Cost-effectiveness & Evaluation Advisory Committee (CEAC)

Northwest Energy Efficiency Alliance

April 30, 2025

CLASSIFICATION LEVEL: PUBLIC

Agenda: Day 1

TIME	TOPIC
9:00AM	Welcome/Agenda Review
9:20	MRE Update
9:35	Market Transformation Framework
10:15	BREAK
10:25	Market Transformation Value
11:10	Market Transformation Costs and Benefits
11:55	Wrap up

Agenda: Day 2

TIME	TOPIC
8:30AM	Welcome/Agenda Review
8:40	State Energy Code Baseline and Key Assumption Review
9:25	Key Inputs and Assumption Updates
10:15	BREAK
10:25	2024 Market Progress and Portfolio Overview: Part 1 – Portfolio Overview
11:15	BREAK
11:20	2024 Market Progress and Portfolio Overview: Part 2 – Market Stories
12:15PM	Wrap up

Introductions & Ice Breaker

- Name
- Organization
- Question(s) for today or tomorrow?
- Favorite fun fact or trivia answer

Website Redesign Announcement

- **New Website Launch**:
  May 2025
- **Key Features**:
  - Continued access to committee materials, documents, and meeting information
  - Simplified navigation for easier access to resources and reports

Why are we here again?

CEAC Charter

Responsibilities

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

Market Research and Evaluation (MRE) Update

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2025 Q1

Market Research & Evaluation Quarterly Newsletter

WHAT'S NEW:

Greetings to all of you!

Welcome to spring and the Market Research and Evaluation (MRE) team's first newsletter of 2025! Here in the Northwest, the days aren't necessarily sunnier, but they are definitely longer.

The MRE team is busy wrapping up several large and long-running studies, including three building code compliance studies (for the states of Idaho, Montana and Oregon) and the first Market Progress Evaluation Reports (MPERs) for two of NEEA's Commercial HVAC programs. The latter launched nearly two years ago, so the team is looking forward to the conclusion of these inaugural studies.

Four other MPERs are also kicking off that will provide evaluation findings and actionable market insights to the programs they support, including: Retail Product Portfolio, Luminaire Level Lighting Controls, Heat Pump Water Heaters, and Commercial and Residential Codes. Read on to learn more and, as always, please reach out with any questions or suggestions.

~ **Amy Webb, Sr. Manager**, Market Research & Evaluation ~

TABLE OF CONTENTS

At a Glance

MARKET RESEARCH & EVALUATION PROJECTS

		PLANNING*	FIELDING*	REPORTING*
Regional Studies	Northwest Market Characterization			✓
Integrated Systems	Efficient Rooftop Units: *Market Progress Evaluation Report #1*			✓
	High-Performance HVAC: *Natural Gas High-Efficiency DOAS Market Research*		✓	
	High-Performance HVAC: *Market Progress Evaluation Report #1*			✓
	Efficient Fans: *Fan Manufacturer Representative and Specifier Market Research*		✓	
	Extended Motor Products: *Agricultural Pumps Market Research*		✓	
	Extended Motor Products: *Market Progress Evaluation Report #2*	✓		
	Motor-Driven Systems: *Industrial Market Research*	✓		
	Luminaire Level Lighting Controls: *Exterior Luminaire Level Lighting Controls in Parking Lots*			✓
	Luminaire Level Lighting Controls: *Market Progress Evaluation Report #3*		✓	
	High-Performance Windows: *ENERGY STAR Windows, Doors, and Skylights Version 7.0 Evaluation*			✓
	Whole Building Special Project: *Commercial Whole Buildings Implementation and Market Research*	✓		
Products	Heat Pump Water Heater: *Market Progress Evaluation Report #8*		✓	
	Retail Product Portfolio: *Televisions Voluntary Agreement Evaluation and Model Review*		✓	
	Retail Product Portfolio: *Market Progress Evaluation Report #3*		✓	
	Retail Product Portfolio: *Connected Consumer Products Market Research*			✓

At a Glance

MARKET RESEARCH & EVALUATION PROJECTS

Codes, Standards, New Construction

	PLANNING*	FIELDING*	REPORTING*
Standards: *Battery Chargers Standard Evaluation* **Notice of Withdrawal Issued by DOE**			
Standards: *Portable AC and Air Compressor Standards Evaluations*		✓	
Codes: *NEEA Codes Baseline and Assumption Review*			✓
Codes: *Market Progress Evaluation Report #6*		✓	
Residential Codes: *Home Energy Raters Market Research*			✓
Residential Codes: *Montana Residential Code Compliance Evaluation*			✓
Residential Codes: *Oregon Residential Code Compliance Evaluation*			✓
Commercial Codes: *Idaho Commercial New Construction Code Compliance Evaluation*		✓	
Commercial Codes: *Montana Commercial New Construction Code Compliance Evaluation*			✓

Market Diffusion

Ductless Heat Pump Market Diffusion Evaluation, Year 3			✓

DUAL-FUEL (Electric & Natural Gas) PROJECTS:

NATURAL GAS PROJECTS:

***PLANNING:** MRE projects from inception through proposal selection

***FIELDING:** MRE projects from kick-off through the completion of field work

***REPORTING:** MRE projects in the analysis/synthesis stage through report posting

Market Transformation Framework

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Question to answer today

- **What** is market transformation?
- **Why** do market transformation?
- **Where** does market transformation take place?
- **How** is market transformation achieved in the Northwest?

***What** is Market Transformation?*

*The **strategic process** of*

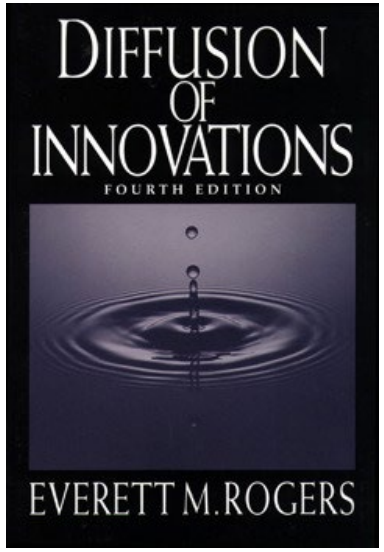
***intervening in a market** to*

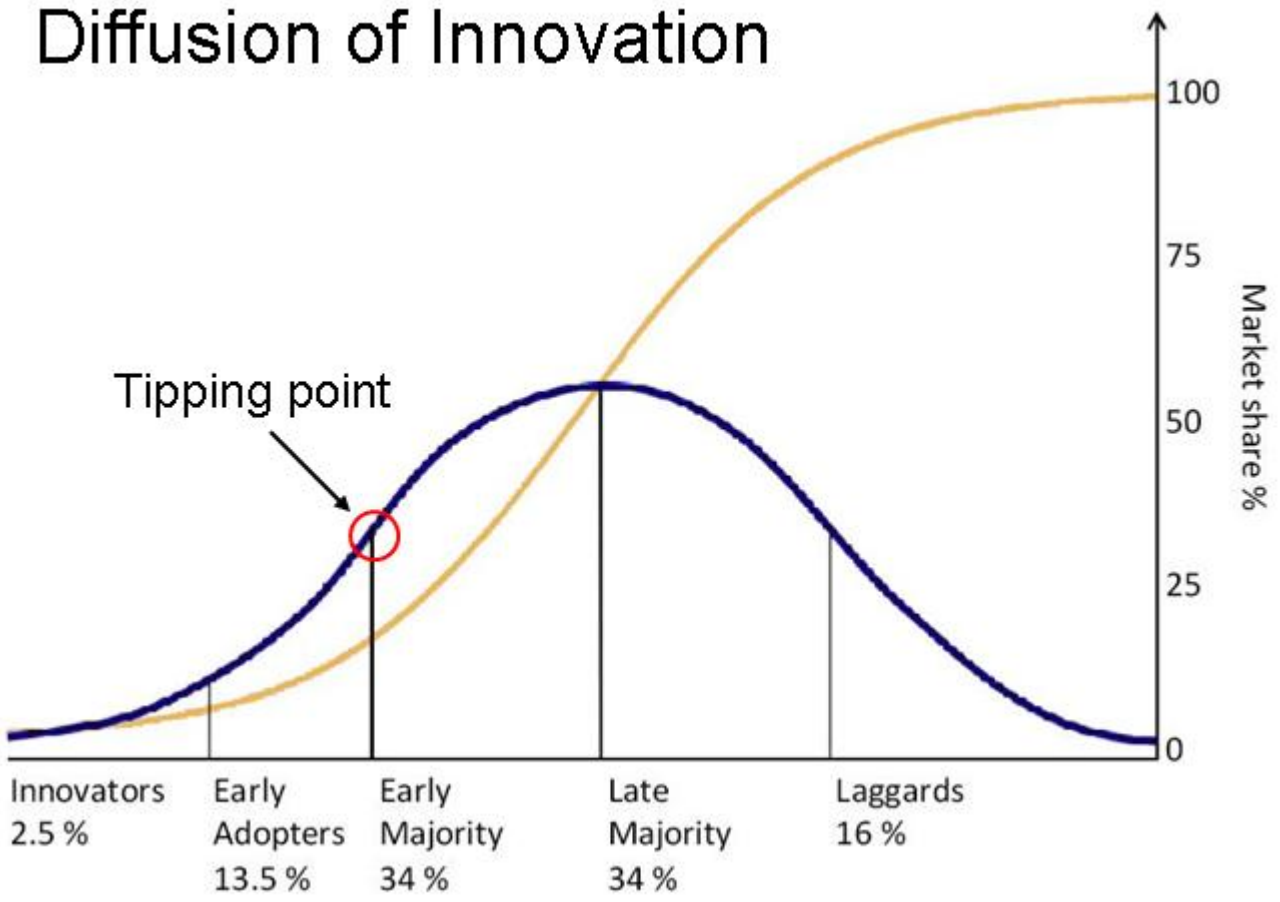
*create **lasting change***

***What** is Market Transformation… to NEEA?*

*The strategic process of intervening in a market to create lasting change in market behavior **by removing identified barriers and/or exploiting opportunities to accelerate the adoption of all cost-effective energy efficiency as a matter of standard practice**.*

Market Transformation and Diffusion of Innovation





Why do market transformation?

NEEA Purpose

NEEA is an alliance of utilities that **pool resources** and **share risks** to **transform the market for energy efficiency** to the benefit of consumers in the Northwest.

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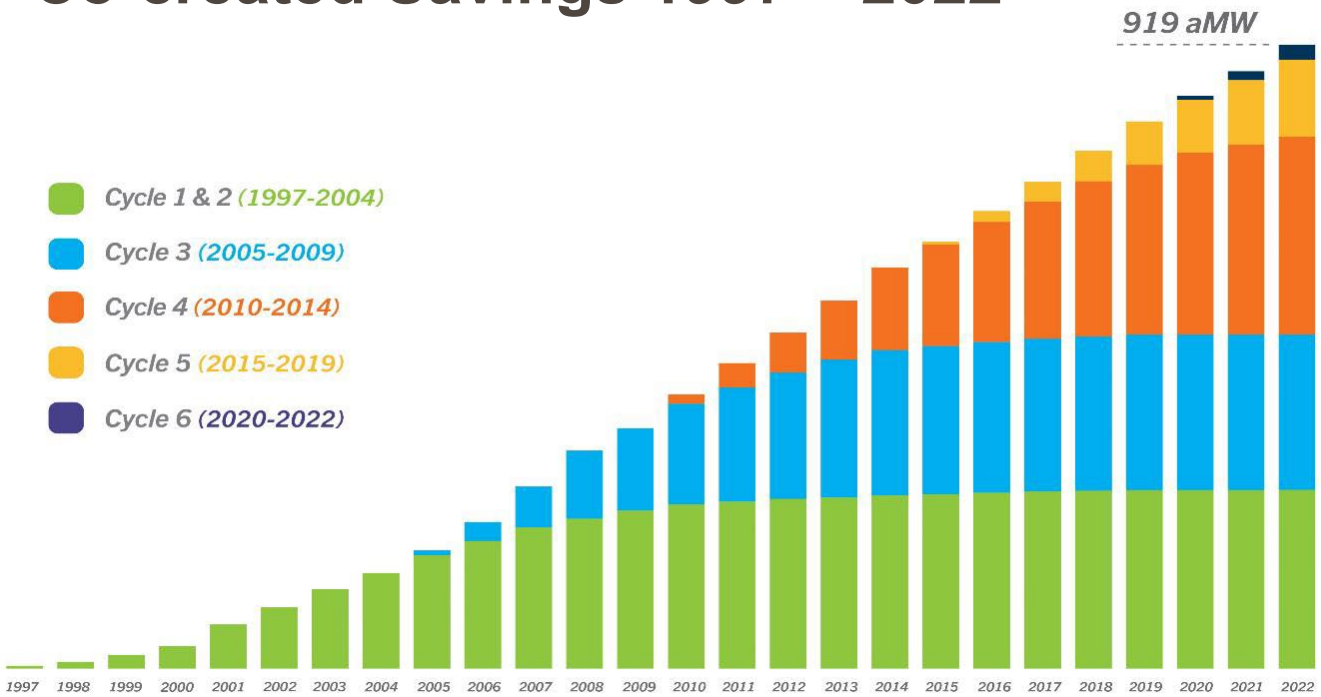
Why do market transformation?

NEEA Purpose

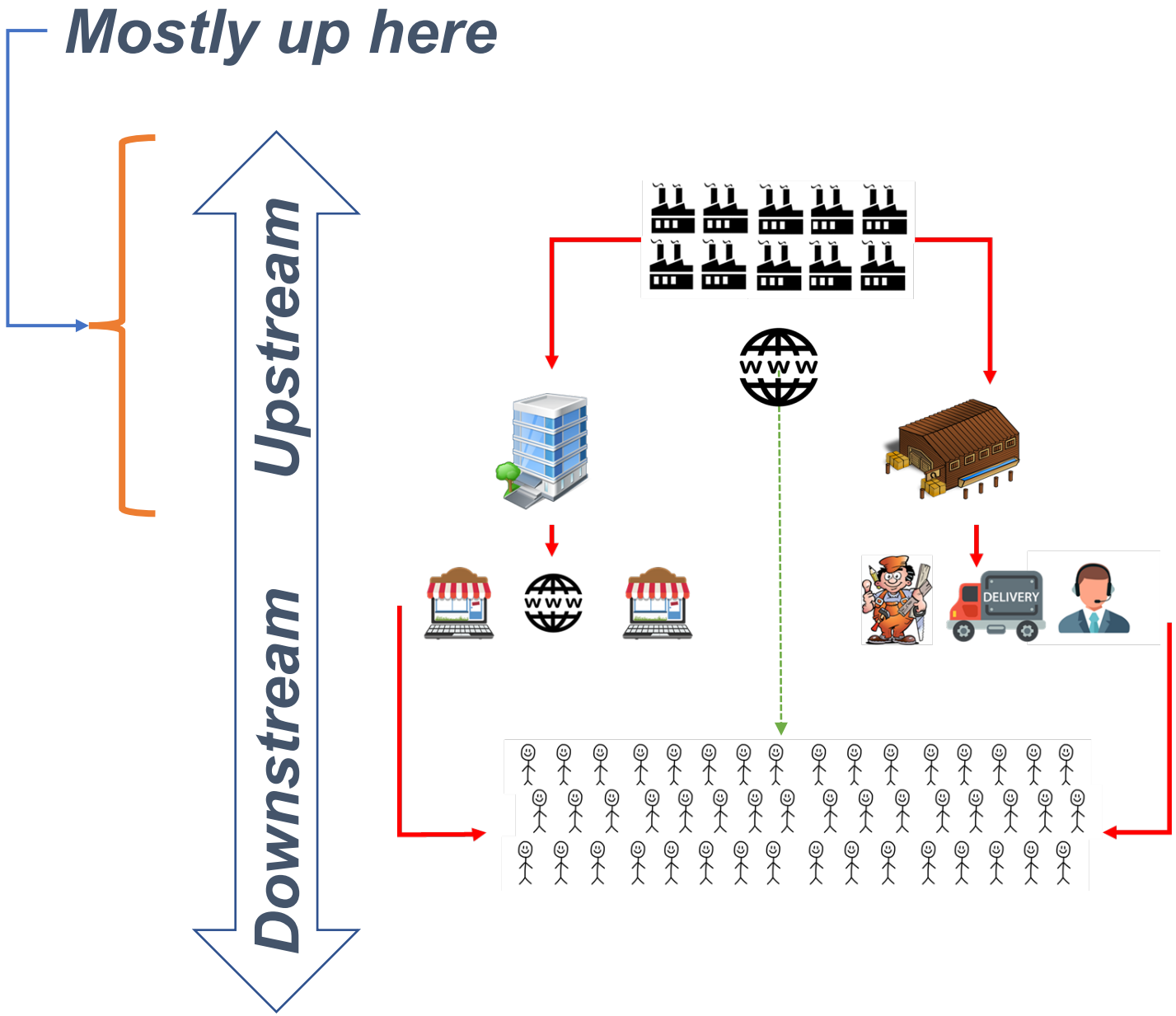
NEEA is an alliance of utilities that **pool resources** and **share risks** to **transform the market for energy efficiency** to the benefit of consumers in the Northwest.

And also because…

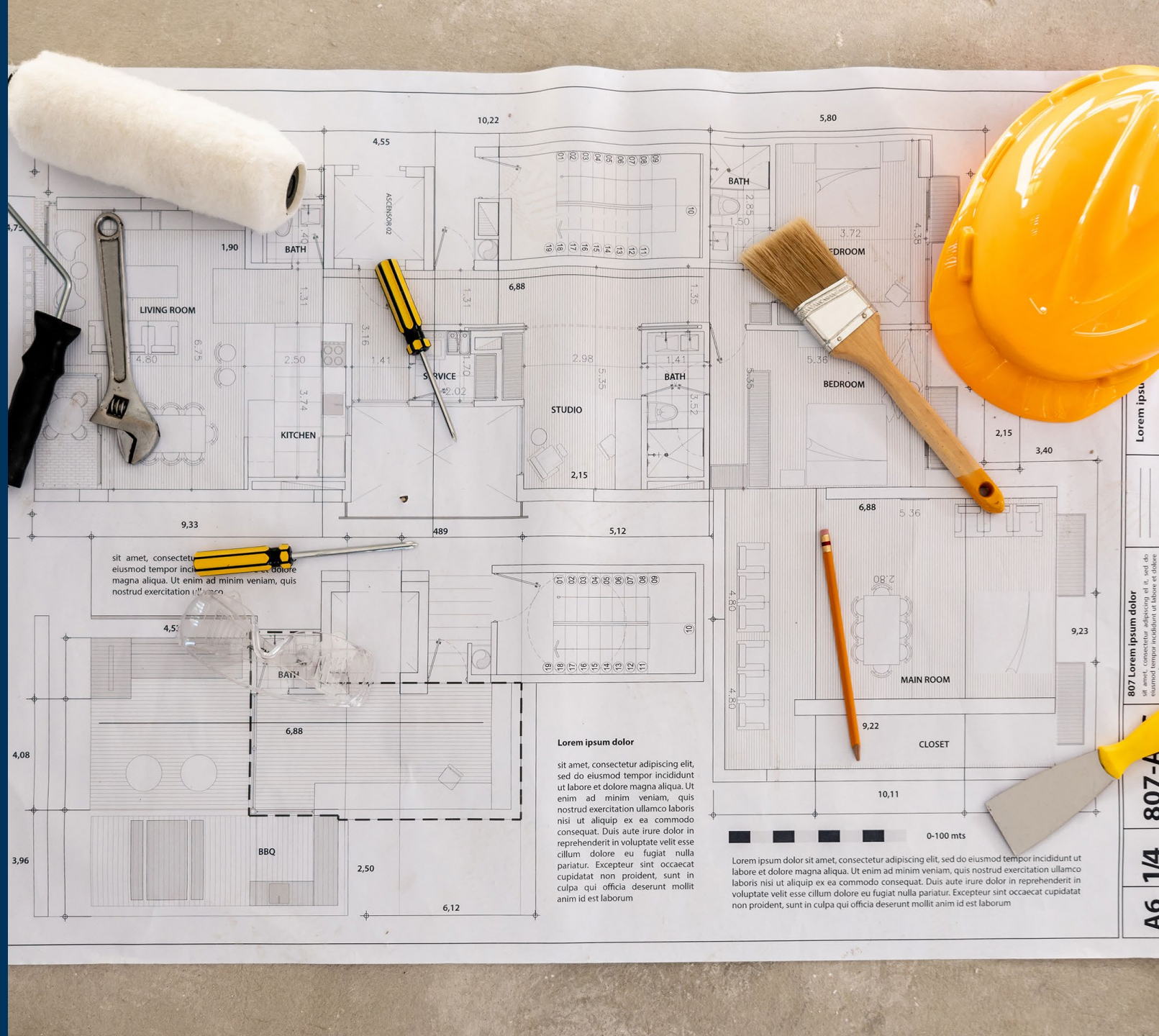
Co-created Savings 1997 – 2022



***Where** does market transformation take place?*



***How** is market transformation achieved in the Northwest?*



Implementing Market Transformation Step by Step

Step Zero:

Market Characterization & Baseline

Step One:

Barriers and Opportunities

Step Two:

Design Interventions / Establish Metrics

Step Three:

Implementation, Evaluation, and Adaptive Management

Initiative Lifecycle

Step Zero:

Market Characterization & Baseline

Step One:

Barriers and Opportunities

Step Two:

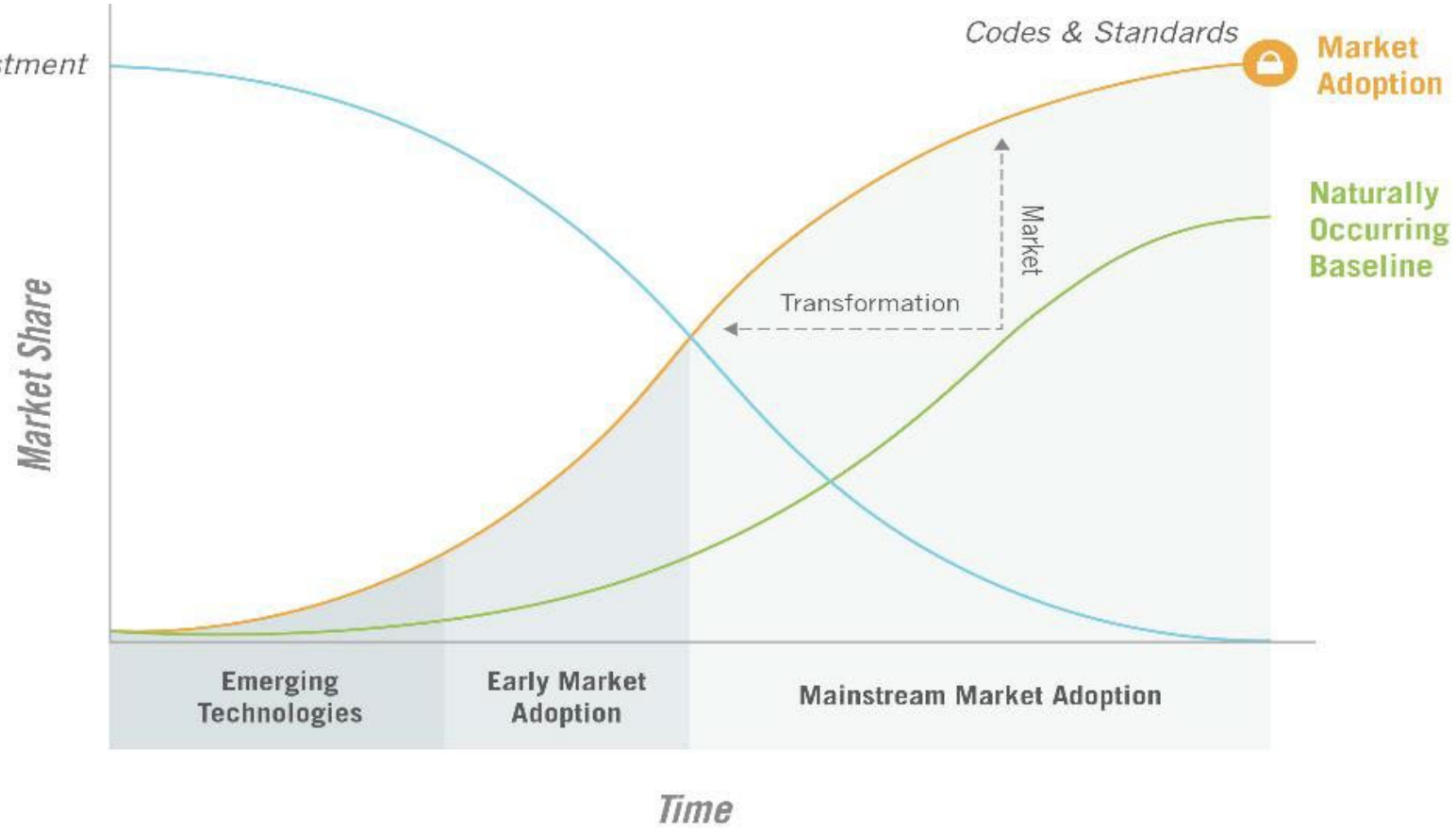
Design Interventions / Establish Metrics

Step Three:

Implementation, Evaluation, and Adaptive Management

Key Objectives

- Market Characterization
- Baseline Development:
  - Pre-intervention Market Conditions
  - Forecast



Step Zero:

Market Characterization & Baseline

Step One:

Barriers and Opportunities

Step Two:

Design Interventions / Establish Metrics

Step Three:

Implementation, Evaluation, and Adaptive Management

Availability?

Supply chain?

Awareness?

Confusion?

Price?

Step Zero:

Market Characterization & Baseline

Step One:

Barriers and Opportunities

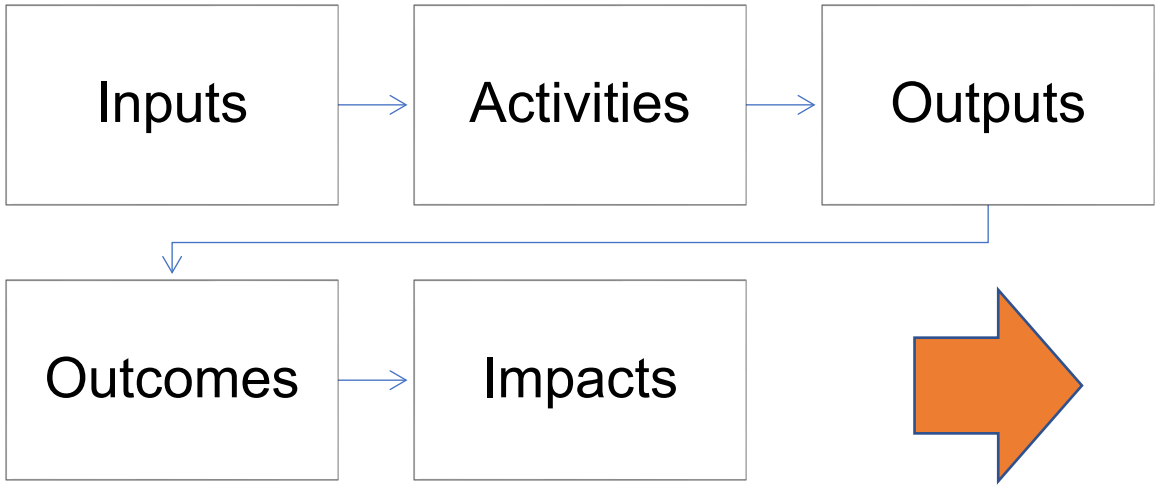
Step Two:

Design Interventions / Establish Metrics

Step Three:

Implementation, Evaluation, and Adaptive Management

Logic Model



Key Objectives

- Develop Market Progress Indicators

Market Progress Indicators

Examples: Outcome →

Logic Model Outcome	Installers choose the efficient approach	Manufacturers have commercialized products available in the market	ENERGY STAR adopts the specification
Market Progress Indicator (MPI)	• Trained installers report installing more of the efficient product than in previous years. • The general population of installers install the efficient product more than in previous years. • Distributor sales of the efficient product increases year-over-year	• The number of manufacturers that have commercially available products increases or does not decline year over year. • Categorizing manufacturers by market share into low, medium and high, the number of high-volume manufacturers that offer the product increases, or does not decline, year over year	• ENERGY STAR adopts the specification

Step Zero:

Market Characterization & Baseline

Step One:

Barriers and Opportunities

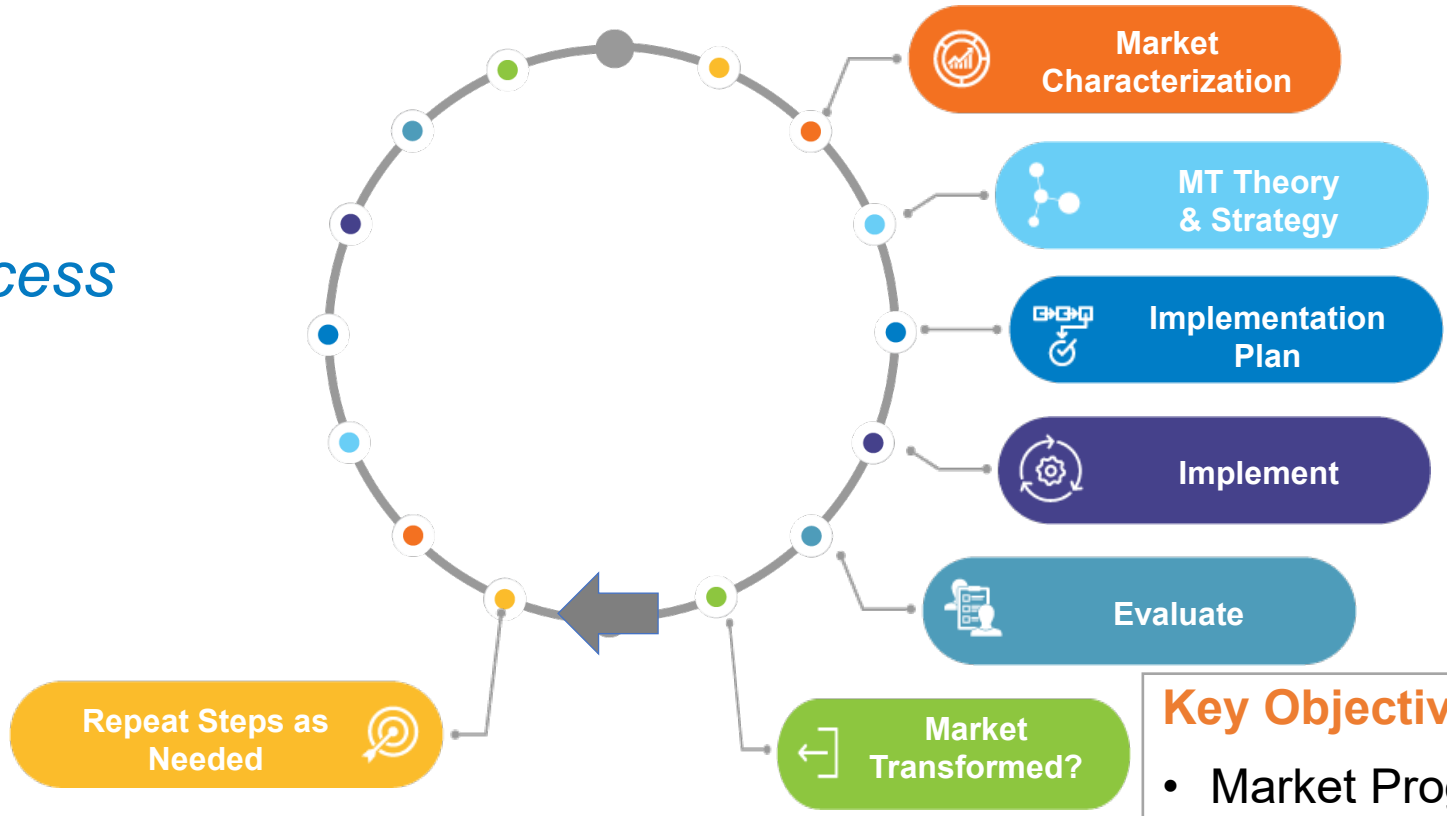
Step Two:

Design Interventions / Establish Metrics

Step Three:

Implementation, Evaluation, and Adaptive Management

Implementation:
A continuous improvement process



Key Objectives

- Market Progress Evaluations
- Long-term Monitoring and Tracking Reports

Questions?

BREAK

Market Transformation Value

Objectives

- Provide background context for committee members to understand the values they will see in funder savings reports as well as NEEA's corporate-level savings reporting.

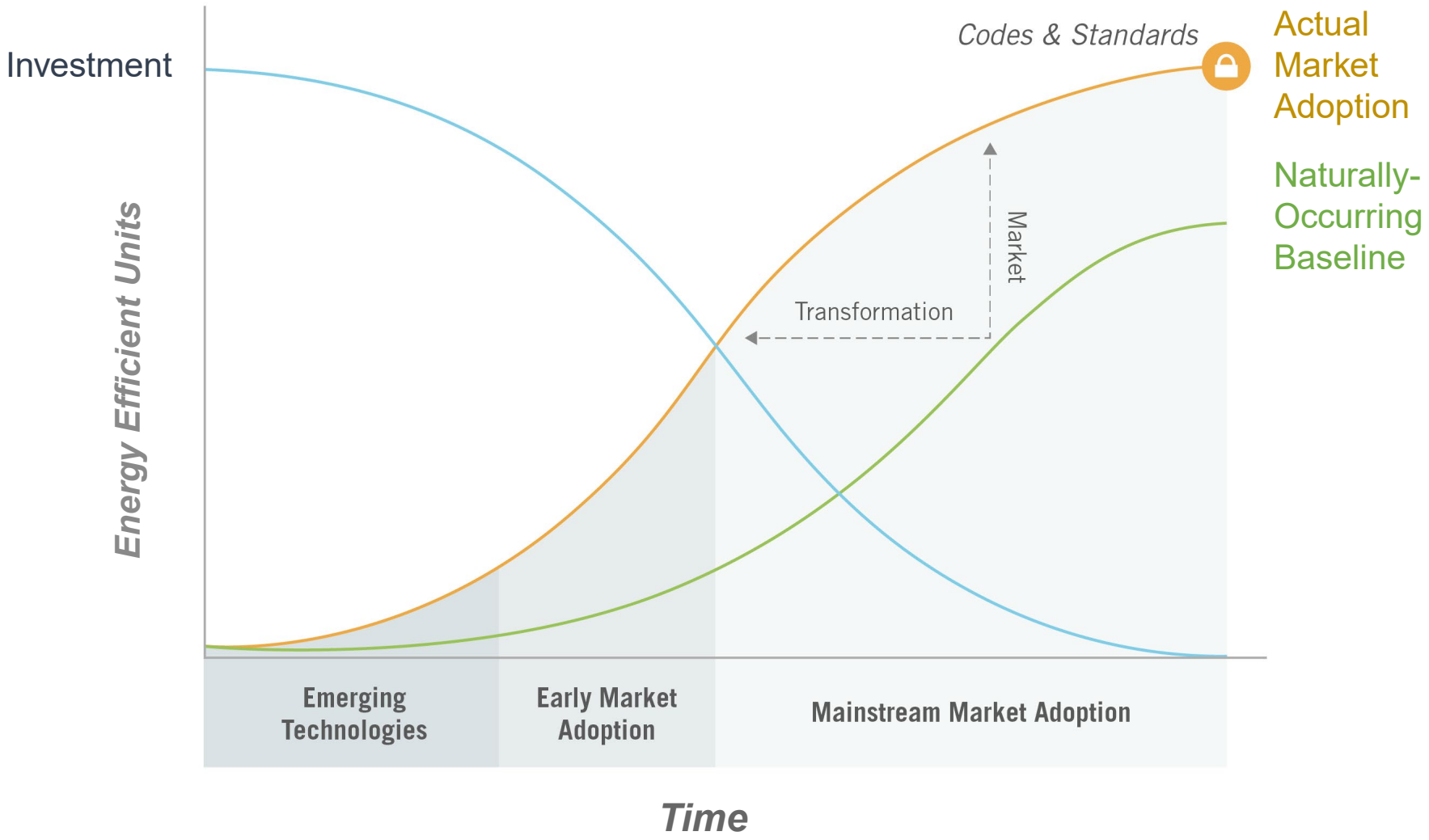
Evaluation Supports Savings Reporting

Savings are important, but not how progress is measured

Progress is measured through evaluation of logic model

Evaluation enables savings reporting at the market level

Market Transformation



Market Transformation Baseline

Definition	• Market adoption and/or energy use forecast without market intervention
Purpose and Importance	• To track the progress of Market Transformation efforts
Development	• Based on program logic and definitions • Rationale developed internally • Third party reviewed

Generic Approach

Steps

1) Define Measure(s)

2) Define Target Market(s)

3) Estimate Pre-intervention Baseline Market Share

4) List Baseline Activities and Drivers

5) Create Baseline Forecast

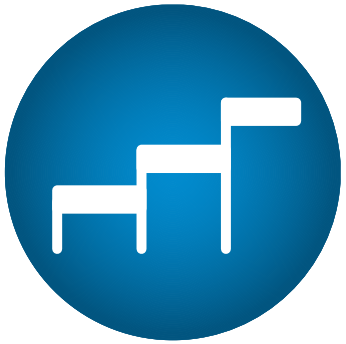
6) Verify the Baseline is Reasonable

Reporting Energy Savings

Two different baseline methodologies:

MARKET TRANSFORMATION APPROACH

Uses the Naturally Occurring Baseline



POWER PLAN APPROACH

Uses a Frozen Efficiency Baseline

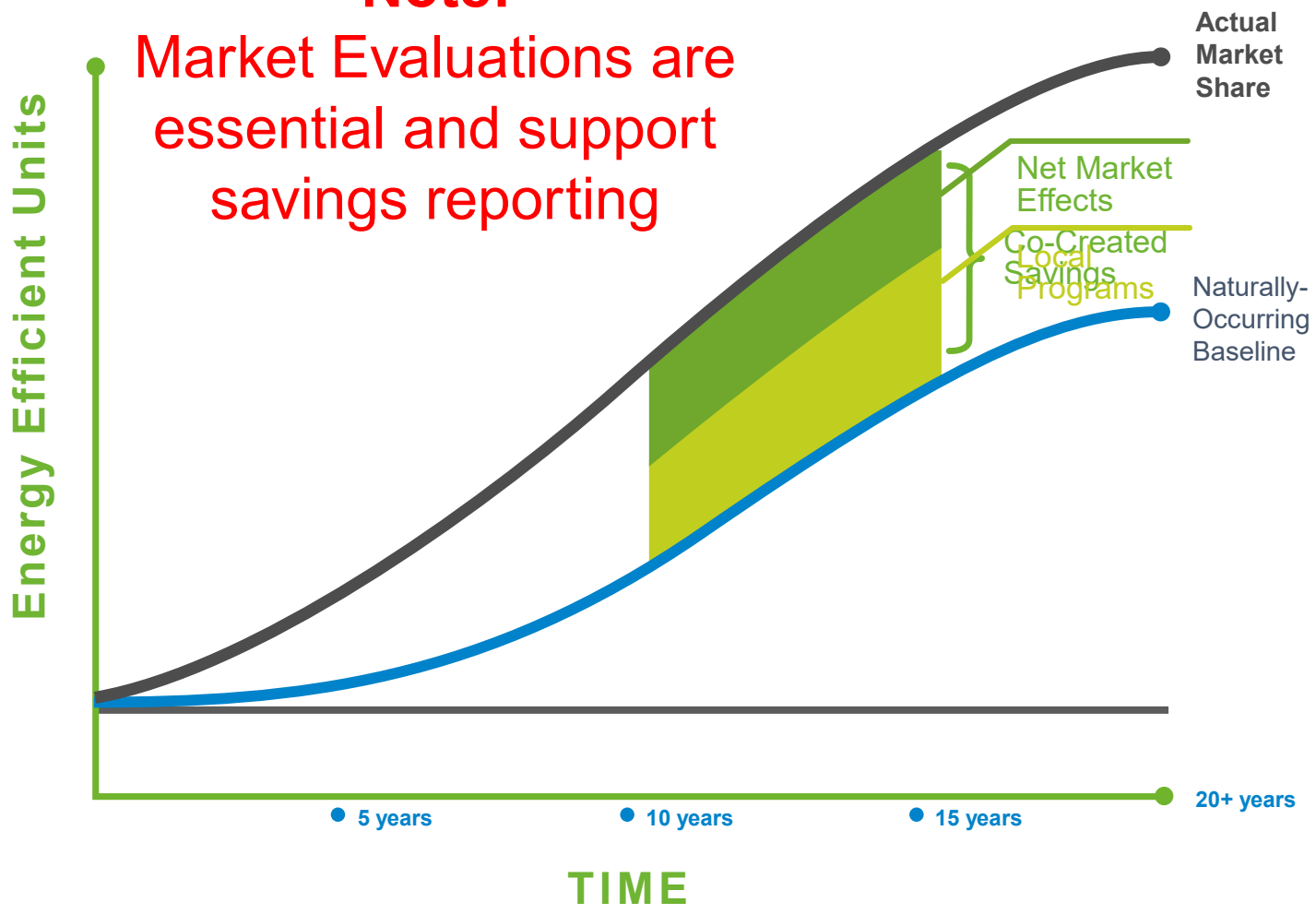
Calculating Reportable Savings

Fundamental approach:

TOTAL REGIONAL SAVINGS

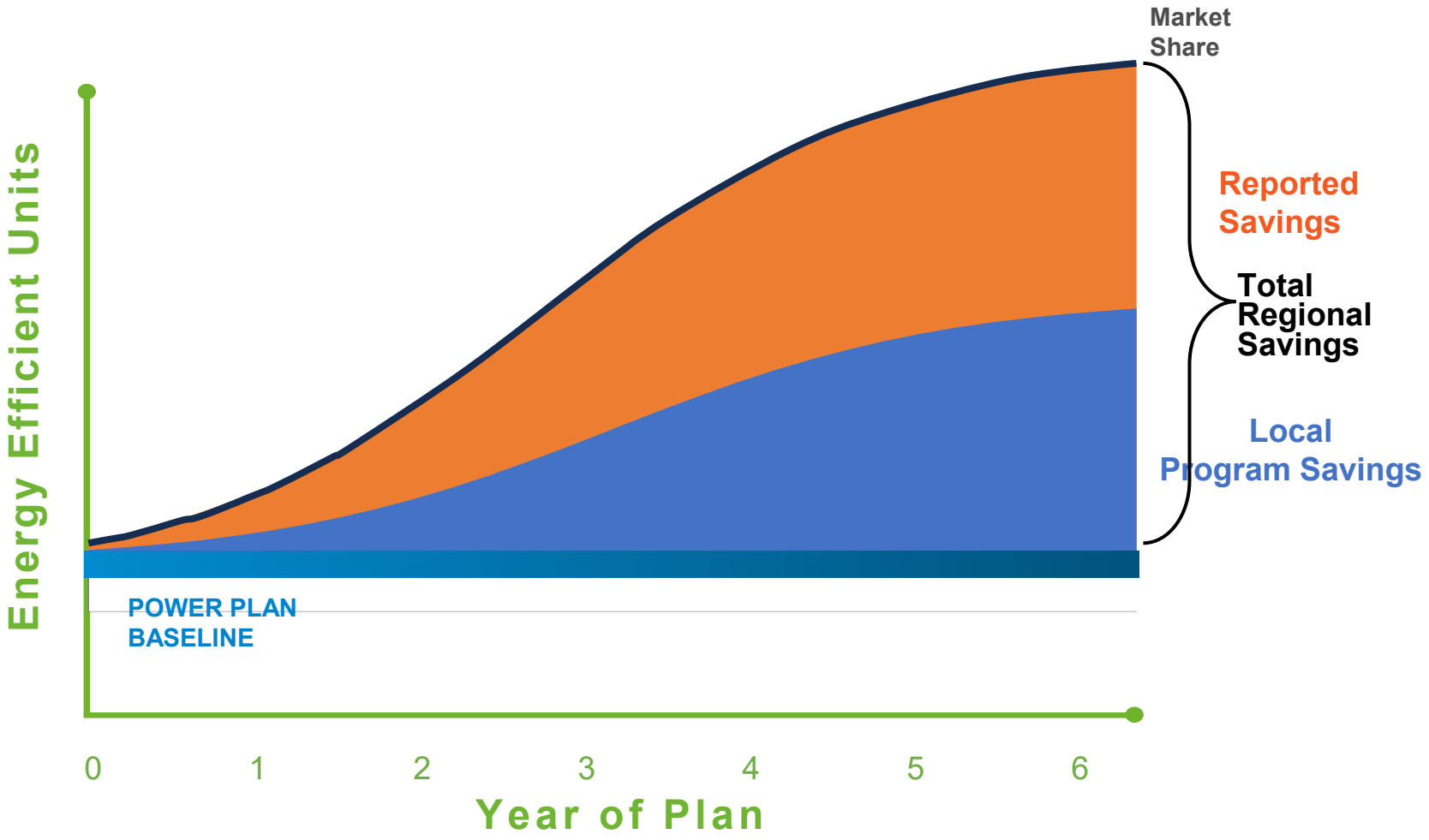
Market Transformation Approach

Note:
Market Evaluations are essential and support savings reporting



Purpose:
Report savings associated with market transformation

Power Plan Baseline



Purpose:
Report savings against Power Plan baseline

Other Value Metrics

Avoided Greenhouse Gas Emissions

Current Approach

- **Metric(s):** tons of CO_2e avoided
- **Reporting level:** Portfolio
- **Source:** Regional emissions rate used in Power Plan
- **Calculation Tool:** ProCost

Coincident Peak Load Reduction

Current Approach

- **Metric(s):** Absolute MW reduction & ratio of MW to aMW
- **Reporting level:** Program
- **Source:** Regional load shapes used in Power Plan
- **Calculation Tool:** ProCost
- **Peak definition:**
  - **Winter –** 6pm on weekday in Dec, Jan, Feb
  - **Summer –** 6pm on weekday in July and Aug

Key Takeaways

- Evaluation process enables Market Transformation savings reporting
- Market baseline tells the story of transformation
- Market Transformation and Power Plan methods not comparable
- We work with each funder to suit their reporting needs where possible

Market Transformation Costs and Benefits

Objectives

- ❑ Committee feels informed on NEEA's approach and has opportunity to ask questions.

Purpose of Cost Benefit Analyses

Assess the total **societal impact** of transforming a market to ensure that the regional investment is an appropriate use of funds for the long term. NEEA considers **all incremental quantifiable costs and benefits** of the total regional savings achieved through transformation, **regardless of who accrues them**.

Ultimately, NEEA, as a regional organization, is attempting to answer the question:

“will benefits of the resource exceed its costs from the perspective of society as a whole?”

Purpose

NEEA has three levels of cost-effectiveness analysis.

Measure Application Level

View of a single measure

Inform Program Strategy

Program Level

Aggregated across measures in Program

Screen Programs

Portfolio Level

Aggregated across programs in Market Development Phase

Meet Business Plan Requirement

Core Principles

- Alignment with NW Power and Conservation Council
- Regional-level analysis
- Market transformation approach
- Full supply chain scope
- Symmetry of costs and benefits
- Transparency
- Hard-to-quantify impacts

The Tool

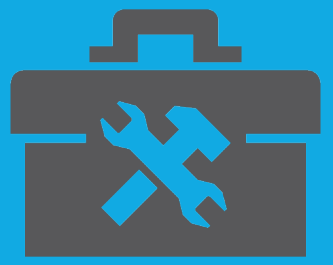
Northwest Power and Conservation Council

Regional Technical Forum

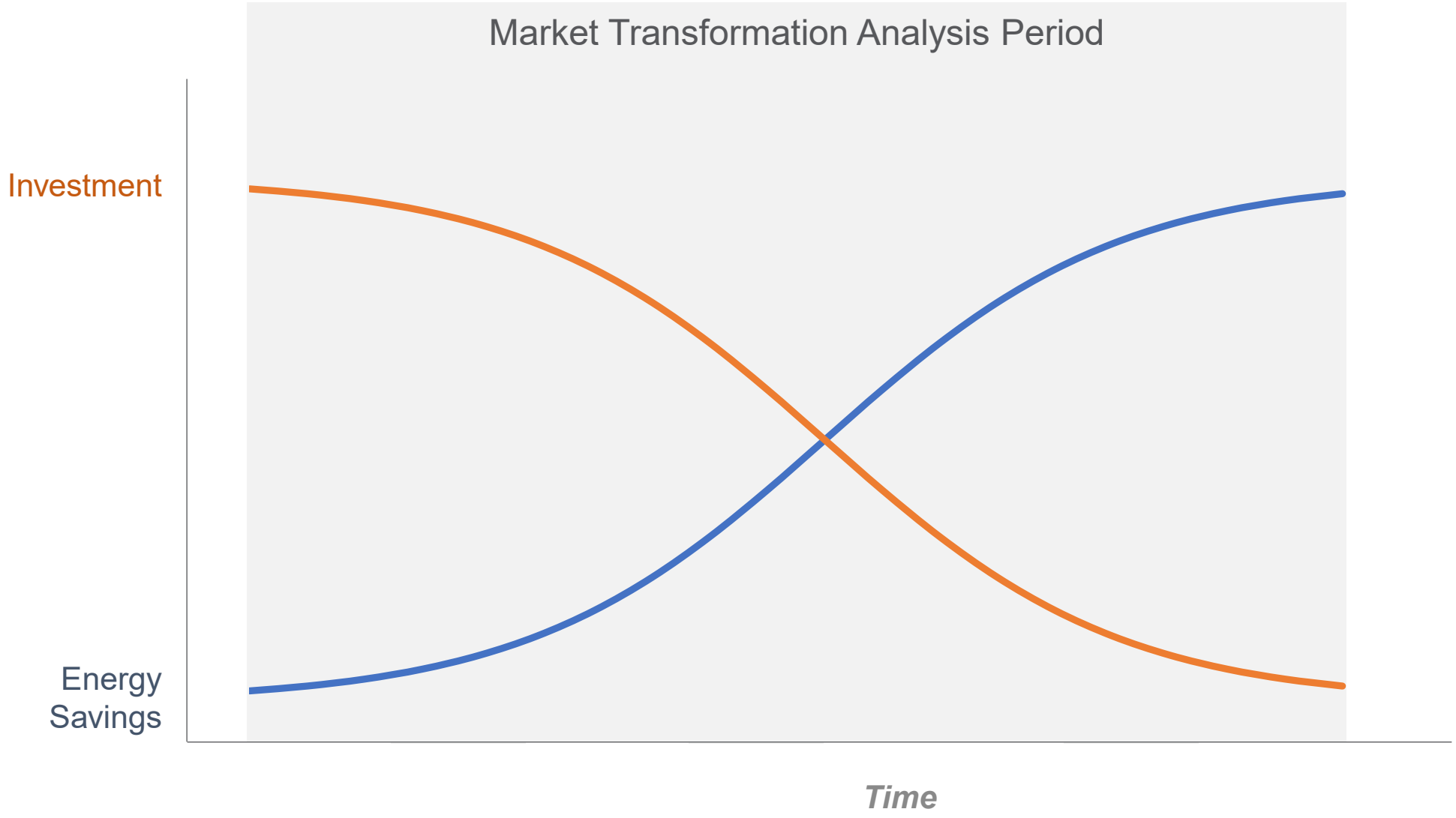
ProCost

- Council's tool
  - Regional perspective
  - Life-cycle view of costs and benefits
- ProCost computes
  - Regional cost-effectiveness
  - Levelized cost of savings ($/kWh)
  - Many additional cost, savings, and carbon parameters

ProCost | Regional Technical Forum (nwcouncil.org)



Purpose of 20 year time-frame



Program Key Assumptions

- Application of Key Assumptions to Benefit Cost Ratio
  - Incremental Costs
  - Measure Life
  - Savings Rate
  - Efficient Units
  - Non-Energy Benefits

Inputs - Benefits

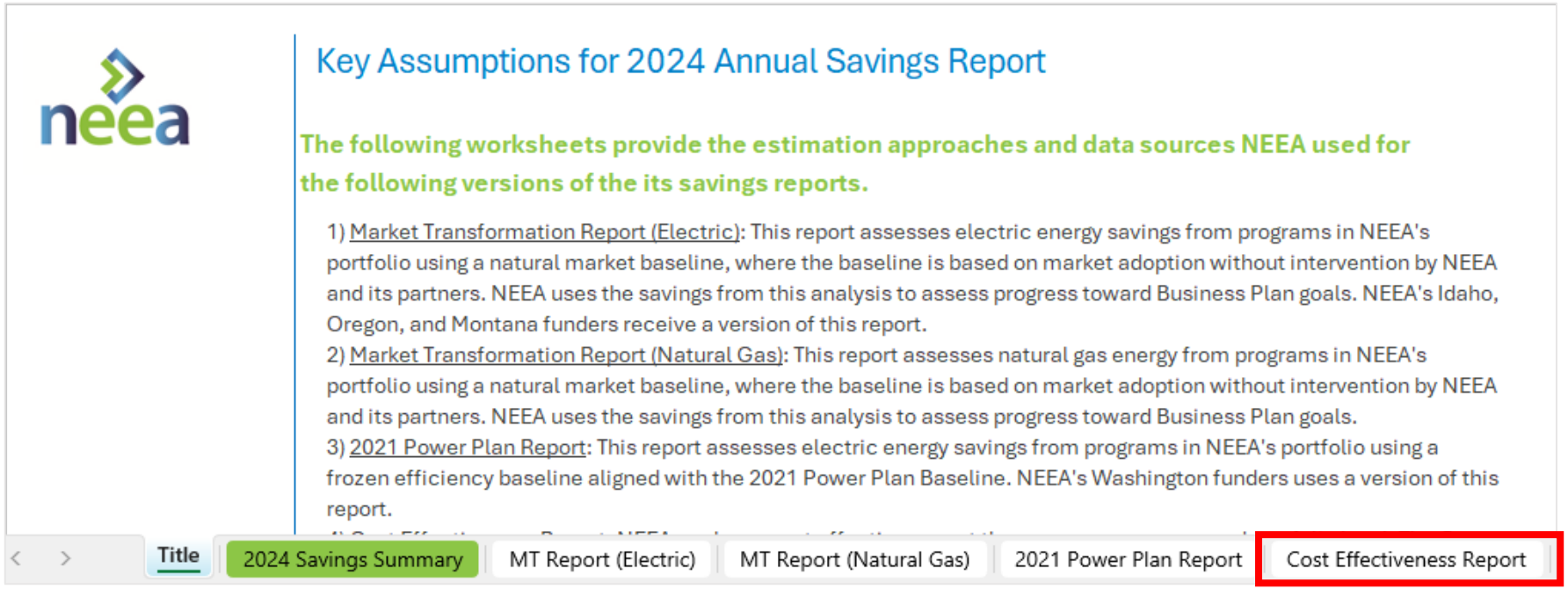
Regional Benefit		Source	
		Electricity	Natural Gas
Energy Benefit	Commodity price of resource	Power Plan	Power Plan
	Risk mitigation regarding supply adequacy		Weighted average of utility values
	Deferred transmission, distribution, and generation capacity costs		Weighted average of utility values
Avoided Greenhouse Gas emissions			Power Plan
Production, storage, transmission and distribution loss			Avoided cost filings, IRPs and discussions with utility staff
Conservation of other fuels		Measure dependent	
Quantified non-energy impacts			
Regional Act Credit		NW Power Act	

Inputs - Costs

Regional Cost	Source	
	Electricity	Natural Gas
First Cost	Measure dependent	
Operations & maintenance costs		
Replacement Cost		
NEEA direct costs	NEEA finance system	
NEEA administrative costs	20% of direct program spending	
Local Program administrative costs	20% of estimated total rebate dollars	
Other costs associated with market change	Measure dependent	

Measure Level Calculation Inputs

- Key Assumptions for 2024 Annual Savings Report spreadsheet will be sent out with the meeting notes
  - Cost Effectiveness Report tab includes inputs used for all measures in the portfolio calculation and notes about changes



Aggregating Results to the Portfolio

Benefits

All NEEA costs included (admin, stock assessments, research, etc.)

Electric Portfolio Benefit-Cost Ratio is 1.95

- *20-year stream of benefits and costs to the region from programs in Market Development*
- *Includes all of NEEA Cycle 6 Budget.*

Gas portfolio

- NEEA's gas portfolio is still in development
- The ERTU program has a Benefit-Cost Ratio of 1.1

Total Program BCR: 1.1

	Component	BCR
Tier	Tier 1	1.1
	Tier 2 (CGF / ERV)	1.2
Modeled Building Type	Grocery	1.2
	Retail	1.0
	Strip Mall	1.5
	1 Floor Medium Office	1.3
Heating Zone	Heating Zone 1	1.1
	Heating Zone 2	1.5
	Heating Zone 3	1.9

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Cost-effectiveness & Evaluation Advisory Committee (CEAC)

Northwest Energy Efficiency Alliance

May 1, 2025

CLASSIFICATION LEVEL: PUBLIC

Re-Introductions & Ice Breaker (in chat)

- Name
- Organization
- The sun is coming back. What are you looking forward to?

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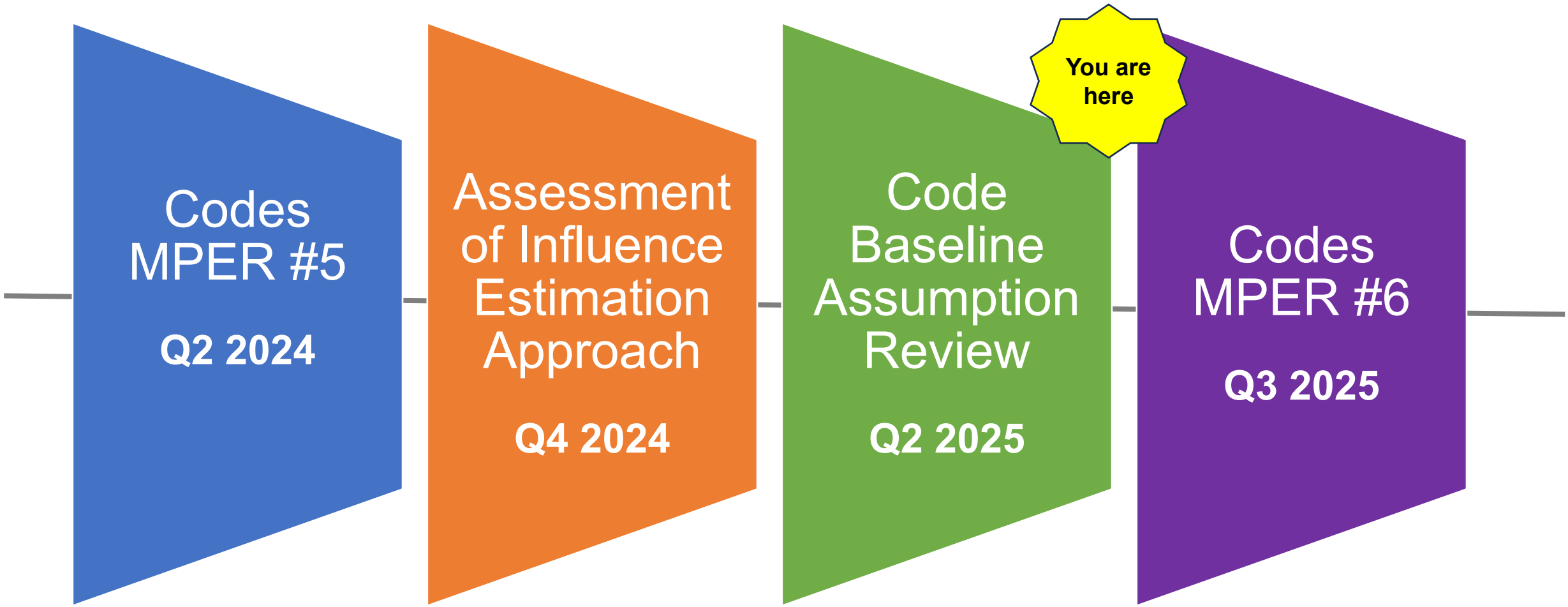
State Energy Code Baseline and Key Assumption Review

Recent Code Evaluations & Reviews



Goals for Today's Conversation

- Provide **emerging findings and recommendations** from the Code Baseline and Key Assumption Review

- Hear **your questions and comments** to inform:
  - The IEc team's final report
  - NEEA's assessment of how to implement recommendations

NEEA State Energy Code Baseline & Key Assumption Review – Emerging Findings

PRELIMINARY FINDINGS PRESENTATION + DISCUSSION

PRESENTED BY
Industrial Economics, Greg Englehart, Christine Lee, Daniel Kaufman
Resource Refocus, Carrie Brown, Nate Heckman

May 1, 2025

IEc

Agenda

1. Evaluation Objectives and Scope
2. Interview Findings
3. External Methods Findings
4. Next Steps
5. Questions

IEc

Current NEEA Approach to Co-Created Savings

Co-Created Savings: Energy savings above the Naturally Occurring Baseline — Market adoption of energy efficiency that would have occurred naturally without intervention by NEEA and its partners.

NEEA reports 100%* of the Total Regional Savings as Co-Created Savings for 10 years (~3 IECC code cycles) after construction starts under a new Code.

*Code-to-code modeled savings with a compliance rate applied

IEc

Evaluation Objectives

Assess/propose refinements to NEEA's approach to estimating the Naturally Occurring Baseline used for calculating Co-Created Savings

- Is tracking 100% of the Total Regional Savings as Co-Created Savings for ten years after construction starts still the most reasonable way to develop the Naturally Occurring Baseline for building energy codes in the Northwest?
  - If not, how should NEEA update its baseline and other assumptions to more accurately capture NEEA + partners influence on code changes in the Northwest?
- Is it appropriate to apply the same approach to all states in the Northwest and to both the residential and commercial sectors?

IEc

Evaluation Activities

Task 1: Theory of Change/Stakeholder Analysis (In Progress)

- In-depth interviews with NEEA staff, key Northwest code stakeholders, and national experts

Task 2: Literature Review (In Progress)

- Review of prior NEEA evaluations
  - Recent specific evals include MPER #5 and the Independent Assessment of NEEA Approaches to Estimating Influence Over State Energy Codes
- Review of existing literature on methodologies used by other states/orgs that work on advancing energy efficiency in building energy codes

Theory of Change/Stakeholder Analysis

IEc

Task 1 Interview Progress

Completed	Ongoing

• Four NEEA staff heavily involved with development of methodology/current codes work
• State code stakeholders:
  ○ Montana Departments of Environmental Quality and Labor & Industry (2 total)
  ○ Idaho Codes Collaborative
  ○ Washington Energy Technical Advisory Group/City of Seattle
  ○ Oregon Building Codes Division
• A national codes expert (ACEEE)
	• Washington State Building Code Council
	• Oregon Department of Energy
	• New York State Energy Research and Development Authority (NYSERDA)

IEc

Key Findings from Initial Interviews

- Respondents generally agreed that NEEA + partners played a major role in codes development in its early years, and that these efforts likely led to 2-3 code cycle/10-year acceleration through at least the mid 2010s

- In the last decade, respondents are less sure that code is still ~10 years ahead of where it would have been without NEEA + partners, especially in Oregon and Washington, due to:
  - Lack of awareness of who is defined as a NEEA partner
  - Local/regional interests in promoting energy efficiency and emissions reductions
  - Legislation/statewide climate and net-zero goals (Washington and Oregon)
  - National progress on building codes (although NEEA + partners have helped advance these)
  - Activities of other organizations/agencies

IEc

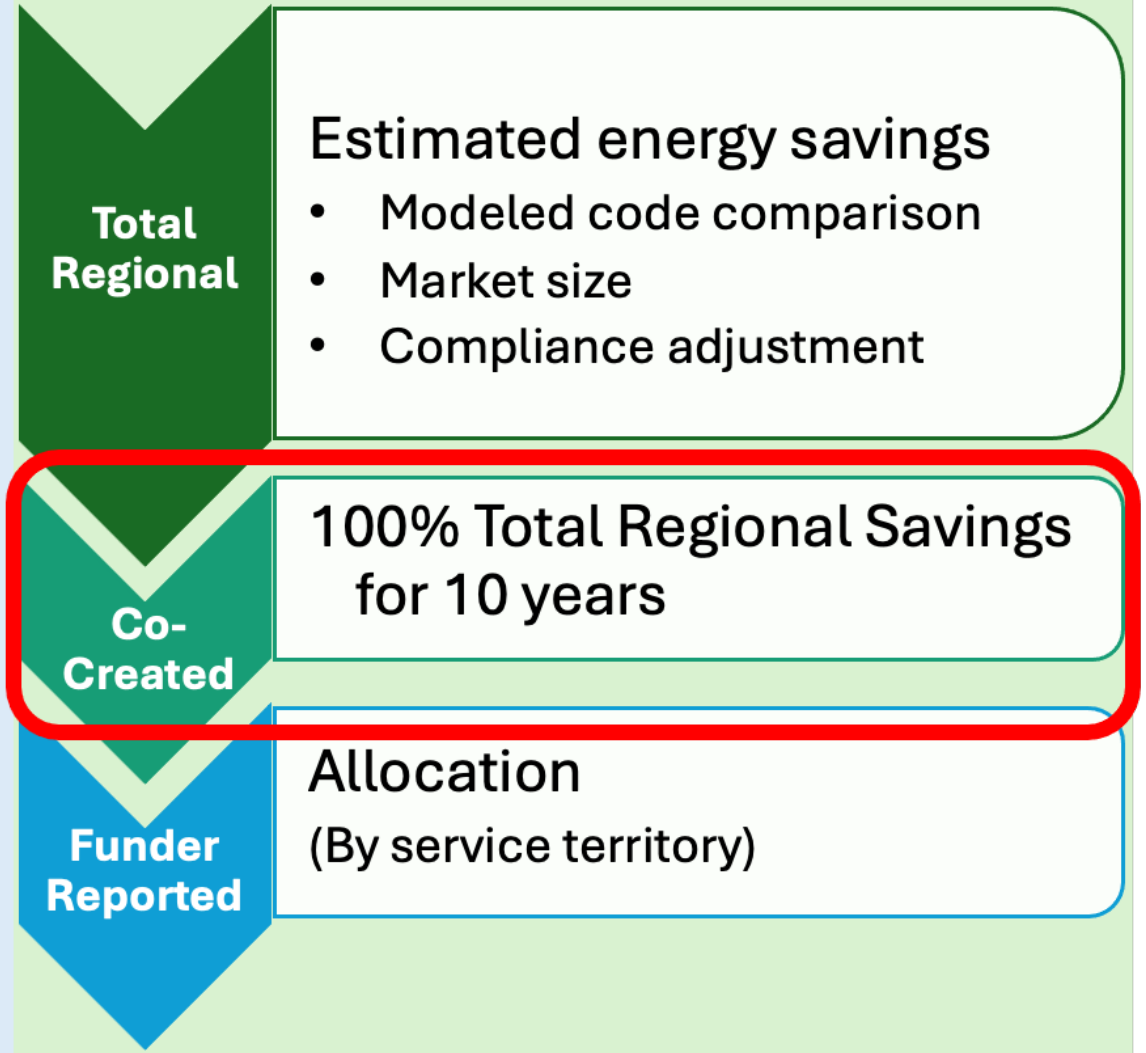
Key Findings from Initial Interviews

- Respondents credit more of the progress in current codes to NEEA + partners in Idaho/Montana than Oregon/Washington
- Mixed results on whether NEEA + partners have had more of an influence in accelerating residential or commercial code
- Respondents agreed that NEEA + partners have played an influential role in advancing codes at the national level
- **Challenge:** Interviewees were largely unaware of the methods NEEA/others use for reporting savings from code adoption or developing a naturally occurring baseline

Literature Review

SAVINGS TYPES

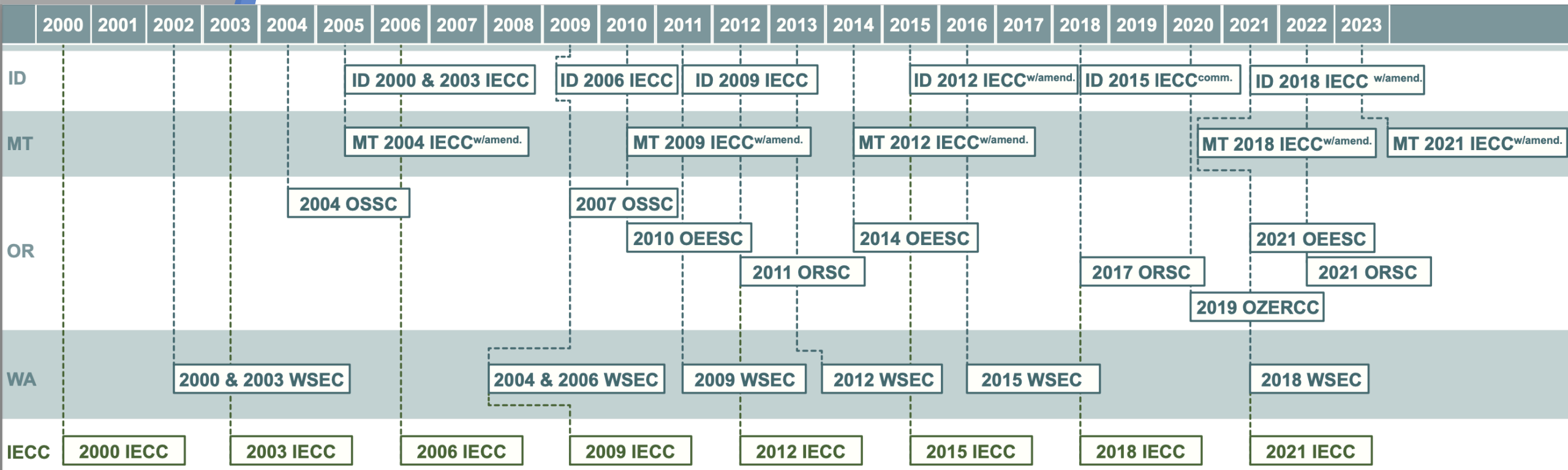
NEEA'S REPORTING



Focus of this study is the counterfactual.

What would have occurred naturally without intervention by NEEA and its partners?

State Codes Tracked by NEEA



*IECC cycles included for reference.

OSSC: Oregon Structural Specialty Code

OEESC: Oregon Energy Efficiency Specialty Code

ORSC: Oregon Residential Specialty Code

OZERCC: Oregon Zero Energy Ready Commercial Code

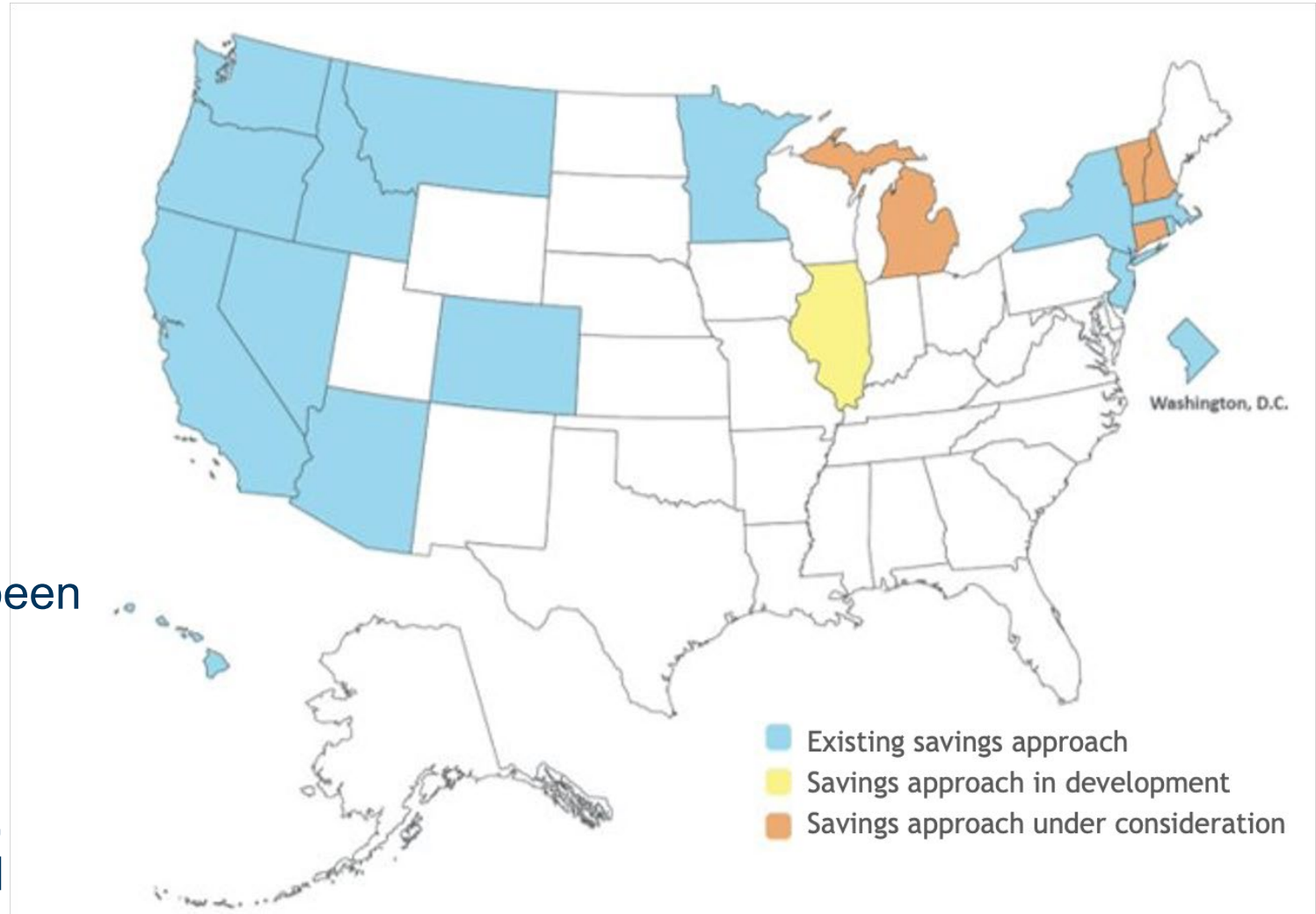
WSEC: Washington State Energy Code

Source: Adapted from "Estimating Residential and Commercial Code Energy Savings"

IEc

Much of the extra-regional documentation was in the context of utility savings attribution.

California's approach has been in effect the longest and is often referenced by other states like Colorado, Massachusetts, Minnesota, Nevada, Rhode Island, and Washington DC.



Status of Energy Code Savings Approaches by State

Source: Adapted from "Engaging and Crediting Utilities for Supporting Energy Code and Building Performance Standard Implementation"

IEc

Extra-Regional Approaches that Differ from the California Methodology

Other extra-regional approaches	
Arizona	Only state with a **deemed attribution approach** for Codes & Standards programs. • State sets attribution factor for these savings. • Quantified through a Measurement & Verification study, field data, and market baselines.
New Jersey	Utilities or state agencies administer energy efficiency programs, but **not Codes & Standards programs**. • Attribute energy savings from updated energy codes toward state targets. • Analysis includes potential, gross, and net savings under **conservative, middle-of-the-road, and optimistic compliance scenarios**.
Massachusetts	Net savings estimated with an **attribution factor for increased compliance** rather than from naturally occurring baseline.
Washington DC	Savings **based on gross** not net.

Source: "Engaging and Crediting Utilities for Supporting Energy Code and Building Performance Standard Implementation"

IEc

Key Findings from Extra-Regional Approaches

- The team did not find other examples that parallel NEEA's approach.

- The team has not identified any methods used by other states that could easily replace NEEA’s simple/straightforward approach. Others are complex, costly, and not necessarily more accurate.

Assessment of Current NEEA Approach

IEc

NEEA's Code Baseline Development Approach Must…

	Current Approach
Not be cost prohibitive	Yes
Enable savings reporting within 1 year of code adoption	Yes
Be transparent, straightforward, and easily reviewable	No
Be unlikely to overestimate savings	Maybe
Account for the long-term nature of market transformation/code influence	Yes
Recognize the full set of NEEA activities that influence code	Yes
Be applicable to future code changes	Maybe
Be appropriate for all four Northwest states	Maybe
Be appropriate for both the residential and commercial sectors	Maybe

May overestimate future Co-Created Savings because:

- Approach does not differentiate across states.
- Lack of clarity about NEEA's partners and their roles makes it difficult to assess whether reported savings might be overestimated.

IEc

NEEA's Code Baseline Development Approach Must…

	Current Approach	Goal for Proposed Approach
Not be cost prohibitive	Yes	Yes
Enable savings reporting within 1 year of code adoption	Yes	Yes
Be transparent, straightforward, and easily reviewable	No	Maybe
Be unlikely to overestimate savings	Maybe	Yes
Account for the long-term nature of market transformation/code influence	Yes	Yes
Recognize the full set of NEEA activities that influence code	Yes	Yes
Be applicable to future code changes	Maybe	Yes
Be appropriate for all four Northwest states	Maybe	Yes
Be appropriate for both the residential and commercial sectors	Maybe	Yes

IEc

Potential Improvements to Documentation & Transparency

- NEEA could improve its methods by developing clearer definitions to use both internally and externally:
  - The purpose/use of the Naturally Occurring Baseline and Co-Created Savings
  - How NEEA's market transformation theory of change differs across each state where NEEA engages in code activities
  - The definition of a "partner," and which stakeholders NEEA does (and does not) consider a "partner" for the purpose of evaluation

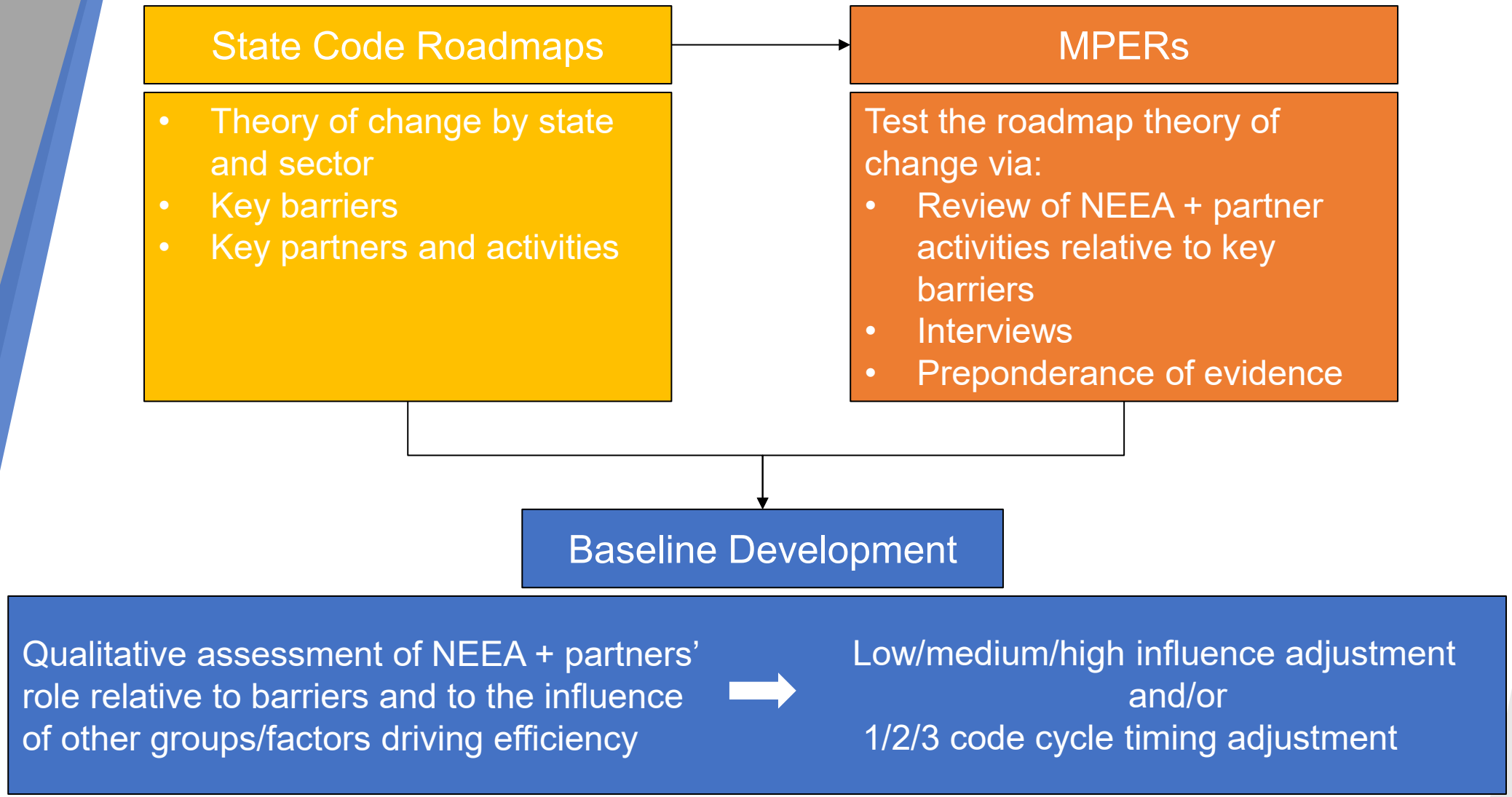
- Additional tracking of the specific (visible & invisible) activities that NEEA + partners are participating in would further benefit external (and internal) parties interested in reviewing NEEA's methods.

IEc

Potential Adjustments to NEEA's Existing Method

- The team is looking at revisions that leverage existing information and methods already developed by NEEA:
  - Codes Logic Model
  - State codes roadmaps
  - MPERs
- The team may propose simple updates to be applied to individual code baseline

Approach We are Exploring



IEc

Next Steps for Evaluation

- Continue outreach for additional interviews
- Finalize literature review findings
- Develop proposed adjustments to apply to NEEA's existing approach

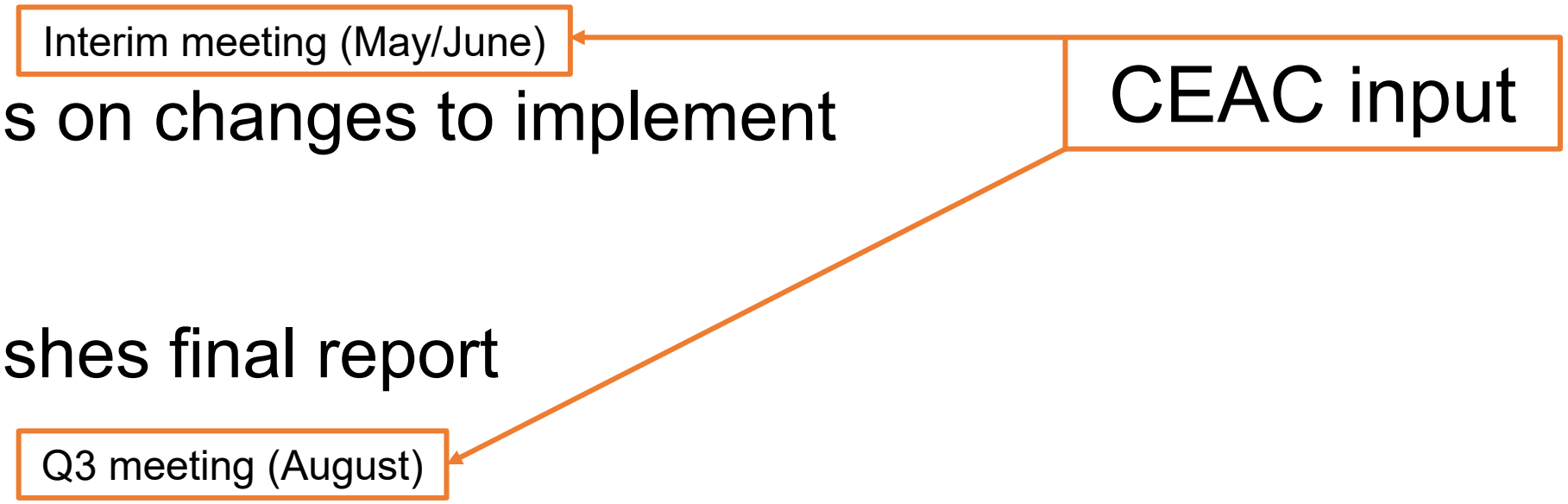
Project Team

IEc

Resource Refocus

Next Steps

- IEc team to complete data collection, analysis, and reporting
- NEEA aligns on changes to implement
- NEEA publishes final report



Key Assumptions

Annual Reporting Process – wrapping up in Q2

Q4 2024

- Review recent key assumption updates

Q1 2025

- Review updates to key assumptions for annual savings reporting

Q2 2025

- Market Transformation Savings and Benefit-Cost Accounting and Reporting
- Review resulting Energy Savings estimates for the NEEA portfolio
- Review cost effectiveness assessment, peak savings and avoided carbon emissions
- Share key market trends and new findings

Key Inputs and Assumption Updates

Objectives

- ❑ Provide visibility to updates made in key assumptions for 2024 reporting of energy savings
- ❑ Answer any questions on updates to NEEA's key assumptions

Why are we here again?

CEAC Charter

Responsibilities

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

Key Assumption Development and Review process

Develop Key Assumptions

NEEA staff develops Key Assumptions in alignment with the region through:

- Internal analysis,
- External studies,
- Regional Technical Forum

Validate Key Assumptions

NEEA staff commissions 3rd party evaluations for new Key Assumptions and for changes to Key Assumptions used in the reporting of savings.

Report Key Assumptions

NEEA staff reviews new and updated Key Assumptions with CEAC every quarter. Additionally, NEEA staff will highlight any Key Assumptions that may warrant updating and solicit input from the committee for better data to inform a Key Assumption.

Post Key Assumptions

Full set of regional key assumptions used for reporting is made available on NEEA Funder Portal

System of Documentation Available

Funder Portal
neea.org

Updated in April

Data Sources
List of data sources NEEA uses to estimate savings & cost effectiveness and explanation of approach
Cost Effectiveness Table
ProCost Inputs for programs in Market Development
Methodology Documentation
Report on energy consumption calculations, data sources and technical assumptions
Operational Guidelines
Overview on energy savings & cost effectiveness calcs

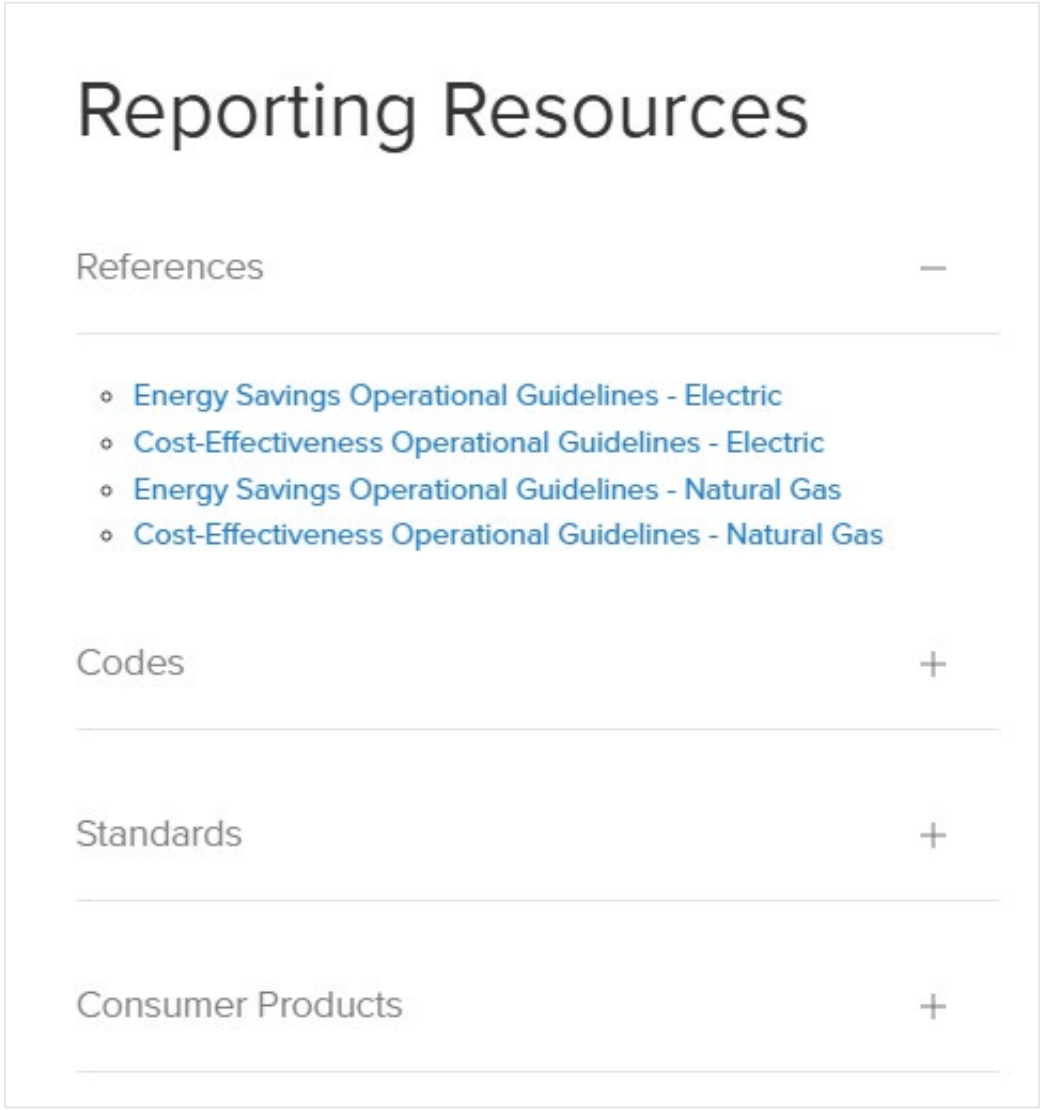
Supporting Documentation on neea.org – Until May 12

Documentation is available at:

https://neea.org/portal/sign-in

→ Login

→ Savings Reports



Q2 2025 Key Assumptions Updates

Dedicated agenda time:

Assumption Update

- Residential New Construction

Data Source Updates

- Retail Products Portfolio: TVs
- Extended Motor Products: Pumps
- Luminaire Level Lighting Controls

In the meeting packet:

- Manufactured Homes
- Ductless Heat Pumps
- Heat Pump Water Heaters

Residential New Construction

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Residential New Construction

Product Groups

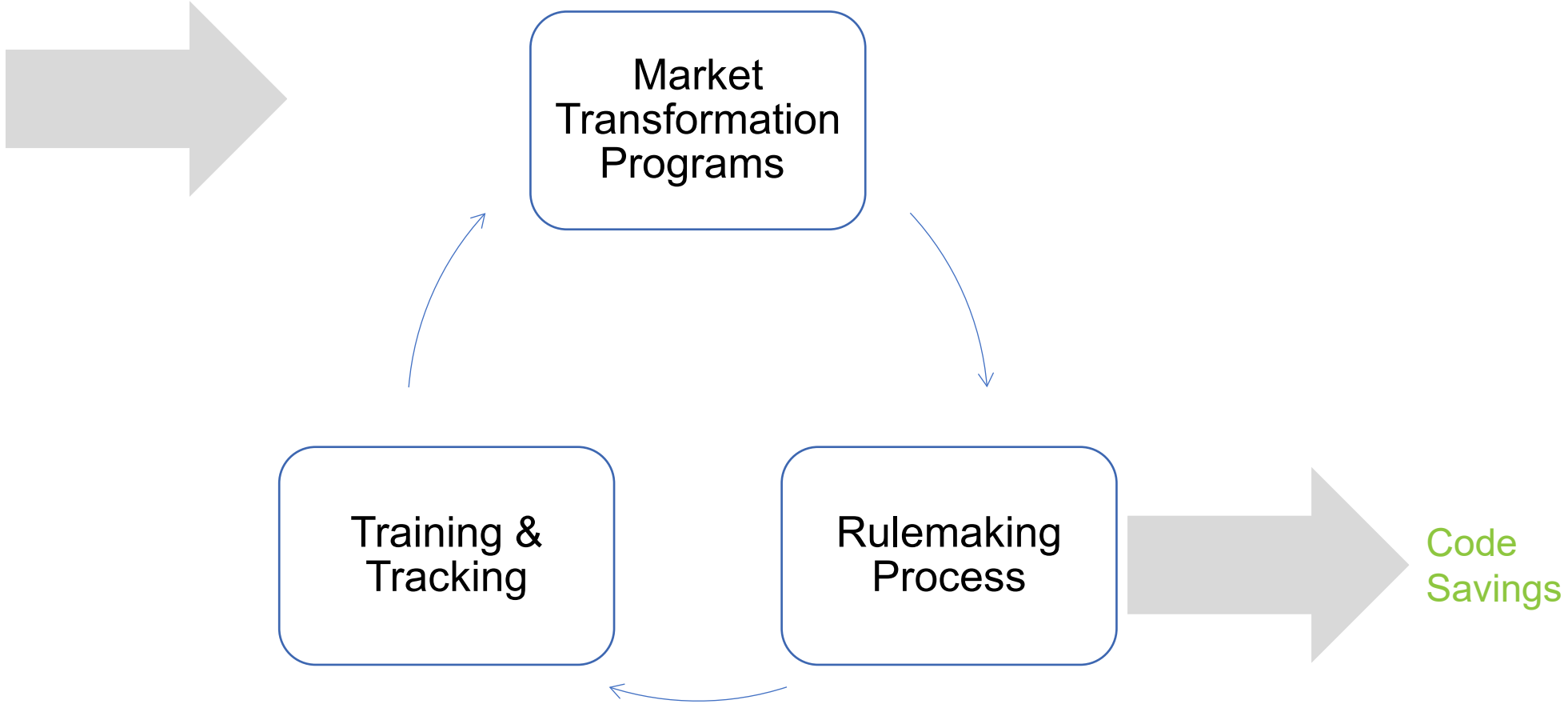
Lighting

HVAC

Water Heating

Envelope

Consumer Products



Drivers the 2024 Annual Savings Report Updates

New Codes Effective

- The *2023 Oregon Residential Specialty Code* went into effect in April.
- The 2021 Washington State Energy Code went into effect in March.

New Savings Analysis

- 2021 Internation Energy Conservation Code w/MT amend,
- 2021 Washington State Energy Code (draft)
- 2023 Oregon Residential Specialty Code (draft)

New Field Studies

- Montana (draft)
- Oregon (draft)
- Idaho (published)

New Savings Analysis

NEEA's goals is to align the Regional Technical Forum.

	Original Plan		New Plan		
Q4 2024	Compare REEDR with SEEM				
Q1 2025	REEDR: 2021 Washington Sate Energy Code		SEEM: 2021 International Conservation Code with MT Amend.		
Q2 2025	PNNL: 2021 International Conservation Code with MT Amend.	REEDR: 2023 Oregon Residential Code	SEEM: 2021 Washington Sate Energy Code (draft)	Other: 2023 Oregon Residential Code (draft)	
Q3 2025			SEEM: 2023 Oregon Residential Code (final)	SEEM: Update 2021 Washington Sate Energy Code (final)	Troubleshoot REEDR with RTF

Montana Residential New Construction

2024 Highlights

- Completed savings analysis for the 2021 Internal Conservation Code (IECC) with MT amends
- Completed field study for both the 2021 IECC and the 2018 IECC with MT amends
- Continued training & education programs
- Continued to participate in future IECC development (starting 2027)

2024 Savings Estimates

Code	New Homes	Compliance	Savings per Home (kWh)	Electric Savings (aMW)
2012 IECC w/ MT amend.	4,256	95%	582	0.27
2018 IECC w/ MT amend.*	4,256	86%	709	0.30
2021 IECC w/ MT amend.*	4,256	85%	522	0.21
				0.78

** Counts toward the 2021 Power Plan Conservation Targets*

Montana Residential New Construction

Savings Analysis

- Added Savings from the 2021 IECC w/MT amend (3-7% electric savings)
  - Improved ventilation fan efficiency
  - Improved lighting efficiency improvement
  - Additional packages (select one): envelope thermal resistance, HVAC equipment efficiency, water heating equipment efficiency, HVAC distribution system efficiency, and envelope air sealing + ventilation efficiency.

Compliance Evaluation

- Electric space heating increased from 2% to 11% for the single-family homes
- Low uptake of electric heat pump water heaters (informed 2021 IECC savings analysis)
- Compliance is in the 85% range for the recent code changes

New Construction Estimates

- Increased 8% over the 2023 estimate
- Updated climate zone weights with the Regional Technical Forum (minimal effect on results)

Idaho Residential New Construction

2024 Highlights

- Continued training & education programs
- Continued to participate in future IECC development, working with the Idaho Energy Code Collaborative to discuss provisions to the 2024 IECC
- Published the Idaho Field Study and Evaluation

2024 Savings Estimates

Electric Savings Reports

Code	New Homes	Compliance	Savings per Home (kWh)	Electric Savings (aMW)
2012 IECC w/ ID amend.	18,155	98%	83	0.17
2018 IECC w/ ID amend.*	18,155	98%	727	1.47
				1.48

Natural Gas Savings Reports (NEEA Region)

Code	New Homes (Gas Space Heating)	Compliance	Savings per Home (Therms)	Gas Savings (Therms)
2018 IECC w/ ID amend.	2,552	98%	114.3	285,805
				285,805

** Counts toward the 2021 Power Plan Conservation Targets*

Idaho Residential New Construction

NEEA completed a code compliance evaluation for Idaho in 2023 and updated the compliance and fuel mix assumptions as part of the *2023 Annual Savings Reports*. For the *2024 Annual Savings Report*, the updates were limited to final new construction estimates.

New Construction Estimates

- Increased by 39% over the 2023 estimate
- Matches building level in 2021/2022
- Significant increase in new construction forecast

Oregon Residential New Construction

2024 Highlights

- The *2023 Oregon Residential Specialty Code (ORSC)* went into effect on April 1, 2024
- Completed field study for the 2021 ORSC
- Continued training & education programs
- Monitored code updates and opportunities

2024 Savings Estimates

Electric Savings Reports

Code	New Homes (multi & single-family)	Compliance	Savings per Home (kWh)	Electric Savings (aMW)
2017 Or. Specialty Code	12,936	89%	843	1.11
2021 Or. Specialty Code*	12,936	89%	279	0.37
2023 Or. Specialty Code*	1,936	89%	330	0.06
				1.54

Natural Gas Savings Reports

Code	New Homes (Gas Space Heating)	Compliance	Savings per Home (Therms)	Gas Savings (Therms)
2023 Or. Specialty Code	976	89%	91	79,095
				79,095

** Counts toward the 2021 Power Plan Conservation Targets*

Oregon Residential New Construction

Savings Analysis (Draft)

- Added savings from the 2023 ORSC (NEEA will update the analysis with SEEM in Q3 2025)
  - Assumptions primarily come from: Energy Studies in Buildings Laboratory, University of Oregon. Aug. 21, 2023. Performance Comparison
  - 0.06 aMW electric savings in 2024 (single & multifamily homes) & 79,095 therms gas savings in 2024 (single-family homes)

Compliance Evaluation

- Electric space heating increased from 16% to 41% for the single-family homes
- More updates about compliance and adoption of heat pump water heaters to come.

Correction

- Updated the multifamily savings rate weights for the 2021 ORSC to match previous assumptions, reduced the historical savings by 0.14 aMW. NEEA will review this assumption as it models savings from the 2023 ORSC in late 2025.

New Construction Estimates

- Decreased by 11% from the 2023 estimate

Washington Residential New Construction

2024 Highlights

- The 2021 Washington State Energy Code (WSEC) went into effect, concluding a 3-year process with NEEA participating throughout by providing data and analysis
- Completed the 2021 WSEC SEEM analysis & updated the 2018 analysis
- Monitored code updates and opportunities

2024 Savings Estimates

Electric Savings Reports

Code	New Homes	Compliance	Savings per Home	Electric Savings (aMW)
2015 Washington State Energy Code	27,429	91.1%	350	1.00
2018 Washington State Energy Code	27,429	76.0%	1,399	3.33
2021 Washington State Energy Code*	4,485	76.0%	124	0.05
				4.38

Natural Gas Savings Reports

Code	New Homes (Gas Space Heating)	Compliance	Savings per Home (Therms)	Gas Savings (Therms)
2018 Washington State Energy Code	3,758	76%	125.3	357,879
				357,879

** Counts toward the 2021 Power Plan Conservation Targets*

Washington Residential New Construction

Savings Analysis (Draft)

- Draft analysis completed for the 2021 (WSEC) by Ecotope (update expected in Q3)
  -0.05 aMW electric savings in 2024 (single-family homes, completed after mid-September)
- The state-average, electric 2018 WSEC Savings Rate increased to 1,507/single-family home to account for increase electric space and water heating
- NEEA is phasing out reporting gas savings until further research can verify code-compliant market adoption of the gas options.

New Construction Estimates

- Decreased by 4% from the 2023 estimate.

Data Source Updates

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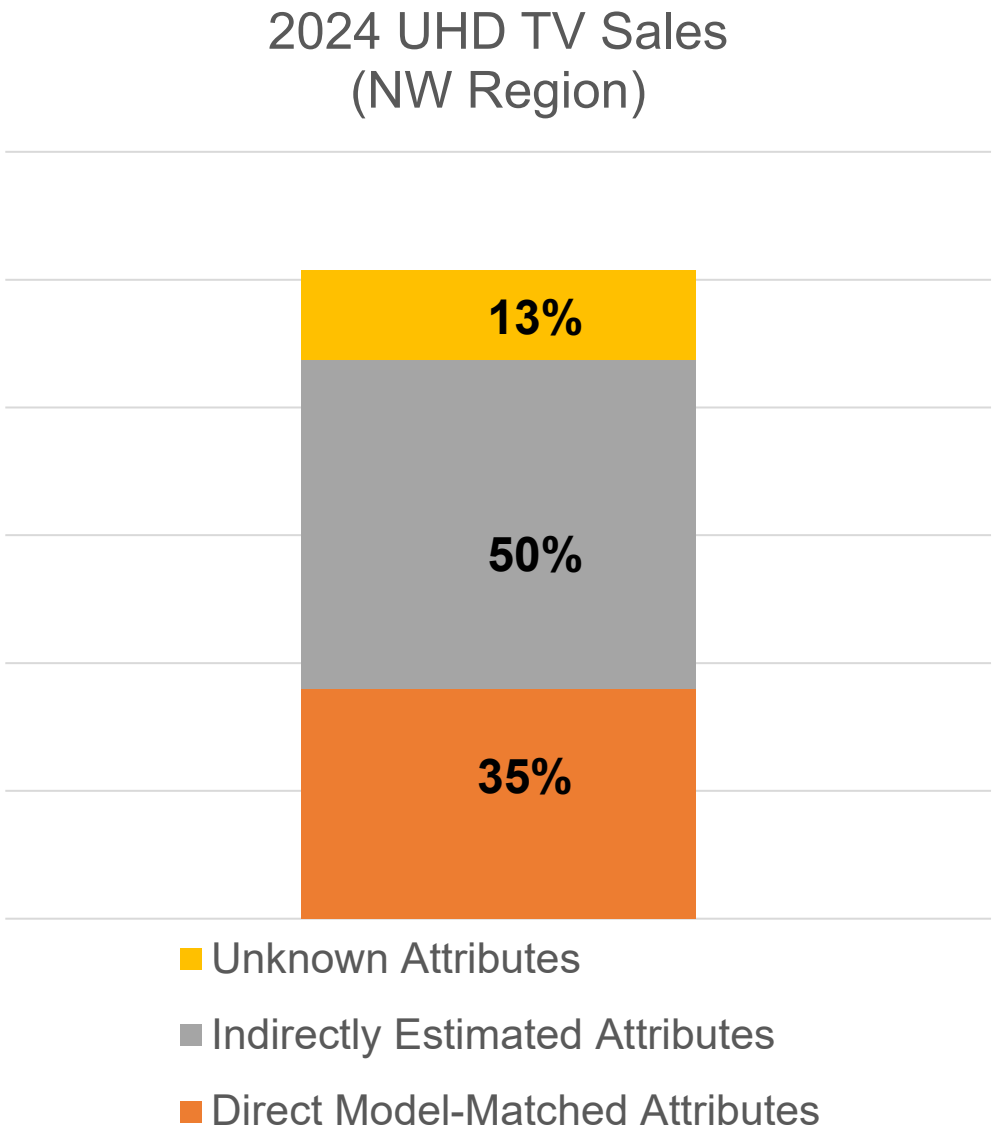
Televisions Dataset Evolution

- NEW: California Energy Commission appliance database published test data in late 2024
  - Over 600 unique models
- Allows for more robust market share estimates
- Updated average wattage values in savings rates



XMP Pumps: New Distributors

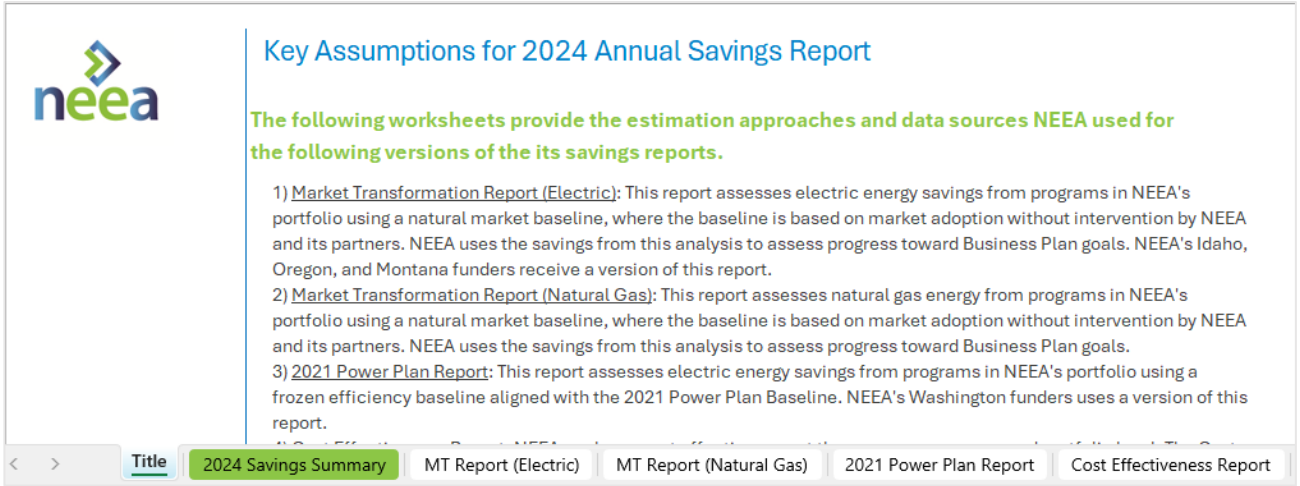
- The XMP Pumps program added two new participating distributors as part of the program strategy to address market barriers around product awareness and availability, and expanding geographic reach
- One of these distributors sells agricultural pumps throughout the NEEA region, and the other sells primarily commercial pumps in Montana
- The sales data provided by these distributors will be incorporated into program analysis and forecasting for 2025 and moving forward

Data Source Update for Luminaire Level Lighting Controls (LLLC) Shipments

- NEEA receives LLLC shipment data through a third-party data aggregator
  - Began in 2021 with 6 LLLC manufacturers
  - 8th manufacturer joined in late 2024
- NEEA estimates the tracked shipments account for 50% of annual LLLC shipments in the Northwest and extrapolates this data to report savings for the region

2024 Annual Reporting Key Assumptions

- Spreadsheet includes:
  - Estimation approaches
  - Data sources
  - Cost effectiveness inputs
  - Savings summary



BREAK

2020-2024 Market Progress and Portfolio Overview

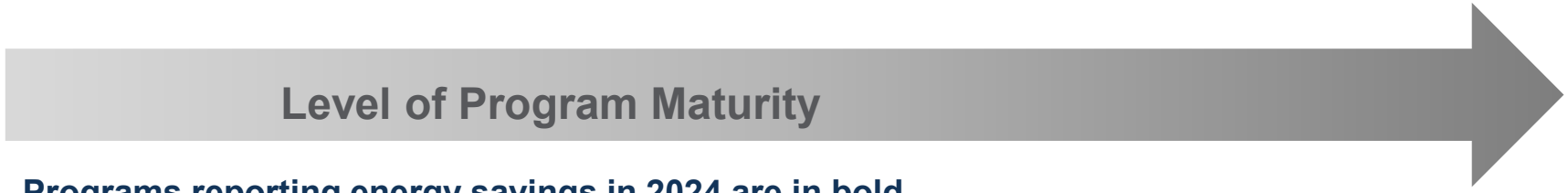
Executive Summary

- Electric portfolio is…
  - Finishing the cycle within the forecast for 2020-2024
  - Seeking acceleration and expansion of existing efforts while managing external impacts in 2025-2029
- Natural Gas portfolio is…
  - Finishing the cycle below forecast for 2020-2024
  - Advancing voluntary programs that can deliver in 2025-2029

Portfolio Context

Gas Market Transformation Portfolio

Scanning/ Concept Development	Program Development	Market Development	Codes & Standards
Dual-Fuel HVAC	Advanced Commercial Water Heaters	**Efficient Rooftop Units** – natural gas	**Residential & Commercial Codes** – dual fuel
Gas High-Efficiency DOAS			**Residential & Non-Residential Standards** – dual fuel
Additional Emerging Market and Technology Opportunities			



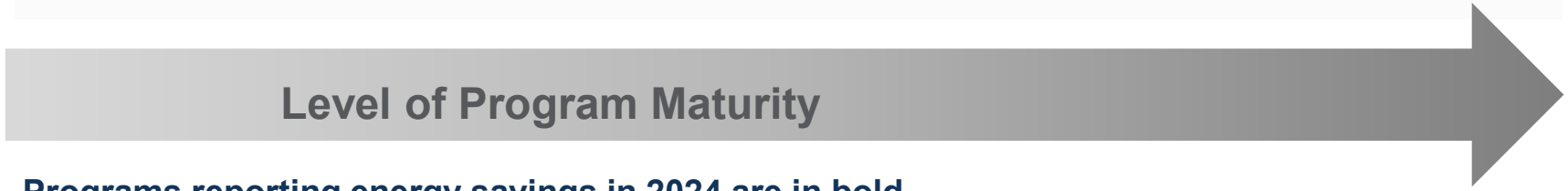
Programs reporting energy savings in 2024 are in bold

Diversifying with new programs and concepts in development

Electric Market Transformation Portfolio

Active Investments

Scanning/ Concept Development	Program Development	Market Development	Codes & Standards
	Extended Motor Products / Fans	**Heat Pump Water Heater**	**New Construction: Residential & Commercial Codes**
	High Performance Windows	**Luminaire Level Lighting Control**	**Products: Residential & Non-Residential Standards**
		Retail Product Portfolio	
		Manufactured Home	
		Extended Motor Products / Pumps	
		High Performance HVAC	
		Advanced Heat Pump	



Programs reporting energy savings in 2024 are in bold

Active Investments:

Programs NEEA is currently investing in during the current cycle, 2020-2024

Electric Market Transformation Portfolio

Previous Investments:

Long-term Monitoring and Tracking	Codes and Standards
Reduced Wattage Lamp Replacement Ductless Heat Pumps Efficient Homes Strategic Energy Management	New Construction: Residential & Commercial Codes Products: Residential & Non-Residential Standards

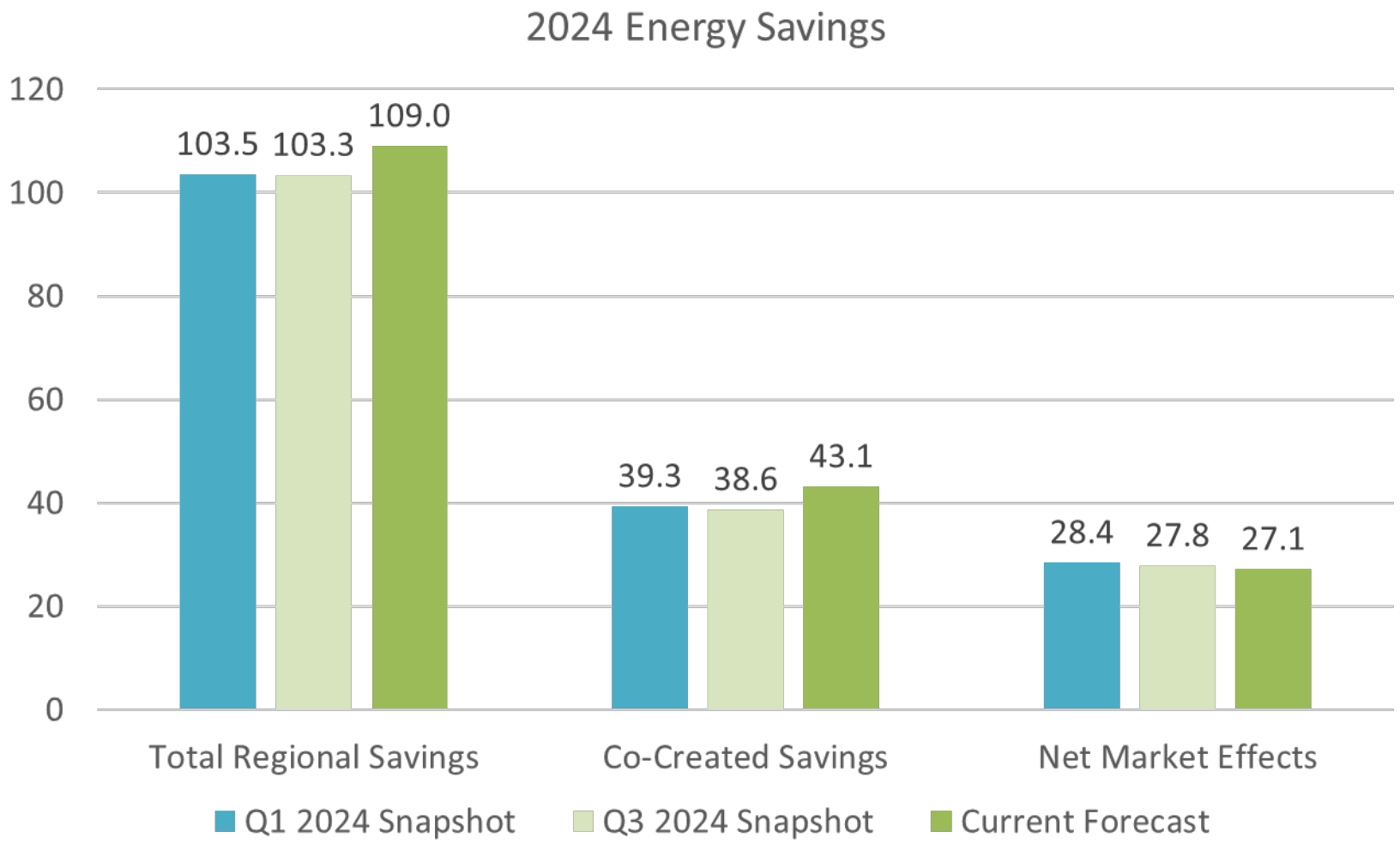
Previous Investments

No longer directly intervening in the market

First year savings above baseline still occurring in market.

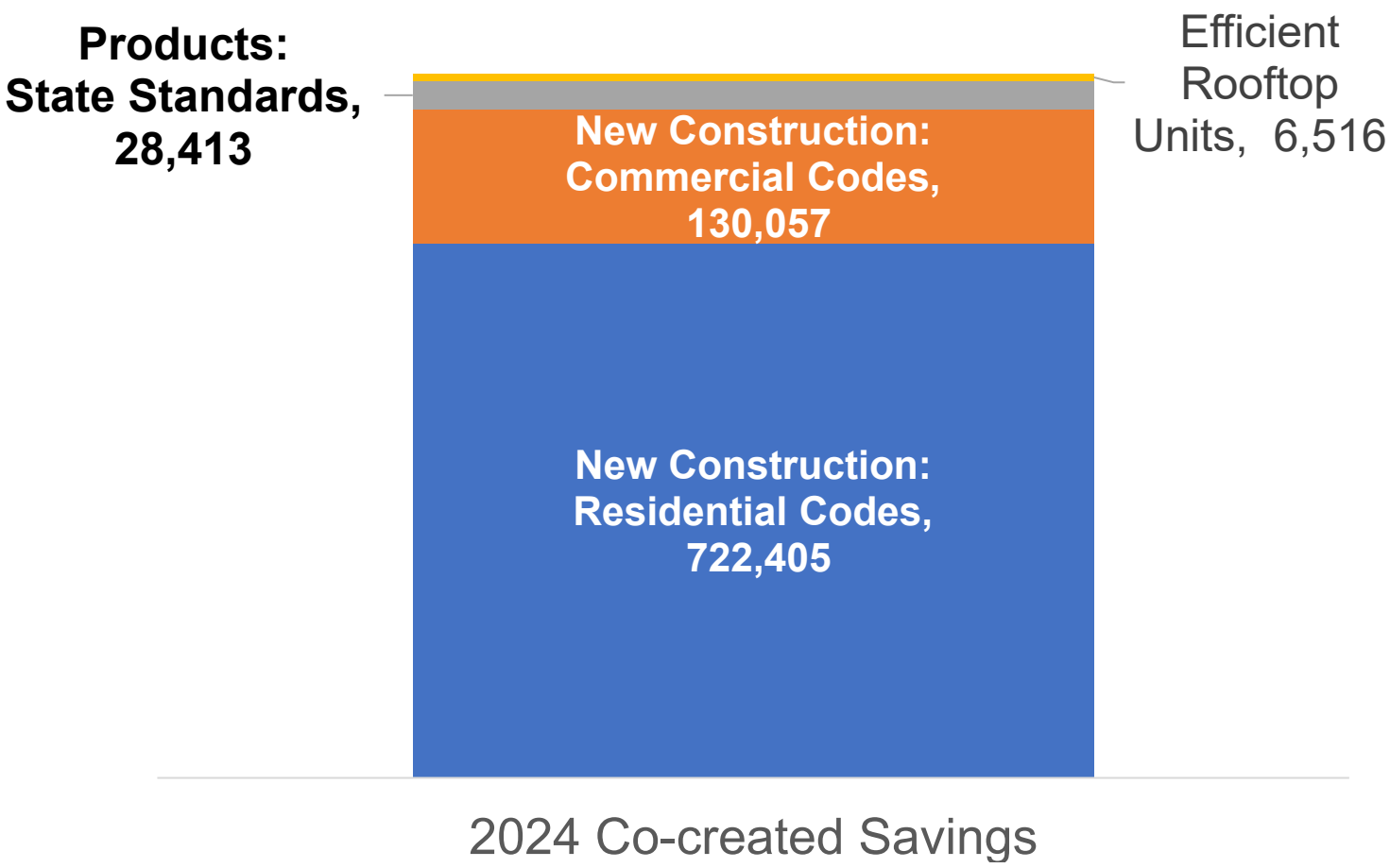
C6 Savings Results

Electric Portfolio generated 43.1 aMW of Co-Created Savings in 2023



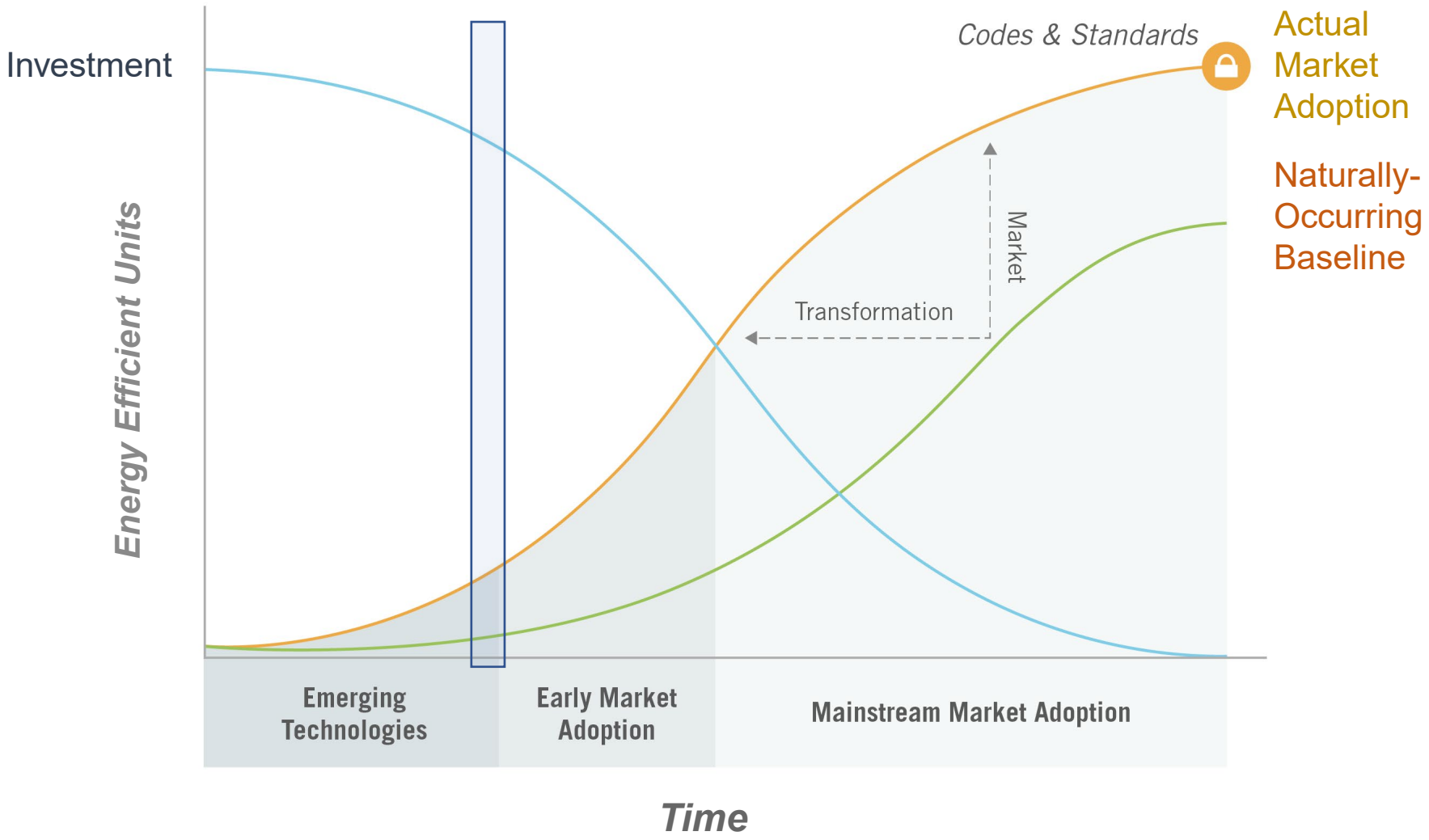
Strategic Energy Management and LLLC increased most from prior snapshot

Gas 2024 Co-Created Therm Savings



Work in Building Codes and Product Standards are generating the majority of near term energy savings

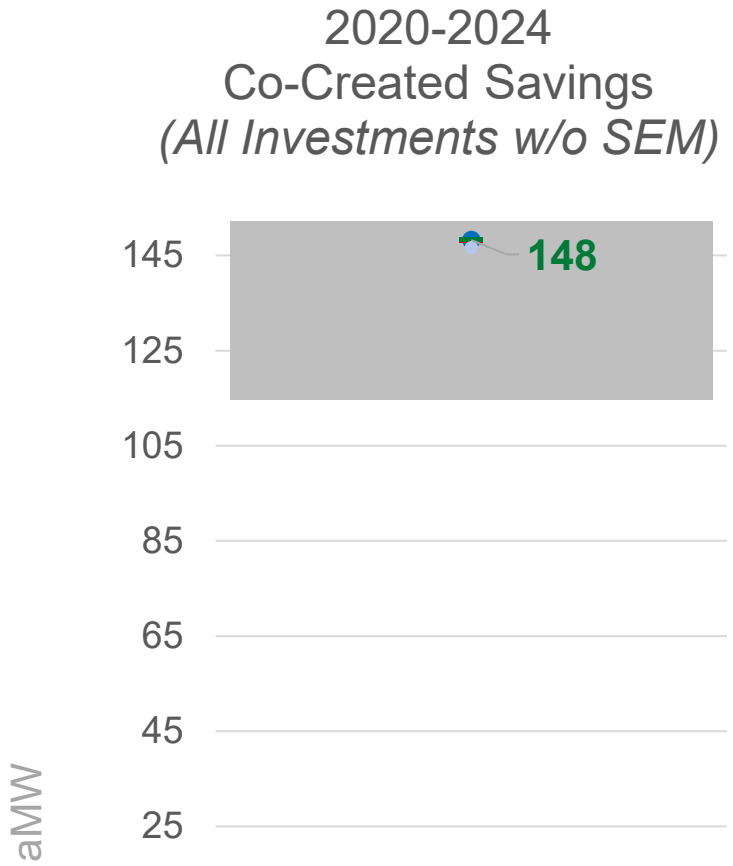
Annual Savings is one slice of results long-term market transformation lifecycle

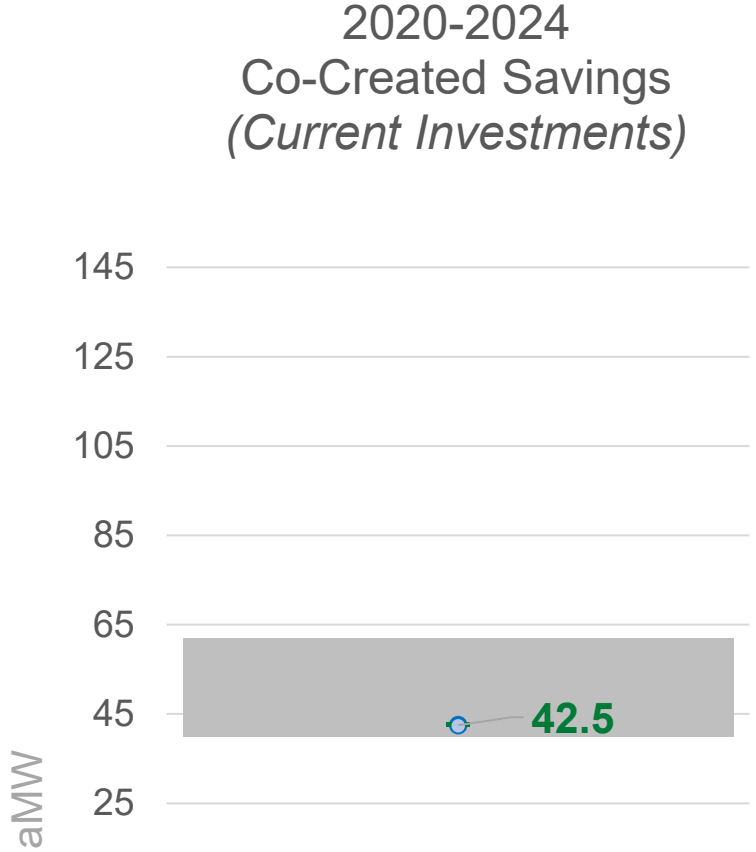


Creating sustainable, long-term conditions through transformative mechanisms:

- Product Specifications
- Improved Test Procedures
- Code
- Standards
- Supply chain commitments
- Market infrastructure and capabilities

Electric Portfolio Co-Created Energy Savings finished within Business Plan expectations





2020-2024 Business Plan Estimate

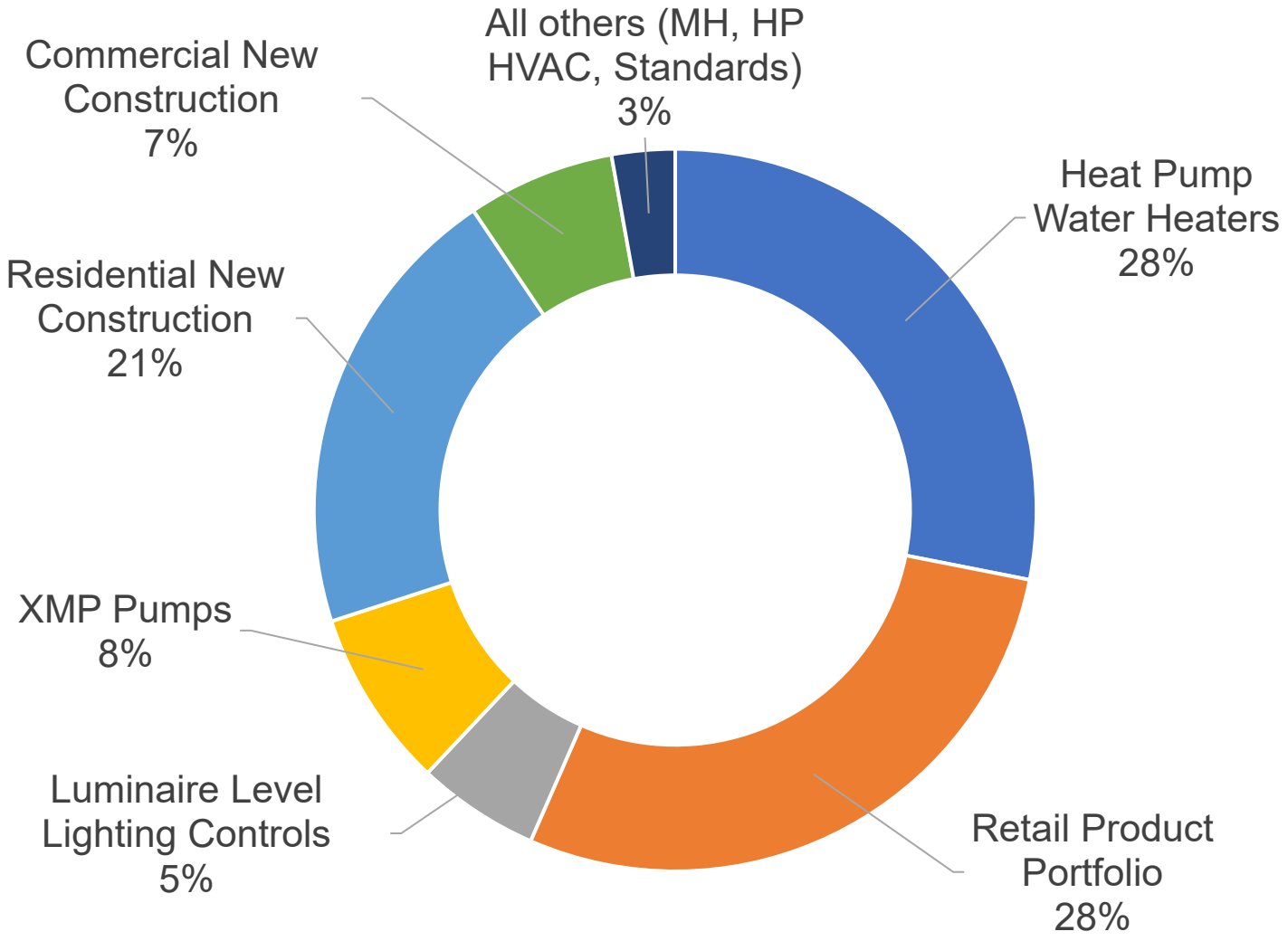
Finished cycle in the bottom quartile for current investments

- Heat Pump Water Heaters finished 82% of original forecast
- TVs savings delay by 2 yrs
- Reduced measurability for refrigerators

Finished cycle in the top quartile for all investments

- Driven by codes and standards
- Over 10 aMW from Ductless Heat Pumps

Share of 2020-2024 Electric Savings
(Current Investments)

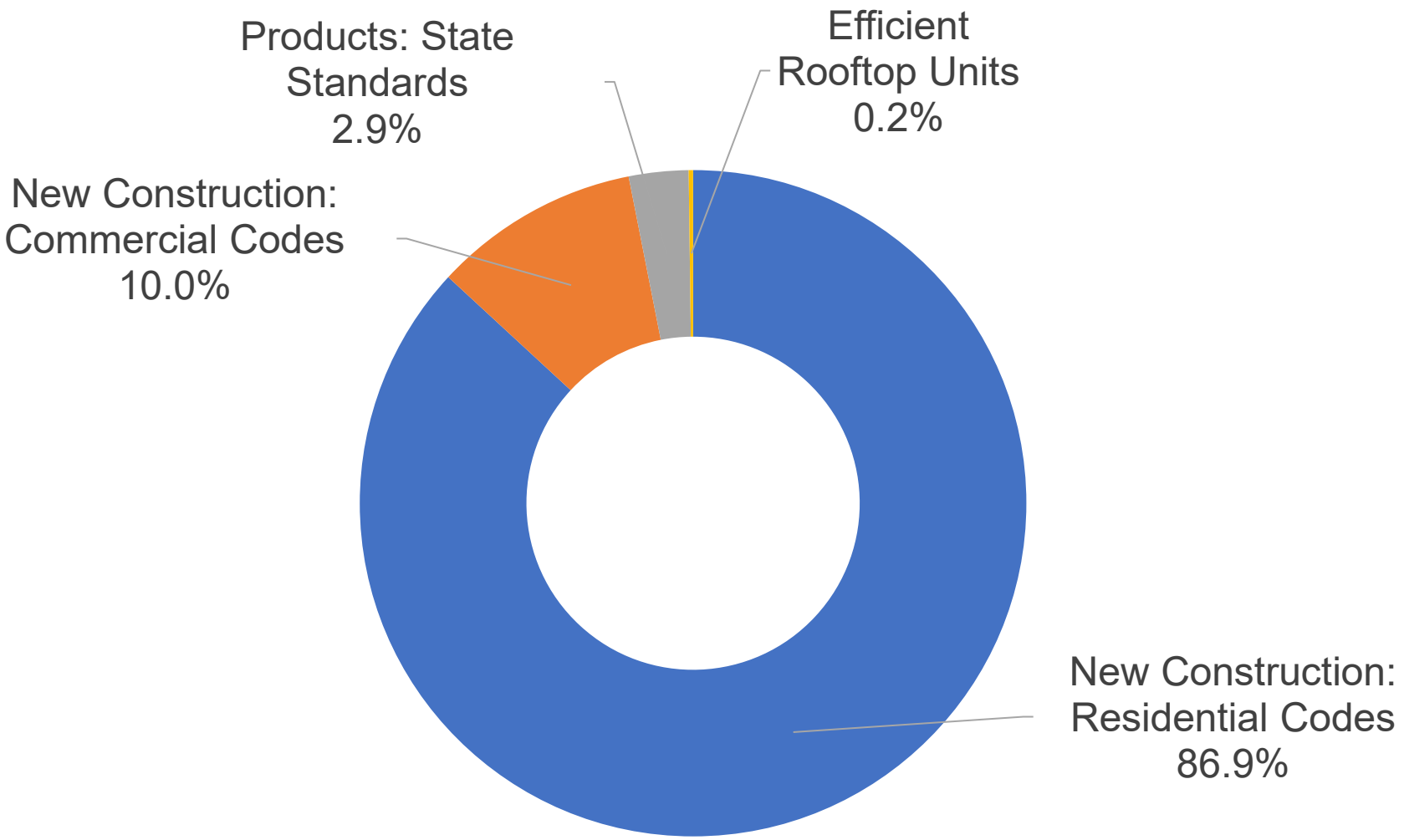


Gas Cycle 6 Accomplishments

Avoided Annual Carbon Emissions:

23,800 tons

Share of 2020-2024 Gas Savings
(Current Investments)



Work in Building Codes and Product Standards generated the majority of C6 energy savings

Other Metrics for C6

Peak, Avoided Emissions, Cost Effectiveness

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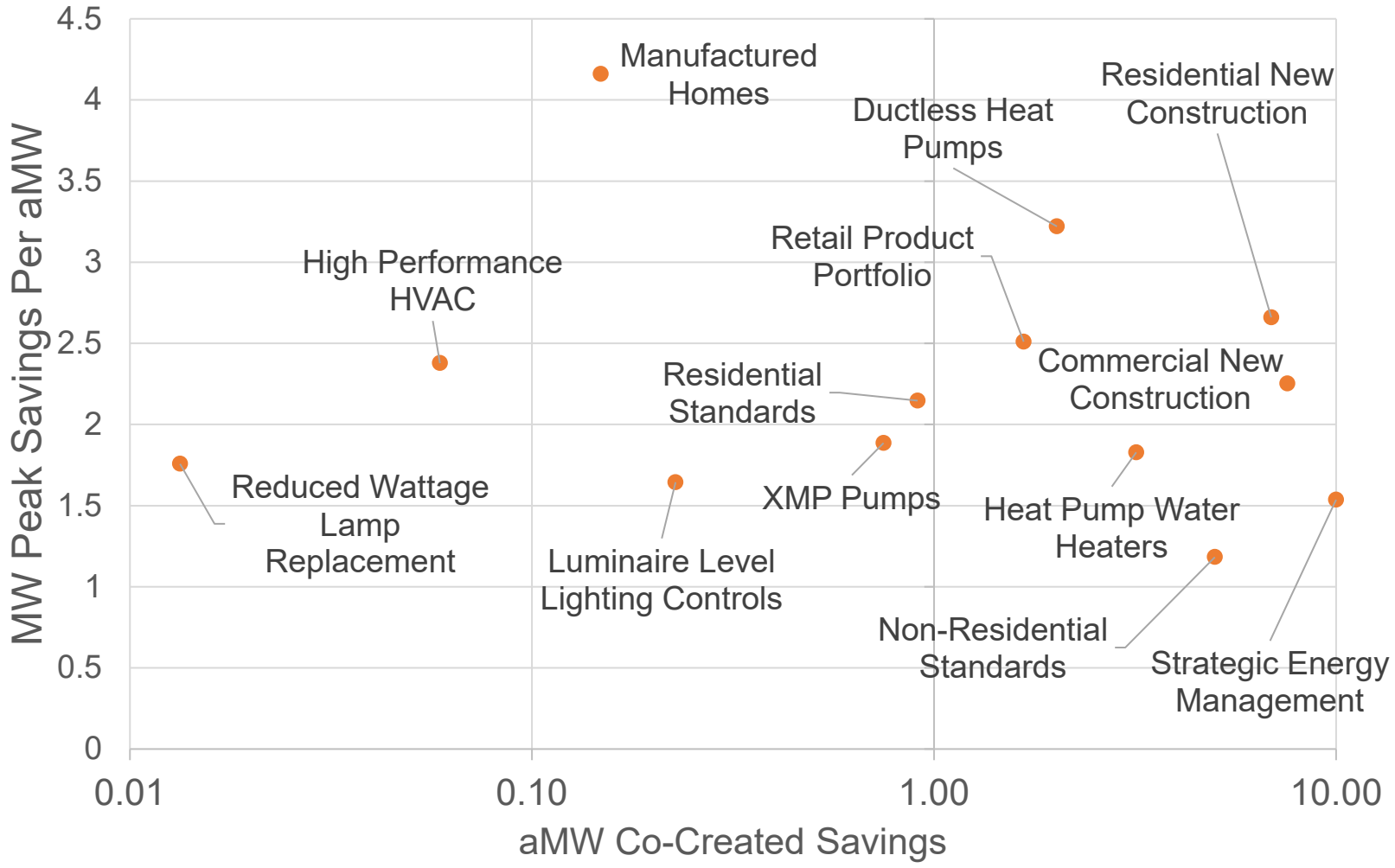
2024 Co-Created Regional Winter Peak Savings is 86 MW



Total Peak Savings

- Winter: 86 MW
- Summer: 69 MW

2024 Co-Created Avoided CO_2e Emissions are 205,900 Tons

($13 million)

Greenhouse Gas Emissions from 43,570 passenger vehicles per year

CO2 Emissions from 25,085 homes energy use per year

Carbon Sequestered by 187,360 acres of US forests in one year

Electric Portfolio Benefit-Cost Ratio is 1.95

- *20-year stream of benefits and costs to the region from programs in Market Development*
- *Includes all of NEEA Cycle 6 Budget.*

Gas Portfolio

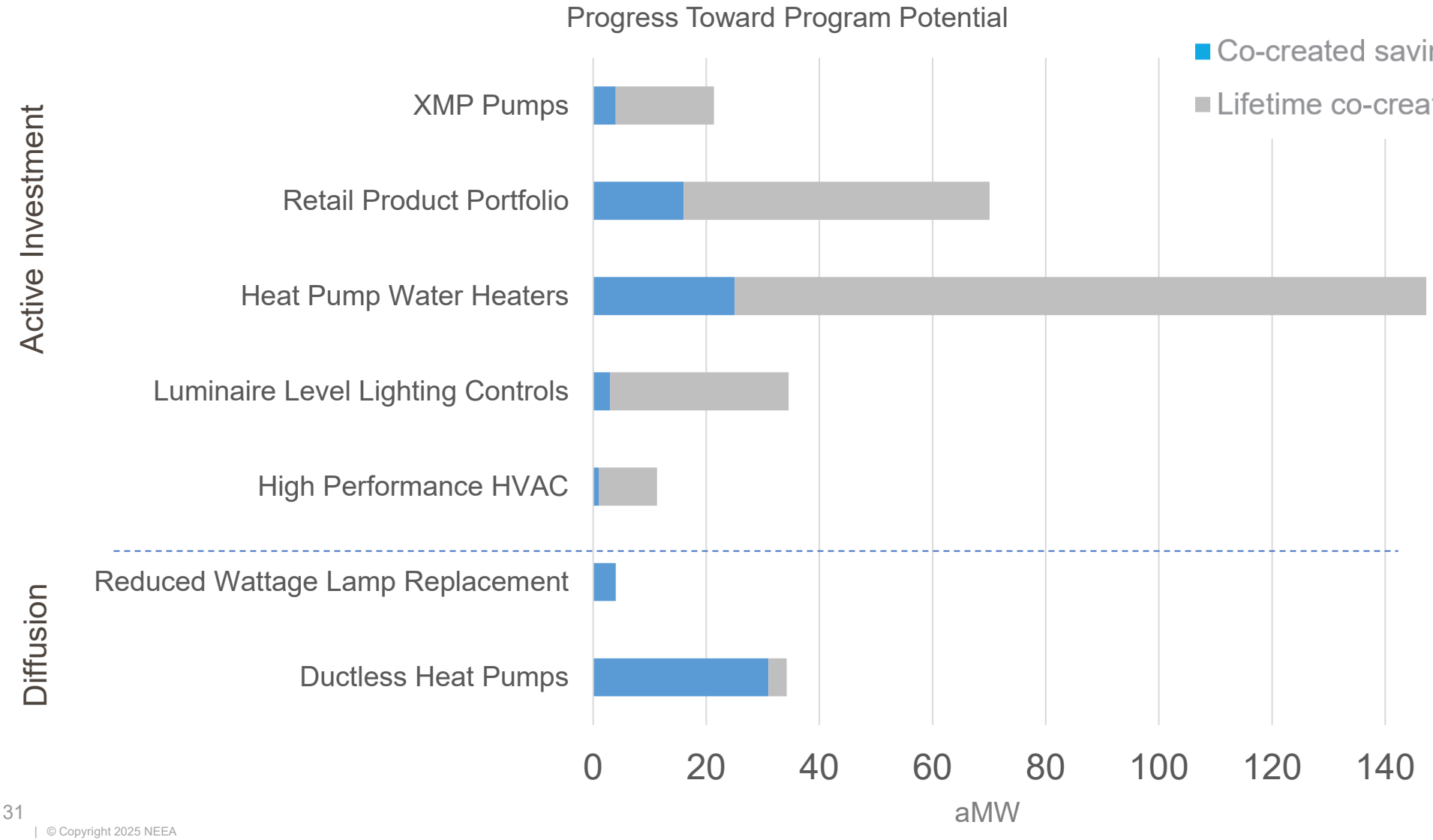
- NEEA's gas portfolio is still in development
- The ERTU program has a Benefit-Cost Ratio of 1.1

Total Program BCR: 1.1

	Component	BCR
Tier	Tier 1	1.1
	Tier 2 (CGF / ERV)	1.2
Modeled Building Type	Grocery	1.2
	Retail	1.0
	Strip Mall	1.5
	1 Floor Medium Office	1.3
Heating Zone	Heating Zone 1	1.1
	Heating Zone 2	1.5
	Heating Zone 3	1.9

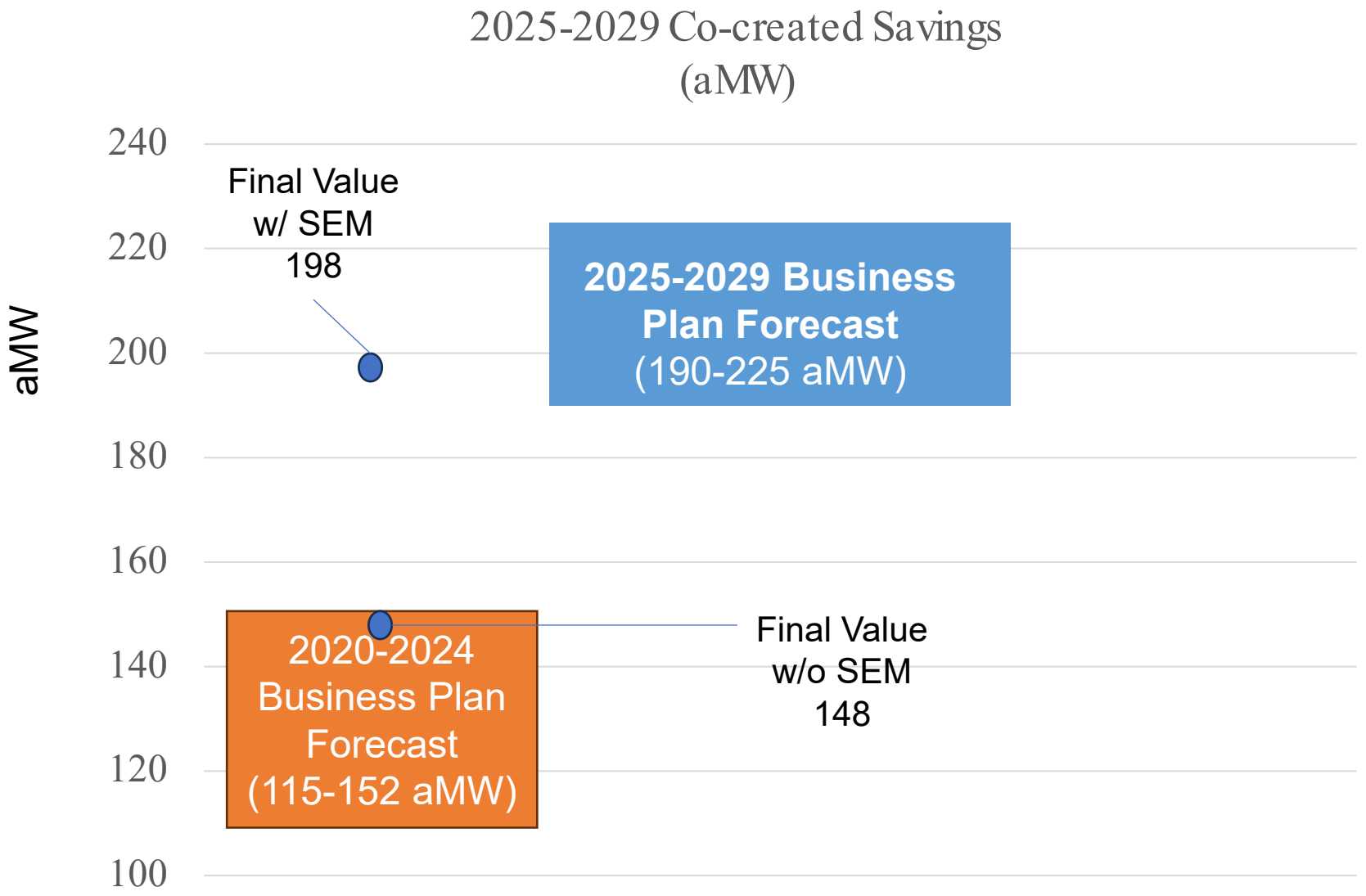
C7 Lookahead

Majority of portfolio potential still ahead



- >400 aMW of total lifetime co-created savings forecasted
- 85 aMW savings achieved to date (<17%)

2025-2029 Electric Savings Forecast



Leveraging a mature portfolio

Focusing on program acceleration and expansion

Navigating external risks

2025-2029 Gas Savings Forecast

Priority is advancing readied concepts

Focus on dual-fuel, fuel-neutral and commercial opportunities

BREAK

Market Stories by Product Group

What are market stories?

Non-savings stories of market change

Highlight key market trends

Contextualizing them within NEEA product groups:

Motor-driven systems	Water Heating	New Construction	Consumer Products	Lighting	HVAC

Motor-Driven Systems Product Group

Product Group C6 Overview

- Product Group Highlights for 2020-2024
  - Advanced Pumps program to Market Development with rapid savings
  - Entered Program Development for Efficient Fans

Cycle 6 Electric Savings
3.4 aMW

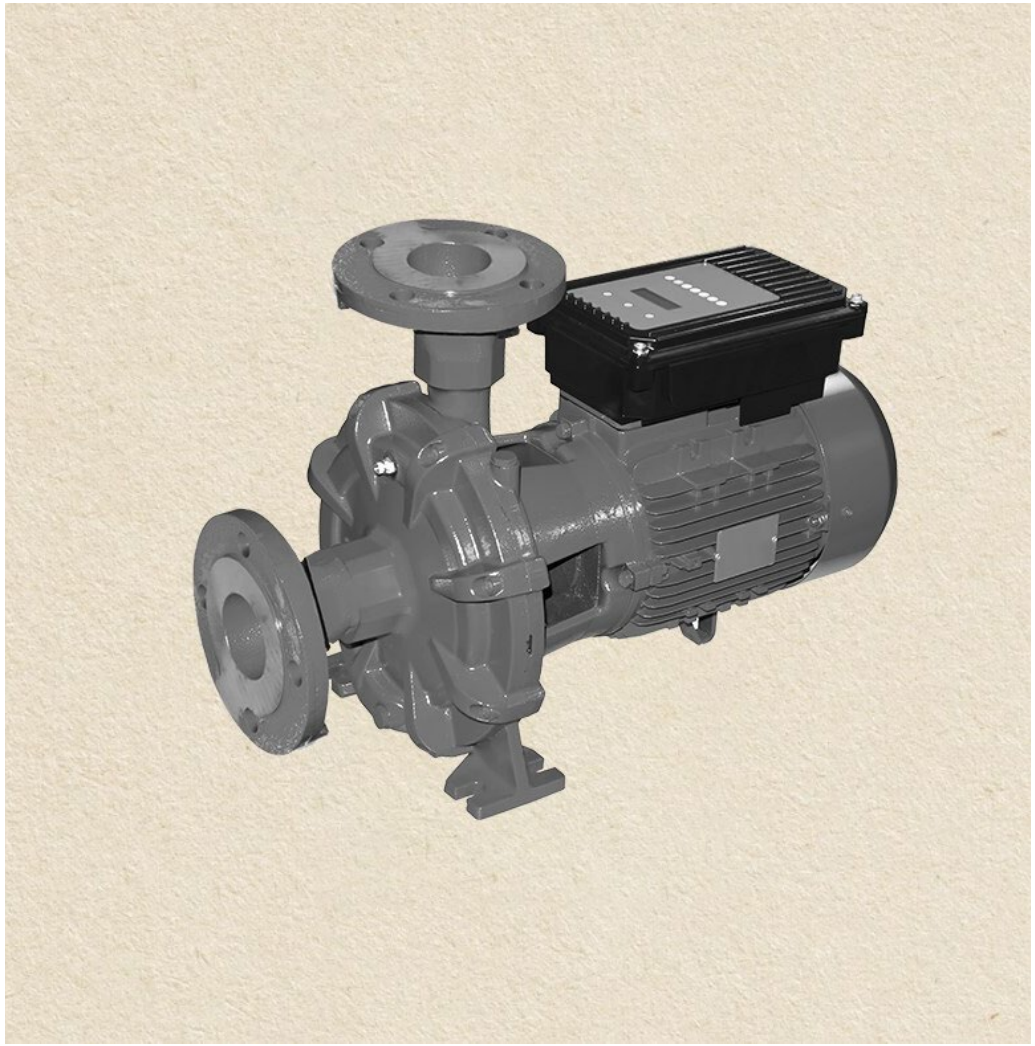
In-house Market Data Processing

Extended Motor Products (XMP):

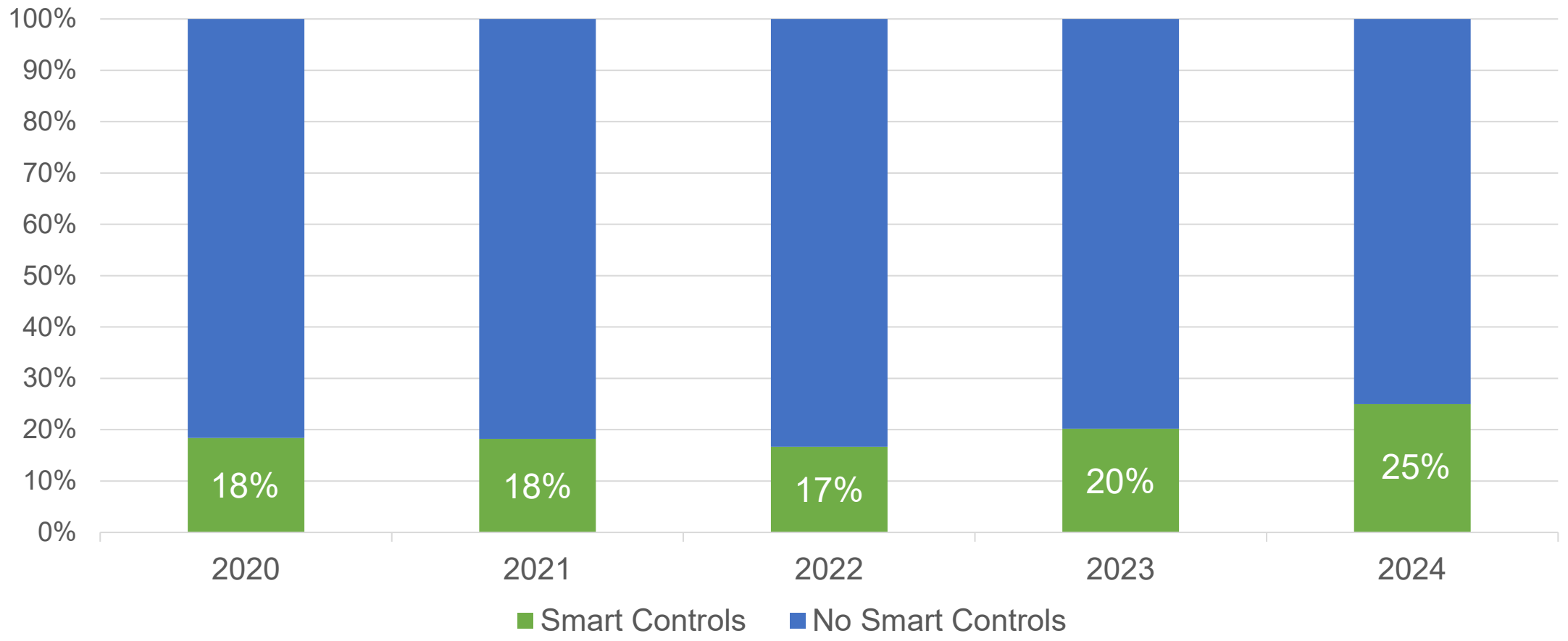
Circulator and Clean Water Pumps

XMP Market Stories: Smart Pumps

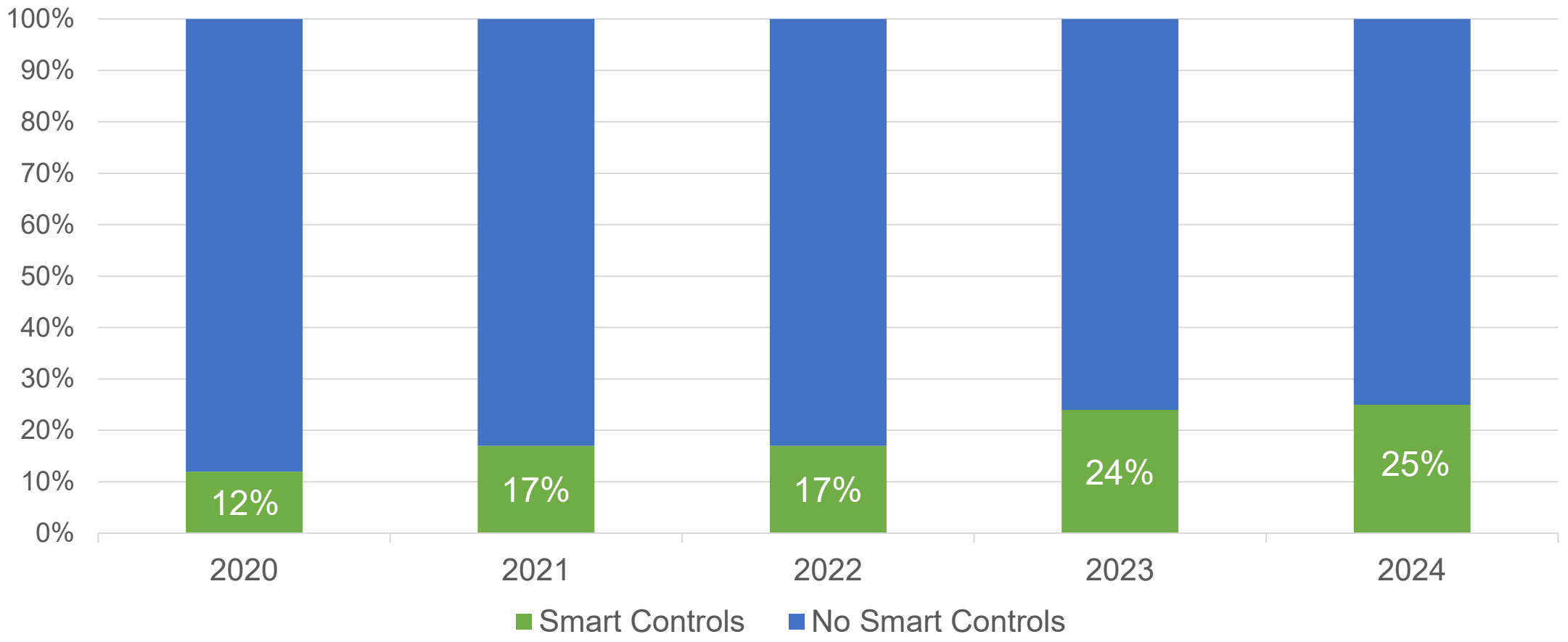
- A key goal of the XMP Pumps program since its inception has been to advance market adoption of Smart Pumps.
- Smart pumps—often termed a ‘self-sensing’ or ‘sensorless’—integrate variable speed controls to optimize operation based on system requirements.
- Thes pumps provide ease of installation and operation as well as enhanced efficiency



Market Share of Smart Controls in Clean Water Pumps



Market Share of Smart Controls in Circulator Pumps



Market Progress Evaluation Report #1 Findings

- The report indicates a significant difference in the rate of efficient pump sales among participating manufacturers' representative firms (16.1%) from 2022 to 2024, versus the rate of such sales among non-participating manufacturers' representative firms (6.6%) over the same time frame.

Product Group
Cycle 7 Lookahead

NEEA Portfolio

- Launching a Motor Systems Stock Assessment
- Strategic expansions into agricultural and other pumps
- Advance Efficient Fans program into market development

Market Factors

- Drives and smart pumps continue to gain popularity across applications
- Motors coalition proposing a metric to enable efficiency labelling for drives

Water Heating Product Group

Product Group C6 Overview

- Product Group Highlights for 2020-2024
  - Moved Advanced Commercial Water Heating into program development
  - Installations of HPWHs grew 19% market share in the region, compared to 3% nationally
  - Transition to Tier 4 HPWHs continued - over 50% in 2024
  - Influenced a federal standard rulemaking for residential water heaters

Cycle 6 Electric Savings
11.9 aMW

In-house Market Data Processing

Heat Pump Water Heaters

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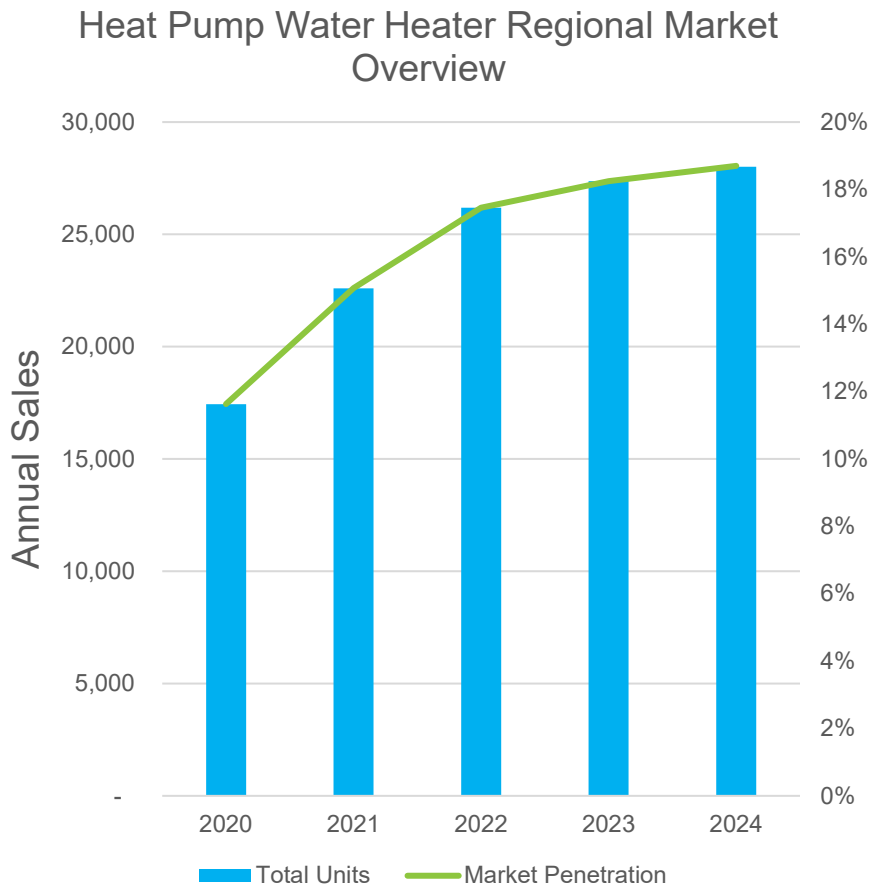
Heat Pump Water Heaters



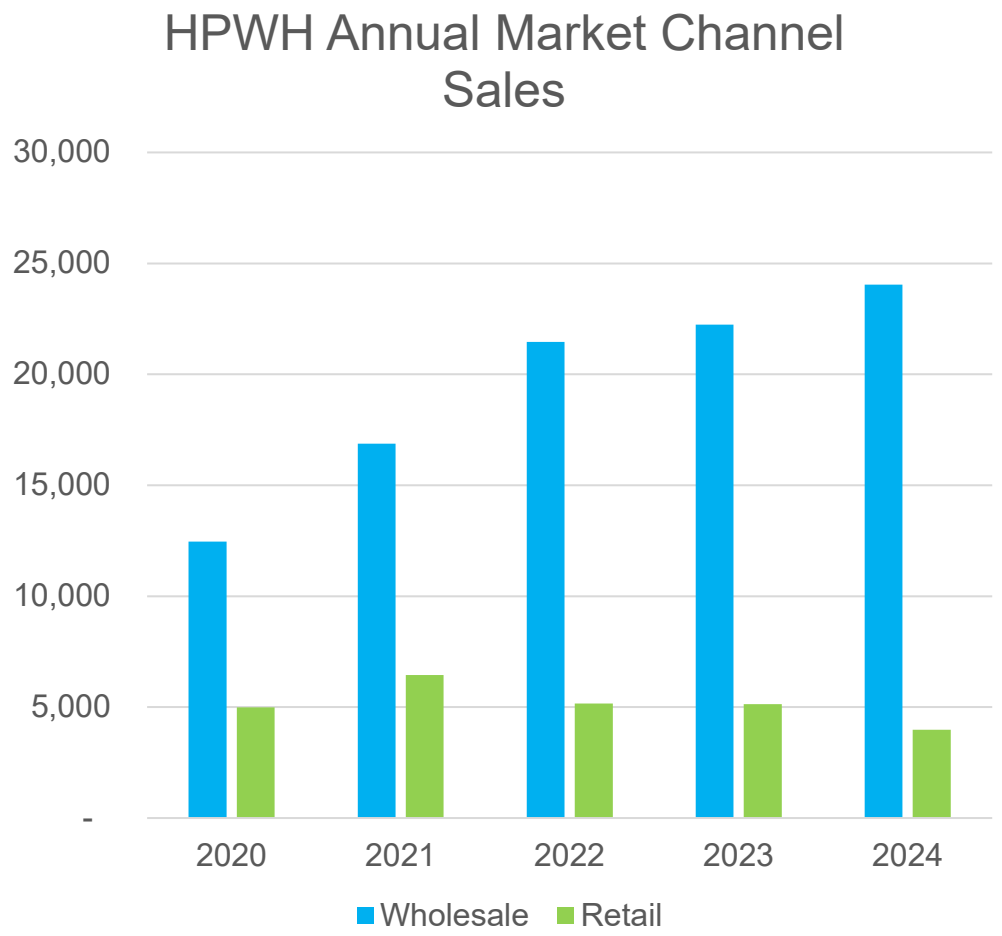
MT Theory: Increase awareness and demand for heat pump water heaters among consumers in the Northwest

Key Takeaways

- Over 120,000 Heat Pump Water Heaters installed in Service Territory over Cycle 6
- Minor amount of market growth for 2024; year end values came in below expectations due to observed decline in retail market sales
- Significant growth in market share through new construction channels
- Consistent support from local programs throughout business cycle

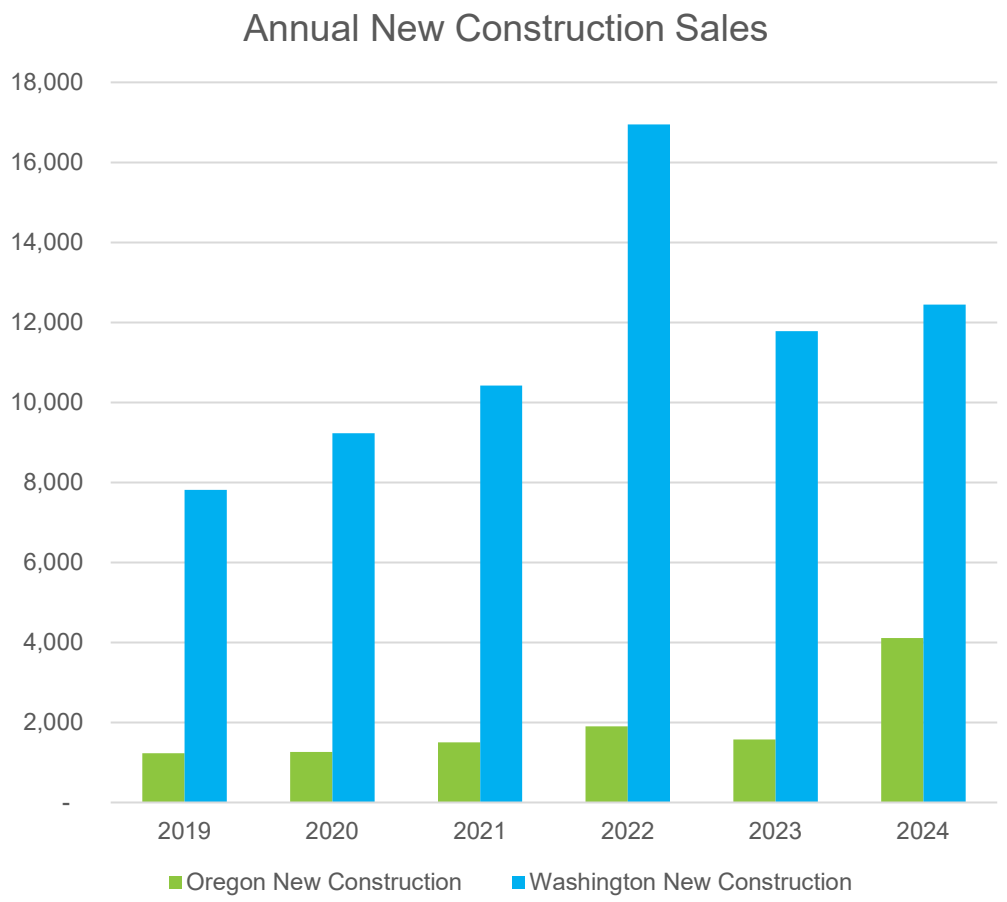
Retail Sales Trends

- Current observed trends suggest a decline in sales through retail channels
- Expanded retail sales data for HPWHs will be available through RPP starting next month



New Construction Trends

- Significant growth in new construction markets
- HPWH currently near 100% market share for new, electric single-family homes in Washington
- Code compliance evaluation Oregon residential codes reported an increase in market share for HPWH from 17% to 43%



Product Group
Cycle 7 Lookahead

NEEA Portfolio

- Preparing the market for the standard in 2029
- Moving Advanced Commercial Water Heating into market development

Market Factors

- More availability of water heaters with Demand Response capability
- Seeking innovation to meet space-constrained small tank installs

New Construction Product Group

Product Group C6 Overview

- Product Group Highlights for 2020-2024
  - New codes adopted in all four states
  - Continued education and training programs to increase compliance
  - Analysis and evaluations to inform future code development and support savings analysis
  - Transitioned from programs in new construction to focus on code development and compliance

Cycle 6 Electric Savings	Cycle 6 Gas Savings
78 aMW	3.6 MM Therms

Manufactured Homes

Groundwork

- New Manufactured Homes
  - Factory-built, regulated by HUD since the 1970s
- **NEEM - Efficient new manufactured homes**
- NEEA involved since the 1990s, program initiated ~2016[1]
- Partnered with Northwest Energy Works to support:
  - NEEM-certified homes in the Northwest through manufacturers and retailers
  - Addition of NEEM v2.0 / NEEM Plus
  - Alignment with national efficiency specs (HUD, Energy Star, etc)
- Program moved to Market Diffusion (aka LTMT) in 2024[2]
  - NEEM v1.1 market share steady ~50%; NEEM v2.0/NEEM Plus low but steady share
  - NEEM (and implementer / certifier Northwest Energy Works) apparently sustainable but with risks

Specification	Brand
NEEM v1.1	Energy Star (current v.2)
NEEM v2.0	NEEM Plus

[1] Manufactured Homes Transition MPER Final Report
[2] NEEA Product Council Dec 2023

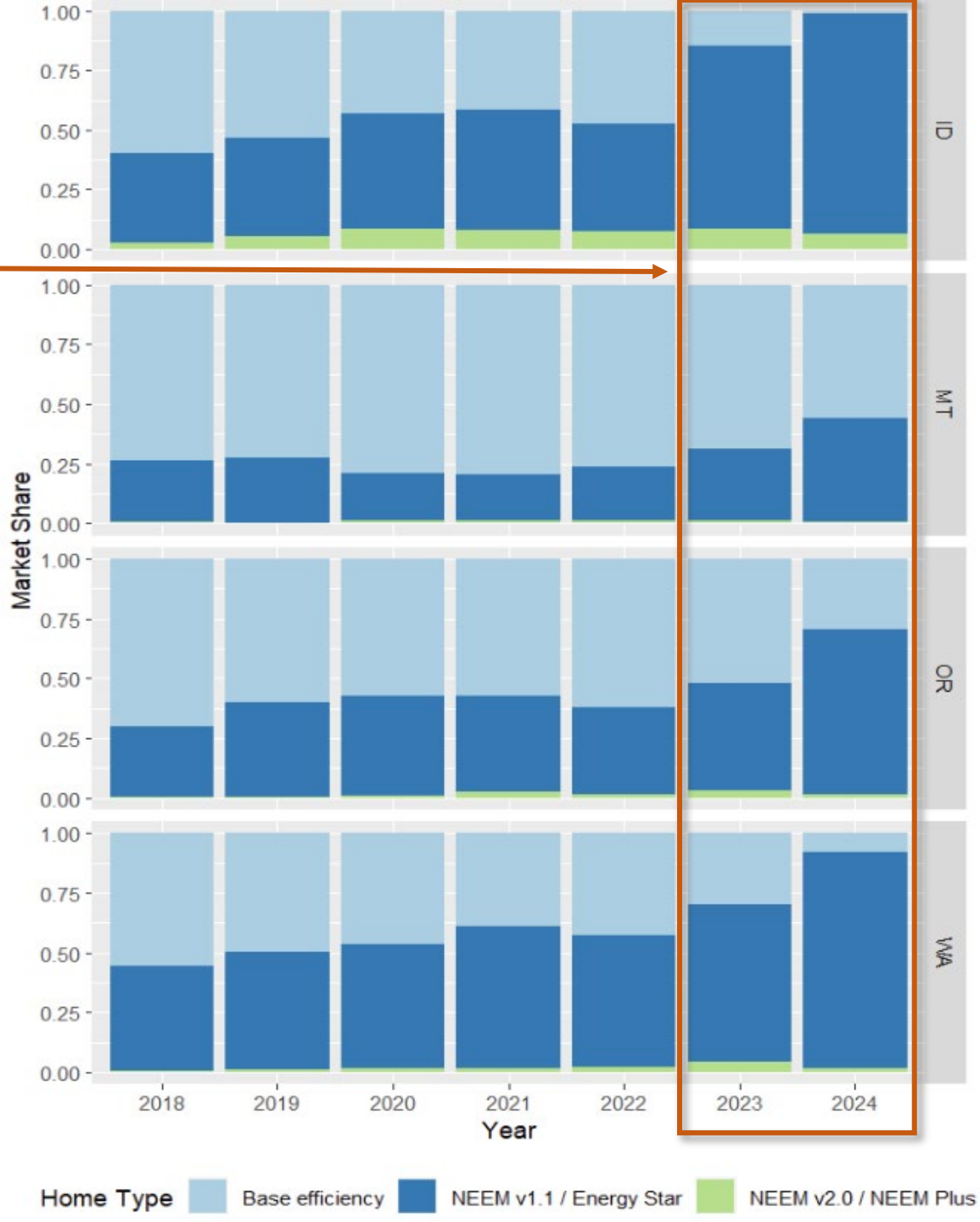
NEEM Takeover

NEEM v1.1 market share jump in 2023-2024

Why? NEEA / Northwest Energy Works groundwork

- **Alignment**
  - Since 2023, IRA Section 45L tax credit to builders
    - **$2500 for Energy Star v2 (NEEM v1.1 homes qualify)**
    - $5000 for Zero Energy Ready Homes (not aligned with NEEM)
  - Federal Conservation Standard - multi-sectional homes July 2025
    - **Approximately aligned with NEEM v1.1**
- **Builder and retailer capability**
  - Already able to build and sell NEEM / Energy Star manufactured homes at scale

Years of effort to get to this point



Future Uncertain

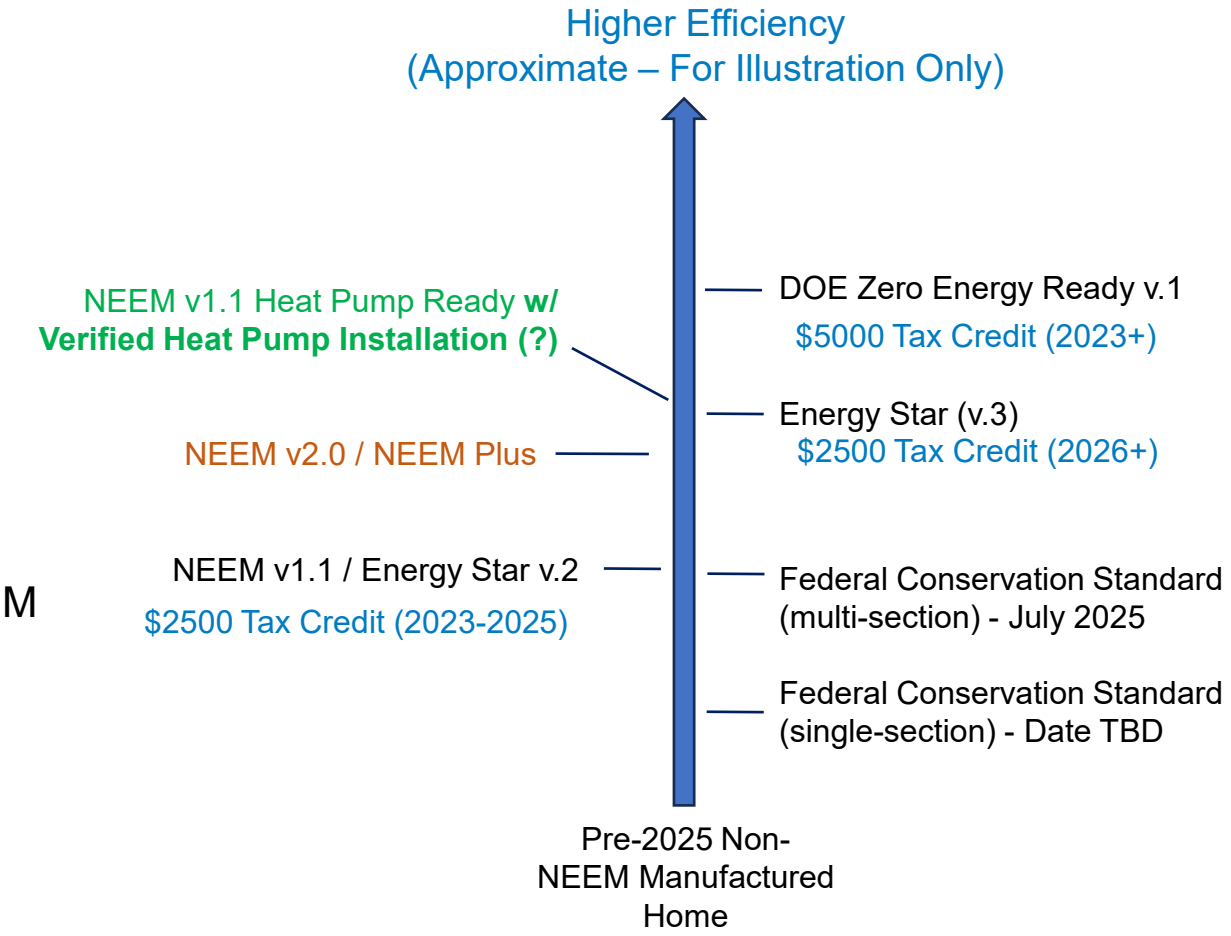
- Energy Star v.3 (potentially Jan 2026)
  - Not factory-certifiable
- Federal Conservation Standard
  - Multi-section (July 2025) vs. Single-section (TBD)
- In-factory quality assurance – not rewarded
  - Key contribution of Northwest Energy Works / NEEM
- NEEM Plus – not rewarded / aligned

Also, some risk to IRA 45L $$

Risk to NEEM and Northwest Energy Works

- Ongoing effort to navigate, adapt
- See NEEA Product Council Dec 2023

Keep monitoring!



Note: See the Regional Technical Forum's November 2024 Presentation on New Manufactured Homes for a more detailed analysis of proposed efficiency levels.

Product Group
Cycle 7 Lookahead

NEEA Portfolio

- Continuing code compliance studies
- Code training and technical assistance

Market Factors

- Tracking policy shifts across the region

Consumer Products Product Group

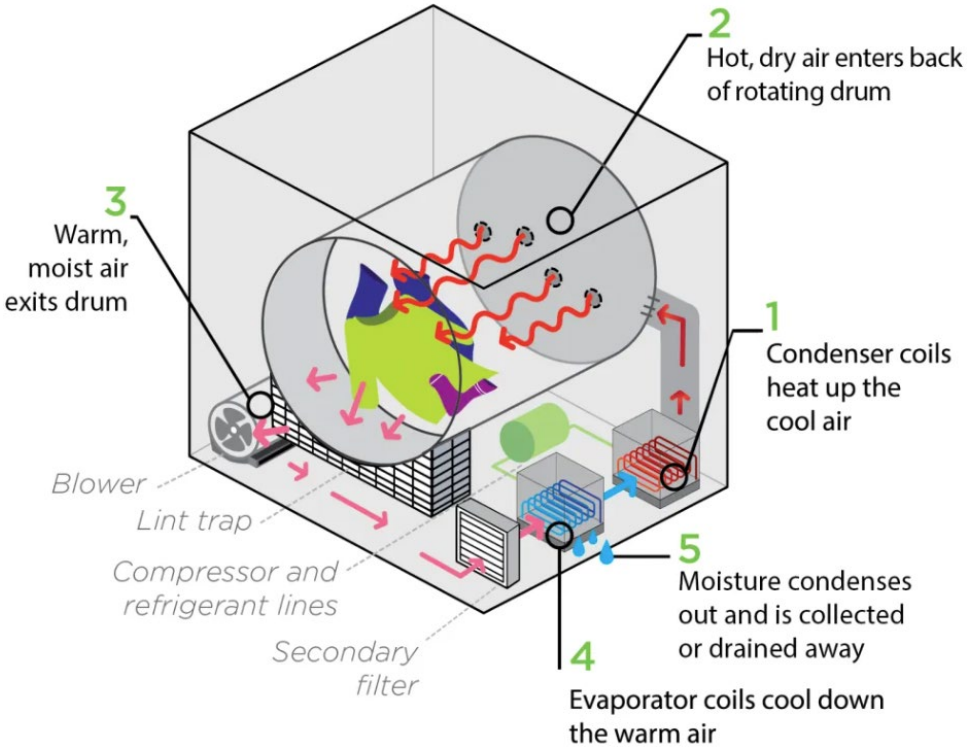
Product Group C6 Overview

- Product Group Highlights for 2020-2024
  - Achieved over 30% of US households represented in national program
  - Improved test method for televisions and supported ENERGY STAR® Version 9.1
  - Super-efficient dryers combined with Retail Products Portfolio
  - Supported several ENERGY STAR specifications through data sharing and comments

Cycle 6 Electric Savings
12.1 aMW

Retail Products Portfolio: Dryers

Heat-Pump Dryer Influence



NEEA Super-Efficient Dryer Program:

Initiative Start in 2014

Foundational Research:

- Testing real world energy use of dryers and consumer laundry behavior
- Research highlighted non-energy benefits like the ventless feature and reduced clothing wear and tear

Program Interventions:

- Test protocol and specification development
- Present and reinforce value proposition to manufacturers
- Incentives to manufacturers to overcome product availability
- Support for utility programs to overcome high first cost
- Marketing to increase consumer awareness of efficient dryers

All-In-One (AIO) products with Heat Pump technology entered the market mid-year 2023

Space-Saving

27”

Energy Efficiency

39”

Convenience

Heat Pump Technology

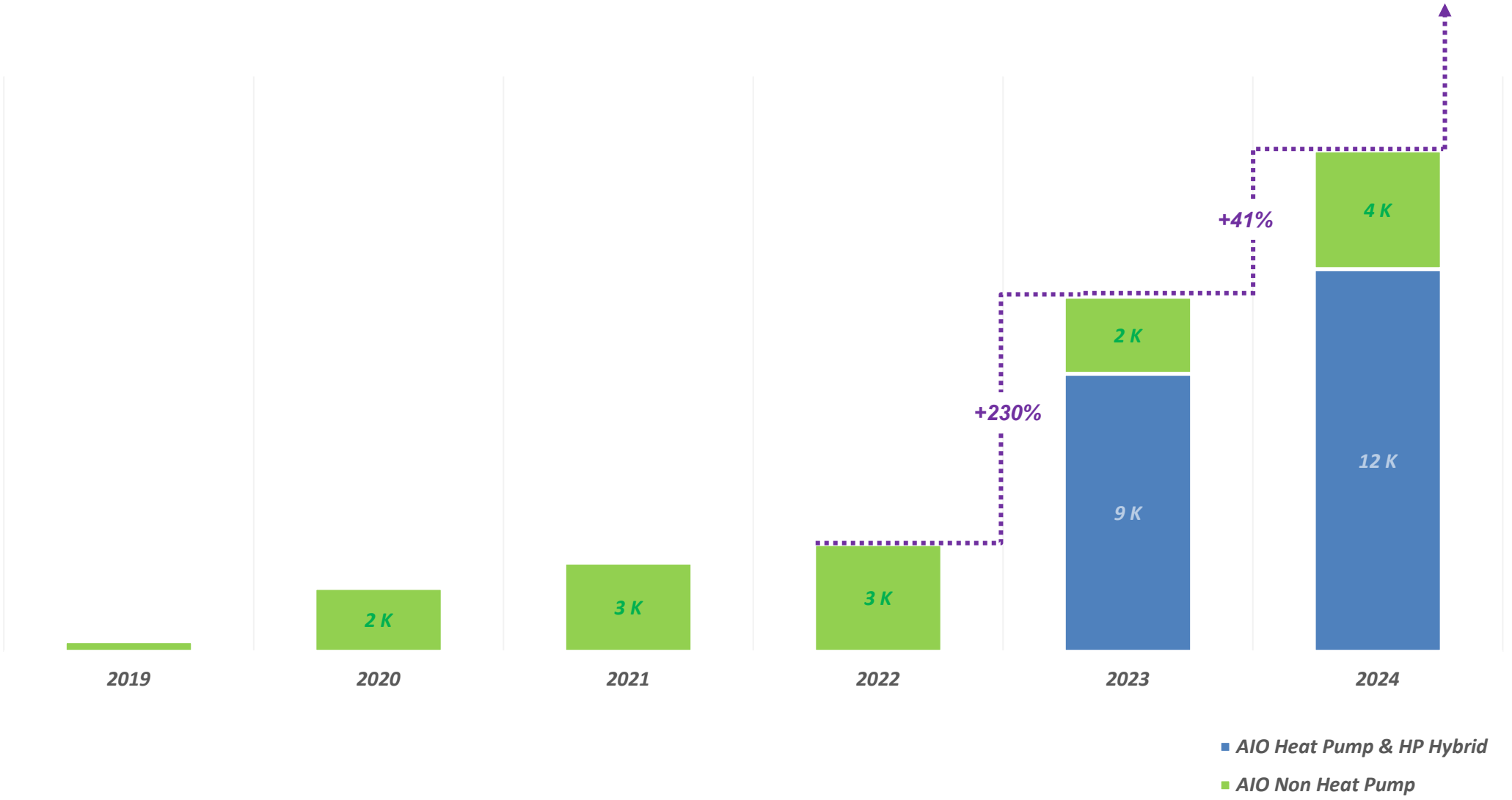
120v Power cord

Water Connection

Ventless

Water Drain

The Rise of Heat-Pump All-In-Ones



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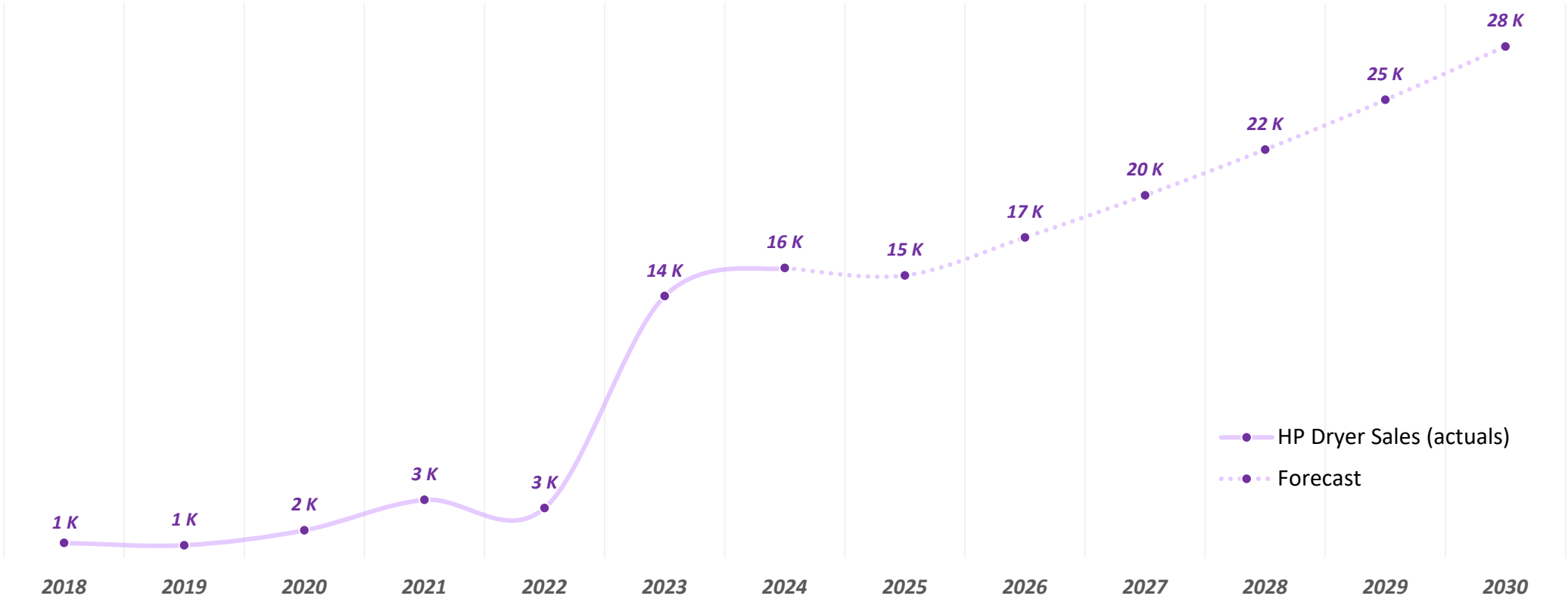
Overall HP Dryer Sales unit Trend



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Product Group
Cycle 7 Lookahead

NEEA Portfolio

- Deepening advancements in TV efficiency
- Considering future laundry strategy

Market Factors

- Affordability is a focus

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Lighting Product Group

Product Group C6 Overview

- Product Group Highlights for 2020-2024
  - Growing the number of available qualified LLLC products by 80%
  - Demonstrating the business case for efficient lighting, allowing these products to be included in industry design standards
  - Sales of LLLC grew by 360%

Cycle 6 Electric Savings
3.6 aMW

Luminaire Level Lighting Controls

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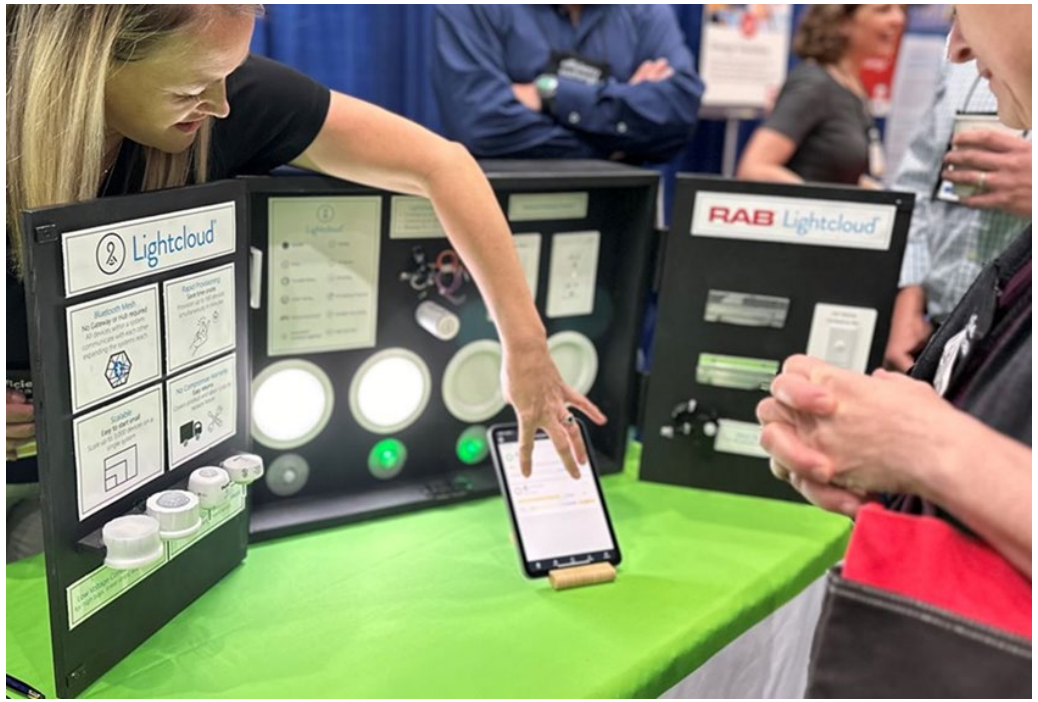
Luminaire Level Lighting Controls (LLLC)

About Program: **The program engages key manufacturers and their supply chain to enhance promotion and sales in the Northwest, builds market awareness and capabilities via regional and national industry organizations as well as key market influencers and early adopters.**

Highlights:

- Annual shipments increased by 89%
- All manufacturers saw at least 40% growth in sales

Addressing Market Barriers: Demo Boards



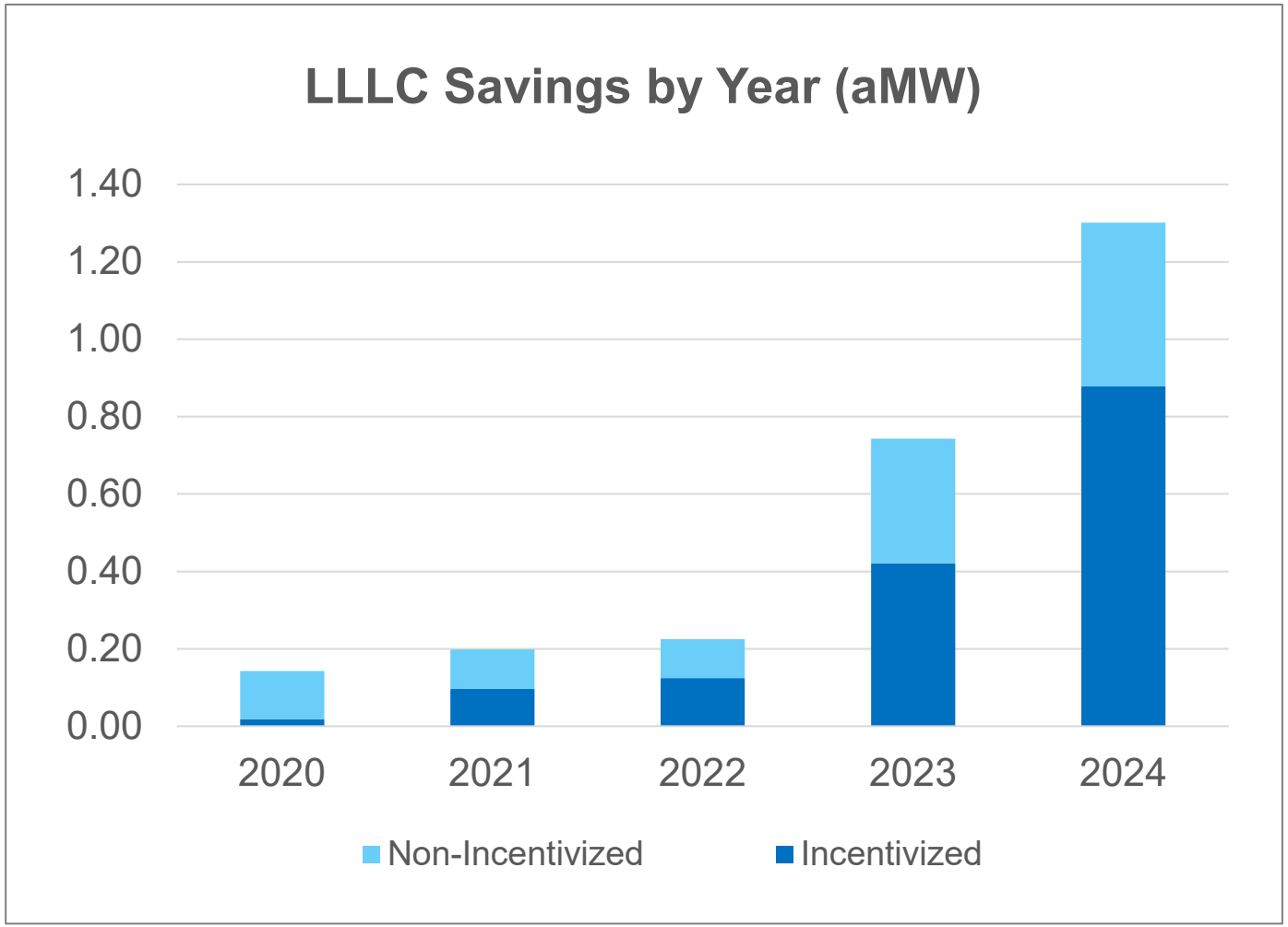
- Purpose:
  - Demonstrate LLLC capabilities and promote its value
  - Hands-on experience to set up and configure LLLC system
- Positive reception of demo boards led to more showcasing at industry conferences and technical trainings

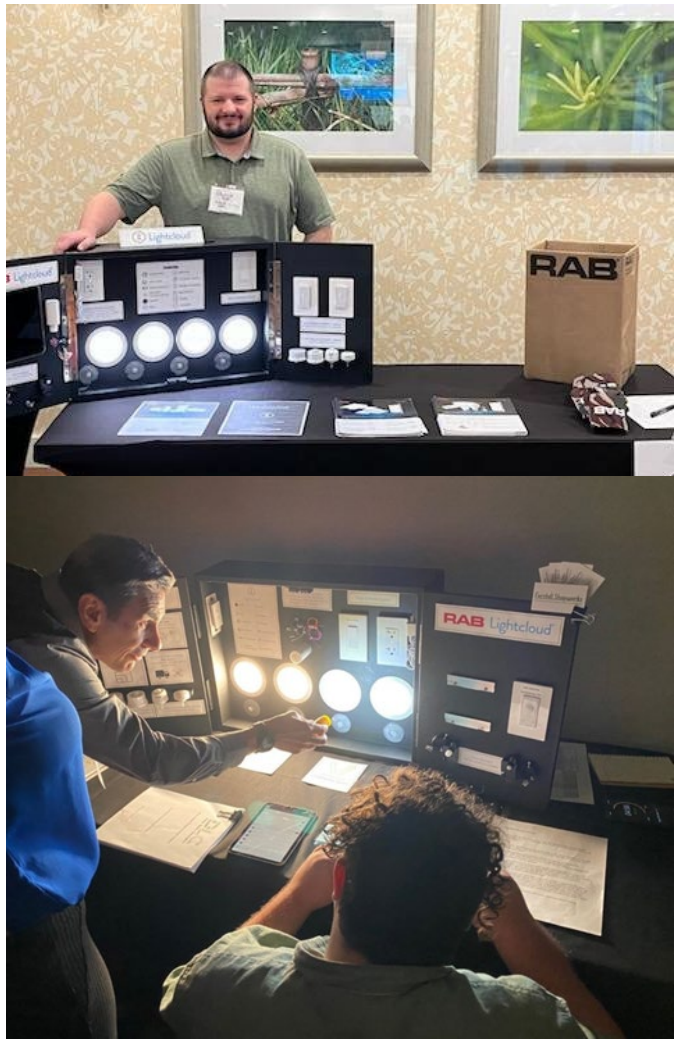
Usage of Demo Boards

- Professional Association Events & Conferences
- Utility-hosted Trade Ally Training
- Sales Tool for Manufacturer Reps



Local Programs Drive Growth in LLLC Savings





Product Group
Cycle 7 Lookahead

NEEA Portfolio

- Monitoring complete on Reduced Wattage Lamp Replacements
- Increasing momentum for LLLC

Market Factors

- Connected products that control multiple building systems (lighting + HVAC)

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HVAC Product Group

Product Group C6 Overview

- Product Group Highlights for 2020-2024
  - Moved Advanced Heat Pumps, High-Performance HVAC, and Efficient Rooftop Units into Market Development
  - Influenced several changes to the AHRI test procedure for Residential Heat Pump ratings
  - High-performance HVAC qualifying HRV/ERV products expanded from under 10 to over 100
  - Ductless Heat Pumps completed 2 diffusion studies showing evidence of sustained change

Cycle 6 Electric Savings	Cycle 6 Gas Savings
10.8 aMW	8k Therms

In-house Market Data Processing

Gas & Dual Fuel

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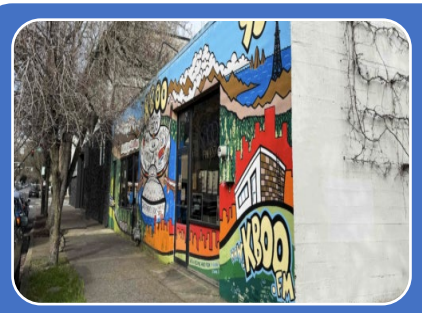
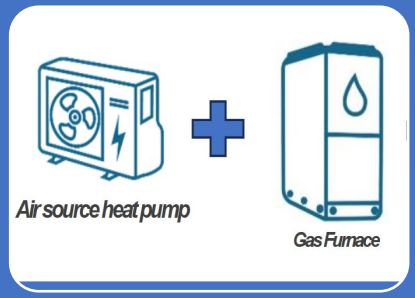
Market Story: Performance Validations and Field Demonstrations



Efficient Rooftop Units

- KBOO radio station site field test
- Whole-building gas savings of 64%!
- Savings in line with modeling and lab testing, validating those results



Dual-fuel res HVAC

- Two modeling studies soon to be published
- System energy savings up to 60% and reduction in gas up to 87%
- Installation begun on field demonstration to validate modeled results

Gas High Efficiency DOAS

- Many technical support projects for electric program showing savings of up to 60%
- Monitored one hydronic system (many of which use condensing gas boilers) and now pursuing modeling

Product Group
Cycle 7 Lookahead

NEEA Portfolio

- Focus on heat pumps, heat recovery ventilators and dual fuel solutions
- Expansion of commercial programs into dual fuel efforts
- Advancement of residential dual fuel program

Market Factors

- Phase-out of high Global Warming Potential refrigerants
- Continued addition of cooling in the region
- Proliferation of variable speed technology

Wrap-up

How was your experience?

- Public Comment?
- Upcoming Meetings:
  - August 27th, 2025
- Feedback:
  - Overall
  - Agenda
  - Packet Materials
  - What went well?
  - What needs work?

