



# Natural Gas Advisory Committee

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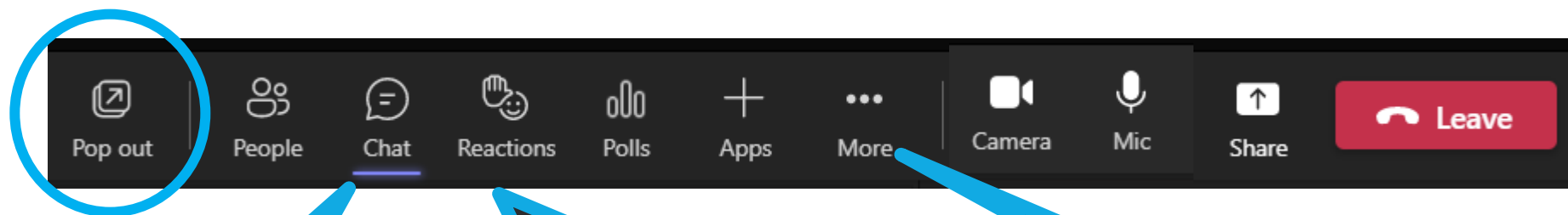
## Q3 2023 Meeting

July 26, 2023  
Virtual





# Tools for Today: Engaging on Teams



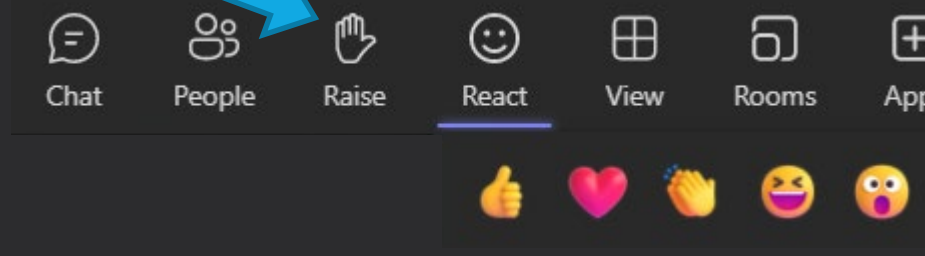
The chat is not captured in the recording.

Do you have any accessibility challenges with this technology today?



## Comments/Questions?

Please raise your virtual hand or chime in  
Chat & reactions also welcome



“...” More includes:

- ✓ Settings: mic & video
- ✓ Background effects

*Heads up:*  
*“Spotlighting” Speakers*





# Agenda

*All times Pacific*

12:30-12:50	Welcome and Introductions
12:50-1:10	Round Robin
1:10-1:30	Housekeeping & Looking Ahead
(10 min)	<i>Break</i>
1:40-2:40	Quarterly Portfolio Update (Q2 Recap)
(10 min)	<i>Break</i>
2:50-3:30	Washington Code Evaluation Update
3:30-4:00	Gas Heat Pump Product Development Update <i>*CONFIDENTIAL CONTENT*</i>
(15 min)	<i>Break</i>
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4:35-4:45	Public comment, wrap up and adjourn





# *Introductions*

- Name
- Organization
- *And...*

**XXX**



## *Round Robin*

- Focus: Organizational & program highlights since April





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## Housekeeping & Looking Ahead

- Product Council updates
- [Notes](#) & action items from Apr 20
- Looking Ahead
  - Workgroups
  - 2024 Operations Planning update
  - Business Planning update
  - Leadership in Energy Efficiency Awards
  - Upcoming meetings
    - Sept 7 interim webinar
    - Q4 anticipated topics
    - 2024 meeting schedule





# Product Council Updates

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**Noe Contreras**

*Product Manager, Gas*

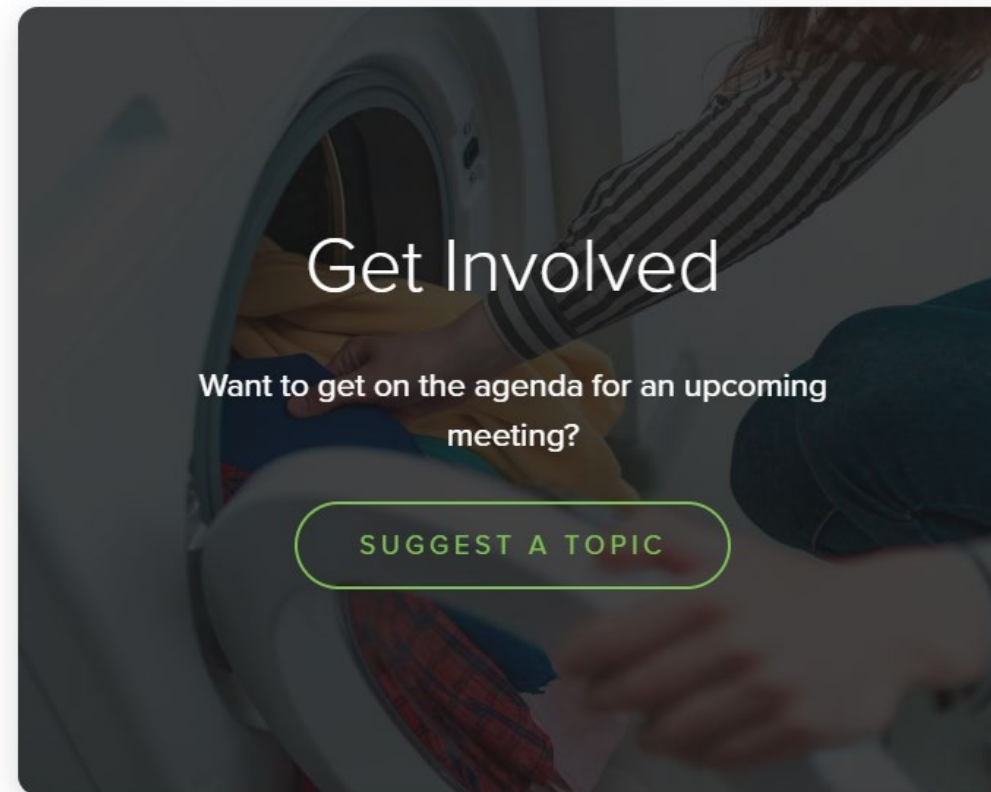
[NContreras@neea.org](mailto:NContreras@neea.org)





## *Product Council on NEEA.ORG*

- Now using Microsoft TEAMS
- NEEA.org (Get Involved → Product Council)
  - Archives, Future Session, Suggest a Topic



[Northwest Energy Efficiency Alliance \(NEEA\) | Product Council](https://www.neea.org/product-council)



# Displacing Central Air Conditioning with ASHPs

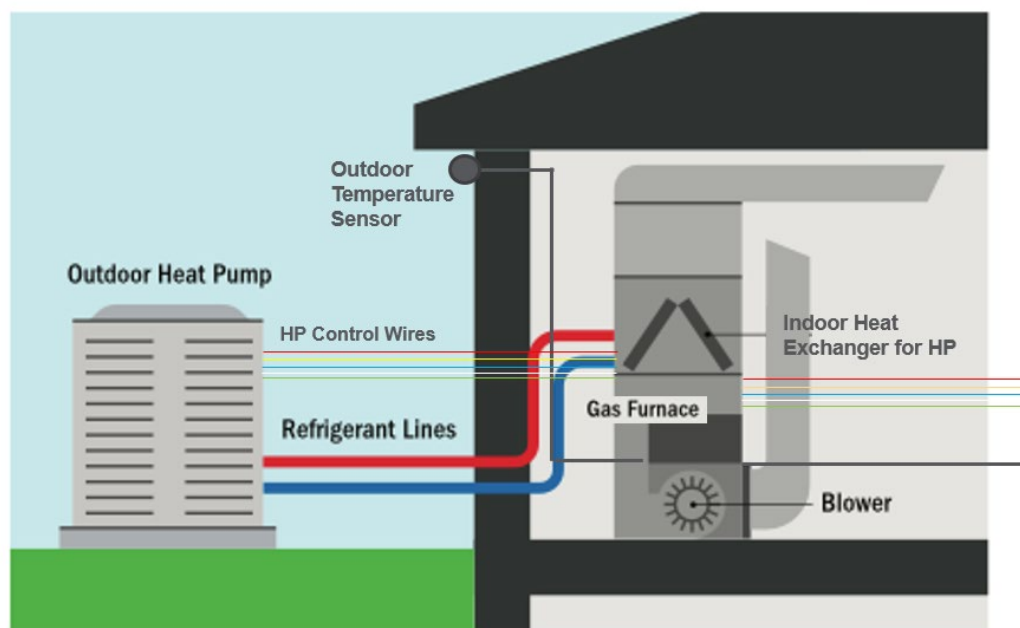
- Modeling Exercise

- Energy

- 3 x Building types with 3 Different ASHP technologies
- Large regional differences in heating load
- Maximizing heat pump

- Economics

- All scenarios yield some bill reductions (although many are very close to zero) - sensitivity to site specific details and modeling assumptions



[Product Council: Displacing CAC with ASHPs](#)





## *Apr 20 Notes & Action Items*

- Notes
  - Action items
    - ✓ CNGC, NWN – let Alisyn know if you want to have a representative on the Federal Funding Coordination Work Group
    - ✓ Peter to share financials once available (late May)
    - ✓ Dual Fuel Work Group - nominate by May 20)
  - Additional edits or questions?



# *Work Groups*



## ***NGAC - Dual fuel work group***

**Purpose:** *Inform and accelerate dual fuel programs and market transformation within the region*

- **Who:** anyone working on dual fuel
- **Frequency:** 3-4x/yr; kicked off July 24, 2023
- **Time:** ~2-5 hrs/quarter

### **Participating Stakeholders**

- Northwest Natural Gas
- Cascade Natural Gas
- Puget Sound Energy
- Energy Trust of Oregon
- Avista





# ***CEAC\* - Dual Fuel Measurement Work Group***



## **Purpose:**

Develop guidelines for NEEA to use when calculating and reporting savings, peak load reductions, and avoided emissions from Dual Fuel Market Transformation programs



## **CEAC-based work group**



**10-15 members**  
(NEEA funders, commission staff, and other technical experts)



**3-5 meetings from Q3 2023 to Q1 2024**



**Email Ryan Brown**  
([rbrown@neea.org](mailto:rbrown@neea.org)) with your organization's representative or with questions



# ***Business Planning for 2025-2029***

Date	Business Plan Milestone
March	Draft Business Plan Outline Review
May	First Draft Strategic + Business Plan Review
June	Second Strategic + Business Plan Review
July/August	<b>Regional Outreach:</b> <ul style="list-style-type: none"><li>• Draft Plans now available at <a href="https://neea.org/plans">neea.org/plans</a></li><li>• Regional webinars July 13 and Aug 1</li><li>• Targeted presentations/ outreach to NWECA, NWPCC, PNUCC, state energy offices, commissions</li><li>• Public Comment period runs through <b>August 4</b></li></ul>
September	Summary of regional outreach, implications for plan, any final edits
November	Final Draft Strategic + Business Plan Review
December	Final Strategic + Business Plan approval



# 2024 Operations Plan Timeline



**Oct. 12:** Full draft plan sent to Board, RPAC & NGAC

**Oct. 12 – Nov 1:** Feedback period for Board and committee members

**December 5:** Board vote on final 2024 Operations Plan







# Upcoming Meetings

Date	Event
Sept 7	Interim NGAC webinar* (1-2pm, if needed)
TBD	Dual Fuel Measurement Work Group Kick Off
Oct 19	Q4 NGAC Meeting* (virtual)
Oct 26	2024 Draft Operations Plan Webinar
TBD	Q4 Duel Fuel Product Work Group Mtg

**\*Key Q4 Topic:** Potential Commercial Gas Heat Pump Water Heating vote (Sept 7 webinar tee-up?)





# 2024 meeting planning/scheduling



## *Ideas? Reactions?*

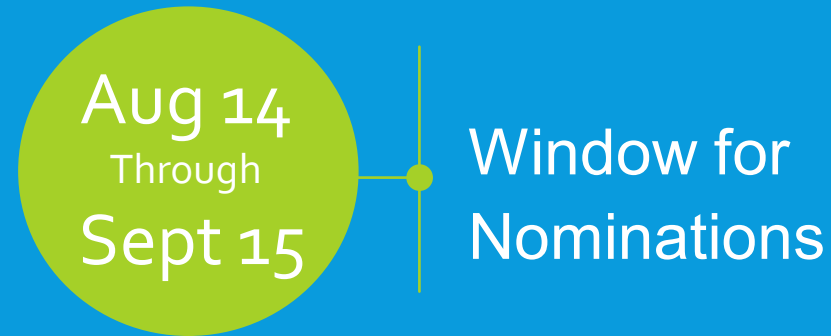
- Keep quarterly?
- What about 3x year, with the summer time free?
  - E.g. Jan / Apr / Oct + bimonthly webinar options
- When would you like to meet in-person (hybrid) / frequency?
- How do you feel about Seattle as the in-person option?





NEEA will recognize individuals and teams for their exemplary dedication and performance in energy efficiency during lunch on the first day of the NEEA Annual Board Meeting on December 4. We are asking for nominations in the following categories:

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



To nominate go to:  
**[neea.org/leadershipawards](http://neea.org/leadershipawards)**





*Other regional /  
industry events or  
announcements?*





***Break!***



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## ➤ PORTFOLIO UPDATE

- *Financials Review*
- *Progress Report Highlights (Q2'23 recap)*







***Break!***



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# ***Washington Residential Code Evaluation Findings***

**Meghan Bean – NEEA**

**Lucy Albin – TRC**

*July 26, 2023*





# *Agenda*

- Background
- Methods
- Key Findings
  - Compliance
  - Gas use in homes
  - Builder compliance pathways
- Data Collection Lessons Learned
  - Methodology key takeaways
  - Data collection challenges





# *Background*



## ***Washington Residential Code***

- WSEC 2018 went into effect in February 2021
- Major shift from WSEC 2015
  - Fuel normalization table
  - Higher energy credit requirements for homes of all sizes
  - More credit options
  - Some “low hanging fruit” credits removed



## *Research Questions*

- What proportion of homes built under WSEC 2018 comply with the code?
- How is gas being used in homes built under WSEC 2018?
  - Primary space and water heating fuel
  - Gas hookups
  - Uses (cooktops, hearths, etc.)
- What pathways are builders taking to comply with WSEC 2018?
- How well do permits represent what is actually being built?



# *Methods*





## *Sampling Approach*

- Completed new construction homes built under WSEC 2018
- Jurisdictions: stratified sampling
  - High, medium & low construction volume jurisdictions
  - Climate zones 4C & 5B
- Homes
  - High construction volume: random sampling
  - Medium & low construction volume: attempted census



## Final Sample

Jurisdiction Type	Count of Jurisdictions in Final Sample	Count of Audits in Final Sample
High construction volume <i>470+ new home permits per year</i>	7	28
Moderate construction volume <i>220-469 new home permits per year</i>	7	18
Low construction volume <i>220- new home permits per year</i>	7	10
Climate Zone 4C	11	32
Climate Zone 5B	10	24
<b>Total</b>	<b>21</b>	<b>56</b>



## ***Data Sources***

- Virtual home audits → built conditions
- Permits → hidden measures
- Compliance certificate test results → hidden measures (when available)



## *Virtual Home Audits*

- Recruited homeowners via postcard and letter and offered a \$100 incentive to participate in a “virtual home visit”
- TRC auditors met with homeowners via video communication platform
- Resident showed auditor various elements of home
  - Equipment nameplates
  - Model numbers
  - Built conditions
  - Compliance documentation (when available)





## *Permit Data*

- Requested approved building permits & plan sets for audited homes that included 2018 WSEC energy credits
  - Table R406.2 (Fuel Normalization)
  - Table 406.3 (Energy Credits)





# ***Data Sources for Determining Code Compliance***

Credit Category	Data Source for Code Compliance
Fuel Normalization	Audit
Efficient Building Envelop Options	Permit
Air Leakage Control & Efficient Ventilation	Audit, permit, or combination
High Efficiency HVAC	Audit ←
HVAC Distribution System	Permit + compliance documents when available
Drain Water Heat Recovery	Permit
Efficient Water Heating	Audit ←
Renewable Electric Energy Options	Audit + permit
Appliance Package Options	Audit
Home Size	Audit, permit, and online sources



# *Key Findings*

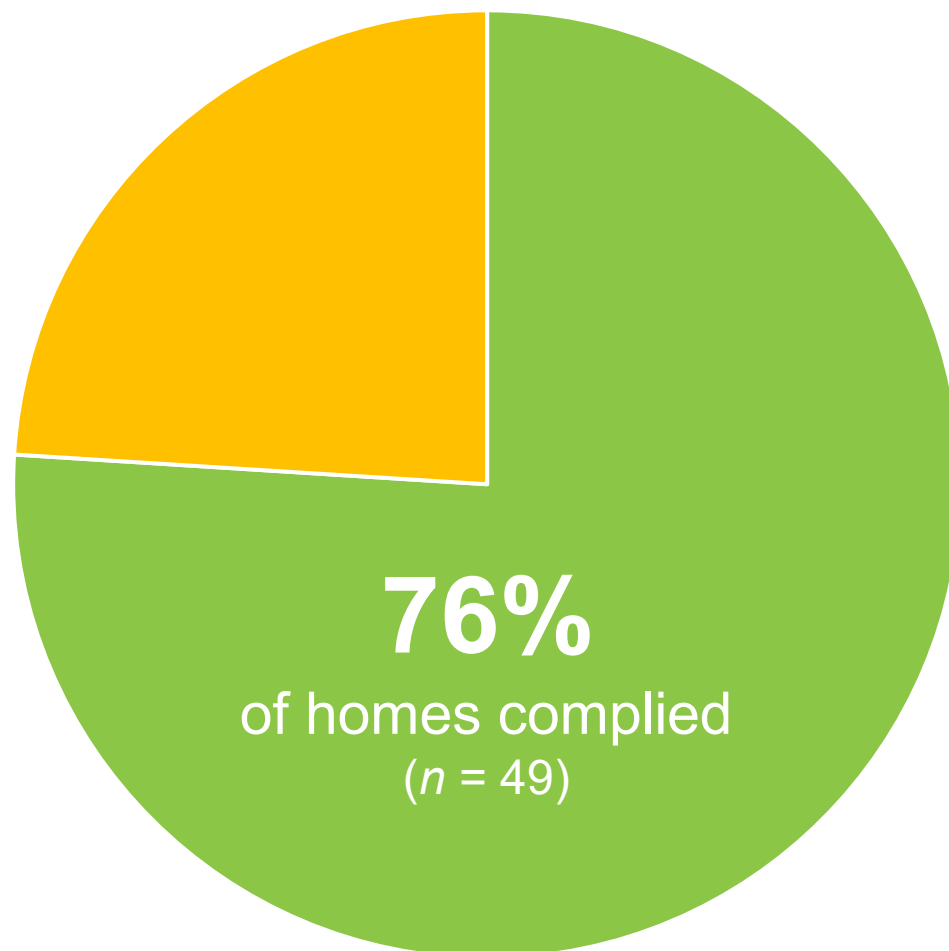
## *Calculating Compliance*

TRC calculated the proportion of homes that complied with 2018 WSEC **energy credit requirements** and assumed 100% compliance with prescriptive minimum requirements







## *Statewide Compliance Results*





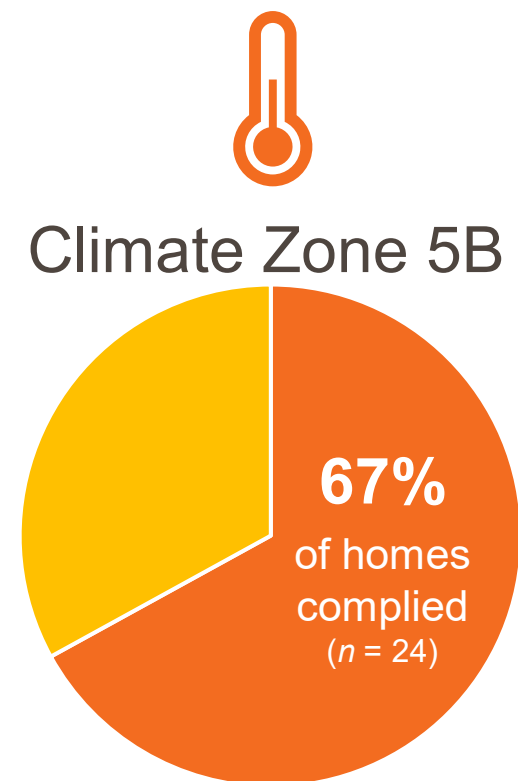
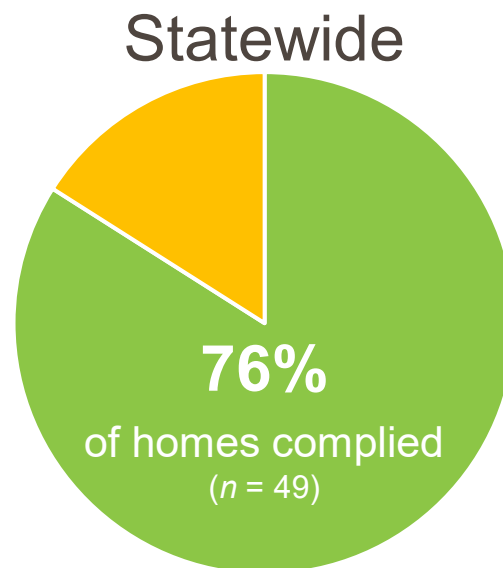
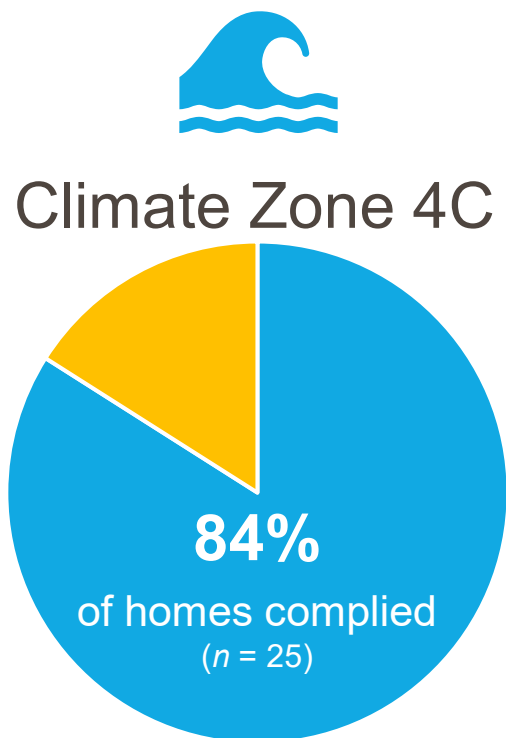
## ***Washington Climate Zones***

- 4C – More moderate, marine climate 
- 5B – Drier, more extreme temperatures 



# Compliance by Climate Zone

*Difference is not statistically significant*



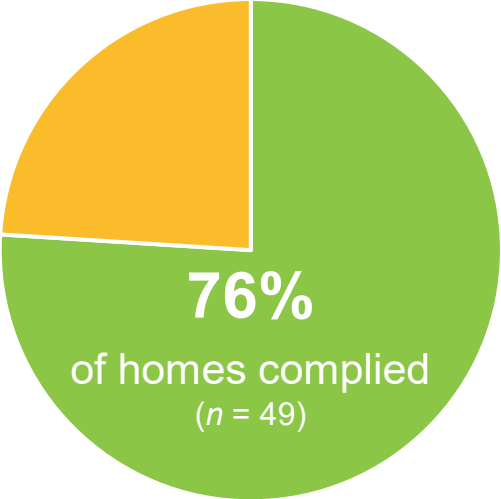




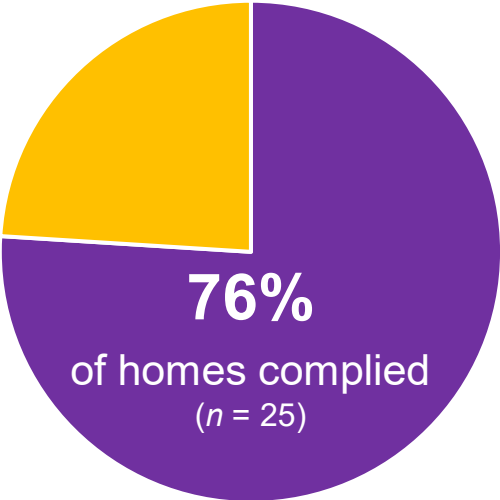
# Compliance by Construction Volume

*Differences are not statistically significant*

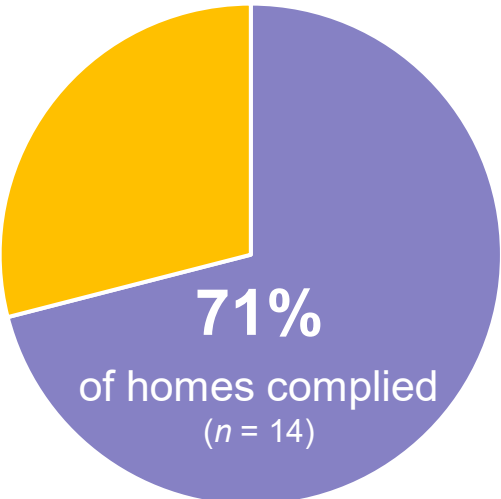
Statewide



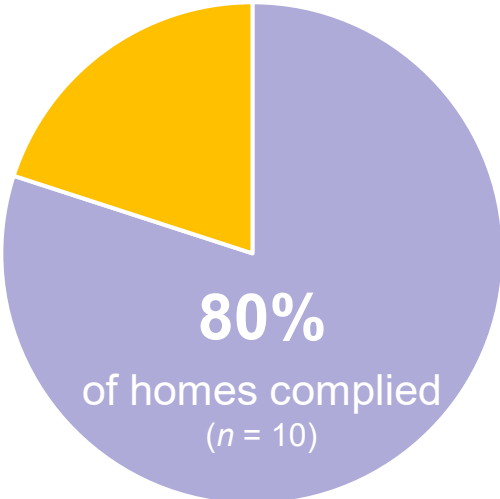
High Construction Volume



Medium Construction Volume



Low Construction Volume





# Primary Space & Water Heating Fuel

WSEC 2018 market research and evaluation studies used different samples

■ Electric ■ Gas ■ Non-Declared

## Space Heating

WSEC 2015 Evaluation  
*On-site inspections (n = 178)*

20%

80%

WSEC 2018 Market Research  
*Permits (n = 178)*

88%

12%

Values corrected after  
Q2 presentation

WSEC 2018 Evaluation  
*Virtual home audits (n = 56)*

79%

21%

## Water Heating

WSEC 2015 Evaluation  
*On-site inspections (n = 114)*

37%

63%

WSEC 2018 Market Research  
*Permits (n = 178)*

83%

12%

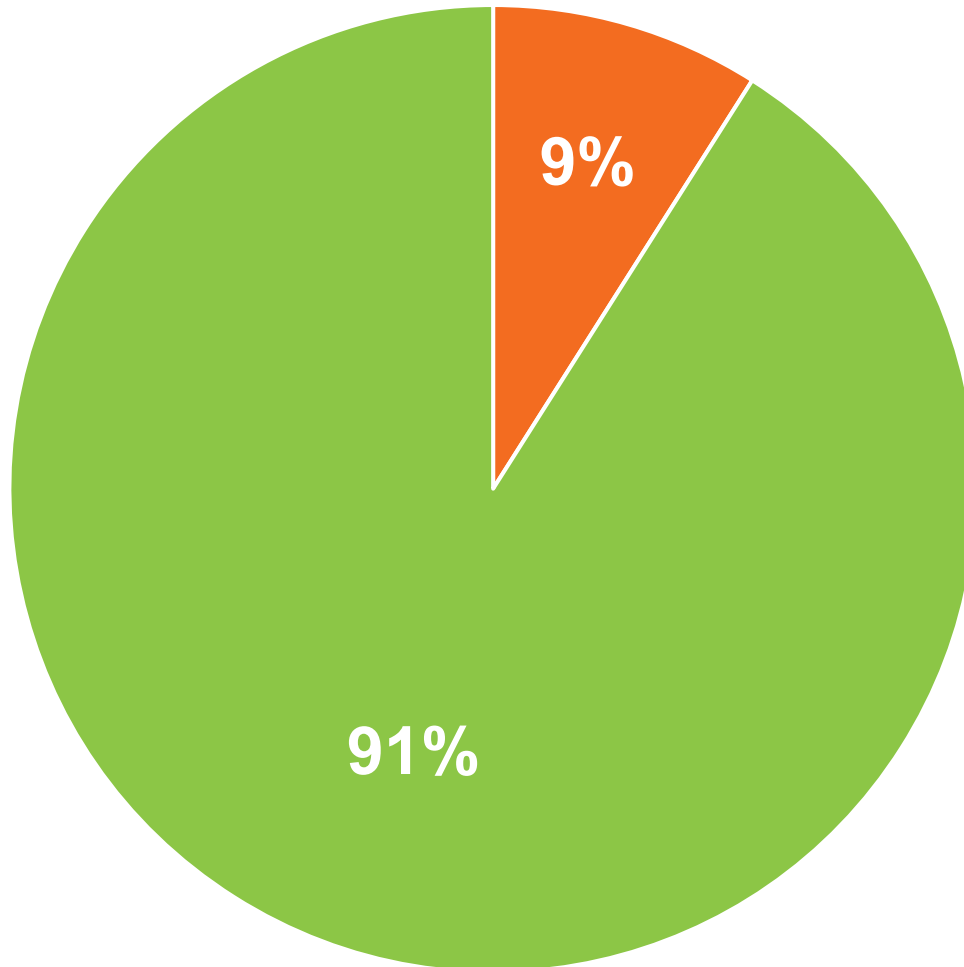
WSEC 2018 Evaluation  
*Virtual homes audits (n = 56)*

89%

11%



## *Dual Fuel Homes*



Of 44 homes with electric primary space heating, **4 had a backup gas furnace**



# Primary Space & Water Heating Fuel by Climate Zone

■ Electric

■ Gas

## Space Heating



Statewide  
*n*=56

Climate Zone 4C  
*n*=32

Climate Zone 5B  
*n*=24

79%

21%

78%

22%

79%

21%

## Water Heating



Statewide  
*n*=56

Climate Zone 4C  
*n*=32

Climate Zone 5B  
*n*=24

89%

11%

94%

6%

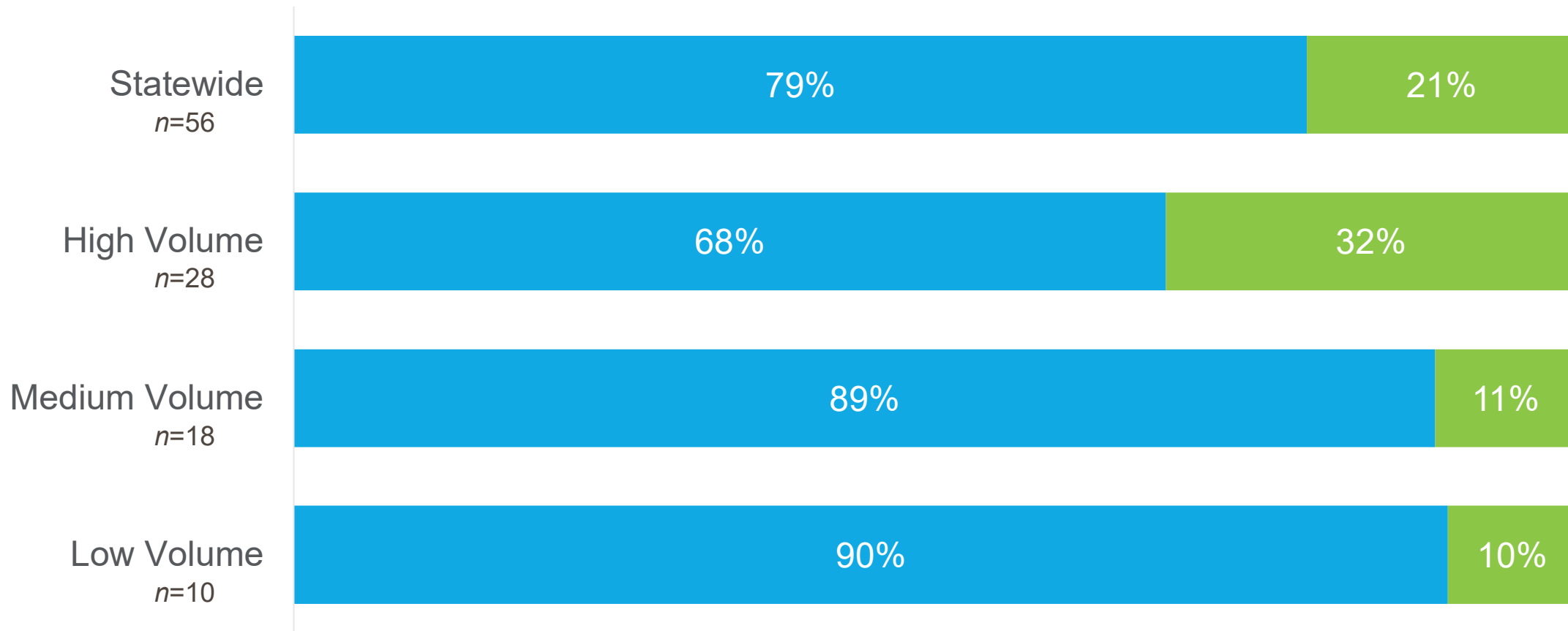
83%

17%



## Primary Space Heating Fuel by Construction Volume

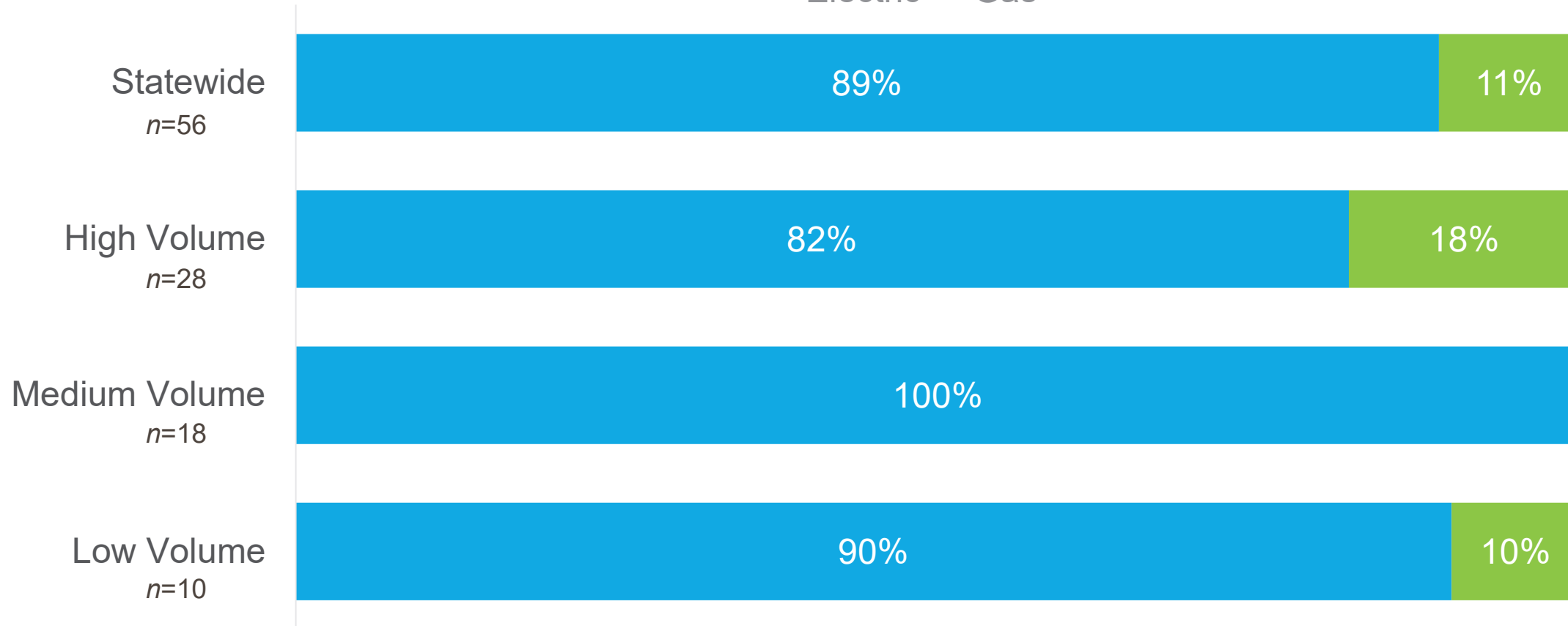
■ Electric ■ Gas





## *Primary Water Heating Fuel by Construction Volume*

■ Electric ■ Gas







## *Gas Hookups*

While results show a transition toward electric primary space and water heating, **73% of homes had a gas hookup**. Of homes with a gas hookup, 95% had a natural gas range and 63% had a fireplace or hearth.





## *Common Compliance Pathways*

- The increase in the number of options and the required number of credits has diversified the approaches that builders use to comply with the energy code
- Among the six most common pathways, one used gas space heating



# *Data Collection Lessons Learned*



## *Methodology Key Takeaways*

- Virtual audits + permits enabled quicker, less expensive data collection with less face-to-face contact than on-site audits
- Homeowners were typically able to identify most of the equipment of interest to the study
- Permits generally represented installed appliances and equipment, but they were less representative of air leakage performance documented in available compliance certificates



## ***Data Collection Challenges***

- Construction Monitor indicated that some homes were permitted under the 2018 WSEC, but permit information showed the homes were permitted under 2015 WSEC
- Homeowners frequently “no showed”
- Some jurisdictions destroyed permits after 90 days

A faint, light blue geometric logo is centered in the background. It consists of several overlapping chevron-like shapes that form a larger, abstract diamond or square pattern.

*Questions?*



# ➤ Meghan Bean

Senior Market Research & Evaluation Scientist, NEEA

MBean@neea.org





# *Reference*



## ***NEEA Code Evaluations***

- Conducted at least one per business cycle for each state
- Measure compliance with the most recent code
- Answer other key questions, including but not limited to:
  - Testing assumptions that inform savings tracking
  - Gathering information about market response to the code
  - Comparing results across jurisdiction types of interest

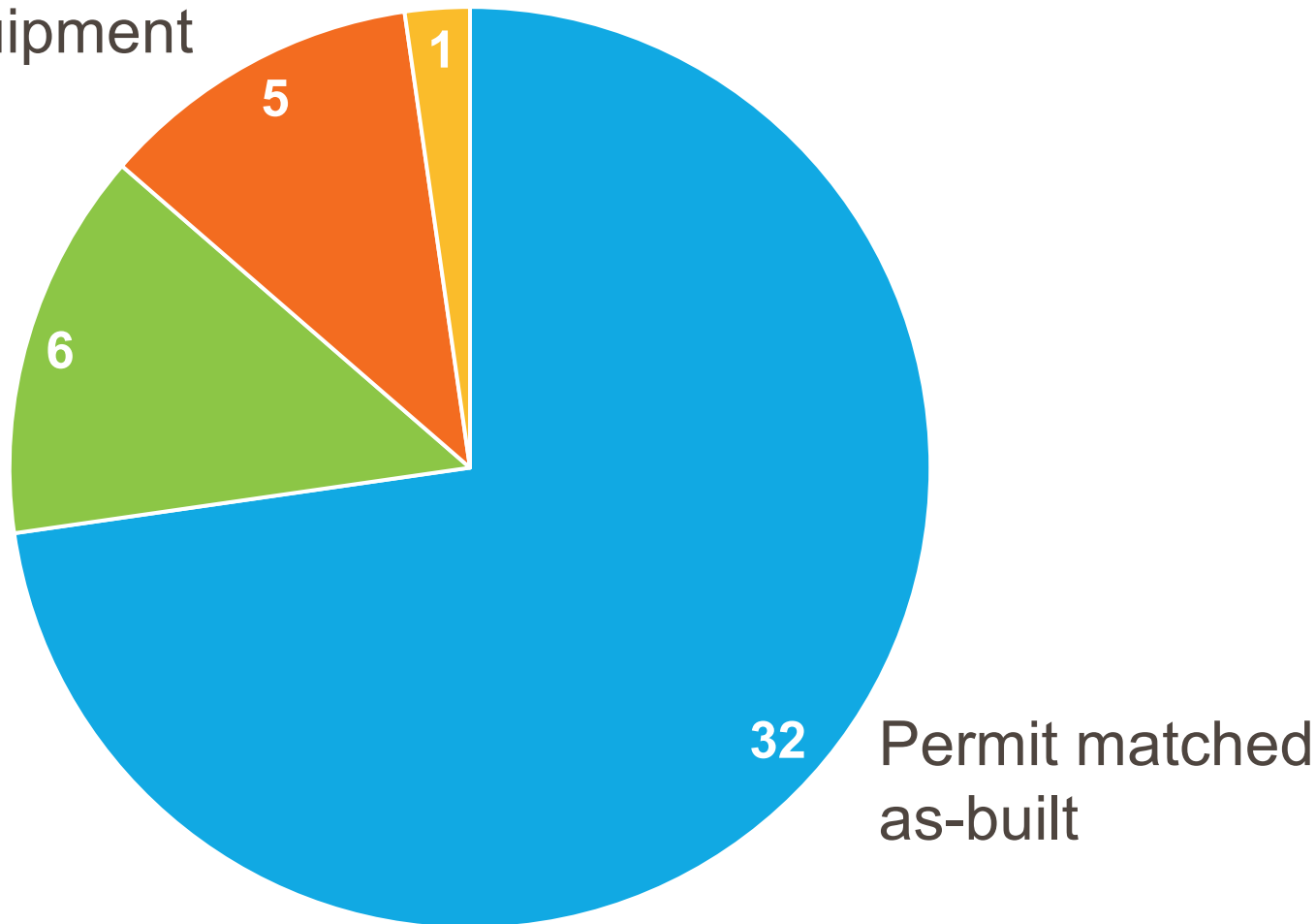


## ***Permits vs. As-Built Conditions – HVAC Systems***

Claimed and installed same fuel but  
installed lower credit equipment

Claimed electric, installed gas

Claimed gas,  
installed electric





## ***RESNET Data Limitations***

- Many of the homes were in same subdivisions with the same builders, and many used the same building practices
- Among the 21 homes analyzed, permits were less representative of installed HVAC equipment compared with audit data
- All 21 homes had gas primary space heating



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Please consider this information for your awareness and not for general public circulation or to be published on web sites.

**\*\*The meeting recording will be paused for this topic\*\***



# Thermally Driven Heat Pumps

**Noe Contreras**

*Senior Product Manager*

*June 2023*

CLASSIFICATION LEVEL: **RESTRICTED**



This content was removed for public consumption.  
We apologize for the inconvenience.  
Please contact Noe Contreras with questions.  
Thank you!



*Questions?*

# » Thank you!

Noe Contreras, Sr. Product Manager - Natural Gas  
NContreras@neea.org





***Break!***



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# » Gas Portfolio Outlook

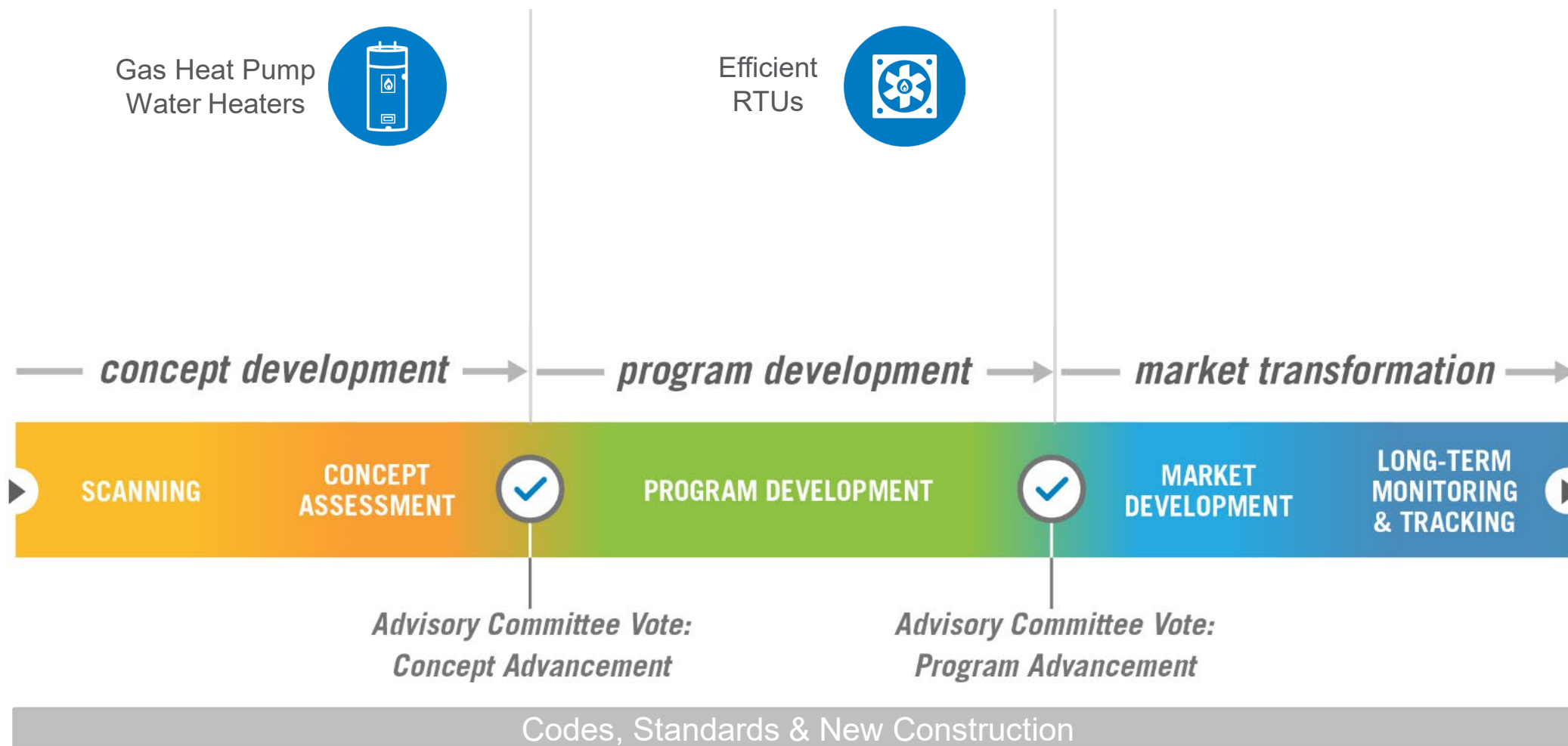
Peter Christeleit

Manager, Natural Gas Portfolio & Strategy



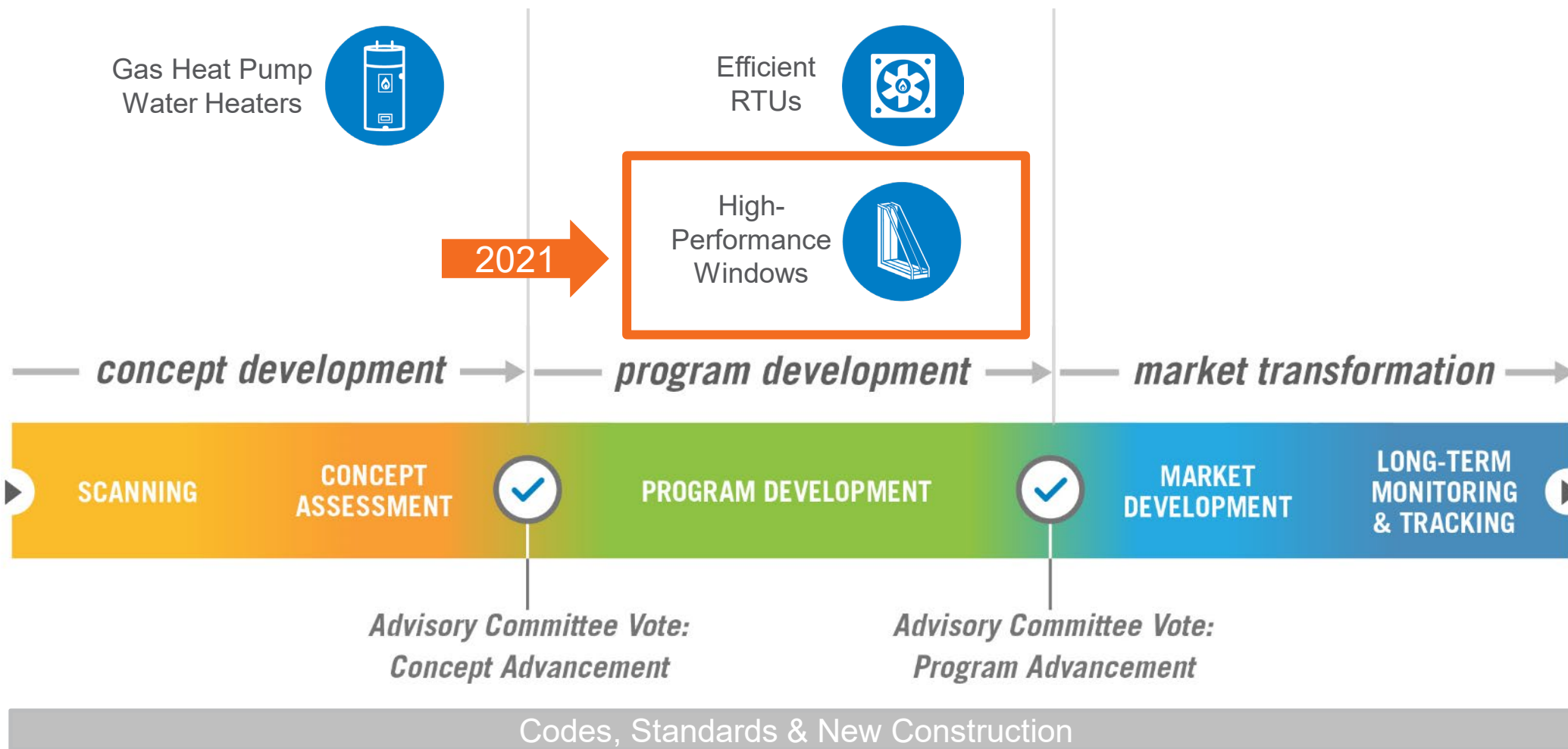


# *Initial Cycle 6 Portfolio*



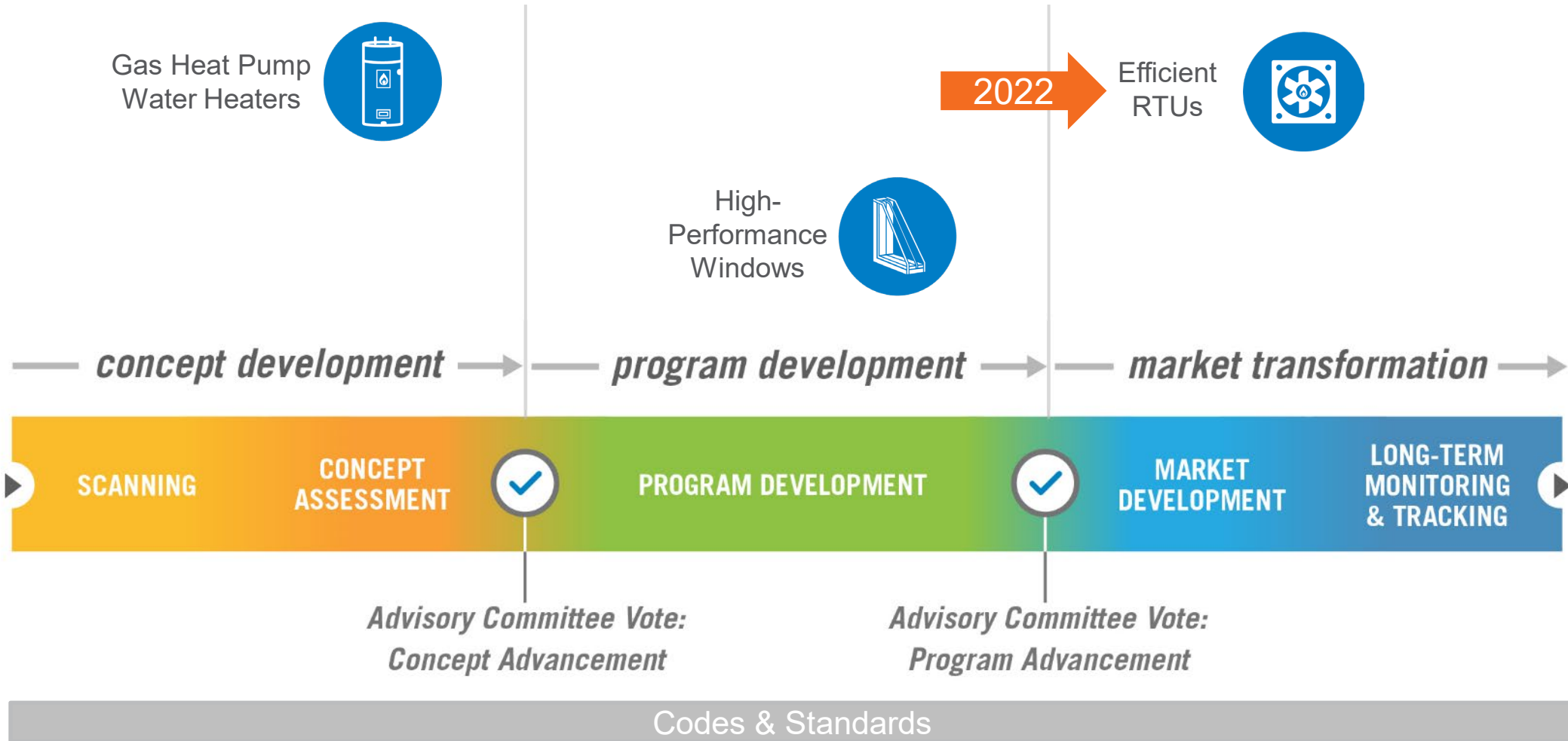


# 2021 Portfolio



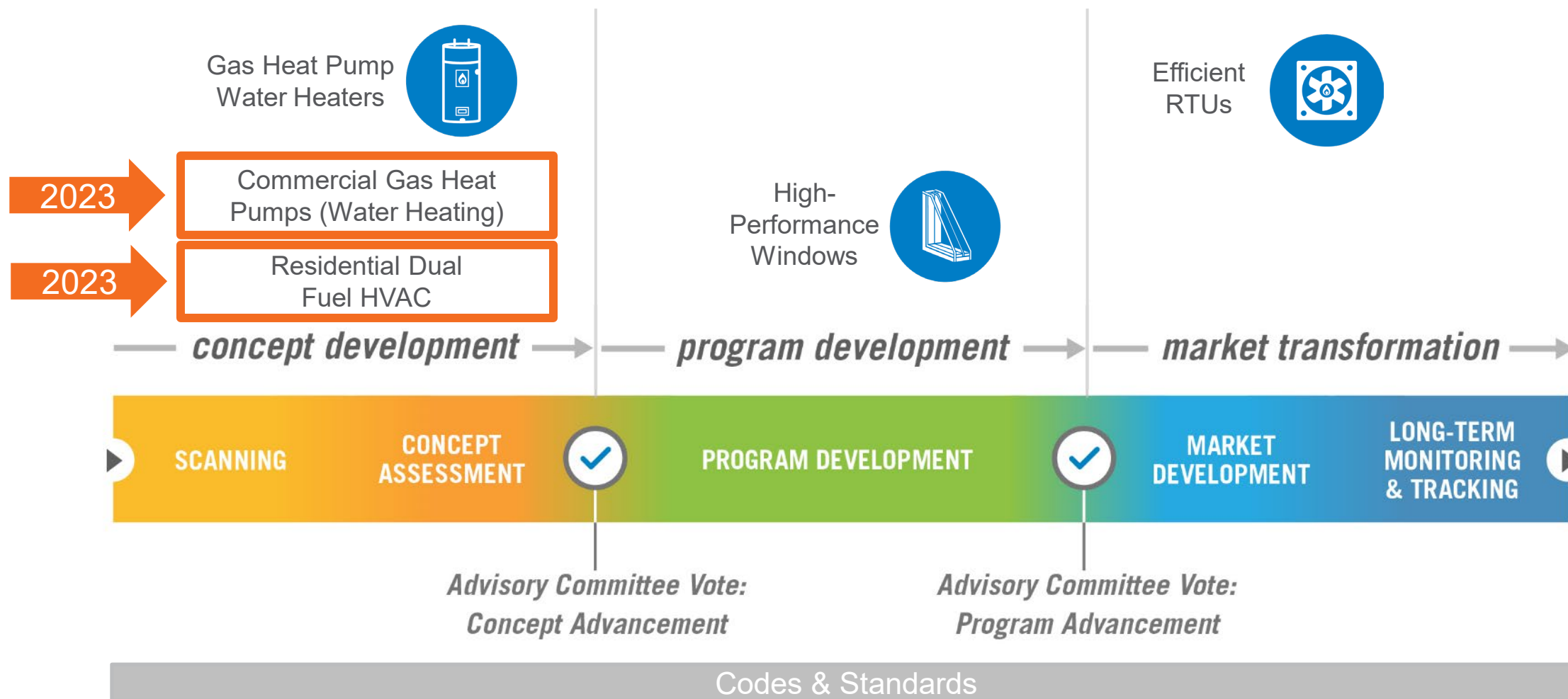


# 2022 Portfolio



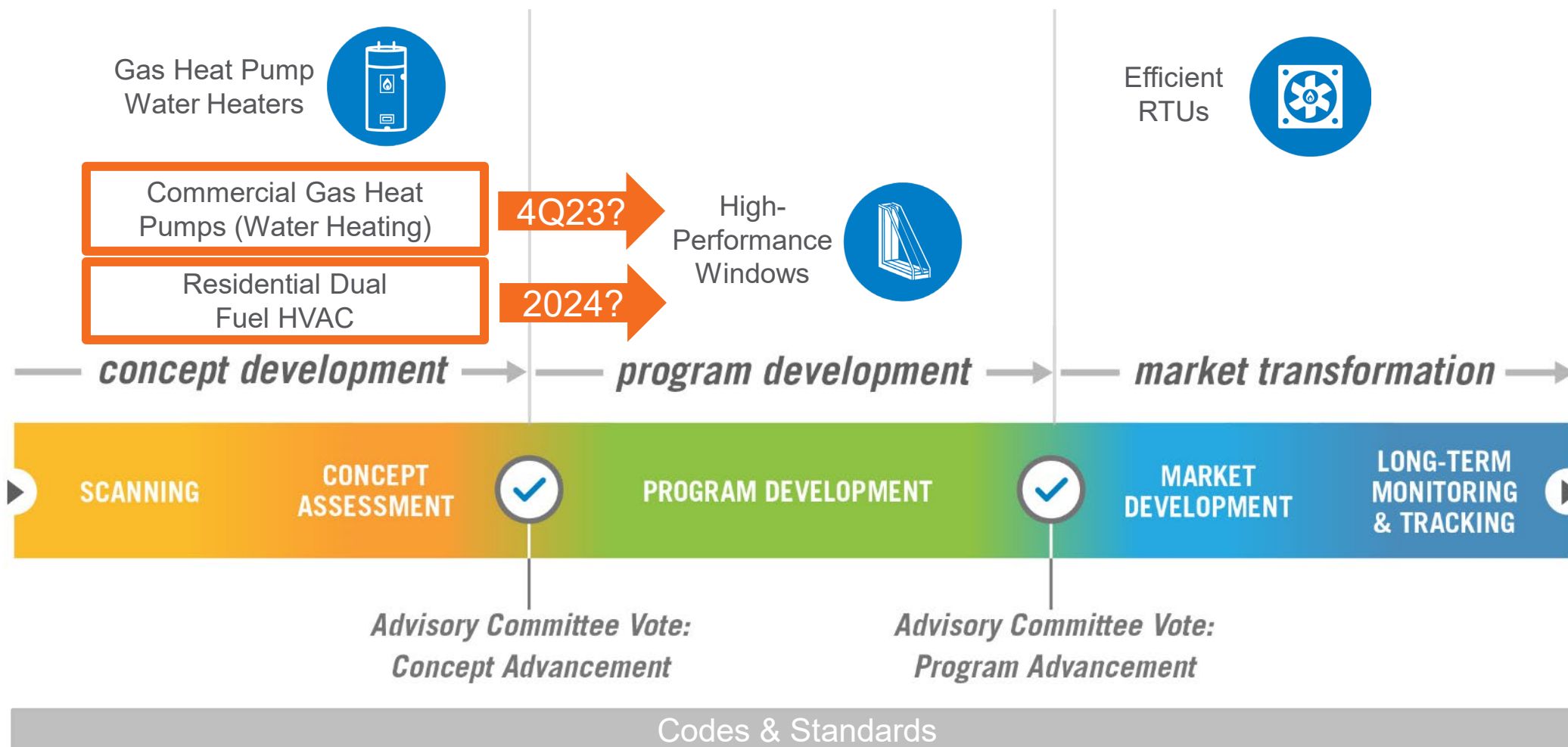


# Today's Portfolio





# Potential Cycle 6 NGAC Votes





# Looking Ahead: 1-2 Year Activities & Options

	Gas Heat Pumps	Dual Fuel/Fuel Neutral	Gas Products
Scanning	<ul style="list-style-type: none"><li>✓ <b>Eff. Gas Water Heating</b></li><li>☐ <b>New Gas Heat Pumps (GHPs):</b><ul style="list-style-type: none"><li>- Vicot      - Yanmar</li><li>- SMTI      - Aisin</li><li>- EU OEM - Broad USA</li></ul></li></ul>	<ul style="list-style-type: none"><li>✓ <b>Dual Fuel research via GTI emerging technology research</b></li></ul>	<ul style="list-style-type: none"><li>✓ <b>GTI ETP</b></li><li>☐ <b>Commercial Dryers</b></li><li>☐ <b>HE Condensing Furnace</b></li></ul>
Concept Assessment	<ul style="list-style-type: none"><li>✓ <b>Comm. GHP Water Heating</b></li><li>☐ <b>Res. HVAC GHP 2024? [vote]</b></li></ul>	<ul style="list-style-type: none"><li>✓ <b>Res. Dual Fuel HVAC</b></li></ul>	
Program Development	<ul style="list-style-type: none"><li>☐ <b>Comm. GHP Water Heating 4Q23? [vote]</b></li></ul>	<ul style="list-style-type: none"><li>✓ <b>HP Windows</b></li><li>☐ <b>Res. Dual Fuel HVAC 2024? [vote]</b></li></ul>	
Market Development		<ul style="list-style-type: none"><li>☐ <b>VHE DOAS Program change 2024?</b></li></ul>	<ul style="list-style-type: none"><li>✓ <b>Efficient RTUs</b></li></ul>

**Pre-Existing Portfolio Activities**  
**Potential Portfolio Options**



## » *Ask: Shall we...*

- Potentially use Sept 7 webinar for commercial gas heat pumps for water heating?
- ... in preparation for a Q1 2024 (or Q4 2023) Concept Advancement vote?

*Thoughts?*





# » Thank you!

Peter Christeleit

PChristeleit@neea.org



## *Recap: Action Items*





*Public Comment?*  
*Closing Remarks?*



# » Until we meet again...

*Upcoming Meetings (all times Pacific):*

- *Dual Fuel Measurement Work Group (kick off TBD)*
- *Interim Webinar: Thursday, Sept 7; 1-2pm (if needed)*
- *Dual Fuel Product Work Group (Q4 mtg TBD)*
- *Q4: Thursday, Oct 19, 2023 (virtual)*
- *2024 Gas + Electric Operations Planning Webinar: Thursday, Oct 26 (1230-430)*

