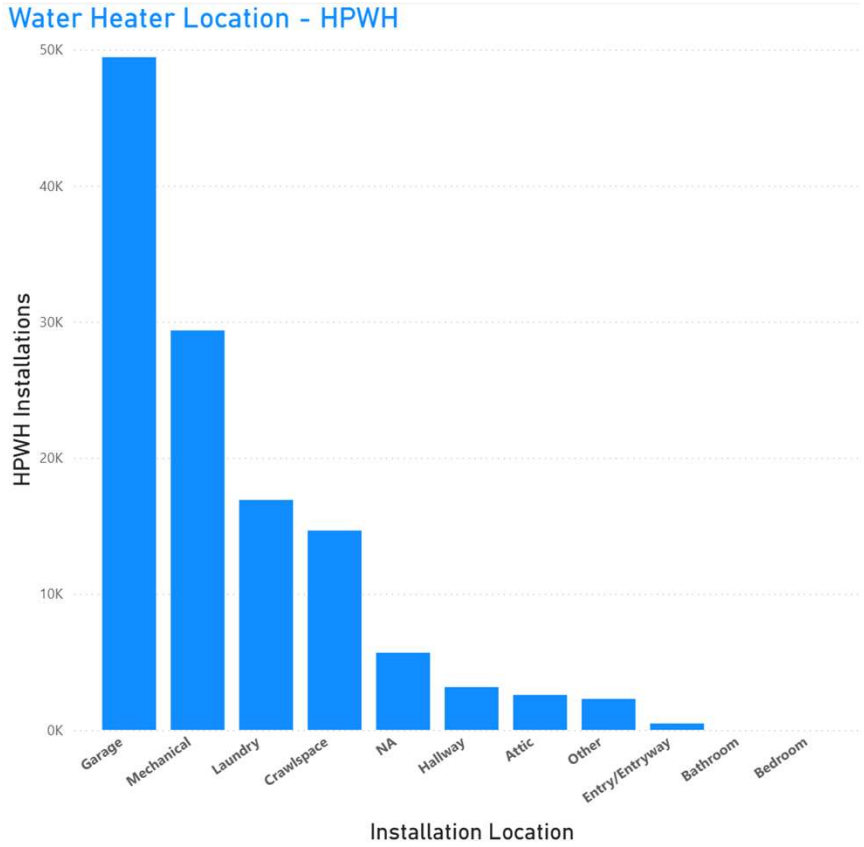
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Stock Turnover Models (HPWHs and EULF)

- Consistent forecasts and assumptions between HPWH and end-use load flex analyses
- RBSA is a key resource informing
  - Historical fuel types for residential water heating
  - Baseline saturation rates for residential water heating technologies including HPWH and electric resistance water heaters
  - Prevalence of tank sizes

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HPWH Insights for Programs

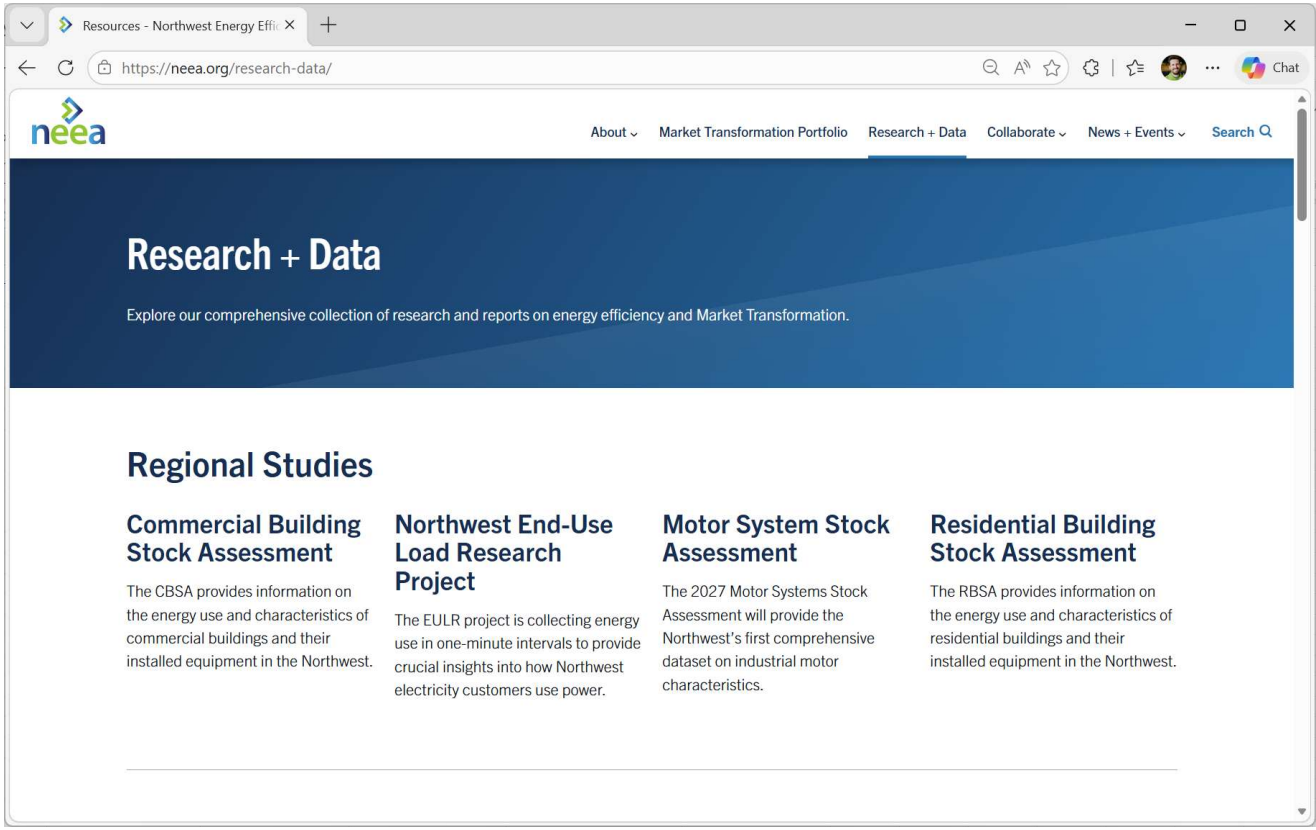


- Market Analysts also provide programs with RBSA insights to inform program activities
- For HPWH, the RBSA provides useful information about
  - installation location, e.g., hallway, garage
  - water heating prevalence for single family detached versus manufactured homes
  - regional distribution
    - For example, the most recent RBSA indicates a higher proportion of electric resistance water heaters in Washington compared to Montana

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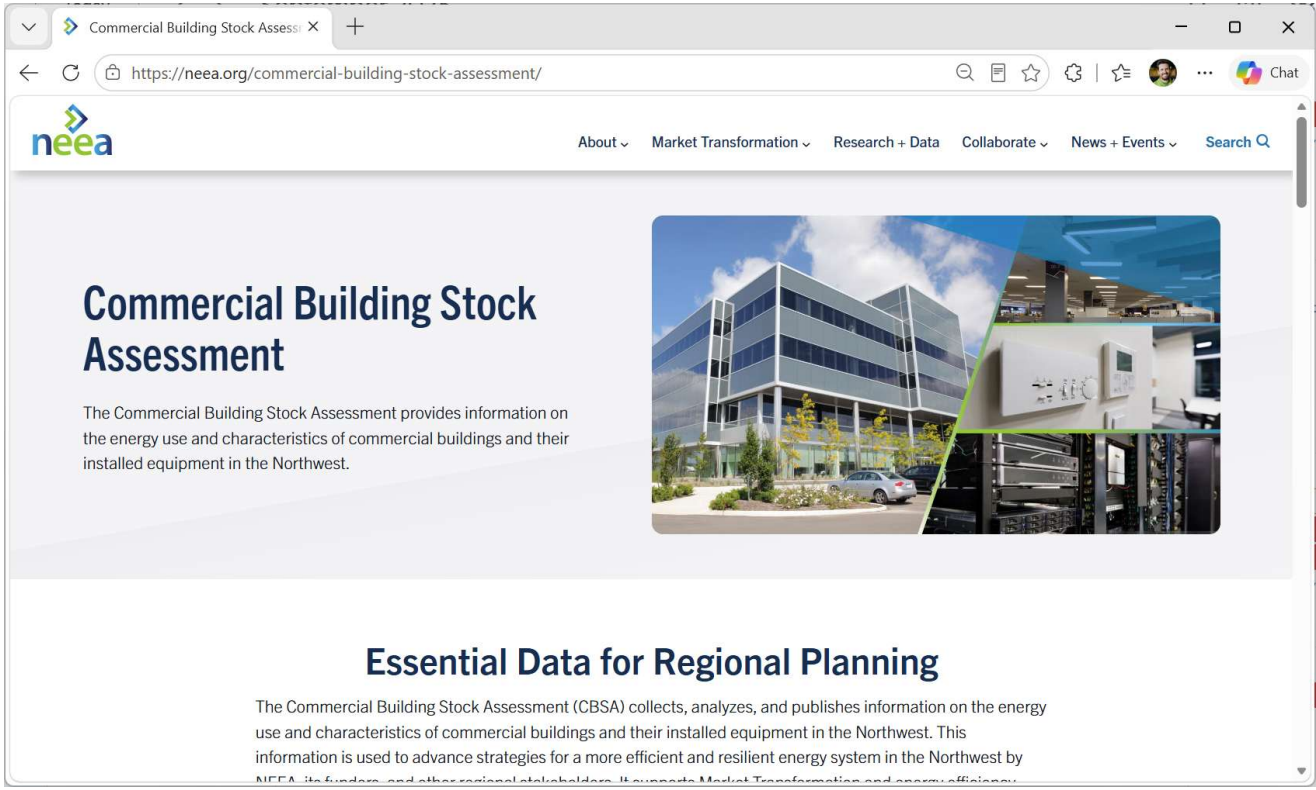
Access Study Information and Data

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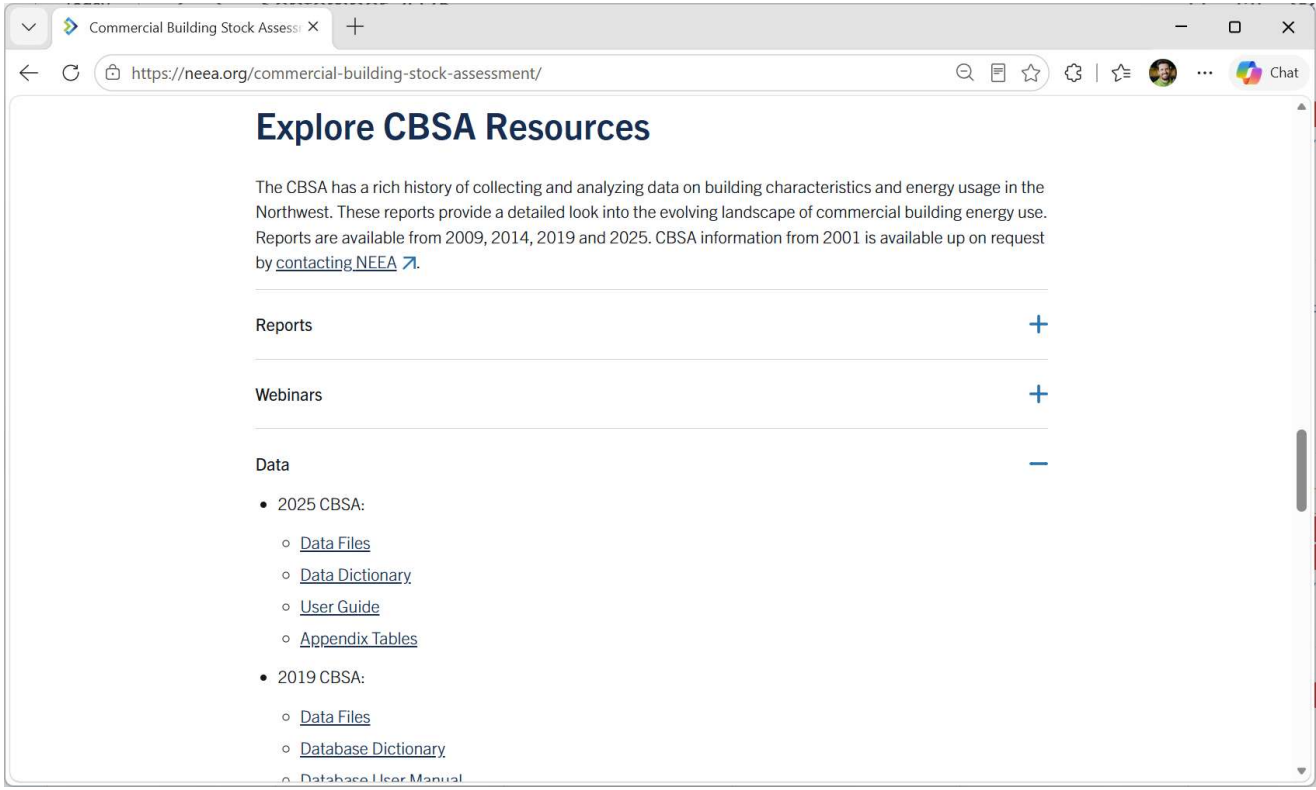
Access Study Information and Data



https://neea.org/commercial-building-stock-assessment/

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Access Study Information and Data



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How does YOUR organization use EUS data?

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Questions?

HPWH MPER #8 Findings Overview

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Heat Pump Water Heater MPER #8 Key Findings

Project managed by Anu Teja, MRE Scientist, MRE

Presented by Meghan Bean, Manager, MRE



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NEEA's HPWH Initiative

NEEA's HPWH Initiative works to transform the Northwest water heater market. ***Since 2012, it has tackled four core market challenges:***

1. **Supply Chain Resistance**
   Installers default to standard electric-resistance tanks instead of heat pump water heaters.

2. **Installation Gaps**
   Existing products do not fit every installation configuration in the field.

3. **Low Consumer Awareness**
   Households are unfamiliar with efficient water heating, especially during emergency replacements.

4. **Lagging Federal Standards**
   Federal test procedures and specifications trailed the Advanced Water Heater Specification.

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The Rationale for MPERs

MPERs turn real-world market data into timely, actionable insight — showing how each initiative is progressing and where it needs to adapt to align with current market conditions.

Track Progress

Measure each program's progress toward its goals using market progress indicators (MPIs).

Adapt in Real Time

Surface timely insights so program managers can course-correct and manage adaptively.

Steady Cadence

Conducted annually — every 12 to 15 months — to keep a continuous pulse on the market.

Grounded in Data

Built on surveys and interviews with market actors to validate findings with real evidence.

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Research Objectives

- Document evidence of HPWH initiative outputs to confirm market progress is rooted in program efforts
- Evaluate program progress against key MPIs
  - Related to contractor recommendations/install rates, consumer awareness, purchaser satisfaction, and federal standard adoption
- Primary research on customer callbacks and HPWH reliability

Market Progress Evaluation Report (MPER) #8

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Research Methods

MPER #8

- Installer survey
  - 101 water heater installers
- HPWH purchaser survey
  - 451 verified HPWH owners
- General consumer survey
  - SF, MF, owners/renters (n=810)

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MPER #8 Key Takeaways

Market Share is Rising

HPWH share has grown since MPER #7, led by Washington.

Installers are Aware of but Not Recommending HPWH

Installers know about HPWHs but rarely recommend them, despite high customer satisfaction.

Install Barriers are Easing

Tough installs still represent a barrier, but installer confidence is growing.

Some Installers Find HPWH Workarounds

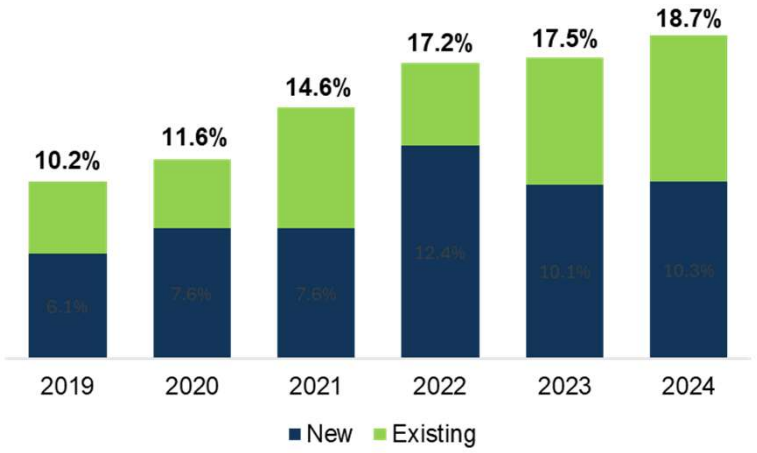
HPWH workarounds could undermine new federal standards.

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Rising Market Share

*HPWH market share in the Northwest has **climbed steadily across region** — and there is still room to grow.*

HPWH Overall Market Share (2019 – 2024)



▲ Growth mainly driven by Washington code

▲ +27%

Market share growth from MPER 7 (2021) to MPER 8 (2024)

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High awareness of HPWHs, but lower recommendation rates

99% of installers are aware of HPWHs and **70%** said their company installs HPWHs.

83% of installers agreed their company's installers can install HPWHs correctly.

75% agreed that replacing electric resistance with a HPWH will lower energy bills.

53% agreed HPWHs are a good replacement for electric resistance and **50%** agreed HPWHs are reliable.

Only **30%** agreed that their company regularly recommends them to customers.

Installers are confident about installing HPWHs but not about their performance.

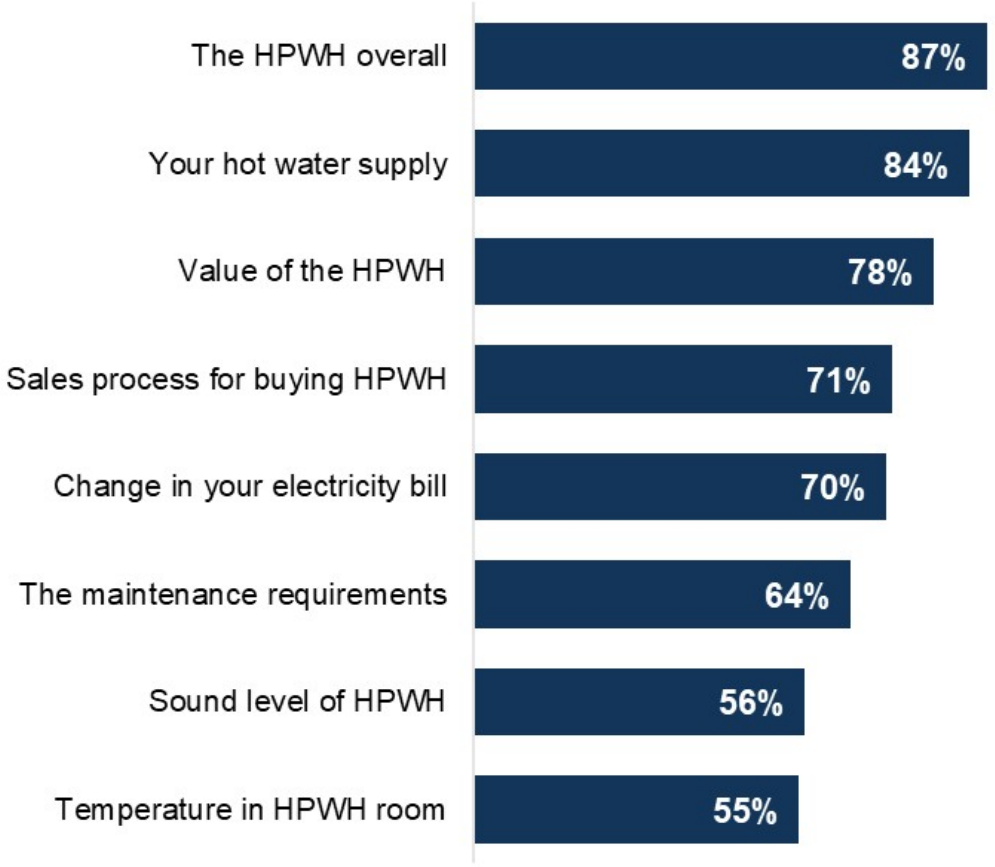
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Purchasers are Satisfied with HPWHs

High satisfaction among purchasers (87% to 90%) since 2018

Satisfaction with HPWH

(Purchaser survey)

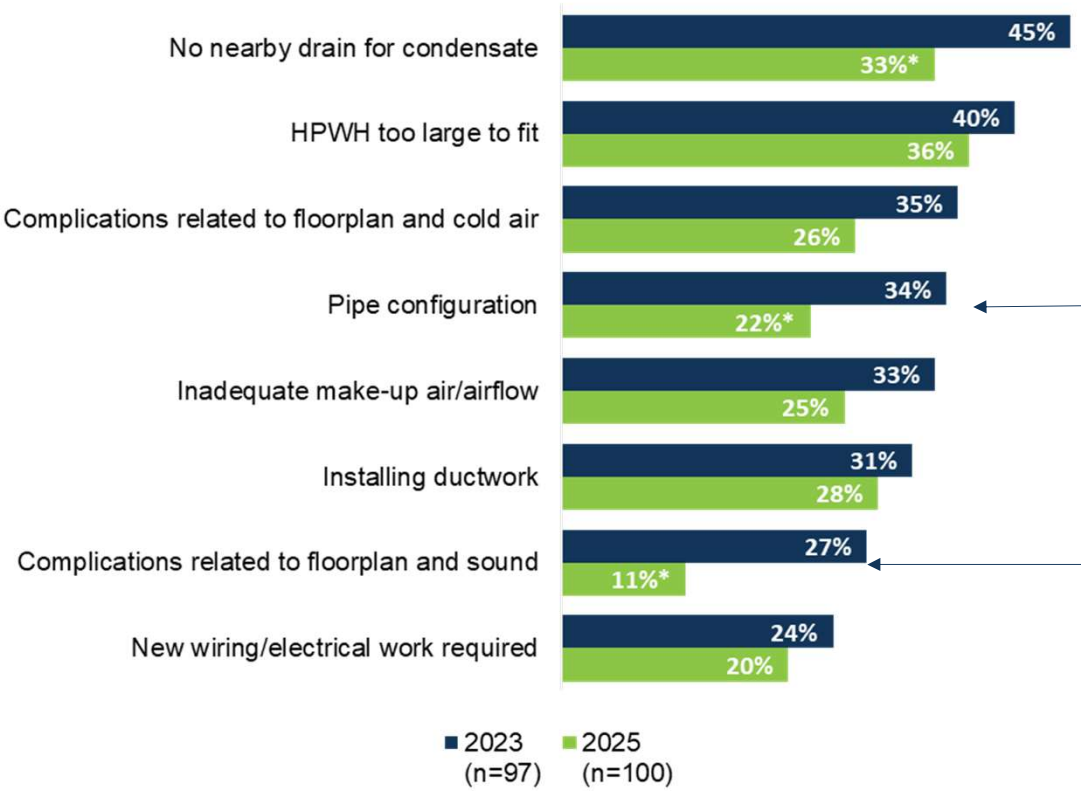


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Installation challenges are less frequent

Installation Challenges

(Installer Survey)



Manufacturers introduced top and side water connections for many models.

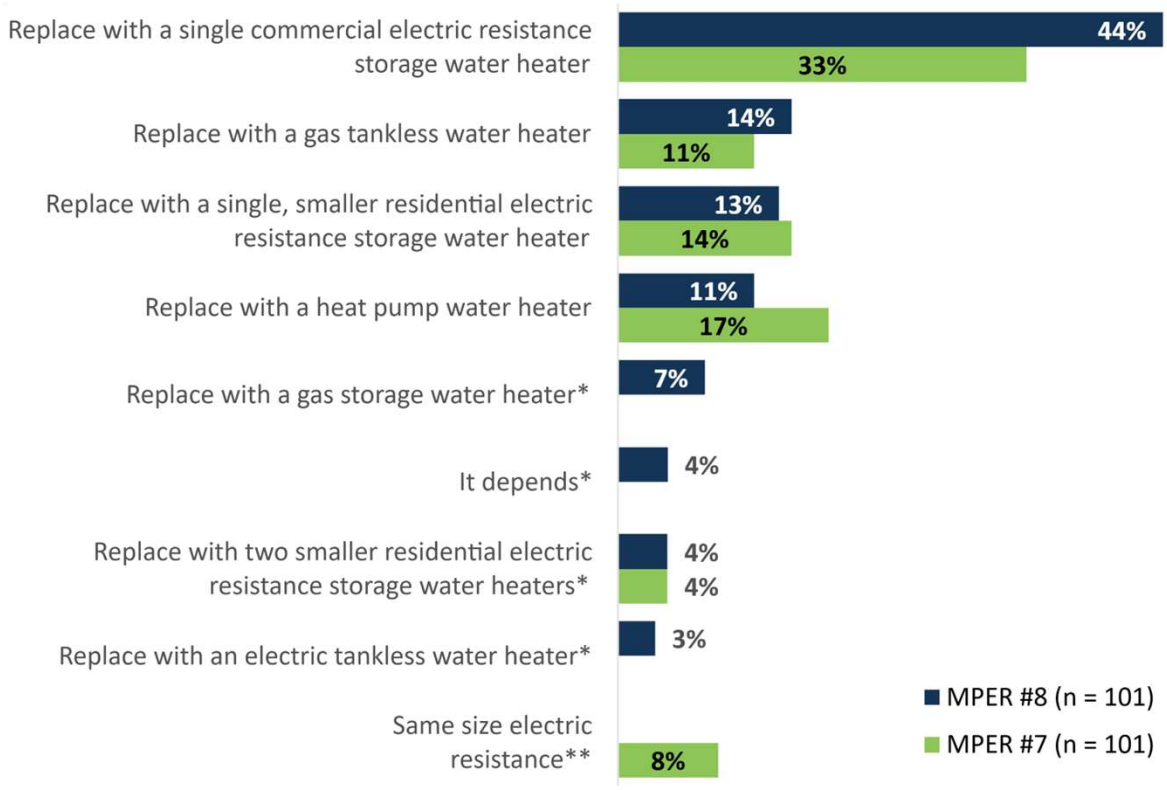
Installers are trained to set expectations with consumer. Manufacturers introduced HPWHs that operate more quietly.

**Significantly different from 2023 at the 90% confidence level.*

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Installers favor other options over HPWHs

Typical Replacement Strategy for >55 Gallon Electric Storage Water Heaters



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Conclusions & Recommendations

The Program has helped lay the groundwork for broad HPWH adoption across the region.

1. **HPWH market share has increased since MPER #7, driven largely by growth in Washington.**
   The MPER recommends that NEEA continue robust consumer awareness campaigns.

2. **Recommendation rates are still low despite installer awareness and generally high customer satisfaction.**
   Since customers rely on installers, the Program should work to minimize installer concerns about HPWHs.

3. **Installer confidence is on the rise.**
   The Program should continue to sponsor trainings to enhance confidence.

4. **Installers turn to workarounds to avoid installing HPWHs given their concerns.**
   The Program should train distributors and installers actively now to get comfortable with HPWHs to facilitate a smooth transition to the new standard in 2029.

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Thank You!

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Market Research & Evaluation Update

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Q2 2026 Newsletter Published Reports

- ERV/HRV Ownership and Maintenance Market Research

- RPP Market Progress Evaluation Report #3
- Heat Pump Water Heater Market Progress Evaluation #8

- Heat Pump Water Heater Baseline and Key Assumptions Review
- Luminaire Level Lighting Controls Key Assumption Review
- Televisions Key Assumptions Review
- Fans Naturally Occurring Baseline Review

- Manufactured Homes Market Diffusion Evaluation Report #1

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Other Newsletter Highlights

- Curious about what MRE has planned, the third-party contractor selected for a particular project, or where to find the link to a published report?

- The MRE newsletter shares projects in three stages
  - Planning *Inception through proposal selection*
  - Fielding *Kickoff through completion of data collection*
  - Reporting *Analysis/synthesis through report posting*

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Key Inputs and Assumptions Update

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Carbon Savings Targets

- NEEA is updating its business plan carbon savings targets to use busbar savings rather than site level savings.
  - Previous estimates were too conservative and did not account for line losses.
  - This update increases carbon savings by 11.3%.
  - The updated carbon savings range is 780-900 thousand tons of CO2.

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Commercial and Industrial Fans Baseline

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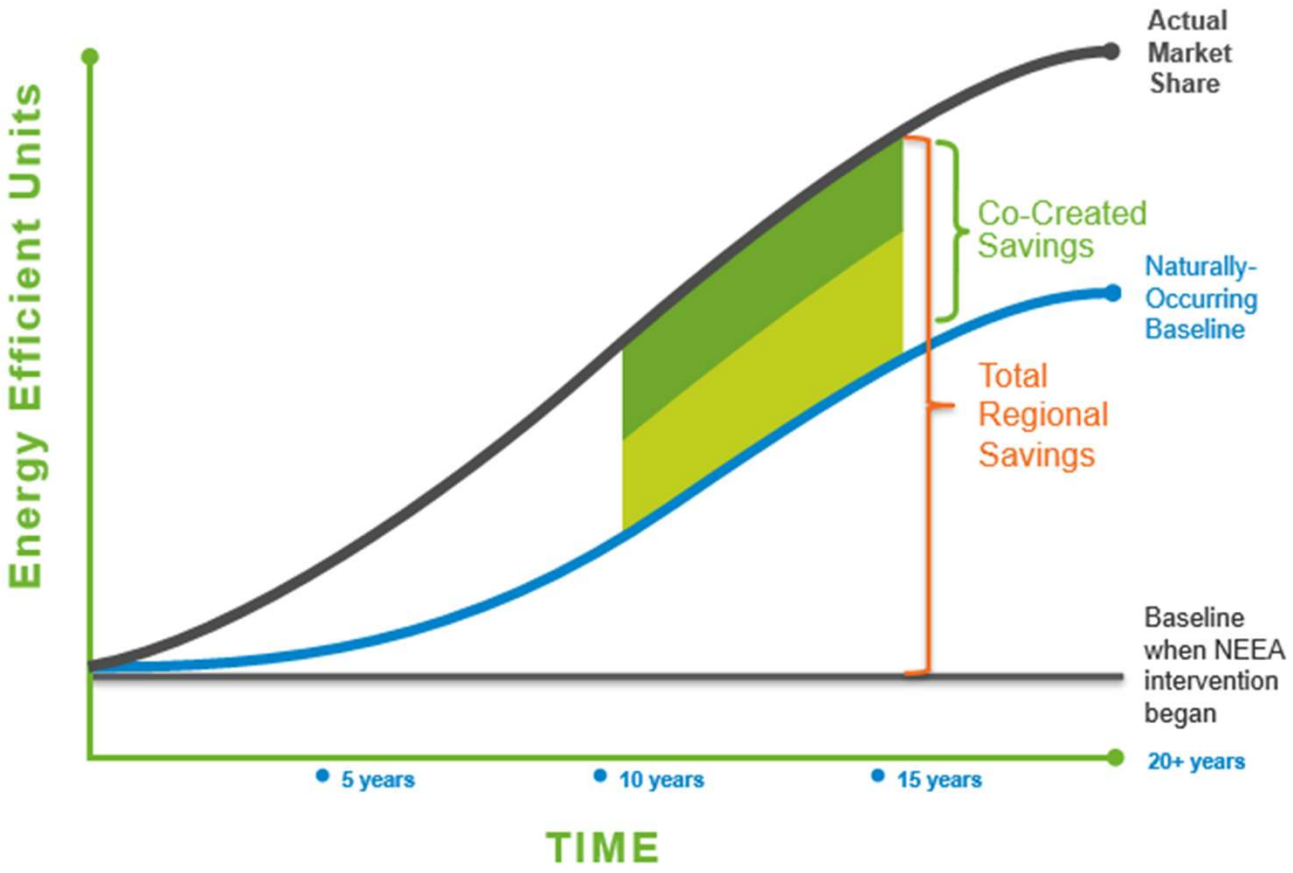
Fans Program Background

- **Definition:** “Efficient Fans” includes
  - Fans not rated by an existing efficiency metric (e.g., AFUE, HSPF, SEER)
- **Market Transformation Opportunity**
  - Increase awareness of efficient fans’ value proposition at the point of fan selection
  - Normalize the use of fan efficiency metric FEI in fan selection by increasing awareness and adoption among manufacturers, reps, and specifiers
  - Build market evidence to support durable, standards-based efficiency improvement
- **FEI Metric:** Developed by AMCA, Measures the efficiency of an entire fan system (fan + motor + drive)



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Savings Type Example



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Total Regional Savings Baseline

DOE Category	Weighted Average FEI
Axial Inline	0.92*
Axial Panel	1.10
Axial Power Roof Ventilator	1.02†
Centrifugal Housed	1.23
Centrifugal Unhoused	1.30
Centrifugal Inline	1.10
Radial Housed	N/A†
Centrifugal Power Roof Ventilator - Exhaust	1.04
Centrifugal Power Roof Ventilator - Supply	0.99*†

* Will be set at 1.00 effective 2026 due to California regulation

† Due to small sample size these fan categories will be updated as additional data becomes available

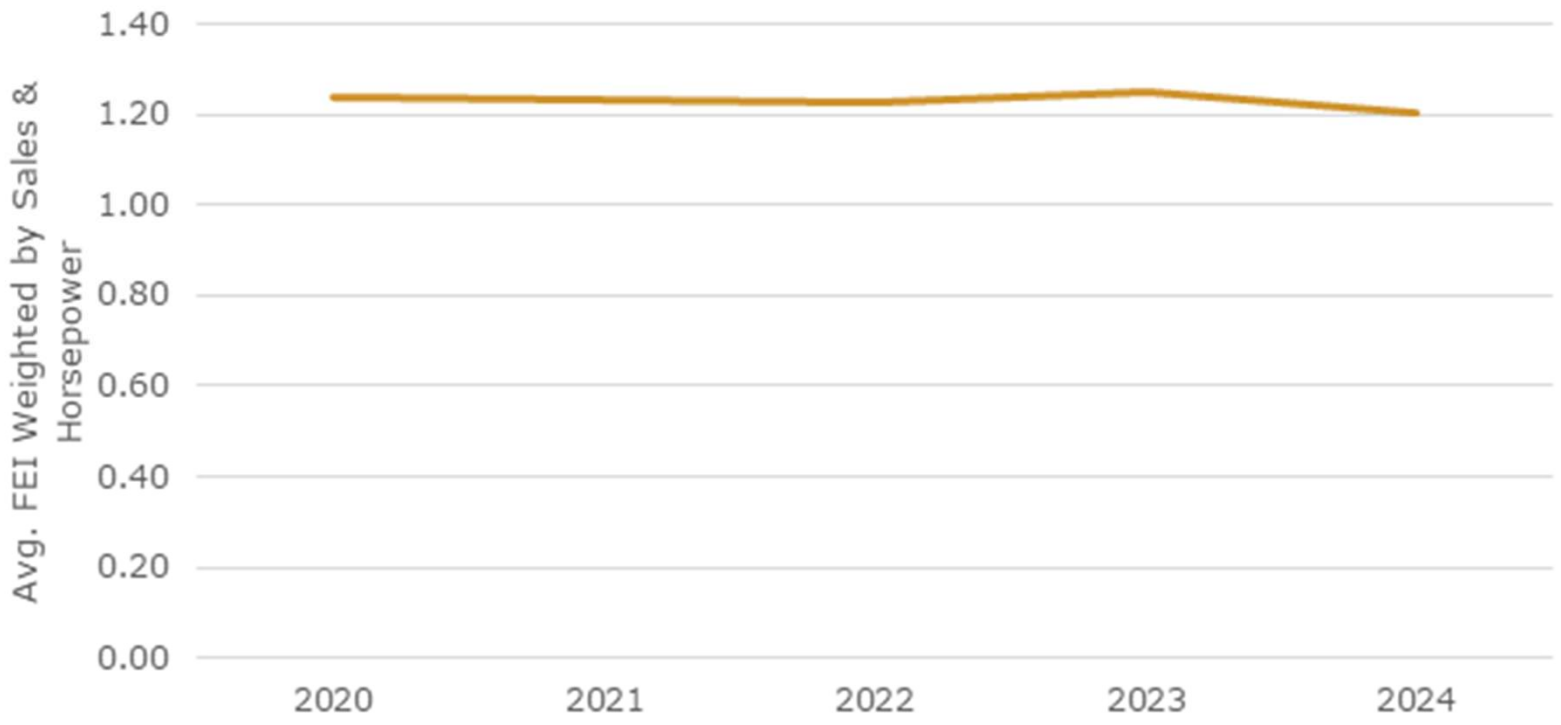
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Baseline Summary

- NEEA will use the historical horsepower weighted average by Fan Class as its Total Regional Savings Baseline
- The Naturally Occurring Baseline forecast will be flat with two exceptions
  - California Fans regulations are assumed to bring the baseline for all Fan Classes to and FEI of 1.0
  - NEEA assumes that the withdrawn DOE fans standard would have eventually gone into effect in 2035

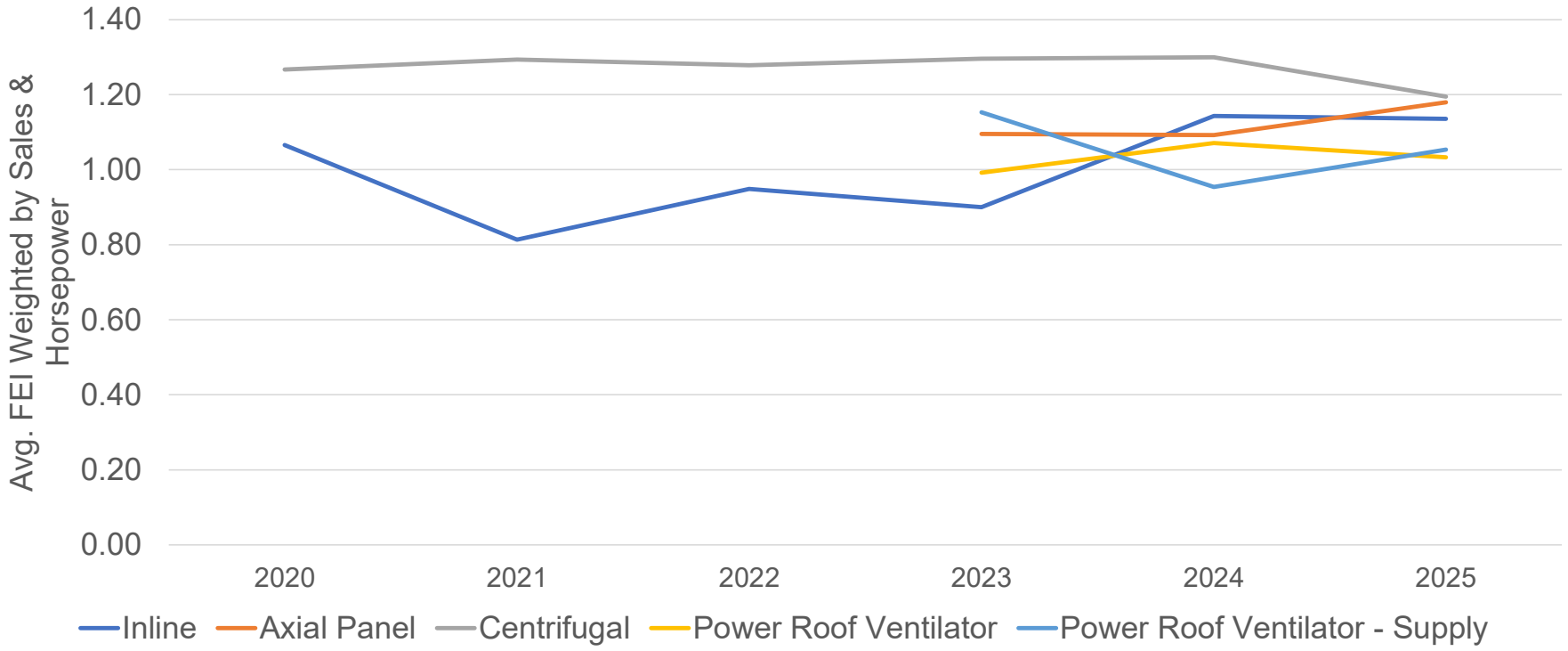
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Naturally Occurring Baseline Trend



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Historical FEI by Class



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Additional Baseline Forecasting Considerations

2026

California fans regulations will require a minimum FEI of 1.0 by 2026

2035

NEEA forecasts that, given the previous effort towards a federal fans standard, a federal fans standard would go into effect in 2035 that will require minimum FEIs equal to the previously proposed

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Third-Party Review of Baseline Assumptions

- Following baseline modeling, NEEA contracted with Apex Analytics for third-party review
- Review occurred Q4 2025 to Q1 2026
- Two primary evaluation questions:
  - Is NEEA's baseline estimation approach appropriate?
  - Are the data underlying NEEA's baseline estimate sound?
- Apex reviewed NEEA materials, sales data, and secondary data sources to provide feedback and recommendations

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Third-Party Findings and Recommendation

- NEEA's approach to estimating a natural market baseline is reasonable based on available data
- NEEA's sales data, while potentially not fully representative of the larger Northwest market, are the best available source for fan market trends
- Apex recommends that NEEA revisit baseline assumptions, as reasonable, when additional historical sales data become available to consider whether any adjustments may be warranted

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Questions?

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Funding Allocation Method for Dual-Fuel Funded Market Transformation Programs

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Funding Allocation Methodology

- Request:
  - CEAC feedback on NEEA's proposed method for applying existing dual-fuel funding allocation guidance
- How it will be used
  - Inform NEEA staff's approach and presentation of Advanced Performance DOAS to CEAC in Q4

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Background

- NEEA has existing internal allocation guidance for dual-fuel funding.
- To date, guidance has been used internally to support business planning and allocation assumptions, including shared regional research activities such as CBSA.
- In Q4, the first dual-fuel funded program since the guidance was established will be presented for Program Advancement, triggering this review by CEAC.

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Expectations

- What we are asking:
  - Is the method clear, reasonable, and appropriate for future funding assumptions?
- This is not a request to revisit the underlying guidance
- Discussion is focused on the allocation method
  - NEEA staff will walk through the calculation methodology and use CEAC feedback to inform how NEEA staff calculate the assumptions brought forward in Q4.

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Principles

- The proposed application method should be consistent with three relevant principles from the guidance:
  - Keep the alliance intact.
  - Be fair and equitable to both direct and indirect funders.
  - Equitably distribute the burden of costs and allocation of benefits.

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Guidance

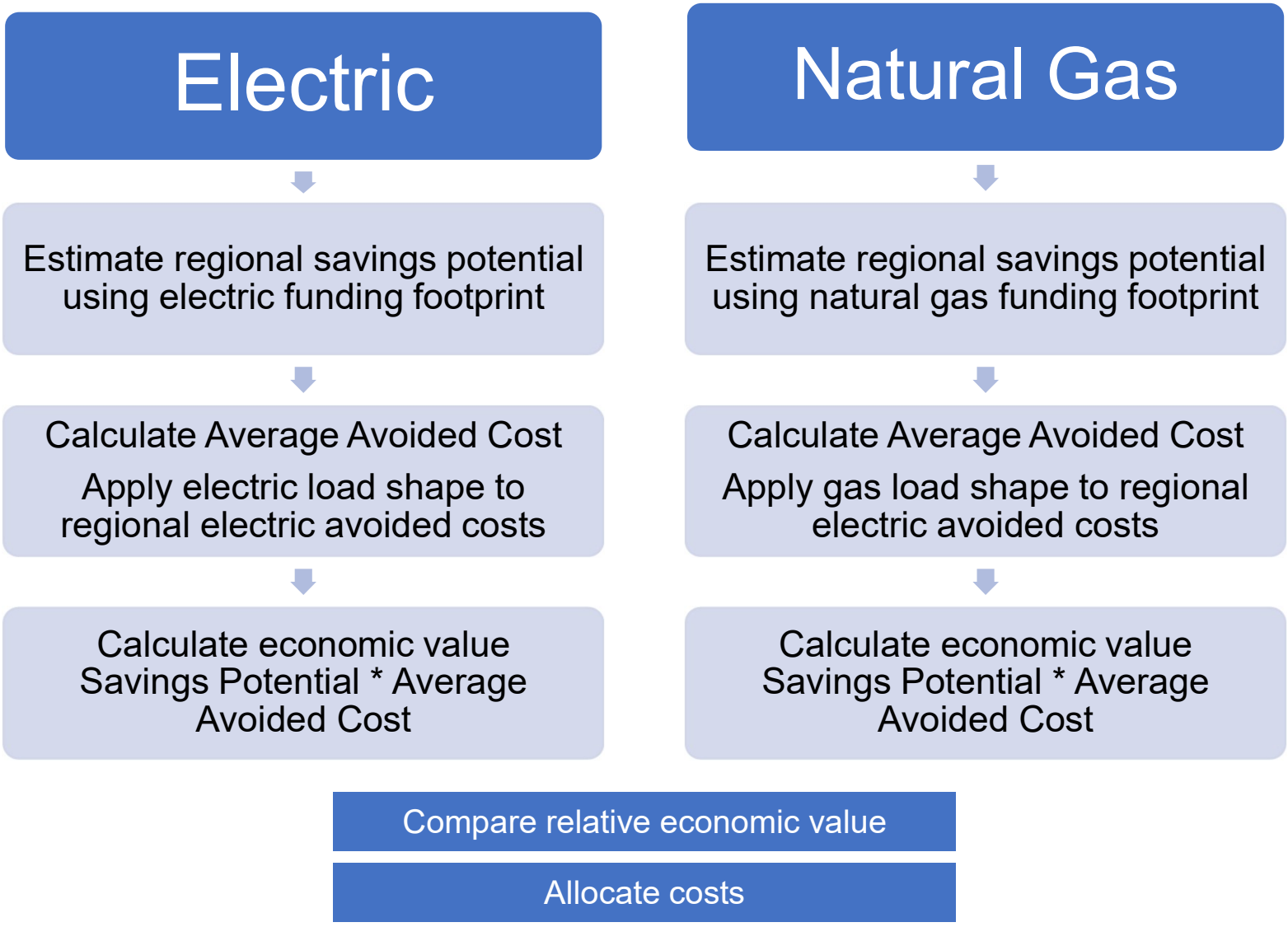
- The allocation ratio should be based on the estimated economic value of the program's energy savings.
- The allocation ratio is determined at advancement stage gates and may be updated annually only if there is a significant change, such as a policy change or loss of a significant funder.
- Once established, the allocation ratio applies to all direct and labor costs charged to the program, including program activities, incentives, evaluation, planning, and market research.

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Proposed Calculation

- Overview of calculation
- Discussion of key inputs
  - Savings potential
  - Avoided costs
  - Load shapes

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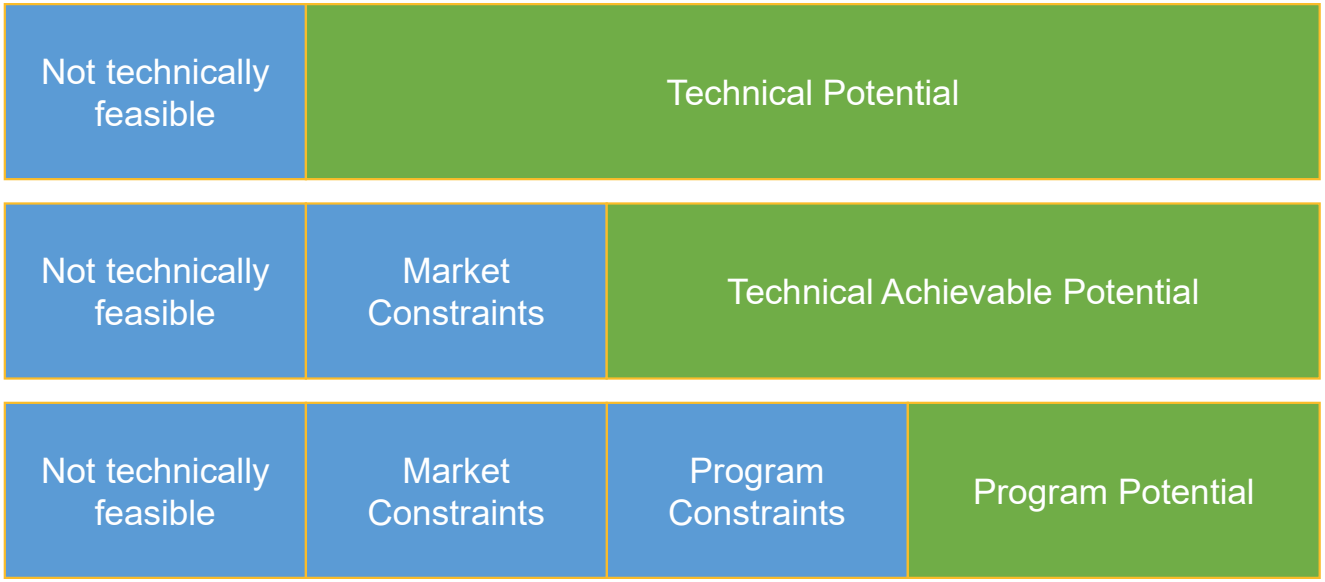
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Inputs

- Next, we will talk in more detail about
  - Savings potential
  - Avoided costs
  - Load shapes

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Overview of Savings Potential



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Recommend using Technical Achievable Potential

- Provides a more stable and comparable basis for estimating electric and natural gas benefits at Program Advancement
  - Program potential may change as budgets, strategies, and portfolio constraints evolve.
- Consistent with how NEEA evaluates relative opportunity across the region
- As a long-term investment, Market Transformation is better served by technical achievable potential as the basis for allocating electric and gas funding at Program Advancement
- This is a *starting point.* NEEA can reevaluate this approach as the program evolves.

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Avoided Costs

- Electric reflects
  - Transmission
  - Distribution
  - Generation
  - Carbon emissions
  - Line losses
  - Peak demand reductions
- Gas reflects
  - Commodity price
  - Transmission
  - Distribution
  - Carbon emissions

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Load Shapes

- NEEA applies an end-use load shape so the avoided cost value reflects when savings occur
- Load shapes weight the avoided costs based on the expected annual savings profile for the relevant end use
- Source: Regional Technical Forum database of savings shapes

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Electric

Estimate technical achievable potential using electric funding footprint

Calculate Average Avoided Cost

Apply electric load shape to regional electric avoided costs

Calculate economic value Technical Achievable Potential * Average Avoided Cost

Natural Gas

Estimate technical achievable potential using natural gas funding footprint

Calculate Average Avoided Cost

Apply gas load shape to regional electric avoided costs

Calculate economic value Technical Achievable Potential * Average Avoided Cost

Compare relative economic value

Allocate costs

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Formula

$$Electric\ Allocation\ Share = \frac{TAP_E * AC_E}{TAP_E * AC_E + TAP_G * AC_G}$$

$$Gas\ Allocation\ Share = \frac{TAP_G * AC_G}{TAP_E * AC_E + TAP_G * AC_G}$$

- Where:
  - TAP_E = 20-year regional electric technical achievable potential, based on the electric funding footprint
  - TAP_G = 20-year regional natural gas technical achievable potential, based on the natural gas funding footprint
  - AC_E = regional avoided cost, weighted average for the relevant electric savings shape
  - AC_G = regional avoided cost, weighted average for the relevant natural gas savings shape

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Questions for CEAC

- Is the proposed calculation methodology clear, understandable, and transparent?
- Does CEAC have feedback on using technical achievable potential, rather than program-specific potential, as the savings basis for applying the allocation guidance at Program Advancement?
- Are there any assumptions or calculation steps that should be clarified before NEEA applies the methodology to Advanced Performance DOAS in Q4?
- Are there additional considerations CEAC recommends NEEA address when presenting the specific Advanced Performance DOAS assumptions in Q4?

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Thank You!

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Quick Poll: Q4 CEAC in-person?

Answer in chat: Are you interested and available for an in-person meeting in Q4?

Currently scheduled for October 28.



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Wrap-Up

- Public Comment
- Upcoming Meetings:
  - Next CEAC meeting: October 28, 2026
  - Interest in an in-person option for the Q4 meeting?
- Feedback:
  - Overall
  - Agenda
  - Packet materials
  - What went well? What needs work?

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