Natural Gas Advisory Committee
Q1 2024 Meeting (Virtual)

DATE: January 31, 2024

TIME: 9:30 – 2:00pm Pacific

WEBINAR: Click here to join the meeting (Meeting ID: 242 984 758 888 | Passcode: etD8mt)
(if needed) Call-in audio only: 971-323-0535 | Phone Conference ID: 575 509 645#

AGENDA (All Times Pacific)

9:30-9:50 (20 min)	**Welcome and Introductions**	Alisyn Maggiora	
9:50-10:20 (30 min)	**Modulating Commercial Gas Dryers** • Highlight 2023 research • Regional share-out/update: Energy Trust, others welcome *Desired Outcome: Committee aware of research/report and understand how their peers are progressing on related measure development.*	Noe Contreras Jackie Goss	**pg. 3**
(10 min)	***Break***	All	
10:30-11:00 (30 min)	**Round Robin** • Share-out on recent key activities/developments • ***NEEA Request*:** Learnings, unique elements, gas-specific barriers on equity-focused pilots/efforts *Desired Outcome: Committee aware of relevant activities/developments across our organizations.*	NGAC Members	

11:00-11:45 (45 min)	**Housekeeping & Looking Ahead**
	• Cycle 7 (2025-2029) Business Plan Update
	• Product Council Updates (5-10 min)
	• Condensing Water Heater Research (10 min) ***new memo p.4***
	• Dual Fuel Workgroups Updates (10 min)
	  ○ NGAC Dual Fuel Program
	  ○ CEAC Dual Fuel Measurement & Methodology
	• Reminder: Vicot field demo (5 min)
	• Notes & Action Items: Oct 22, Dec 7 meetings
	• Annual NGAC Charter Check-in
	• Reminder: Stakeholder Satisfaction Survey due Feb 9
	• Looking ahead
	  ○ Efficiency Exchange Reminder
	  ○ Upcoming meetings
	  ▪ 2024 meeting schedule
	Desired Outcome: Committee refreshed on previous meeting notes/action items and aware of significant upcoming items.
		Becky Walker
		Noe Contreras
		Aaron Winer
		Anu Teja
		Peter Christeleit
		Ryan Brown
		Alisyn Maggiora
			pg. 4-11

(45 min)	***LUNCH***	All	

12:30-1:45
(75 min)
	Quarterly Portfolio Update
	• Portfolio Review
	• Budget Update
	• Quarterly Progress Report highlights
	  ○ Q4 2023 Recap
	  ○ 2024 Program Goals Preview
	Desired Outcome: Committee apprised on gas portfolio developments.
		Peter Christeleit
		Noe Contreras
		Aaron Winer
		Jason Jones
		Tamara Anderson
		Mark Rehley
			pg. 12-22

1:45-1:55 (10 min)	**Public comment, wrap up and adjourn**	Alisyn Maggiora	

Informational Updates:

- None

Additional Resources:

- Q4 2023 Newsletter – Market Research and Evaluation
- Q4 2023 Newsletter – Emerging Technology
- Q3 2023 Newsletter – Codes, Standards and New Construction
- Recent NGAC Meeting Materials (Q4 2023)
  - Oct 22 Packet, Slides, Notes
  - Dec 7 (Commercial Gas Water Heat vote) Packet, Slides, Notes
- NGAC Charter

Memorandum – *Agenda Item*

January 24, 2024

TO: Natural Gas Advisory Committee (NGAC)

FROM: Peter Christeleit, Manager, Natural Gas Portfolio & Strategy

SUBJECT: Commercial Gas Dryer Data and Measure Development Discussion

Ask of You:

Committee members please come prepared to share any experience you have in developing related measures as it may be useful to other attendees who are thinking about or actively developing measures.

Purpose/Context:

The purpose of this agenda item is to highlight research that was done last year to support committee members in developing measures for modulating commercial gas dryer valves and to hear from any members who have had any recent experience developing such measures and would like to share.

Noe Contreras will highlight the NEEA research and report that was completed in 2023.
Committee members please come prepared to share any experience you have in developing related measures as it may be useful to other attendees who are thinking about or actively developing measures.

If you're interested in reviewing the report, you can find it published on neea.org here:
https://neea.org/resources/modulating-gas-valve-for-commercial-dryer-study

Please contact me (PChristeleit@neea.org) or Noe (NContreras@neea.org) if you have questions or would like to discuss further.

Memorandum – *Agenda item*

January 31, 2024

TO: Natural Gas Advisory Committee

FROM: Anu Teja and Aaron Winer, NEEA Staff

SUBJECT: Condensing Gas Storage Water Heater Research

Our Ask of You:

Please review the below overview of planned research prior to the January 31 meeting and come prepared with any questions you have.

During the meeting, we will ask if there is a possibility your organization can contact customers who may have purchased a condensing storage gas water heater and direct them to an opportunity for compensated focus group participation (as described below).

Overview:

NEEA's market transformation efforts for residential gas water heating focus on three primary areas:

- Exploring opportunities for and value of increasing adoption of currently available efficient gas water heaters
- Driving development and commercialization of GHPWH products
- Collaborating with utilities throughout North America to enact mass deployment of GHPWH through a combination of traditional programs and innovative strategies

In support of these efforts NEEA is looking to improve its understanding of the demand side for the residential gas market. NEEA's Efficient Gas Water Heater Program is particularly keen to better understand the purchase motivators among owners of the most efficient currently available gas storage water heaters (condensing gas water heaters) across North America. The Program recognizes this is a niche market. However, the current hypothesis is that there is potential to utilize this market as a beachhead for early GHPWH adoption by converting sales that would have been condensing to GHPWH. Essentially, the hypothesis is that the condensing storage market could be a proxy for an early GHPWH market.

Recent market analysis indicates that the estimate of water heater installations across the regions covered by the North American Gas Heat Pump Collaborative is about 1,075,000 units annually, representing about one in twelve households. In terms of power source 65% would be gas vs. 35% electric. We estimate that about <10% are made up of gas condensing water heaters. Though a small number, we are interested to learn the possibility to capture a larger piece of this niche market.

The key objectives of this research are to

- Understand purchaser behavior and attitudes that resulted in the actual purchase and installation of these highly efficient condensing gas units in their homes
- Explore the purchaser's path to purchase this product
- Identify key barriers or challenges they experienced in the purchase of this product, such as:
    - First cost consideration
    - Annual maintenance of the unit
    - Issues with call backs to the installer

    - Ease of use
- Understand their overall satisfaction of the unit and interaction with the unit (do they need to adjust settings
- Determine purchaser willingness to replace current units with newer condensing units and under what scenarios (replacement or emergency etc.)

We plan on completing between 4-6 virtual focus groups and if needed supplementing them with up to 20 one on one video interviews. It would be useful to gather screen shots of the participants' condensing water heaters and their locations.

We recognize that publicly available lists of purchasers may not be available and will work directly with utility partners (both in the Northwest and throughout the rest of North America) to bolster recruitment. This might mean asking utility partners to outreach to their customers and direct them to a secure site to answer screening questions.

Please contact Anu Teja (ateja@neea.org) and/or Aaron Winer (awiner@neea.org) if you have questions or would like to ensure any topics are included in the discussion.

Memorandum *– Agenda item*

January 24, 2024

TO: Natural Gas Advisory Committee (NGAC)

FROM: Alisyn Maggiora, Sr. Stakeholder Relations Manager

SUBJECT: Annual NGAC Charter Review

Brief Overview:
The NGAC Charter calls for an annual charter review by the committee, and if substantive changes are proposed, that they be routed through the appropriate NEEA Board committee(s) for approval.

From NEEA staff's perspective, no charter edits are needed at this time.

History of most recent changes:
NGAC reviewed the charter in Q1 2023 and made no changes at that time. As you may recall, NGAC adopted a robust charter update in Q3 2020, and made additional, non-substantive updates in Q1 2022, including:

- Updated milestone names per NEEA's refreshed Initiative Life Cycle (e.g. "Initiative Start" changed to "Concept Advancement")
- Updated business case description reflecting the streamlined milestone template
- Language/grammar best practice updates

Ask of You:
Please review the NGAC Charter following this memo. If you have any questions or concerns, or any revisions you'd like to suggest, please share during our Q1 NGAC meeting on January 31. Please don't hesitate to reach out to me if you'd like to discuss anything directly in advance of our meeting. Thank you!

NATURAL GAS ADVISORY COMMITTEE CHARTER

Review process:

Advisory Committee → Governance → Executive → Board

HISTORY			
Source	**Date**	**Action/Notes**	**Next Review**
Board Decision	6-2-2015	Reviewed and approved with no changes.	2016
NGAC	5-18-2020	Revised	Q1 2021
Governance Committee	7-8-2020	Recommended for Board consideration	Q2 2025
Executive Committee	8-27-2020	Recommended for Board consideration	Q2 2025
Board Decision	9-15-2020	Board approval	Q2 2025
NGAC	2-1-2022	Revised	Q1 2023
Governance Committee	5-13-2022	Recommended Board approval	Q2 2025
Executive Committee	5-26-2022	Recommended Board approval	Q2 2025
Board Decision	6-22-2022	Board approval	Q2 2025
NGAC	2-1-2023	No changes	Q1 2024

Purpose

The purpose of the Natural Gas Advisory Committee (NGAC) is to support Alliance success by advising on NEEA's gas program portfolio, including a formal vote for program advancement at two key points in NEEA's Initiative Lifecycle, consistent with the goals and objectives of NEEA's current Business Plan and annual Operations Plan.

NGAC is a leadership advisory committee with a formal voting function that is used to advise NEEA's Executive Director on portfolio management. As such, NGAC members have significant influence on alliance work and are expected to be sufficiently resourced to perform this function.

Responsibilities

1. Review and advise on NEEA's annual gas Operations Plan to support effective gas portfolio performance consistent with the goals, strategies and objectives of NEEA's Business Plan.
2. Review and vet within NGAC member organizations the "business case" document provided at voting milestones, and work as a committee to reach full consent to advance NEEA gas programs per the Program Advancement Process (refer to Addendum A), including adaptive management to achieve regional objectives via the "challenge flag."
3. Share knowledge, expertise and resources to support successful implementation of NEEA's gas program portfolio, including identifying opportunities for leverage among alliance and local programs, and managing intersecting activities in common markets.
4. Participate, as appropriate, in the "RPAC+" downstream marketing coordination process (refer to NEEA's 2020-2024 Business Plan, Appendix 9) to ensure transparency, coordination in the planning process, and the ability to assess the effectiveness of the alliance's evolving regional downstream marketing work.
5. Monitor developments in energy savings estimates, including those due to changes in assumptions or methodology vetted by the Cost Effectiveness and Evaluation Advisory Committee, to stay apprised on implications for NEEA's gas program portfolio.
6. Monitor developments in alliance emerging technology efforts, including those vetted by the Regional Emerging Technology Advisory Committee, to advise on potential gaps in NEEA's gas program portfolio.
7. Provide a forum for information exchange within the region on gas market and program portfolio updates and developments, and opportunities for collaboration.

Committee Membership
Each direct funder of the natural gas portion of NEEA's Business Plan (NGAC Funder) will appoint a representative on NGAC and the Executive Director may appoint additional non-voting member(s) as needed to support or enhance the effectiveness of the committee. Voting is limited to NGAC Funders.

Portfolio Consent Voting
Full consent must be reached by NGAC in order for a NEEA gas program to advance through the Concept Advancement and Program Advancement milestones (refer to Addendum A – Program Advancement Process, Portfolio-Consent Voting, for voting rules). To conduct a vote, a quorum of NGAC Funders must participate (a quorum is a simple majority of eligible participants).

Authority
NGAC is authorized to take action or make recommendations as necessary to fulfill the responsibilities delegated to NGAC in this charter. NGAC advises NEEA's Executive Director.

Open Meetings and Closed Sessions
All NGAC meetings shall be open to the public. With the exception of sensitive information not appropriate for public dissemination, meeting materials (including but not limited to meeting packets, slide presentations, summary notes and Portfolio Consent Voting records) will be posted for public access. A closed session for part or all of any committee meeting may be called at any time to discuss sensitive information such as competitive or proprietary information that can not be publicly shared. Any NGAC member may request a closed session.

Meeting Schedule
NGAC will conduct standing meetings quarterly and additional meetings and/or webinars as needed.

Shared Commitment
NGAC members and NEEA Staff share a commitment to communicate within and coordinate among the member organizations on the activities of this and related advisory committees, in the spirit of collaboration and with the intent of operating with no surprises.

Review schedule
NGAC will review this Charter at least annually and route substantive revisions to the appropriate NEEA Board Committee(s) for review. The Board will review this charter during the first year of the funding cycle, or at other times as needed.

NEEA Governance/ Management/ Advisory Roles and Responsibilities	
NEEA Board	• All corporate governance and fiduciary duties, including ensuring the system of rules, practices and processes by which NEEA is directed to balance the interests of the alliance's stakeholders, to support the achievement of the organization's purpose • Strategic and Business Plan development and approval • Operations Plan and budget approval
NEEA Executive Director	• Manage the business of NEEA according to Strategic, Business and Operations Plans, set forth by Board • Oversee business operations and staff
Regional Portfolio Advisory Committee (RPAC)	• Advise NEEA's Executive Director on portfolio performance and program advancement; "challenge flag" process; RPAC+ downstream marketing elections • Monitor developments from other advisory committees with regard to regional coordination, market progress, and emerging technology
Coordinating Committees (CCs)	• Collaborate with NEEA Staff and report to RPAC on coordination and optimization of NEEA programs and related activities, to identify and manage

	through potential implementation challenges between NEEA and local utility activities, and seize opportunities for amplified market influence
Cost Effectiveness and Evaluation Advisory Committee (CEAC)	• Advise NEEA's Executive Director on methods, data sources and inputs for use in NEEA's cost-benefit analysis and energy savings reporting • Advise NEEA's Executive Director on market research and evaluation methodologies
Regional Emerging Technology Advisory Committee (RETAC)	• Advise NEEA's Executive Director on NEEA's work toward achieving its strategic pipeline goals • Track and coordinate the progression of energy efficiency technologies to improve technology readiness and market adoption in the Northwest
Natural Gas Advisory Committee (NGAC)	• Advise NEEA's Executive Director on gas portfolio performance and program advancement; "challenge flag" process; RPAC+ downstream marketing elections • Monitor developments from other advisory committees with regard to market progress and emerging technology
Work Groups	• Formed by RPAC on an as-needed basis and staffed with as-needed expertise, for a limited term and specific purpose that is distinct from that of RPAC, the CCs, and other Advisory Committees or Work Groups

NGAC CHARTER ADDENDUM A – NEEA PROGRAM ADVANCEMENT PROCESS

OVERVIEW

The Natural Gas Advisory Committee (NGAC) will take a formal vote prior to a NEEA Program being adopted into the NEEA natural gas market transformation program portfolio (Concept Advancement milestone), and prior to a NEEA Program being approved to scale-up its market activities (Program Advancement milestone).

NEEA will provide NGAC with a detailed "business case" at least 10 business days prior to a vote. Key components of the business case include: progress and findings to date; planned activities for the next stage; investment rationale and proposed budget, including estimated energy savings and cost effectiveness (at Program Advancement milestone); market transformation theory, including market drivers, barriers and intervention strategies; a program risk assessment, and detailed roles and responsibilities to clarify expectations for funders and for NEEA staff regarding the execution of and coordination on key program activities.

In addition to this process, there is a formal intervention process (i.e. the "challenge flag") that allows NGAC Funders to request changes and improvements if the funder believes a program is heading in a direction contrary to that which was agreed upon.

PORTFOLIO-CONSENT VOTING

A roll-call vote will be taken at NGAC prior to a NEEA gas program advancing through the Concept Advancement and Program Advancement milestones. Full consent[1] must be reached by those casting votes for a NEEA program to advance.

An NGAC Funder may register a vote as follows:

1. Yes
    a. In person or by phone during a meeting where a vote is taken
    b. In writing (electronic or otherwise) to NEEA Staff in advance of a meeting
    c. Via an appointed delegate, in the event the NGAC member is unable to participate
2. No
    a. In person or by phone during a meeting where a vote is taken
    b. NGAC Funders voting "No" shall identify their concerns and propose a solution consistent with 3(c) under Challenge Flag Process
3. Abstain
    a. An NGAC Funder may choose to abstain as a means of registering a neutral opinion or dissent without voting "No"
4. Present, Not Voting
    a. An NGAC Funder who is present may choose not to vote as a means of remaining neutral on a program's advancement.

Note:
Voting results will be shared with NEEA's Executive Director, communicated to the Board, and posted for public access along with other NGAC meeting materials. If NGAC does not reach full consent for program advancement, the committee shall follow Step 4 under Challenge Flag Process.

"CHALLENGE FLAG" PROCESS

The "challenge flag" is a formal intervention process that allows an NGAC Funder to request changes and improvements if the funder believes a program is heading in a direction contrary to that which was agreed upon. In such a case, the requesting Funder should exercise the process as follows**:**

1. Funder shall first communicate the concern in a timely way to NEEA staff and attempt to resolve the matter directly. If a satisfactory resolution cannot be reached, Funder should inform NEEA Staff that the funder intends to exercise the "challenge flag" option.

2. Funder and NEEA Staff work together to determine the best option for addressing the concern with NGAC, based on the impact on the program and timing of the next scheduled NGAC meeting. Options include, but are not limited to:
    a. Discuss during the next regularly scheduled NGAC meeting.

[1] **Full Consent** = In groups that require unanimous agreement or full consent (unanimity) to approve group decisions, if any participant objects, a participant can block consensus.

b. Convene a special NGAC meeting/webinar.

3. Funder prepares "Challenge Flag" memo for NGAC, articulating:
    a. The NEEA activity that a funder believes is going in a direction contrary to that which was agreed upon by NGAC;
    b. The nature and scope of Funder's concern;
    c. A proposed solution that Funder feels addresses both the funder's concern and the viability of the NEEA market transformation effort.

4. NEEA Staff convenes NGAC for a facilitated discussion on Funder's proposed resolution, with the goal of addressing both (i) Funder's concern, and (ii) the viability of the NEEA market transformation effort.
    a. If NGAC and NEEA staff agree on a proposed solution that achieves 4(i-ii), then NGAC shall indicate its support by reaching full-consent on the proposed solution and the NEEA market transformation effort shall proceed as modified.
    b. If NGAC and NEEA staff cannot agree on a proposed solution that achieves 4(i-ii), NEEA's Executive Director shall escalate the matter for discussion by the full Board (the Board's Executive Committee shall not serve as a proxy for the full board in such instances) prior to the Executive Director making the final decision on how the NEEA market transformation effort shall proceed.

Natural Gas Progress Report

Northwest Energy Efficiency Alliance (NEEA)

Q4 2023 Highlights

Northwest Energy Efficiency Alliance
700 NE Multnomah, suite 1300
Portland, Oregon 97232
p 503.688.5400
neea.org
info@neea.org

Scanning

- Combi
  - Field demonstration sites concluded monitoring DHW-only performance and continue to collect data for the early winter mode. Conclusion of the project, expected late Q1 2024, will include decommissioning and developing a final report, expected Q2 2024.
  - Ongoing commissioning issues continue to delay Vicot V20 testing at GTI Energy. Update expected Q1 2024.
- Dual-Fuel
  - Ongoing work with the Utilization Technology Development (UTD) group to finalize market assessment of emerging or commercially ready gas furnace/electric heat pump products in the North American market.
  - The next phase is a laboratory evaluation of these systems. GTI Energy has designed and built a thermostat environmental emulator for dual-fuel load-based testing.
- Commercial Dryers
  - Continuing work with partners to support study of liquid desiccant-based heat recovery solution for commercial clothes dryer systems.
- HVAC
  - Working with multiple developers and manufacturers to analyze the effort and opportunity for new and, adaptations to, existing products.
- Commercial Water Heating
  - On December 7, 2023 the Natural Gas Advisory Committee held a vote to move the Advanced Commercial Gas Water Heating initiative into Program Development. Future updates will move to Program format, as below.

Codes, Standards, and New Construction

Codes & Standards

In the third quarter of 2023, NEEA staff submitted one comment letter to a request from the Department of Energy.

- Consumer Boilers – Efficiency Conservation Standard – NOPR (Supplemental Notice of Public Rulemaking)

Washington

- Commercial Code: The 2021 Washington State Energy Code–Commercial (WSEC-C) revision process to reduce the risk of violating the federal Energy Policy and Conservation Act (EPCA) concluded in Q4 2023. After the State Building Code Council (SBCC) voted in Q3 2023 to approve the recommendations of its Mechanical, Ventilation and Energy (MVE) Committee and set March 15, 2024 as the new effective date for 2021 WSEC, a final draft of the 2021 WSEC-C EPCA revision was posted. A public comment period, including two public hearings, was conducted in Q4 to collect feedback on this final draft, and the SBCC voted to finalize adoption of the revised 2021 WSEC-C, including a few relatively minor amendments, at its November 28, 2023 meeting. While this revised 2021 WSEC-C mitigates risk of violating EPCA, it is expected to maintain the approximately 24% increase in efficiency over the 2018 WSEC-C of the pre-revisions version approved in 2022. An official final version of the 2021 WSEC-C is being developed, and the code is still scheduled to go into effect March 15, 2024.
- Residential Code: The 2021 Washington State Energy Code–Residential (WSEC-R) revision process to reduce the risk of violating EPCA concluded in Q4 2023. After the State Building Code Council (SBCC) voted in Q3 2023 to approve the recommendations of its Mechanical, Ventilation and Energy (MVE) Committee and set March 15, 2024 as the new effective date for 2021 WSEC, a final draft of the 2021 WSEC-R revision was posted. A public comment period, including two public hearings, was conducted in Q4 to collect feedback on this final draft, and the SBCC voted to finalize adoption of the revised 2021 WSEC-R, including a few relatively minor amendments, at its November 28, 2023 meeting. While the revised 2021 WSEC-R mitigates risk of violating EPCA, it is expected to maintain the approximately 38% increase in efficiency over the 2018 WSEC-R of the pre-revisions version approved in 2022. An official final version of the 2021 WSEC-R is being developed, and the code is still scheduled to go into effect March 15, 2024.

Montana

- The National Center for Appropriate Technology (NCAT) recently created a new section on its website for the Montana Homes Collaborative. On that website, NCAT and MT DEQ published the Fall 2023 Energy Code Compliance Best Practices newsletter whose topics included ADUs in Montana (and how several new bills impact zoning and ADUs) and the 2021 IECC Residential ADU Code Provisions.

Oregon

- Commercial – In Q4 2023, the Oregon Building Codes Division (BCD) nearly completed its 2024 Oregon Energy Efficiency Specialty Code (OEESC) update process. A first draft of the 2024 OEESC, which is based on the model standard ASHRAE 90.1-2022, was reviewed and approved at the October 17, 2024 Construction Industry Energy Board meeting. However, no further rulemaking steps have been taken because the COMcheck software version for ASHRAE 90.1-2022 is not yet available. Thus, the original target adoption date of January 1, 2024 was not achieved, and the 2024 OEESC is now expected to be finalized sometime in 2024 and go into effect six months later. While ASHRAE 90.1-2022 is expected to deliver an approximate 10% increase in energy efficiency from the current code (2021 OEESC), the approved draft includes weakening amendments.
- Residential - The 2023 Oregon Residential Specialty Code (ORSC) adoption process was completed early in Q4 2023. The 2023 ORSC was adopted on October 1, 2023 and will go into full effect on April 1, 2024. A final version of 2023 ORSC has been posted. BCD also continued the process of updating the Oregon Residential Reach Code (ORRC). In Q4 2023, BCD posted a 2023 ORRC first draft and solicited 2023 ORRC proposals from October 20 through December 18, 2023

Idaho

- After the Idaho Building Code Board voted into “proposed” status the updated IDAPA 24.39.30 document proposed by the Division of Occupational and Professional Licenses (DOPL) in Q3 2023, DOPL hosted the two required public hearings, the second in Q4 2023, and then provided the recommendation to the governor’s office to go “pending” with the updates. The 2024 legislative session commenced on January 8, 2024, and will continue throughout Q1 2024.

International Energy Conservation Code (IECC):

- The 2024 IECC development process was nearly completed in Q4 2023. After finishing the third and final round of reviewing code change proposals in Q3 2023, the Residential and Commercial IECC committees (and their subcommittees) voted to approve this final set of Residential and Commercial proposed amendments, which will be applied to the Residential and Commercial 2024 IECC Public Draft #2. The final step to finalize the 2024 IECC is the appeals process, and nine appeals were filed before the January 2, 2024 deadline. All appeals are scheduled to be processed in Q1 2024, and any resulting changes to the 2024 IECC will presumably be incorporated before it is expected to be published later in 2024.

New Construction

NEEA staff is continuing to support utility programs for above code new construction. Data is collected monthly on homes built and rated.

Other Updates

- Highlights from the North American Gas Heat Pump (GHP) Collaborative include:
    - Residential Space Heating Committee:
        - Residential Manufacturer Outreach and Engagement – Finalized
            - Available on NAGHPC SharePoint
        - Development of Residential and Commercial GHP Collateral – Finalized
            - Available on NAGHPC website under "Collateral"
        - Residential GHP TRM Workpaper Template
            - Template finalized 10/2023, modeling begun late 2023, drafts expected Q1 2024
    - Commercial GHP Committee:
        - Mission: Accelerate the development and adoption of Commercial GHP Space and Water Heating systems across North America.
        - Q1, 2024 Meeting will facilitate planning for scoped activities
            - NEEA will propose shared market characterization research
- Alliance staff attended multiple meetings/workshops highlighting Northwest progress, identifying opportunities to collaborate and gaining industry insight. Events included:
    - GTI Energy Emerging Technology Program (ETP): Staff attended meeting learning multiple product updates, highlighting regional activities, sharing knowledge and networking with stakeholders throughout North America to identify opportunities.
        - NEEA staff presented portions of our dual-fuel residential HVAC research synthesis and led a focused group discussion to identify opportunities to accelerate GHP product advancement and testing, align on ERTU activities, and collaborate on market research.
        - Materials available for download on the ETP Member Site under "Meetings"

Efficient Rooftop Units (Efficient RTUs)

2023 Goal	Key Success Metric	Status	Progress and Next Steps
Finalize specification and refine QPL; identify partner/ owner of specification and QPL.	Partner identified by Q1	Partial Threshold Achieved	• Specification and Prescriptive Path QPL is posted on BetterBricks.com and is being revised quarterly, or as needed. • Consortium for Energy Efficiency (CEE) has delayed taking ownership of specification and QPL. CEE and NEEA are still in discussion with CEE and their member utilities about the need for a national specification for efficient gas-fired RTUs. • The program accomplished only one of two parts of this goal by year end. Specification is finalized, and QPL is being updated regularly. NEEA did not have a partner to own the specification and QPL by year end, therefore NEEA will continue to manage and host QPL and specification.
Encourage manufacturers in developing and promoting efficient RTUs for the light commercial market.	Agreement from two manufacturers to produce and offer light-commercial units by Q2.	Threshold Achieved	• Regular meetings with manufacturers are ongoing. • One manufacturer (Daikin North America) has designed and is bringing an energy recovery ventilator (ERV) product to market to be used in place of the economizer of their light commercial RTUs. This product will be available for wholesale purchase in 2024. • Threshold goal was met.

2023 Goal	Key Success Metric	Status	Progress and Next Steps
Create awareness of and support for efficient RTUs from market actors (manufacturer reps, distributors, contractors) and utilities across the U.S. and Canada.	Three partners reference Efficient RTU specification by Q4	Target Achieved	• Regular meetings are ongoing for regional market actors to align ERTU specification extra-regionally. This alignment will show increased demand to manufacturers for qualifying products. • Minnesota's Center for Energy and Environment has included ERVs as a measure in their Efficient RTU initiative, and the teams are aligning on talking points regarding insulation and leakage. • NEEA has also partnered with Nicor Gas and Resource Innovations to align on the ERTU specification for market transformation efforts in Nicor's service territory and is working with CalMTA as they design their RTU initiative. • NEEA is working to build a collective of North American utilities to collaborate on commercial HVAC measures, primarily around RTUs that are gas-fired, dual-fuel, or HP, and include common features include in the ERTU specification.
Improve cost data, increase understanding of costs of Efficient RTUs.	Acquire data by Q3	Goal Not Achieved	• Did not collect improved cost data in 2023. Still working on the milestone assumptions on cost. • NEEA staff is continuing to work with manufacturers and suppliers to acquire cost data for Efficient RTUs and ERVs in 2024.

Activities, achievements, or events

- Jason traveled to Houston to tour the Daikin NA and supplier factories. Met with light commercial designers and sales team to discuss the "bring to market" strategy of their new light commercial ERV option. Also discussed long term design priorities and strategies to get ERTU design elements in future product improvements.
- The second field study site in Portland, the KBOO radio station is collecting heating data. Expecting preliminary data in the spring with a full report published mid-summer.

Efficient Gas Water Heaters

2023 Goal	Key Success Metric	Status	Progress and Next Steps
Drive GHPWH product advancement and testing	Successful lab demonstration, >1.0 UEF, of *both* absorbtion and adsorption GHPWH technologies (Threshold: Successful demonstration of one technology)	Goal not achieved	• North American testing of adsorption GHPWH prototype began later than expected and non-GHP component issue prevented achieving UEF >1 in initial testing. Resolution of issue and further testing planned Q1, 2024. • Technology developer of absorption GHPWH has decided to focus on commercialization of GHP furnace/combi product in the near term, NEEA staff maintaining ongoing engagement
Understand certainty of commercialization timelines	2 manufacturers initiating product commercialization (Threshold: 1 manufacturer initiating commercialization)	Goal not achieved	• Regular meetings with manufacturers and technology developers, ongoing • Discussions with manufacturers regarding potential to commercialize adsorption GHPWH are focused on results of testing mentioned above; next steps delayed and will resume Q1, 2024
Assess utility commitment to supporting a GHPWH	NEEA NGAC + North American GHP Collaborative formalize commitment platform (Threshold: NEEA NGAC indicates significant support for GHPWH)	Threshold achieved	• North American GHP Collaborative “Golden Carrot” draft report indicates members are currently unable to make financial commitments commensurate with those previously identified as required to significantly affect manufacturer decision making. • Through NEEA’s Cycle 7 Business and Strategic Planning process, the draft plan has a focus area to support market transformation work of products that become commercialized and have a good regional fit.

Activities, achievements, or events

- Supported commercial GHPWH Concept Advancement Milestone documentation development and successful NGAC vote on advancement at the Q4 NGAC meeting.
- Began involvement in 2024 ACEEE Hot Air/Hot Water Forum Steering Committee, where NEEA will present and/or moderate multiple sessions related to emerging HVAC and water heating technologies.

High-Performance Windows

2023 Goal	Key Success Metric	Status	Progress and Next Steps
Builders engaged in pilot grow their use of HPW as a standard offering in new homes	3 builders grow their use of HPW as standard offering in new homes in the Northwest	On target	• Two of the four builders who participated in the volume builder pilot for 2022 have committed to grow their use of High-Performance Windows as their standard offering in new homes in the Northwest, as documented in the exit interviews from the project and the 2022 final report. The other two builders who participated in the volume builder project for 2022 will continue to consider High-Performance Windows as a path to energy efficient homes. • The program continued the volume builder pilot in 2023 with three different builders. Two of those builders have indicated that they will use High-Performance Windows as their standard offering in new homes in the Northwest.
Engage manufacturers to co-create strategies for scaling future supply of HPW to meet growing demand	By Q2, 1-2 leading manufacturers supplying the Northwest develop roadmap to scale production of HPW	On target	• Two new brands have entered the thin-triple market: JELD-WEN announced production of their true thin-triple line starting up at their Stayton, OR plant. PGT recently announced they are collaborating with Corning to build thin-triple IGUs that will be used in PGT windows and also sold to other window manufacturers; they are specifically targeting the northern climate zones and announced construction of a dedicated manufacturing plant near Richmond, VA. They join Andersen, Marvin, Milgard, Pella, PlyGem and Prime as major manufacturers offering triple pane product in the northern climate zone. • Incremental prices appear modest relative to code windows ($40-80/window for an average sized window). Lead times are on par with code / double-pane windows as experienced through the builder pilot. Builders in NEEA's pilot had no problem or delays sourcing triple pane windows from multiple manufacturers.
Finalize key intervention strategies and transition to market development.	Q4 Program Advancement presented to RPAC and NGAC.	Action Required	• The High-Performance Windows program is in the Program Development phase and is currently uncertain of the path forward to Market Development. Using currently available data—not including non-energy benefits—the High-Performance Windows program does not meet NEEA's Benefit/Cost Ratio threshold of >1 at the measure level now, nor will it in the near future. • The program will remain in in the Program Development phase, with limited scope and resourcing in 2024.

Activities, achievements, or events

- The Confederated Tribes of Grande Ronde Case Studies are up on BetterBuilt[NW]
  - Video: Triple-Pane Windows Bring Comfort to the Heart of a Tribal Community
  - Video: Tribes' Net Zero Homes Built to Maximize Efficiency and Optimize Comfort
  - Print Case Study: Net-Zero Comfort for the Heart of a Tribal Community

- The case study on Lennar is forthcoming.

- Grace Weger, of the Bend/Redmond Habitat for Humanity affiliate, who participated in in our Builder Pilot, was recognized as a Rising Star for her efforts at the Leadership in Energy Efficiency Awards ceremony in December.

- We are collaborating with MN CEE on a **macro level study based on manufacturer/supplier interviews** to understand the total number of units sold in 2022 in the Northwest (and MN) segmented by efficient and non-efficient windows defined as 0.22 U-Factor or less, along with understanding the breakdown of prescriptive (≤ 0.22 U-Factor) and the equivalent energy performance defined by the new ENERGY STAR v7 specification for the Northern Climate Zone. This will be published soon on neea.org.