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Codes Market Progress Evaluation Report #5

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Executive Summary

The Northwest Energy Efficiency Alliance (NEEA) selected ADM Associates ("ADM") and its subcontractor, Johnson Consulting Group (together "the ADM Team"), to conduct the fifth Market Progress Evaluation Report (MPER) for the NEEA Codes Team. This MPER examined NEEA's influence on energy code development and adoption (hereafter referred to as "code influence") in the Northwest and on code-related training and education efforts. MPER #6 will address additional elements of the Codes Team's work.

The code influence aspect of this evaluation assessed the evaluability of those activities and documented the NEEA Codes Team's recent work on energy codes in the Northwest (Idaho, Montana, Oregon, and Washington) as well as at the national level through their work on the International Energy Conservation Code (IECC). NEEA's work on the IECC carries over to the NEEA region because the IECC forms the foundation of residential and/or commercial codes in each state.

The assessment of NEEA's code-related training and education activities involved determining the evaluability of those activities, developing progress indicators (PIs) related to training, and soliciting feedback from trainers, implementers, and trainees. Trainer/implementer interviews assessed how respondents develop and offer trainings and their recommendations for evaluating the outcomes of trainings. The trainee survey assessed changes in trainee knowledge, behavior, and attitudes as a result of the trainings and explored satisfaction with code trainings.

Another objective of MPER #5 was to provide feedback and recommendations on the current Codes logic model (Appendix A) to ensure that it accurately reflects the theory underlying the Codes Team's work, is logically sound, identifies evaluable outcomes, and captures nuances between the commercial and residential sectors. The ADM Team used the data collection activities associated with the code influence and education and training assessments to assess the logic model.

Code Influence

One goal of this assessment was to develop progress indicators (PIs) related to NEEA's code influence work. However, the ADM Team, in consultation with the NEEA Team, determined that developing quantitative PIs related to code influence activities was not possible for two reasons. First, **attribution of influence is difficult or impossible to determine**. NEEA's influence often happens without the market knowing NEEA was involved. For example, the ADM Team could not survey builders, code officials, designers, and other stakeholders and ask about how NEEA influences energy code decisions in each state because most market actors will not be aware of NEEA or its work influencing energy code. Second, **the complexity of code cycle processes in the region means there is no one set of PIs that apply**. The current logic model outcomes pertaining to code influence work are not evaluable because, by design, the logic model is too general to capture the nuances of what is happening and needs to happen in each state and with IECC. Therefore, ADM presents qualitative assessments of NEEA's influence on code.

NEEA's involvement in code development activities varies based on the policy objectives and processes existing in each state, and NEEA's varied work is vital to maintaining and increasing code stringency. Each state has different processes and legal requirements when it comes to supporting energy code. For example, an Executive Order in Washington de facto requires the state to have a stringent energy code whereas a recent Executive Order in Idaho jeopardized the existence of an energy code in the state. Interviews with market actors demonstrated that NEEA

has successfully, and uniquely, worked in each state by filling gaps in its respective code process. NEEA's work and resources are highly valued, especially among those working to develop IECC and Washington energy code. Furthermore, according to respondents, NEEA plays a role in each state that no other organization could or would fill to the extent that NEEA does. Key activities include:

- **NEEA writes their own energy code proposals, and they fund and review others' energy code proposals, in Washington, Oregon, and for IECC.** Their work on IECC contributes to energy code development in all states in the region, especially Idaho and Montana that adopt the IECC nearly verbatim with few state-specific amendments.
- **NEEA funds and participates in stakeholder meetings and technical advisory groups** that contribute to awareness of energy code and ultimately contribute to development and adoption of a more robust energy code.
- **NEEA funds third parties to research the impact code changes can have on a state.**
- In Montana, **NEEA funds code awareness and education efforts** that serve as a first step to influencing more stringent energy code by explaining the benefits of energy codes.

NEEA faces two notable challenges to developing more efficient code in the near future. First, **the process of changing energy codes has become increasingly contentious and market actors forecasted that it will continue to become more contentious.** Respondents reported that different stakeholder groups – builders, utilities, efficiency advocates, and others – have become less willing to reach consensus and more interested in emphasizing a specific point of view than in years past. Second**, identifying measures, systems, and practices to include in future code cycles will become ever more difficult and complex because it will be increasingly challenging to find simple pathways for designers and builders to follow to make a building more efficient.** Building owners and their teams of managers and contractors have picked the "low-hanging fruit" of energy efficiency like installing LEDs, often with the assistance of utility efficiency programs, making only the "harder-to-pick fruit" like controls and comprehensive designs available for code changes**.**

Conclusion #1: NEEA is filling gaps in each state's energy code process that would likely go unfilled or inadequately filled without their involvement. By filling those gaps and working in and around an increasingly contentious code development environment, NEEA is contributing to a more robust energy code regionally and nationally**.** Specifically, NEEA is:

- **Funding and disseminating nationally respected data and research** that enable NEEA and its partners to inform decision makers about the importance of a code change. There are few, if any, other groups that play this role in the region.
- **Participating in and contributing to energy code groups and organizations**. NEEA has carved out an important role in each of these organizations by increasing the number and quality of energy code proposals, facilitating discussions around energy code changes, and being a valued voice in each of these groups.
- **Cross-pollinating energy code change ideas across the region and the nation**. As an entity active in multiple places, NEEA staff see varying degrees of energy code stringency and varying processes for implementing energy code. Therefore, they can share information, ideas, and best practices across the places where they are active.

  Recommendation #1.1: Continue to look for ways to fill gaps within each state's energy code process. That could mean funding state-specific research, convening a new group of

stakeholders, improving awareness of energy codes, or some other activity that fills a gap supporting the development and maintenance of energy codes.

Recommendation #1.2: Continue developing more stringent and cost-effective energy code changes and providing these proposals to Oregon, Washington, and IECC decision makers. Continue to look for other places or opportunities to contribute to energy code changes, such as the American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE).

Recommendation #1.3: Continue supporting and sharing data-driven and vetted research that NEEA and its partners can use to demonstrate energy savings and cost-effectiveness that result from potential changes to energy code.

Code Training and Education

The ADM Team determined that the training and education outcomes identified in the logic model are largely evaluable. NEEA staff, trainers, and implementers recommended the following sources of data that evaluation teams could use to assess progress over time.

- Regular and consistent **post-training surveys** administered across training courses can help NEEA assess market actors' understanding and valuing of energy codes.
- **Code compliance studies** can inform NEEA about the degree to which market actors understand energy code, as lack of compliance may indicate a lack of knowledge and understanding. Additionally, these studies can help NEEA to assess whether installation of certain measures of interest in new construction buildings has changed over time.
- Many questions about a single topic coming into the state **technical assistance hotlines** may signal that the market is unsure about the topic and that training may be needed.
- **Data from other NEEA programs** about measure adoption can help the Codes Team assess the degree to which builders are installing a measure of interest.
- Data from the **commercial code compliance webtool**[1] in Washington can help NEEA understand how much, if at all, the market is using new products to comply with code.

The ADM Team conducted a trainee survey to assess PIs and solicit trainee feedback. The PI assessment is relevant to trainings conducted from Q4 2021 to Q4 2022 and does not explore change over time as this was the first administration of the survey. The PI assessment revealed that trainings:

- **Helped many market actors understand code requirements,**
- **Contributed to an improvement in market actors' attitudes about energy codes**,
- **Had a relatively low impact on market actor's knowledge of specific products**, most likely because training does not often cover these topics because product specific training typically comes from distributors and manufacturers, and
- **Contributed to code officials' valuing of energy codes.**

Trainees reported **high satisfaction** with their instructors, the technology, the time needed for the training, and the materials supplied for the training, and they reported at least one-quarter of the

[1] The Washington State Energy Code Webtool assists designers, contractors, and jurisdictions with commercial energy code compliance. NEEA funded development of the tool.

material covered in the training was new to them. Respondents recommended providing more handouts and hands-on examples and providing more peer networking opportunities and interactions with trainers. Some trainees requested training on more "advanced topics" including grey water systems, solar, and battery systems.

Conclusion #2: Most trainees reported that NEEA-supported training influenced at least one aspect of their knowledge, behaviors, or attitudes related to energy codes, and opportunities exist for NEEA to get more regular feedback on trainings that would inform them about changes in the market.

> Recommendation #2.1: Consider developing a standardized survey that trainers could deploy after each training session to provide more regular feedback about the impact of training on trainees' attitudes and behavior and collect information to guide improvements or future training offerings. Consider using a model such as the Kirkpatrick Model of Evaluation[2] to guide the development of this standardized instrument. This model assesses a trainee's reaction, learning, and behavior resulting from the training and can help NEEA determine if the training is having the desired effect. Tracking these responses over time could help quantify more fully the respondents' interest in code training topics and their perceptions of the new code.

Conclusion #3: Data from technical assistance hotlines could be used more consistently to inform NEEA and its partners about training topics to deploy, code language that could be improved, and general understanding of code among market actors.

> Recommendation #3.1: Consider developing a systematic method for logging data from the hotlines in each state that would capture themes and trends from the questions.

Conclusion #4: Many trainees reported that training improved their view of energy code. Trainees' relatively positive view of energy code and training indicates NEEA is positively influencing the market's view of energy code and should continue to evaluate this over time.

> Recommendation #4.1: As part of the post-training survey recommended in response to Conclusion #2, ask trainees about the degree to which they value energy code.

Conclusion #5: Trainees generally reported high satisfaction with all modes of training, the technology used to present the training, the training topics, the instructors, and the presentation of the material. Pre-pandemic, many training courses were held in-person and survey results indicate at least some desire for in-person trainings again.

> Recommendation #5.1: Work with trainers to develop more in-person trainings that would enable opportunities for market actors to interact with and learn from peers and trainers. Good candidates for in-person training would be topics that benefit from hands-on training such as working with a specific tool or learning steps for how to install a measure.

> Recommendation #5.2: As part of the post-training survey identified in Conclusion #2, ask trainees to specify advanced topics they would like to see included in training.

[2] The Kirkpatrick Training Evaluation Model. University of San Diego. The Kirkpatrick Training Evaluation Model [+ Benefits & FAQs] (sandiego.edu)

Logic Model

Conclusion #6: The logic model largely captures NEEA's training and education activities, but it does not fully capture the extent of NEEA's work to influence energy codes. The ADM Team's evaluation shows clearly that NEEA works to adapt to changing code cycles, state and national policies, and organizational processes, but the logic model misses some key distinctions and nuances needed to fully capture the nature of the Codes Team's work. Separate state- and code cycle-specific plans that draw from the broader strategies captured in the logic model may serve as more appropriate reference points for future evaluations.

Recommendation #6.1: Develop state- and code cycle-specific plans that identify how NEEA's tailored strategy can influence an individual code cycle.

Recommendation #6.2: Edit the logic model to reflect the changes described in Section 6.

1 Introduction

The Northwest Energy Efficiency Alliance (NEEA) selected ADM Associates ("ADM") and its subcontractor, Johnson Consulting Group (together "the ADM Team") to conduct the fifth Market Progress Evaluation Report (MPER) for the NEEA Codes Team. The fourth Codes MPER[3] examined activities related to energy code development and adoption (expanded sphere of regulation, lessons learned, development and submittal of code change proposals, national model code adoption); implementation (enhanced enforcement capabilities, improvement of code compliance); and compliance (compliance rates, resulting energy savings).

MPER #5 focuses on three areas.

1) NEEA's influence on code development and adoption in the Northwest (hereafter referred to as "code influence"),
2) NEEA-supported energy code-related training and education efforts, and
3) A review of the current Codes logic model as it pertains to NEEA's influence on code development and training and education efforts.

1.1 Code Influence Assessment

The code influence evaluation work involved assessing the NEEA Codes Team's work to influence energy codes in Idaho, Montana, Oregon, and Washington, as well as at the national level through their work on the International Energy Conservation Code (IECC). Additionally, the ADM Team explored whether NEEA's work with one process may have spillover effects to other processes. For example, its work on IECC connects directly to Idaho, Montana, and Washington because the IECC forms the foundation of these state's codes. To conduct this assessment, the ADM Team reviewed program documents and conducted interviews with NEEA staff and market actors involved in code development across the Northwest and with knowledge of the IECC development process.

One initial goal of this assessment was to develop progress indicators (PIs) related to NEEA's code influence work. However, as will be described in subsequent sections, the ADM Team, in consultation with the NEEA Team, determined that developing quantitative PIs related to code influence activities was not possible for two reasons.

1) **Attribution of influence is difficult or impossible to determine**. NEEA's influence often happens without the market knowing NEEA was involved. For example, the ADM Team could not survey builders, code officials, designers, and other stakeholders and ask about how NEEA influences energy code decisions in each state because most market actors will not be directly aware of NEEA or its work on code development and adoption.
2) **The quantity and complexity of code cycle processes in the region mean there is no one set of PIs that applies**. The current logic model outcomes pertaining to code influence work are not evaluable because, by design, the logic model is too general to capture the nuances of what is happening and needs to happen in each state and with IECC. It would not be possible to accurately describe all the activities, outputs, and outcomes happening in

[3] Codes Market Progress Evaluation Report #4. February 14, 2017. Report # E17-345. Prepared by Cadmus for NEEA.

each state and with IECC in one document. As described in subsequent sections of this report, the development of energy codes is unique to the policy environment and process of each code development cycle. This means that NEEA (or any other party interested in energy code) must adapt to the needs of each state and each code cycle, so one set of static PIs may not apply to each place. For instance, what makes sense for NEEA to do in the 2021 Washington code cycle may not make sense to do in the 2024 Washington code cycle. Likewise, NEEA's activities in Idaho may not apply to Oregon.

1.2 Training and Education Assessment

The assessment of NEEA's code-related training and education activities involved determining the evaluability of those activities, developing PIs related to training, and providing feedback from trainers and trainees about NEEA-supported codes related training. The assessment of NEEA's code-related training and education activities involved the following tasks:

1. Interviewing former and current NEEA staff to understand the purpose, target audiences, delivery methods, and outcomes of the various trainings and tools,
2. Interviewing trainers about their work delivering training, and
3. Reviewing existing training feedback forms in preparation for developing a survey of trainees to assess their decision-making regarding energy code compliance, get feedback on training delivery, and understand the value and impact of the training and tools. The ADM Team used this survey to develop and administer PIs related to training.

1.3 Logic Model Review

Another objective of MPER #5 was to provide feedback on and recommendations for improving the current Codes logic model (Appendix A) as it pertains to code influence and training and education. Specifically, the ADM Team reviewed the logic model to ensure that it accurately reflects the theory underlying the Codes Team's work, is logically sound, identifies evaluable outcomes, and captures nuances between the commercial and residential sectors. The team used the data collection activities associated with the code influence and training assessments to assess the logic model.

2 Methodology

2.1 Code Influence Assessment

2.1.1. Document Review

In June 2023, NEEA supplied the ADM Team with access to about 200 documents including communications, tracking sheets, and other files that documented NEEA code influence activities across states. The ADM Team also reviewed the logic model elements that focused on activities related to influencing energy code in the region and nationally. A more comprehensive discussion of the Team's logic model review appears in Section 2.3.

2.1.2. NEEA Staff Interviews

In late July 2023, the ADM Team interviewed the four key NEEA staff that work on codes development about their work to influence code. Interviews focused on:

- The logic model as it relates to influence activities,
- Differences in state and national code cycles, and
- The Code's teams influence activities in each state and by code cycle.

2.1.3. Market Actor Interviews

With guidance from NEEA staff, the ADM Team identified 31 key market actors that may be aware of NEEA's code influence activities. These market actors included representatives of state agencies responsible for codes, advisory group members that make recommendations about code changes, other code stakeholders, and code trainers. Of the 31 actors contacted, 19 agreed to the interview. Two of the three respondents that could speak to the IECC national code process also spoke about their local state process. Interviews occurred in September through November 2023.

The ADM Team conducted the first four interviews with key representatives from each state. Based on the results of those first four interviews, the ADM Team modified the interview guide to reflect better what the respondents could address. For example, in the first four interviews, the ADM Team asked multiple questions about the respondent's work enhancing or maintaining energy codes, but the Team learned that in many cases the questions assumed respondents were working to make codes more stringent, and that was not always the case. Therefore, in the revised guide (Appendix F), the ADM Team asked more general questions about the respondent's work on energy codes. The Team conducted the remaining interviews using the revised guide.

Of the 19 respondents, one-half represented a state agency. The remaining respondents represented an organization such as a design firm, utility, nonprofit, or university. Most respondents played multiple roles in the code development process with the majority characterizing themselves as providing technical resources. Seven, all in Washington or Oregon, indicated they are involved in proposing new codes.

2.2 Training and Education Assessment

2.2.1. NEEA Staff Interviews

The staff interviews focused on:

- The goals and objectives of the Codes Team's training and education work,
- The types of training and education NEEA supports for market actors, and
- NEEA staff members' perspectives on progress toward logic model outcomes associated with training and education activities.

2.2.2. Trainer and Implementer Interviews

In November and December 2022, the ADM Team interviewed 15 of the 16 key implementers and trainers identified by NEEA. Implementers are those people associated with organizing training and doing the administration – behind the scenes – aspects of conducting training. Trainers are the people that conduct the training. In many cases, one person is both the implementer and trainer.

The ADM Team completed these interviews to accomplish two key goals:

- Ensure a thorough understanding of how the training and education activities manifest in the marketplace.
- Inform the ADM Team's development of progress indicators (PIs) to assess logic model outcomes associated with the Codes Team's training and education activities.

The interview guide (Appendix E) covered the following topics:

- The content and intended outcomes of the NEEA-supported trainings,
- The respondents' understanding of the intended outcomes of NEEA-supported trainings and their feedback about ways NEEA could track progress related to these outcomes,
- How trainers identify training topics,
- Their perspectives on training approaches and modalities, and
- What feedback they heard from trainees about the value and impact of the training.

2.2.3. Trainee Survey

In January 2023, the ADM Team surveyed market actors including builders, designers, contractors, code officials that attended a NEEA-supported training from Q4 2021 through Q4 2022. The primary purpose of this survey was to assess PIs associated with the training-related outcomes identified in the program logic model. These indicators will enable NEEA and interested stakeholders to observe the effect of code training activities on the market over time. Additionally, this survey provided insights into trainees' satisfaction with the trainings along with their suggestions for improvement.

Survey Instrument

The ADM Team proposed 12 PIs, which NEEA reviewed and approved (Table 1).

Table 1: Training and Education Outcomes and Progress Indicators

Training and Education Outcomes Identified in logic model	Progress Indicator
Market actors (builders, manufacturers, supply chain) understand requirements of code	1.1 Percentage of trainee market actors indicating NEEA-supported trainings increased understanding of code requirements
	1.2 Percentage of trainee market actors indicating NEEA-supported trainings helped them implement new strategies for working with energy code changes
	1.3 Percentage of trainee market actors indicating they are sharing information from NEEA-supported trainings with colleagues
Builders have at least a neutral attitude toward energy codes	2.1 Percentage of respondents reporting at least neutral attitude toward energy code and that training improved their view of energy code
	2.2 Percentage of non-code officials that report advocating for energy saving policies because of training
Increased builder industry understanding of product availability and use of or application of new products	3.1 Percentage of respondents indicating training increased understanding of product availability, related to energy code measures.
	3.2 Percentage of respondents indicating training increased understanding of applications of new technology, as introduced in the energy code
Code officials and other participants in the code process understand the value of energy code and how to achieve their code compliance goals	4.1 Percentage of code officials indicating training increased ability to assess code compliance
	4.2 Percentage of code officials that share information from training with others
	4.3 Percentage of code officials indicating they recommended training to anyone else
	4.4 Percentage of code officials that changed procedures as a result of training (exclude those that changed type of work)
	4.5 Percentage of code officials indicating NEEA-supported trainings increased understanding of code requirements

The survey included questions designed to assess the above PIs and covered the following topics to provide more general feedback for possible use in future training development:

- How respondents learned about the trainings,
- Reasons for taking the trainings and expected outcomes,
- Suitability of the training venue or online platform, training duration, and training time(s),
- Feedback on training delivery and instruction,
- Trainer mastery of content and training skill,
- Suitability of training approaches and modalities, and
- Any obstacles or challenges involved in the training.

The ADM team used the four levels of the Kirkpatrick Model of Evaluation[4] to guide development of the instrument. Specifically, the survey instrument assessed trainees' reaction, learning, and behavior that resulted from the training and provided preliminary insights into the results the training achieved.

Appendix B provides an overview of the respondent characteristics, Appendix C describes how survey responses were used to assess the PIs, and Appendix D provides the survey instrument.

[4] The Kirkpatrick Training Evaluation Model. University of San Diego. The Kirkpatrick Training Evaluation Model [+ Benefits & FAQs] (sandiego.edu)

Sample Frame

NEEA staff provided ADM with attendee lists from all NEEA-supported trainings carried out from Q4 2021 through Q4 2022. The combined lists comprised 4,724 individual records, with each record identifying a specific person taking a specific training. The records varied in terms of the amount of contact information available. All records included the trainee name, and all but 81 included an email address. The ADM Team identified 364 cases of a single individual associated with more than one email address and selected the most recently recorded email address. The above process identified a total of 2,343 trainees that attended at least one training.

Respondents who attended more than one training were surveyed about the training they had attended most recently. To develop the stratified sample frame, the ADM Team identified the state and sector (commercial, residential, or both) associated with each training. This information was not always available in the documentation provided and had to be inferred based on the name of the training, the identity of the training organization, and/or the name or address of the trainee organization (when available) or identified through guidance from NEEA staff.

Sampling Approach

The original survey completion goal was to achieve 90% confidence and 10% precision (90/10) for results at the state and sector levels as well as 80% confidence and 10% precision (80/10) at the sector-within-state levels. However, the number of trainees from Idaho and Montana was not sufficient to achieve those confidence and precision levels. Therefore, the ADM Team treated Idaho and Montana as a single stratum for the state-level sampling. Moreover, the Montana training courses were specific to the residential sector and the Idaho courses covered both commercial and residential sectors. Therefore, the ADM Team treated all Idaho and Montana trainings as a single residential stratum for the sector-level sampling and for displaying results.

Table 2 summarizes the sampling approach. The top section shows the trainee populations for each state, sector, and sector within state and the middle and bottom sections show the number of completions needed to achieve 80/10 confidence/precision for each sector-within-state and to achieve 90/10 for each sector (across states) and each state (across sectors).[5]

[5] The sample sizes applied the finite population correction (fpc) factor to the number of completions needed to achieve 80/10 (n = 41) or 90/10 (n = 68) in an infinite population. The fpc is calculated as $((N - n) / (N - 1))^{1/2}$, where N is the population size and n is the sample needed in an infinite population.

Table 2: Sampling Approach

Sector	State			Total
	Washington	Oregon	Idaho/Montana	
Trainee Population				
Commercial	680	190	0	870
Residential	821	534	118	1,473
State Total	1,501	724	118	2,343
80/10 Completion Targets for Sector within State				
Commercial	39	34	n/a	n/a
Residential	40	39	31	n/a
90/10 Completion Targets for Sector and State				
Commercial	n/a	n/a	n/a	64
Residential	n/a	n/a	n/a	66
State Total	66	63	44	

Survey Implementation

ADM implemented the survey primarily as a web survey, using email recruitment, with some phone surveying to complete some stratum targets. The ADM Team carried out the email recruitment in three waves, with a new sample drawn for each wave.[6] The sample for each successive wave accounted for the cumulative stratum response rates from the prior recruitment waves.

The ADM Team initially sent up to three email recruitments to each wave. Those efforts brought the Team close to achieving the completion targets but left the Team somewhat short of some targets. At that point, the Team identified all remaining trainees in the incomplete strata and asked trainers to send emails to those trainees to encourage them to complete the survey. The ADM Team then sent one final email recruitment to each of those trainees, followed by phone calls. The survey took respondents about 15 minutes to complete, and all respondents received a $35 gift card.

The ADM Team contacted a total of 1,480 trainees, 205 of whom completed the survey, for an overall response rate of 14%. Overall, the Team achieved a 90/5 confidence/precision.

Sample Weights

To accurately estimate the assessed parameters within each sector, ADM weighted the sample data within each sector to reflect each state's contribution to the trainee population (Table 3). Unweighted data are provided in Appendix B along with an overview of respondent characteristics.

[6] A soft launch was conducted with a subset of the Wave 1 sample. The soft launch is included as part of the Wave 1 counts in this report. Additionally, all samples were drawn without replacement.

Table 3: Weights for Trainee Survey Data

State	Population		Sample		Weight
	Count	Percent	Count	Percent	
Commercial					
Oregon	190	22%	34	42%	.520
Washington	680	78%	47	58%	1.347
Residential					
Idaho/Montana	118	8%	31	25%	.320
Oregon	534	36%	49	40%	.917
Washington	821	56%	44	35%	1.570

2.3 Logic Model Review

The ADM Team reviewed the existing Codes logic model to assess whether it accurately captures the theory of change underlying the Codes Team's work, the underlying logic is sound, the outcomes are evaluable, and the model captures any key differences between NEEA's residential and commercial Codes work. To assess the logic model, the ADM Team relied on the data collected as part of the code influence and training assessments identified above.

3 Assessment of Code Development and Adoption Influence

Each Northwest state develops and maintains energy code differently. On the surface, the process appears similar for each state – each has an agency responsible for overseeing the development of energy code and administering that code that typically relies on an advisory group or board to inform them or make policy decisions about their energy codes (Table 4).

Table 4: State Agencies and Groups Responsible for Developing and Administering Energy Code

State	Agency Responsible for Code	Commercial Group	Residential Group
Idaho	Division of Occupational and Professional Licenses (DOPL)	Idaho Building Code Board	
Montana	Department of Labor and Industry (DOLI)	Building Codes Division (BCD)	
Oregon	Building Codes Division (BCD)	Construction Industry Energy Board	Residential and Manufactured Structures Board
Washington	State Building Code Council (SBCC)	Commercial Technical Advisory Group (TAG)	Residential TAG

States differ in terms of how they use national code organizations' work in their code foundation. Idaho and Montana adopt IECC nearly verbatim for commercial buildings and with relatively few amendments for their residential code. Oregon uses the American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE) Standard 90.1 for their commercial code and bases its residential code on Chapter 11 of the International Residential Code, which is nearly identical to the IECC, before amending it significantly. Washington uses the IECC as a base for both commercial and residential buildings and then adds more stringency to that code. Table 5 provides the most recent code version in each state at the time of this study, with these being the focus of this evaluation.

Table 5: Most Recent Code Version Names by State and National Code Organization Affiliation

State	Commercial	Residential
Idaho	IECC 2018	IECC 2018 with Idaho amendments
Montana	IECC 2021	IECC 2021 with Montana amendments
Oregon	2021 Oregon Energy Efficiency Specialty Code (OEESC) (ASHRAE 90.1-2019)	2023 Oregon Residential Specialty Code (ORSC) (IECC 2021 with amendments)
Washington	2021 Washington State Energy Code — Commercial (WSEC – C) (IECC 2021 with amendments)	2021 Washington State Energy Code — Residential (WSEC – R) (IECC 2021 with amendments)

How the state agencies operate, the degree of influence the boards and advisory groups have, and differences in states' goals and laws create unique environments in which energy code functions. The state-specific sections below describe how states develop and maintain energy codes, how NEEA engages in the code development process and the extent of NEEA's influence. Note that this study does not capture how NEEA's other programs that support energy efficiency may eventually influence code even though there could be a case made for this influence occurring.

There are significant challenges to developing specific quantitative PIs related to assessing NEEA's influence on energy codes. One of the initial goals of this work was to develop and assess PIs that would demonstrate how NEEA's influence on code stringency changes over time. Developing overarching indicators that NEEA could use year over year is challenging, as the subsequent sections describe, due to the state-specific processes and the changes in code cycle priorities. Quantitative assessments of progress are particularly difficult to develop for something like influencing code, and establishing attribution becomes even more difficult. While one can measure the stringency of code over time, it is difficult to parse out how large a role a single organization (like NEEA) played in contributing to that stringency. Additionally, it is difficult to assess how much influence an organization (like NEEA) had in maintaining or defending energy codes in a state. In both instances, there are only a handful of individuals in each state that would be aware of NEEA's efforts and be able to speak to their influence. Further, outputs like counting numbers of energy code proposal changes are not a particularly insightful metric. For example, the quantity of proposals does not speak to the quality of the proposals and, depending on NEEA's strategy for influencing code in each state for a given code cycle, increasing the number of proposals may not be desirable or effective. Further, the number of proposals could change for reasons other than NEEA's effectiveness. For these reasons, the ADM Team provides a qualitative assessment of NEEA's influence on energy codes in the Northwest, summarized below.

All interviewed market actors noted the importance of NEEA's work to support energy code in their state. The interviews showed that, across all states, NEEA has identified and filled gaps in the code process, often playing a role that no other organization could or would fill or filling voids left by organizations that no longer participate in the process.

3.1 Idaho

The most recent code review cycle in Idaho was unique due to an Executive Order. In a typical code year, Idaho adopts the latest version of IECC for both residential and commercial buildings, including any state-specific amendments. The most recent code cycle was affected by the Governor's Zero-Based Regulation Executive Order[7] requiring all state agencies to reduce all regulations, including energy related regulations. Under this order, the Idaho Building Code Board, housed under the Division of Occupational and Professional Licenses (DOPL), created a first draft of new energy codes that marked much of the commercial and residential energy codes for deletion. The Idaho Energy Code Collaborative, a group of stakeholders interested in upholding energy code, worked with DOPL to present data and research indicating the value of having the current energy codes (IECC 2018 with Idaho amendments) in place. According to market actors, energy codes in Idaho stayed (largely) as they were prior to the Executive Order due in part to the work of the Collaborative members working with DOPL staff.

NEEA engages with three key groups that contribute to the development of energy code in Idaho:

- **The International Code Council (ICC).** NEEA participates in the national code development process facilitated by ICC, and Idaho ultimately adopts the IECC for residential and commercial buildings. NEEA staff participate on IECC committees and contribute code change proposals that often are incorporated into the next IECC and, therefore, Idaho code.
- **The Association of Idaho Cities (AIC).** Using NEEA funds, the AIC convenes the Idaho Energy Code Collaborative, which brings together nonprofits, energy professionals, utilities, government agencies, subject matter experts and others. Through their meeting with

[7] Executive Order 2020-1 and Idaho Code 67-5220(2)

stakeholders, they prepare the state for energy code changes using studies from NEEA and its partners that analyze the impact of any proposed changes. NEEA provides data-driven and vetted information— "very impactful recommendations," stated one respondent— that members of the collaborative can use to support energy code in front of decision makers. According to two market actors, NEEA cannot "take sides" or advocate a position. Instead, NEEA must "stand on the outside of what's going on [regarding energy code changes]" and be careful not to be seen as lobbying for a specific position.

- **The University of Idaho Integrated Design Lab (IDL).** With NEEA's financial support, the IDL provides technical knowledge and analysis to better understand the impact of code changes. In 2022 and 2023, the IDL analyzed the effect that removing energy codes would have on both the commercial and residential markets. The IDL's research determined that rolling back existing energy codes—a step proposed by DOPL operating under the Zero-Based Regulation (ZBR) Executive Order—would negatively affect commercial and residential ratepayers by imposing higher energy costs. Additionally, representatives from the IDL made presentations to the public about their findings.

3.2 Montana

The Building Codes Division (BCD) of the Montana Department of Labor and Industry oversees the administration of energy codes in the state, and it adopts the IECC for commercial and residential buildings including any state-specific amendments. Additionally, the Department of Environmental Quality (DEQ) offers training and technical assistance, with some NEEA funding, to make homes as energy efficient as possible. A stakeholder advisory board—the Building Codes Council (BCC)—reviews and comments on the IECC and works with state agencies and other interested parties to "harmonize building codes… with the needs of the construction industry and the public interest in efficiency, cost effectiveness, and safety."[8] The most recent IECC adopted in Montana is from 2021.

NEEA influences energy code in Montana via three primary efforts.

- NEEA participates in the IECC development process. As with Idaho (see Section 3.1), NEEA influences Montana energy codes via their work on IECC.
- NEEA improves awareness of energy code by:
    - Funding the publication and distribution of the DEQ Energy Code Guide for New Home Construction. This booklet provides builders and homeowners with information about the energy code requirements new homes are subject to. The booklet includes a copy of the energy code compliance label all new homes are supposed to have. This label lists the insulation values (R-value) and information about the windows and HVAC systems installed in the house.
    - Attending a state vendor conference at which staff offer input and education regarding current codes.
    - Coordinating, facilitating, and participating in the Montana Code Collaborative, a group of builders and stakeholders interested in energy codes. This network of energy stakeholders works to get builders ENERGY STAR® rated and provides a venue for builders to share best practices for constructing energy efficient homes.
- NEEA funds the National Center for Appropriate Technology (NCAT) to host the Montana Homes Collaborative (MHC). This group of builders, architects, energy raters, municipal representatives and others convenes every second month to discuss energy code, cold

[8] The Building Codes Council. Montana Department of Labor and Industry. Accessed November 30, 2023. Building Codes Council (mt.gov)

climate best building practices, and other similar topics. By funding the MHC, NEEA is supporting a group of stakeholders interested in efficiency which may carry over to a more stringent residential energy code in the state.

3.3 Oregon

The state agency responsible for developing energy code in Oregon is subject to a 2020 Executive Order and the subsequent 2023 House Bill 3409 requiring the state to meet energy-saving goals. Specifically, the Oregon Building Codes Division (BCD) must set targets to adopt a code that limits new commercial and residential buildings' regulated site energy consumption to 60% of what was allowed under the 2006 Oregon code by 2030.[9] The legal requirement of limiting energy consumption across all new construction in the state de facto requires local jurisdictions to enforce energy code. Historically, the BCD used a different code adoption process during each code cycle. Due to the need to comply with the executive requirement, BCD has developed a new process for making energy codes more stringent over the next several code cycles.

Oregon uses ASHRAE 90.1 as its commercial code baseline and considers IECC advancements when updating its residential code.[10] When updating to new code versions, BCD takes a prominent role in proposing code language to keep the state on track to achieving its regulatory goals. There are varying levels of opportunity for members of the public to influence these code updates depending on the code. For the most recent residential code cycle, BCD held a formal code change proposal period to solicit public input and convened a technical advisory group to review and comment upon the changes proposed by BCD and the public. In contrast, there was neither a code change proposal period nor a technical advisory committee for the most recent commercial code cycle. The Construction Industry Energy Board and the Residential and Manufacturers Structures Board under the BCD can then accept, reject, or modify any changes before approving final codes for adoption.

NEEA's influence on energy code in Oregon consists of three actions.

- NEEA funds energy modeling research to determine if the latest energy code changes would meet the energy goals established in the Executive Order. In the most recent code cycle, NEEA contracted with an engineering firm to conduct energy modeling to determine whether the first draft of the Oregon Residential Specialty Code (ORSC 2023), approved by the BCD, would achieve the energy goals in the Governor's 2020 Executive Order. This research determined that ORSC 2023 was inadequate to meet the Executive Order. BCD disagreed with that analysis and the Residential and Manufacturers Structures Board adopted the code without additional changes.
- NEEA coordinates with a variety of actors in the state to develop energy code proposals and encourage energy-efficient code. NEEA does this by working with private engineering firms, nonprofit organizations, and coalitions of efficiency organizations to develop code change proposals. According to program documents and staff interviews, in the most recent code cycle, NEEA staff worked with stakeholders to identify possible code changes and winnowed the list of possible changes into specific proposals to develop and submit to BCD. NEEA either directly or via one of its partners submitted six of the 25 proposals the BCD received in its most recent residential code cycle, and two of those six became part of the ORSC.

[9] Office of the Governor. State of Oregon. Executive Order No. 20-04. eo-energy-20-04.pdf (oregon.gov)
[10] Oregon references Chapter 11 of the International Residential Code (IRC) for its residential code which is nearly identical to the IECC requirements.

- NEEA participates in regular stakeholder meetings where parties interested in the energy code can discuss policy and how to best meet the energy savings targets set forth by the Executive Order. The Oregon Department of Energy (ODOE) convenes stakeholder meetings that utilities, Energy Trust of Oregon, nonprofit organizations with an interest in efficiency, and building industry groups regularly attend. These meetings provide information about code changes the state is considering and provide an opportunity for interested parties to ask questions or express concerns with the agency's strategic direction. According to one key respondent, these meetings are "policy-focused" and "strategic" rather than focusing on a specific code measure or code language.

There were some discrepancies in respondents' opinions about the extent of NEEA's role in the most recent residential code development process in Oregon. One respondent reported that NEEA has been very active in recent code cycles, developing code proposals, contributing to the residential code committee, and partnering with other organizations to support code changes. As noted above, program data and documentation available online show that NEEA staff drafted or supported proposals submitted to the BCD for consideration in the last code cycle. However, other respondents reported that NEEA was less engaged in the most recent code cycle than it had been in past cycles. These respondents would like to see NEEA more extensively involved with the next code cycle process, including becoming involved earlier.

3.4 Washington

Washington state law[11] requires the Washington State Building Code Council (SBCC), the state agency responsible for administering energy code, to reduce annual net energy consumption of residential and commercial new construction by 70% compared to 2006 levels by 2031. Using the IECC as a baseline, the law requires SBCC to enact energy saving measures via the energy code during each code cycle until the state meets its emissions goals. This legal requirement encourages and effectively requires cities and counties to enforce energy code. This requirement contributes to Washington having one of the most stringent energy codes in the nation, and it provides a model that other states look to.

Washington has a robust code development process. When updating its energy codes, SBCC staff first incorporate the relevant IECC changes into the most recent state code to develop a first draft of the new state code. SBCC then launches a public process that relies heavily on nonprofits like the New Buildings Institute and RMI, state agencies like the Department of Commerce, cities and counties, and businesses. These groups propose energy code changes, serve on Technical Advisory Groups (TAGs) that review these proposals and provide guidance to SBCC, and comment in public meetings and hearings facilitated by SBCC. According to market actors and the review of program documents from the most recent Washington code cycle, the recommendations and energy code proposals that emerge from the TAGs often become code.

NEEA influences more stringent code in Washington and works to make code as clear and simple as possible. The ADM Team's document review revealed NEEA staff and its partners created 43 commercial and 37 residential code change proposal documents for the 2021 code cycle process. Of those draft proposals, NEEA and its partners had 24 commercial proposals and 18 residential proposals approved by their respective TAGs.

[11] Chapter 19.27A RCW: ENERGY-RELATED BUILDING STANDARDS (wa.gov)

NEEA also partners and coordinates with a variety of actors in the state to encourage development of more stringent energy codes. According to program documents, staff interviews, and market actor interviews, NEEA staff support the work of the TAGs, and staff work with a cadre of state and local officials, utility staff, the Pacific Northwest National Laboratory (PNNL), nonprofit organizations, industry representatives, and other energy code stakeholders. NEEA develops its own code proposals, and it supports partner staff in developing code proposals with technical assistance and, in some cases, funding for research about a specific proposed code change. NEEA is a key coordinator of these entities that can facilitate the development of code proposals that the TAGs vote on and often will become part of the next accepted code.

One Washington respondent noted that NEEA's funding of technical assistance hotlines can translate into improving code language. By logging questions that come to the hotline, NEEA and its partners can identify problem areas the market is experiencing by trying to interpret code. NEEA and its partners can then propose revisions to code language by using less complicated language or removing ambiguities to make it more understandable in the market. This would improve compliance, build rapport with the market, and create conditions in the market more amenable to a more stringent code.

NEEA has funded and supported organizations to conduct research and energy modeling regarding potential changes to energy code, and all respondents reported this was a valuable service. This work helps decision makers determine energy savings and the cost effectiveness of code changes. One market actor echoed the other six Washington respondents' sentiments about the importance of NEEA's support, saying "NEEA evaluates the effectiveness of code changes. This is a key service… [Without NEEA's work] we would have less proposals to consider." NEEA's funding enables the TAGs, and ultimately the SBCC, to make data-driven decisions on code changes. The SBCC "has limited funds to support research." Another respondent stated NEEA is "taking what limited resources they have and helping others' work be more impactful," implying that NEEA is building a synergistic relationship to supporting code with its funding. Further, NEEA has recently filled a void left by a national organization that no longer funds code research in the state.

TAG members and stakeholders in the code development process use NEEA resources regularly. One TAG member specifically mentioned their regular use of NEEA's advanced heat pump research document in the most recent code cycle. According to this respondent, when TAG members debated specifics about heat pumps in the code, they regularly consulted NEEA's advanced heat pump research to inform their decisions. Furthermore, this respondent stated that "everyone [on the TAG] is aware of NEEA and its work is well regarded…. There is a lot of brand recognition [of NEEA] and [NEEA] is associated with expertise and trust."

One respondent reported that NEEA used to be more in the foreground of conversations about energy code and that has changed to more of a background role in recent years. According to this respondent, NEEA has been less involved in strategic thinking about changing code and more involved in background activities like funding research. While appreciative of the research funding, this respondent would also like to see NEEA regain a more foreground role in supporting changes to code. This respondent thinks that by playing a more public role, NEEA can have greater influence on efficiency in Washington and at the national level. They did not specify exactly what that "foreground" role may entail.

3.5 IECC

As noted in the state-specific sections, the IECC is the basis of residential and commercial energy code in Montana, Idaho, and Washington and informs the residential code in Oregon. Each state makes amendments to the IECC to fit its specific needs by adjusting the baseline IECC to increase (Washington) or decrease (Idaho and Montana) stringency – or a mix of both (Oregon).

NEEA resources are highly valued among those developing and contributing to the IECC. According to one respondent with experience working with the IECC over the last four code cycles, when NEEA brings a proposal to IECC "everybody— manufacturers, the Department of Energy, [California IOUs] …— sit up and take notice." The respondent stated this is because NEEA is a trusted source of research among the many proposals and research efforts the IECC sees.

NEEA staff serve on the IECC Commercial Consensus Committee, the HVAC subcommittee of the Commercial committee, and the HVAC subcommittee of the Residential Consensus Committee. As part of these committees, NEEA staff review and vote on code proposals and participate in discussions about changes to the IECC. Additionally, in consultation with its partners, such as private engineering firms and nonprofits, NEEA develops proposals for and revisions to the IECC. The ADM Team's document review revealed that NEEA staff and their partners drafted 38 proposals or edits for consideration in for the most recent IECC version (IECC 2024).

One market actor noted that NEEA's involvement in Washington often carries over to influence the IECC. For example, this respondent reported that the IECC committee relied on NEEA's work on water heating and codes in Washington to inform the IECC residential water heating code. NEEA staff noted that they have repurposed code change language they developed for Washington for inclusion in the IECC.

3.6 Challenges to Developing More Efficient Code

Market actors and NEEA staff described two key challenges that NEEA and its partners must address in all states when developing more efficient energy codes in future cycles. The first challenge is procedural, and the second challenge is technical.

First, according to all market actor respondents, **the process of changing energy codes has become more contentious over the last decade or so.** Respondents described past code cycles where individuals with various perspectives on energy code came to a table and reached a consensus about what the code should be. In each state and with IECC, respondents reported that groups are now less willing to reach consensus and are more interested in emphasizing a specific point of view.

- One respondent stated, "We spend time on political fights instead of technical clarity. [When submitting proposals] we don't get feedback anymore— now we get push back."
- A Washington respondent shared that elected officials and lawyers— people generally without technical expertise— now attend TAG meetings. Traditionally, the members of the TAG are technical experts discussing engineering and economic minutiae, not pushing a specific point of view. According to this respondent, the elected officials and lawyers are more interested in advocating a specific point of view.

- An Oregon respondent reported that past code cycles used to involve efficiency groups and home builders meeting and reaching consensus about what was achievable and affordable. Now, the two groups seem pitted against one another.
- An Idaho respondent stated that "energy code has never been popular in the state" and that energy code has become "increasingly" a more political and contentious process since adopting an energy code in 2009.
- A respondent familiar with the IECC process described how the IECC's newly established process for adopting code was designed, at least partially, to facilitate a consensus-based code and make the process as data-driven as possible. The ICC designed the new process because the process they used previously led to more politically motivated or advocacy-based changes to code instead of data-driven changes to code.

Second**, identifying measures, systems, and practices to include in future code cycles will become ever more difficult and complex because it will be increasingly challenging to find simple pathways for designers and builders to follow to make a building more efficient.** Building owners and their teams of managers and contractors have picked the "low-hanging fruit" of energy efficiency like installing LEDs, often with the assistance of utility efficiency programs, making only the "harder-to-pick fruit" like controls and comprehensive designs available for code changes.

The available pathways will increasingly involve measures and procedures that require designers and builders to learn new approaches to construction. Furthermore, according to two Washington respondents, the push by governments to reduce carbon emissions and electrify buildings will make it increasingly difficult to use natural gas in buildings. Because natural gas utilities partially fund NEEA, this will put NEEA in an increasingly difficult position for each coming code cycle. NEEA remains fuel-neutral when supporting research into energy code, and these two respondents implied that will be increasingly difficult for NEEA because at some point in the future code will not be able to accommodate natural gas in buildings, assuming no change to the current laws. Currently, NEEA is working to build adoption of efficient gas appliances that will help Washington meet their carbon goals while using natural gas.

4 Assessment of Code Training and Education

The ADM Team gathered feedback from NEEA staff, trainers, and implementers about ways to assess influence in this and future evaluations. This section presents each training outcome in the logic model, an assessment of the evaluability of each outcome and proposed data sources that NEEA could use to assess progress toward the outcome in the future, proposed progress indicators (PIs) related to each outcome through trainee surveys, and the status of each PI.

4.1 Outcome #1: Market Actors Understand Requirements of Code

4.1.1. Evaluability and Potential Data Sources

According to staff, trainers, and implementers, regular and consistent post-training surveys would provide NEEA with a better sense of market actors' understanding of code requirements over time, at smaller intervals of time compared to MPERs. Additionally, follow-up surveys with trainees six months or more post-training may inform NEEA about the long-term impacts of training. Trainers typically collect their own survey data from trainees shortly after the training, which does not necessarily reflect any subsequent impact the training had on attendees' behaviors. As one NEEA staff person noted, the trainers are "taking the temperature" of trainees at one point but not over time. Another staff member shared that there is still a gap in understanding, "Did [the training] change their behavior? Did [the training] make a difference?"

NEEA's code compliance evaluations can help NEEA assess market actors' understanding of code and tailor training efforts to address gaps in knowledge. According to respondents, NEEA's code compliance evaluations gather data on the degree to which homes built under a new code comply with the code. From the results of these studies, NEEA may be able to infer market actors' understanding of code requirements because low compliance may be a result of builders and designers not knowing about a change in code or understanding how to comply with the code. Trainers noted that these studies are time-consuming and expensive but worth the effort because they are a critical source of information about the market's understanding of code requirements. Results of a compliance study can inform NEEA about areas where more (or less) training may be necessary.

NEEA can use data from the technical assistance hotlines to gauge market actors' understanding of code by developing a comprehensive method for logging data from the hotlines for analysis. The NEEA Team reported limited insight into the outputs or outcomes resulting from the technical assistance hotlines they support. Further, the NEEA Team wants to know if someone calling a technical assistance hotline had their questions successfully addressed and if there are any themes emerging from those that contact the hotline. Additionally, trainers reported that the complexity of the questions that come through the hotline serve as an indicator of how well the market understands the code. The more complex the questions, the better the market understands the requirements. For instance, if a trainer conducts training in one town in October, and more complex questions about the code topic come in from that town in November, that is evidence that the market has a greater understanding of code requirements after the training.

4.1.2. Progress Indicators

Trainees often share information they learned from training with their colleagues and the majority reported that training helped them better work with energy code changes. Fewer

reported increased understanding of code requirements resulting from training. More than one-third of trainees reported that the training increased or improved their understanding of energy code, and more than half reported that the training helped them identify new strategies to work with energy code. More than two-thirds of respondents indicated that they are sharing information from the training with their colleagues (Figure 1).

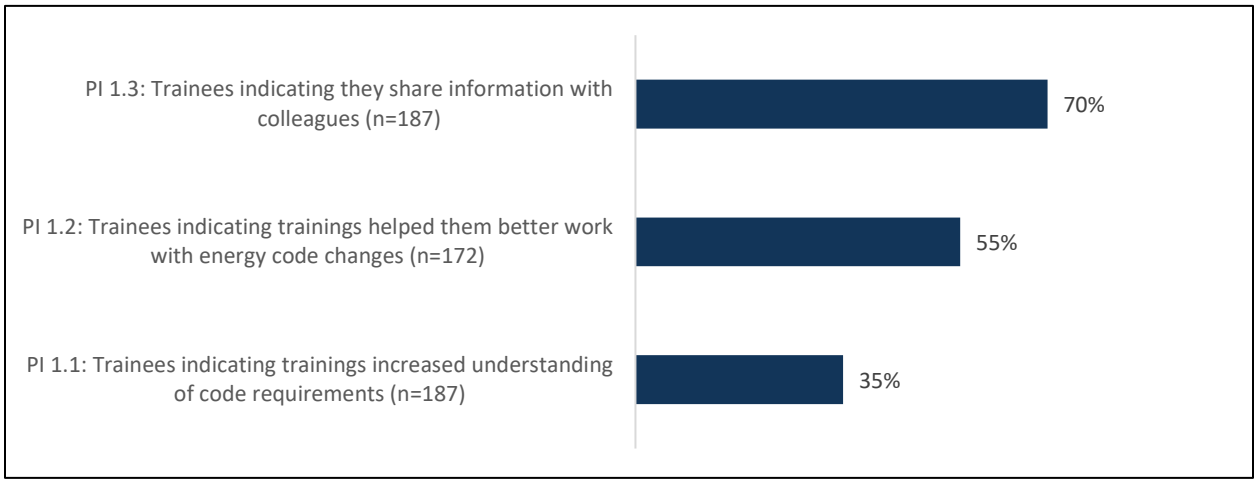


Figure 1: Trainee Understanding of Code Requirements

4.2 Outcome #2: Market Actors Neutral Toward or Value Energy Codes

4.2.1. Evaluability and Potential Data Sources

Interviews with staff, trainers, and implementers revealed that there is not much data that would help NEEA assess market actors' attitudes toward or valuing of energy codes. However, staff and trainers identified a potential source of data – measuring resistance to energy code changes at state code development meetings. Several staff members and trainers reported that quantifying resistance (or receptivity) to code changes at state code development meetings would provide insight into whether NEEA and its partners are making progress towards achieving this outcome. Respondents noted that at code change meetings, which typically happen every three years, there are typically some groups that resist code changes and other groups that support code changes. If the quantity of "resistance" groups is small or if the code officials receive few letters or minimal testimony objecting to code changes, that could be a sign that NEEA is contributing to increasing market actors' valuing of energy codes.

Post-training surveys (mentioned in Section 4.1.1) could ask about how much market actors value energy code. One trainer mentioned a trainee survey NEEA conducted in 2018 that asked about the value trainees see in the energy code. According to this respondent, that NEEA-sponsored survey was valuable because results indicated that most trainees were neutral about energy code, a finding that contradicted what he was hearing from a handful of builders that were vocal about their negative perception of energy codes.

Several trainers reported that demonstrating progress related to this outcome may never happen due to code changes disrupting market actors' businesses and there is little NEEA, or anyone else, can do to change that. According to several trainers, many market actors will be

reluctant to ever embrace energy code as a neutral or positive force. One group of respondents, all from Washington, reported that this outcome— "market actors are neutral toward or value energy codes"— is impossible to achieve because many market actors see codes as an unwelcome interference with their business. According to one residential trainer, the best way to overcome this resistance is to get builders to understand how the code changes also improve non-energy benefits associated with an energy-efficient building, such as improved air quality or building durability.

4.2.2. Progress Indicators

Training helps trainees advocate for energy saving policies and contributes to having neutral or positive attitude about energy codes. More than half of all respondents reported having at least a neutral attitude towards energy code and that training improved their view of energy code, and two-thirds of non-code officials reported advocating for energy saving policies because of the NEEA training (Figure 2). These results are somewhat contradictory to what some trainers and implementers reported in the preceding section.

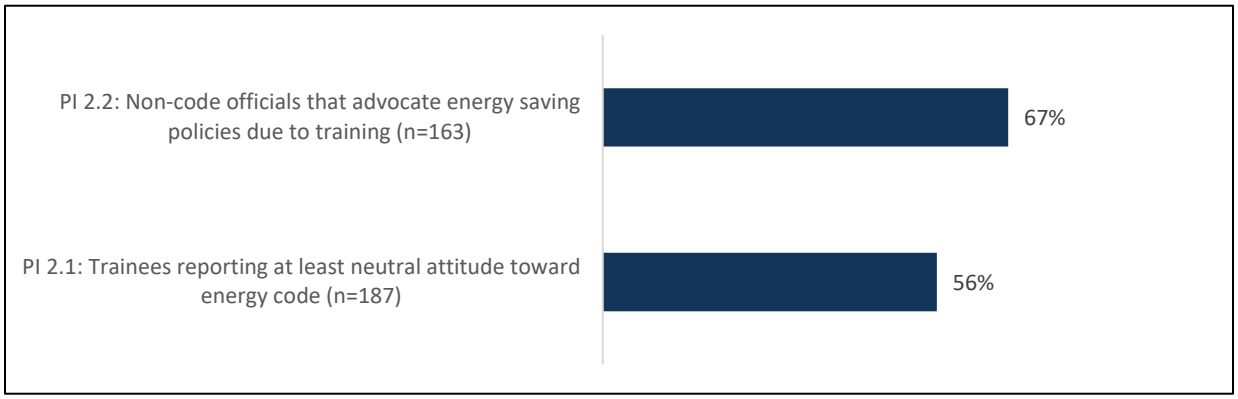


Figure 2: Trainees Valuing of Energy Code

4.3 Outcome #3: Increased Builder Industry Understanding of Product Availability and Use or Application of New Products

4.3.1. Evaluability and Potential Data Sources

NEEA staff and trainers from Oregon, Washington, and Idaho suggested five possible sources of data NEEA could use to measure the building industry's understanding of product availability and application of new products.

1) Conduct **market research** with distributors, manufacturer representatives, and manufacturers to understand how the market for specific technologies has changed over time.
2) Look to NEEA's **market transformation programs for data** about measure adoption. For instance, the Heat Pump Water Heater (HPWH) Program collects data about HPWH installations in the region.
3) Continue conducting **code compliance evaluations** and use those studies to document the use of technologies of interest to NEEA. For example, NEEA could use code compliance evaluations to assess whether installation of certain measures of interest in new construction buildings has changed over time.

4) NEEA may also be able to use the **commercial code compliance tool in Washington,** a tool they funded, as a source of data to help them understand how much, if at all, the market is using new products to comply with code. NEEA could explore how best to use the Washington State Energy Code (WSEC) Webtool to help them assess adoption of new energy efficient products in the market. The webtool is relatively new, so it is just now collecting enough data to enable assessment.

5) Research possible use of **other data sources** such as permits, REScheck and COMcheck, or energy modeling databases like HERS for information about measure adoption. Like the WSEC webtool, REScheck and COMcheck log construction project data as designers and builders use the tool to assess code compliance and consider trade-offs in complying with code.

Respondents recognized that these options are expensive to conduct and that the compliance studies and the market research may need to happen more frequently than in the past to inform progress over time, making them even more expensive options to consider.

4.3.2. Progress Indicators

Relatively small numbers of trainees reported increased knowledge of products or applications of new technology. About one-quarter of respondents reported that the training increased their understanding of product availability and use of new products (Figure 3). The relatively low percentage of respondents, compared to the other PIs, reporting an increase in knowledge about products is not surprising because trainers reported they do not typically train about a specific product. Trainers do not want to promote one manufacturer's product over another. Furthermore, trainers and trainees noted they learn about specific products via training from distributors and manufacturers.

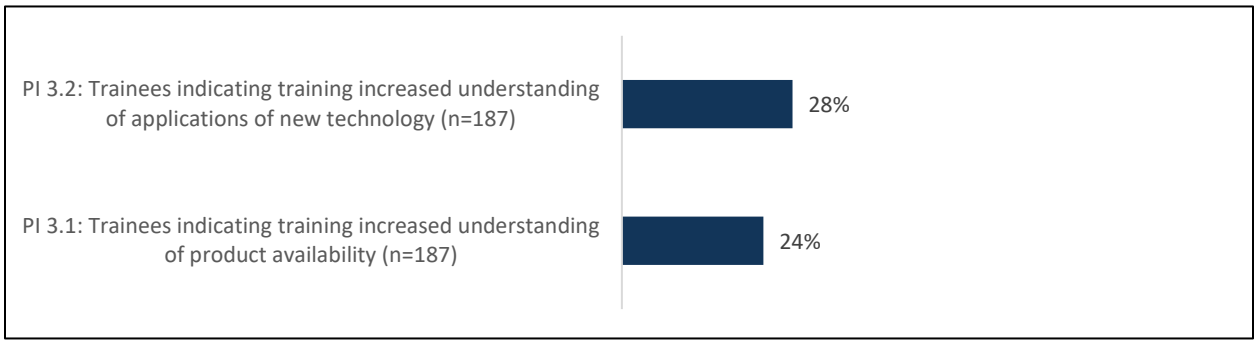


Figure 3: Trainees Knowledge of Products that Result from NEEA Training

4.4 Outcome #4: Code Officials and Other Participants in the Code Process Understand the Value of Energy Code and How to Achieve their Goals

4.4.1. Evaluability and Potential Data Sources

Trainers recommended that NEEA survey code officials about their attitudes toward and valuing of energy code and how, if at all, it enables them to achieve state-level energy saving goals.

4.4.2. Progress Indicators

Most code official respondents understand the value of energy code and indicated the training changed their behavior. Specifically, more than four-fifths indicated they share information from trainings, and more than half reported that NEEA's training increased their understanding of code requirements and their ability to assess compliance. More than two-fifths reported recommending the training to others and changing their procedures because of the training (Figure 4). The trainee sample included a small number of code officials from each state relative to the overall sample size of 205.

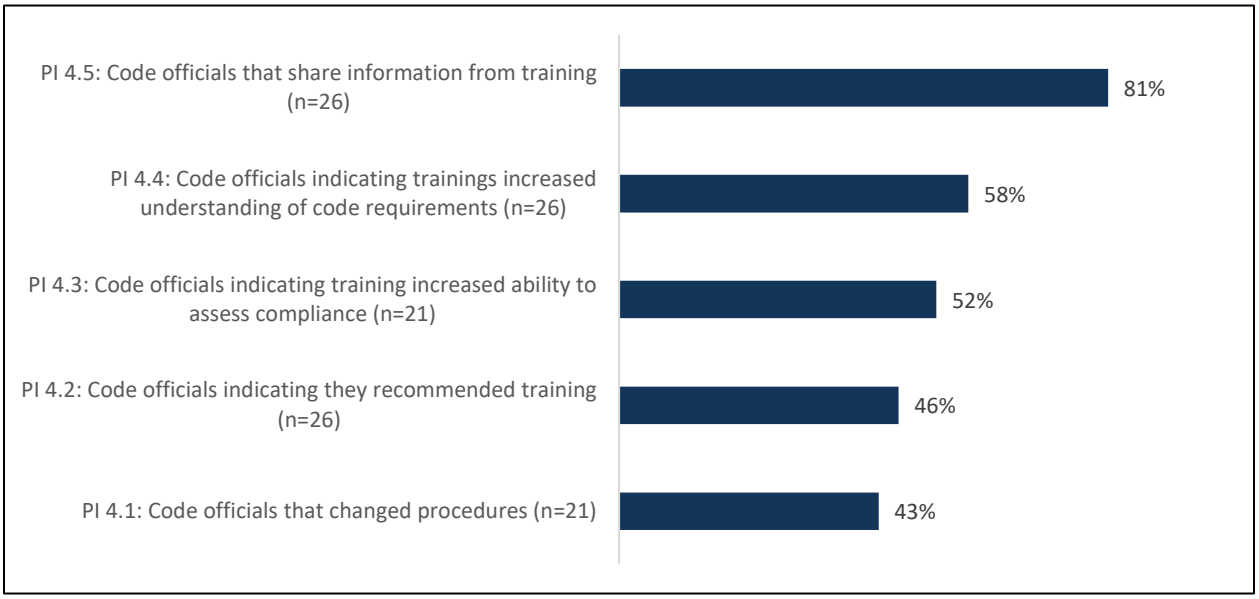


Figure 4: Code Officials and Other Participants in the Code Process Understand the Value of Energy Code and How to Achieve Their Code Compliance Goals

5 Feedback About Training and Education

To provide the NEEA Team with information they can use to improve their support of training, this section presents trainee feedback, organized by sector because satisfaction and suggestions differ by sector. Statistically significant differences across states are noted. Appendix B provides more detail about respondent characteristics. To accurately estimate the assessed parameters within each sector, the ADM Team weighted the sample data within each sector to reflect each state's contributions to the trainee population.

Insights into NEEA-supported education activities is somewhat limited as the research focus was on training. However, information about education activities gleaned through trainer/implementer interviews and trainee surveys is shared at the end of this section.

5.1 Satisfaction and Suggestions to Improve Commercial Training

Commercial respondents almost exclusively took live-webinar training. Therefore, results in this section are about respondents' satisfaction with this training modality.

Respondents reported being at least somewhat satisfied with their instructors, the technology, the time needed for the training, and the materials. More than 80%, and often more than 90%, of respondents indicated they were satisfied with all elements of the training they received. Satisfaction was particularly high with the instructor and technology (Figure 5).

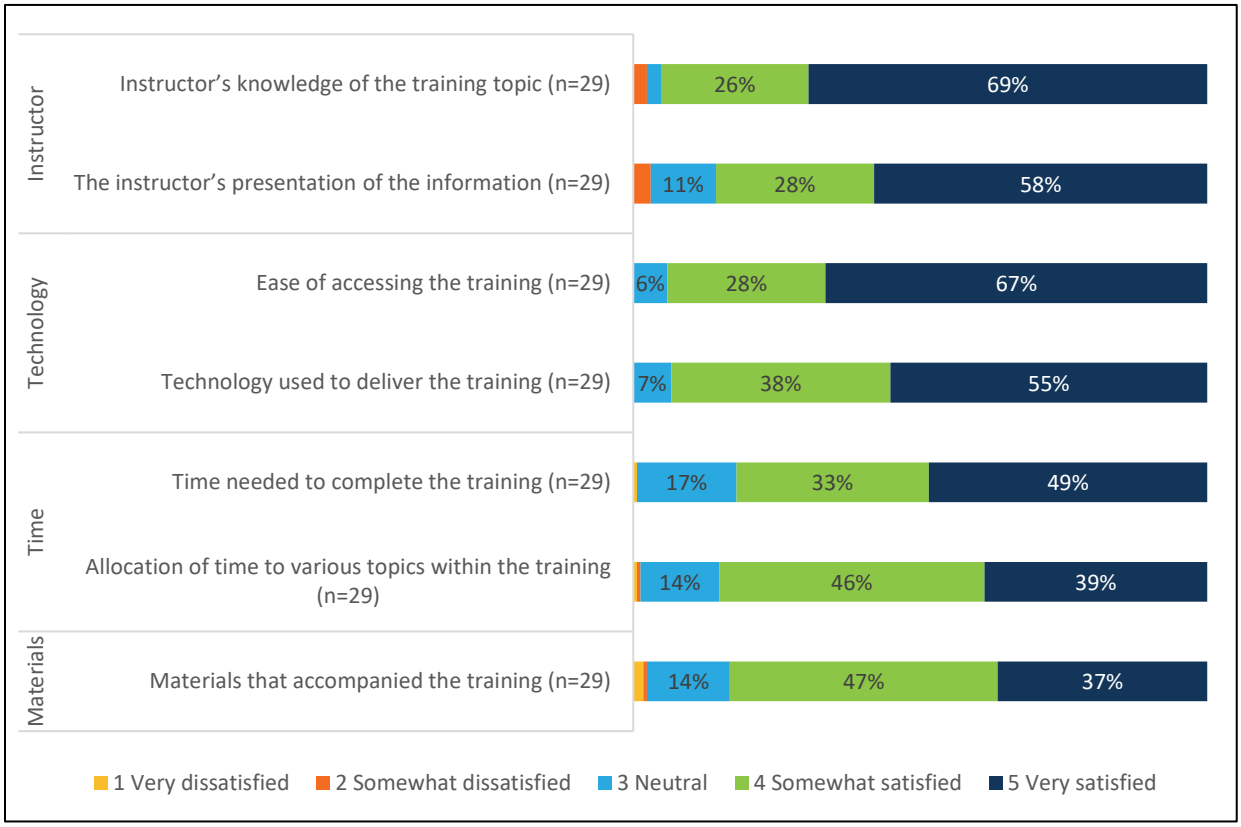


Figure 5: Commercial Training Participants' Satisfaction with Training Elements

Most respondents reported that at least some of the material covered in the training was new to them. Fifty-four percent of respondents reported that one-half or more of the information covered in the training they received was new to them. About 9% reported that none or almost none of the material was new to them

Most respondents reported that the training and the instructors met or exceeded their expectations. Across the five training categories and seven instructor categories, about three-quarters or more of respondents reported the training met or exceeded their expectations. Respondents were especially likely to report that the instructors met or exceeded expectations. The one category where more than 20% of trainees indicated the training had not met expectations pertained to networking with other trainees. However, as noted above, these trainees completed live webinar training, a medium that would be difficult to facilitate networking (Figure 6).

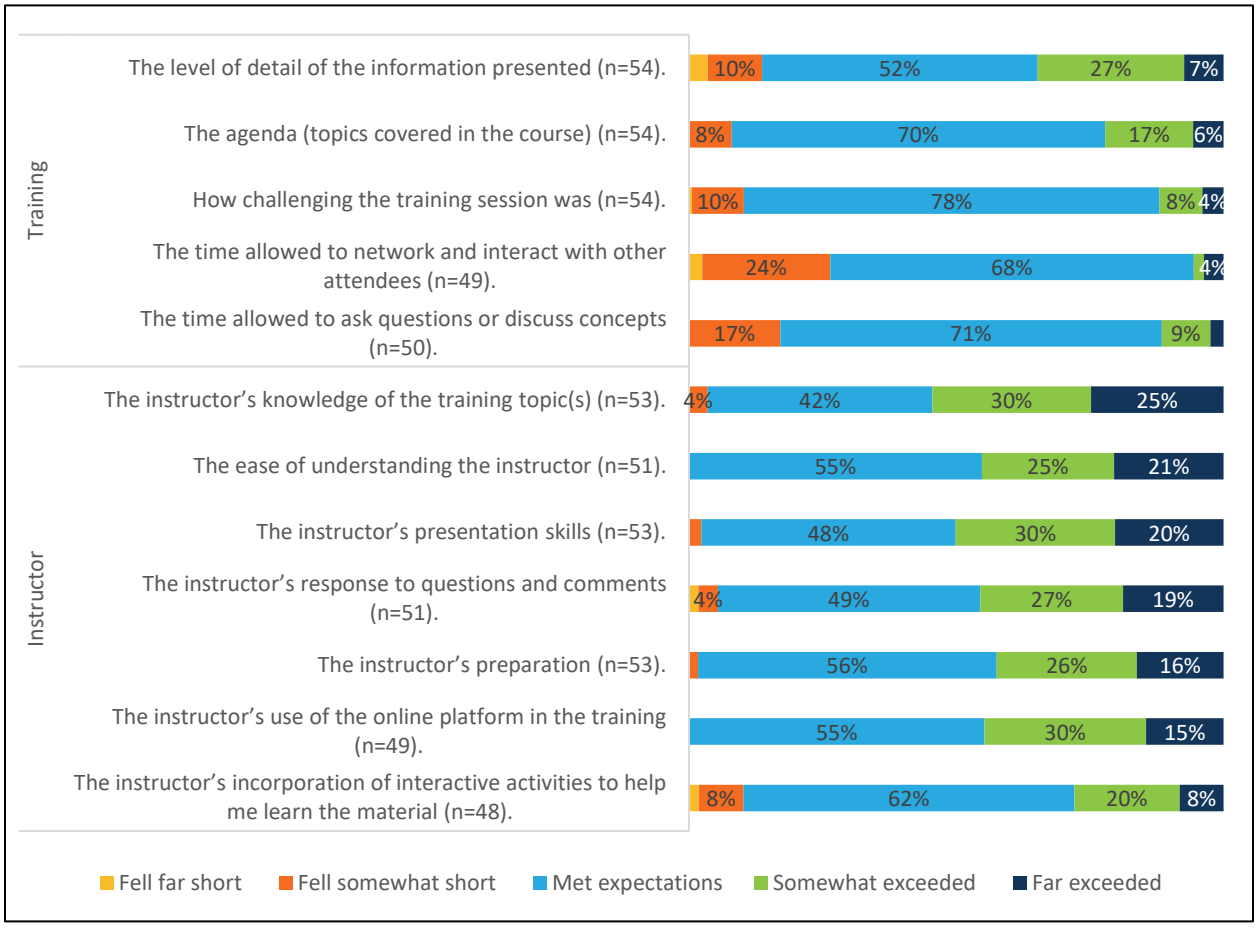


Figure 6: Degree to Which Training Elements met Commercial Trainees' Expectations

Another indication of satisfaction with the training was the high percentage of commercial respondents that reported they would recommend the training to their colleagues. Eighty-one percent of all respondents reported they were at least somewhat likely to recommend the training they took to their colleagues.

Respondents generally reported that the training met their professional needs with about three-quarters (76%) reporting the training either closely or completely met their needs (scoring a

four or five on a five-point scale). Few respondents reported the training did not meet their professional development needs.

Respondents provided multiple suggestions for improving training delivery, training topics, and interactions with others. Of the 83% of respondents that provided suggestions for improvement, 73% suggested changes to the delivery of the training, with most of those wanting more handouts or hands-on examples like site visits or demonstrations of technology. More than half reported wanting more advanced instruction topics, with some respondents providing examples like training on grey water systems, solar, and battery systems. Additionally, more than 25% of respondents expressed interest in having more interaction with peers and instructors.

5.2 Satisfaction and Suggestions to Improve Residential Training

Almost all residential training survey respondents completed an online method, with 73% taking live webinar training and 23% completing on-demand training. The remaining respondents, all in Idaho, took in-person training**. Most online respondents reported satisfaction with the delivery of the training (80%), the time needed to take the training (80%), and allocation of time to the training topics (74%).** Participants of online training reported less satisfaction (65%) with the materials that accompanied the training. The in-person trainees were satisfied with all elements of the training they completed.

When examined by state, respondents that completed live-webinar training varied in their satisfaction with the ease of accessing the training, the instructor's knowledge, and presentation of information. Compared to Washington and Idaho/Montana respondents, Oregon respondents reported higher satisfaction with the instructor's presentation of information, knowledge of the topics, and the ease of accessing the training (Figure 7). Of the three respondents that reported dissatisfaction with the ease of accessing the training, one reported sound quality issues at the outset of the training. The other two did not provide details about their dissatisfaction.

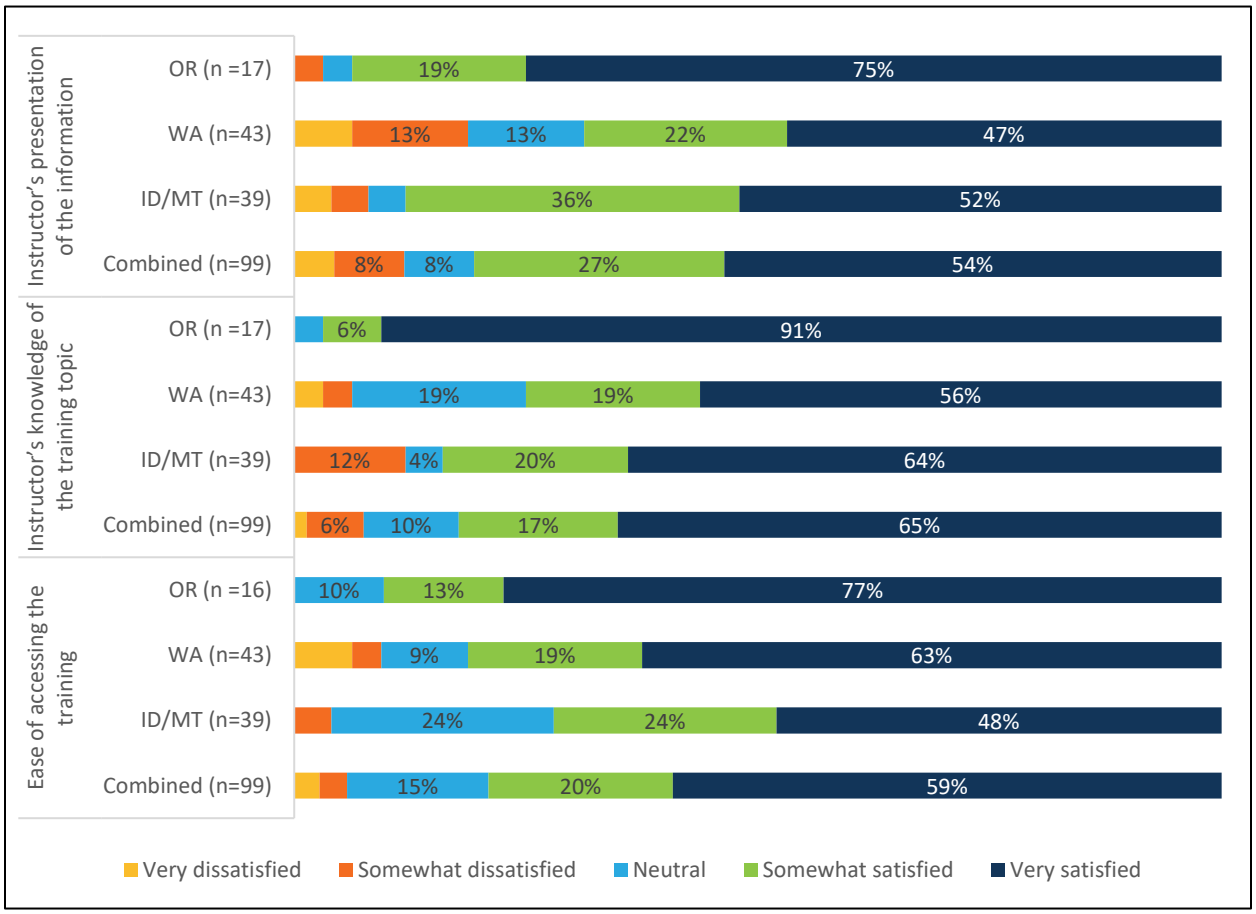


Figure 7: Satisfaction with Live-Webinar Trainings by State among Residential Trainees*

Most respondents reported that at least some of the material covered in the training, across all modes, was new to them. Fifty-five percent of respondents reported that at least half of the information covered in the training was new to them. About 14% reported that none or almost none of the material was new to them.

Most respondents reported that the training and the instructors met or exceeded their expectations. Across the four training related categories, three-quarters or more of respondents reported the training met or exceeded their expectations. The one category where more than 20% of trainees indicated the training had not met expectations pertained to networking with other trainees. However, consistent with findings from commercial trainees, all those that reported an interest in networking took online (live or on-demand) training, which can make networking difficult compared to in-person training (Figure 8).

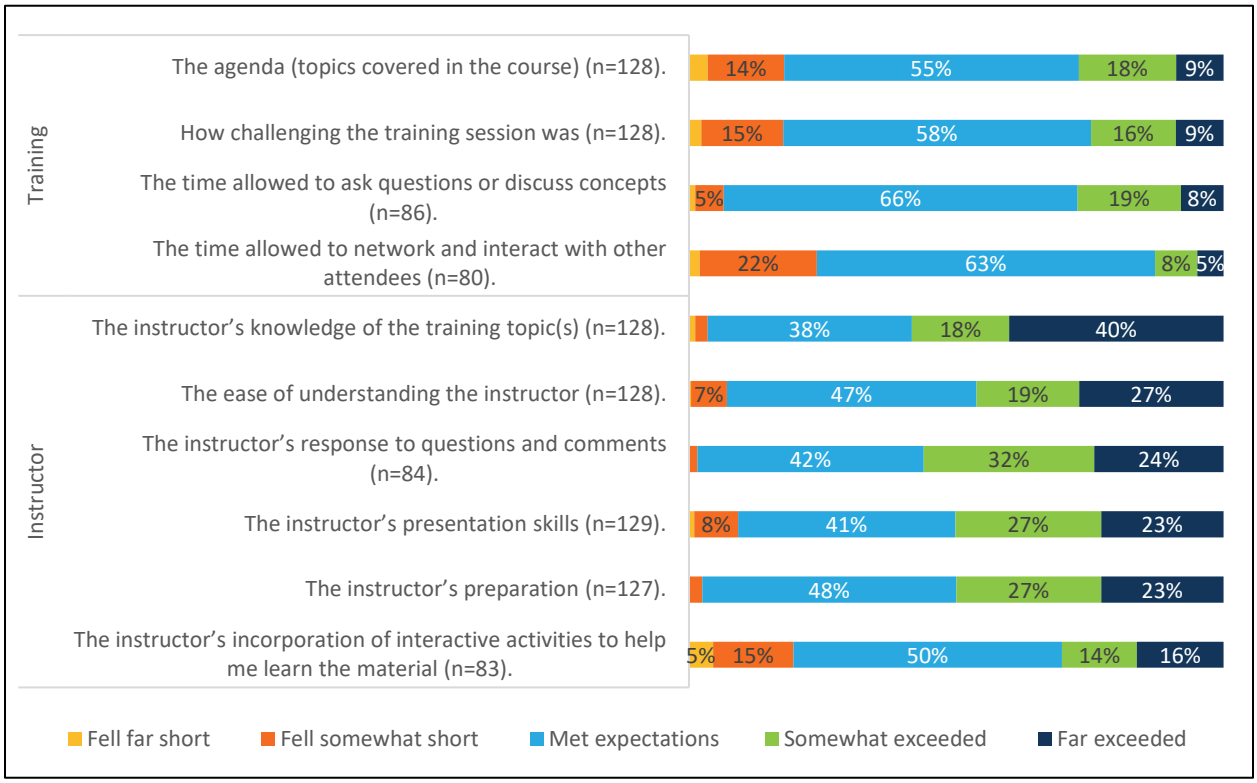


Figure 8: Degree to Which the Training and Instructors met Residential Trainees' Expectations

Idaho/Montana respondents were more likely to report that the training did not meet their expectations when it came to the level of detail presented. Almost one-third of Idaho/Montana respondents reported that the level of detail in the training did not meet their expectations compared to 16% of Washington respondents and 7% of Oregon respondents (Figure 9).

Oregon respondents were more likely to report that the instructor's use of the online platform far exceeded their expectations compared to respondents from other states. More than one-third of Oregon respondents stated the instructor's use of the online platform exceeded expectations compared to less than 20% of Washington respondents (Figure 9).

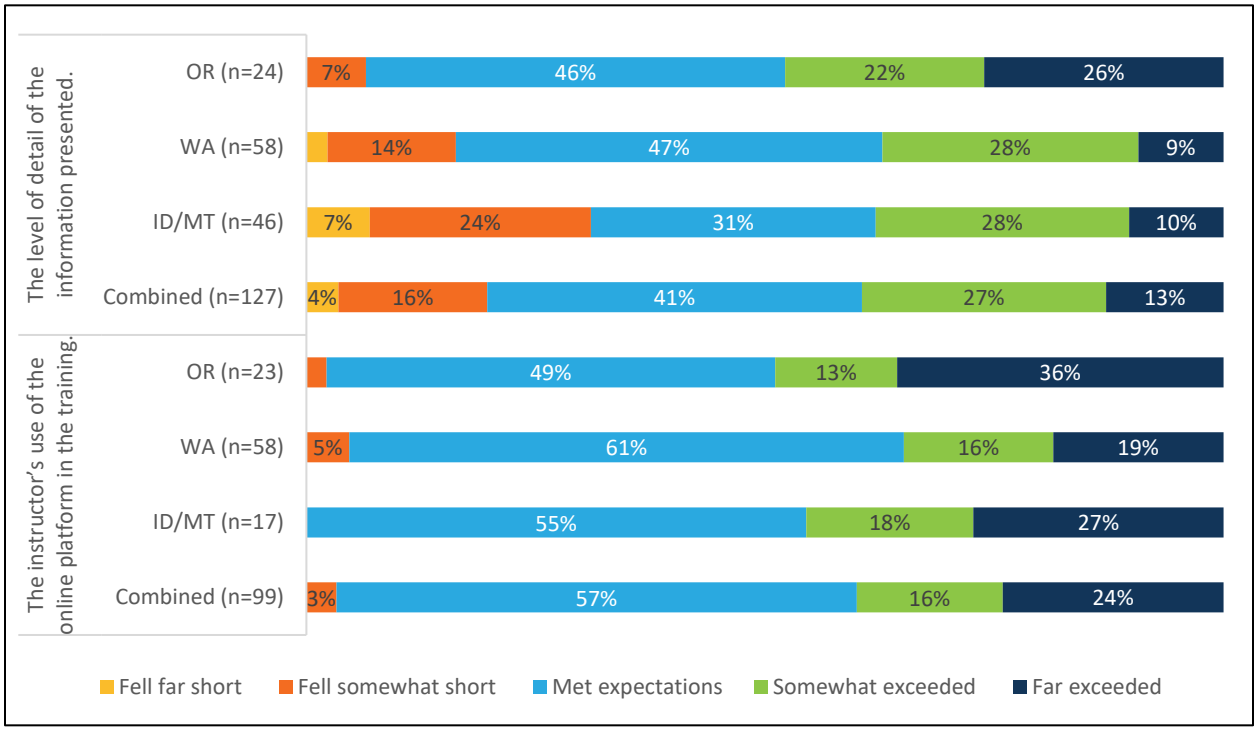


Figure 9: Degree to Which the Training and Instructors met Residential Trainees' Expectations by State

Another indication of satisfaction with the training was the high percentage of residential respondents that reported they would recommend the training to their colleagues. Eighty percent of all respondents, across all training modes, reported they were at least somewhat likely to recommend the training they took to their colleagues.

Respondents provided multiple suggestions for improving training and those suggestions fell into three overarching areas: training delivery, training topics, and interactions with others. Of the 81% of residential respondents that provided suggestions for improvement, 76% suggested changes to the delivery of the training with most of those wanting more handouts or hands-on examples like site visits or demonstrations of technology. Sixty-two percent reported wanting more advanced instruction topics such as advanced framing and more HVAC specific training related to code and one percent wanted a more basic introductory course. Additionally, 30% of respondents expressed interest in having more interaction with peers and instructors.

5.3 Feedback from Post-Training Surveys

Trainers reported that trainees generally provide positive feedback in post-training surveys or informal follow-up conversations. One trainer stated that, generally, their post-training surveys show that 90% of trainees report high levels of satisfaction with trainings, 5% report the training was too technical and difficult, and the remaining 5% report the training was not detailed enough. In most cases, according to trainers, most trainees report wanting more training or more advanced training about certain topics. Respondents did not provide specific feedback about topics or material on which market actors wanted training.

5.4 Feedback About NEEA-Supported Education Activities

While not the focus of this research, the ADM Team did receive some feedback about NEEA-supported education activities from trainers and trainees. This feedback centered on three resources NEEA supports: 1) Technical assistance hotlines in each state, 2) The Washington Commercial code compliance webtool[12], and 3) Publication of research reports and technical resources. Additional education activities that NEEA supports that will be addressed in MPER #6 include BetterBuiltNW[13] and the Idaho Energy Code website[14].

The NEEA Team has limited insight into how (or if) the market is using NEEA's technical resources, and they would like to know if questions come to the state technical assistance hotlines related to these resources. For example, the NEEA Team would like to know both (a) if the dissemination of a technical resource about a piece of technology resulted in state hotlines receiving questions about that technology and (b) if someone calling a technical assistance hotline about that technology (or any other topic) had their questions successfully addressed.

Staff and trainers noted that the technical assistance hotlines play an important role in educating the market and in shaping the development of training topics. The NEEA Team and trainers select training topics, at least partially, based on feedback from trainees that call into the technical assistance hotlines. According to trainers, they receive phone calls or emails from market actors and use the frequency of questions about a specific topic that comes into the hotline to identify needed training topics. For example, if the quantity of calls/emails about heat pump water heaters (HPWH) starts to increase, the trainers will fold information about HPWH and how they can help with code compliance into subsequent trainings.

The Washington State Website Portal, created with NEEA funds, and a tool from Pacific Northwest National Laboratory serve multiple purposes, including educating market actors about code. The tools are data entry tools that commercial market actors are using to test their designs to ensure code compliance. The tools serve as an educational resource for commercial market actors in the state and as noted previously in this report, they help the Codes Team assess commercial market actor's understanding of code.

NEEA provides educational resources to code officials and market actors by providing reports and through informal one-on-one interactions. NEEA staff reported that they support state energy offices and building codes councils with information and resources that those organizations can share with local code officials. For example, NEEA will prepare a report relevant to a new technology that can help a builder meet new code requirements and they will share that information with code officials. Also, NEEA staff and NEEA affiliate groups interact with state and local building officials at regional conferences, code development meetings, and through one-on-one interactions where they share resources.

[12] https://waenergycodes.com/
[13] https://betterbuiltnw.com/case-studies
[14] https://www.idahoenergycode.com/

6 Logic Model Review

NEEA uses logic models to describe the barriers to market adoption its initiatives are designed to address (for example, lack of knowledge about energy codes), the activities they conduct that address the challenges (for example, providing training), the outputs that result from those activities (for example, number of training participants), and the intended outcomes (for example, market actors build code compliant buildings). NEEA staff regularly revisit the logic models to ensure their work is following the model or to alter the model to reflect the market and their work more accurately. The Codes Team most recently updated their logic model in 2022.

The ADM Team reviewed the current logic model to assess whether:

- The model accurately captures the theory of change underlying the Codes Team's work and accurately captures the necessary elements of the previous logic models,
- The underlying logic is sound,
- The outcomes are evaluable,
- The model captures key differences between NEEA's residential and commercial codes work, and
- The model contains any inaccuracies in the outcomes as they pertain to NEEA's code influence activities.

6.1 General Observations

The logic model largely captures the activities, outputs and outcomes related to NEEA's training and education work. The ADM Team's review demonstrated that the logic model captured the theory of change, that the underlying logic was sound, and that the logic model captured key differences between the residential and commercial codes work.

The logic model misses some key distinctions and nuances needed to fully capture the NEEA Team's code influence work, the state- and organization-specific work they must do, and their adaptations to changes in policy. At a high level, NEEA is clearly conducting most of the activities documented in the logic model, producing the expected outputs, and working toward the desired outcomes. However, as described in Section 3, respondents in this study described how NEEA and its partners must react to policy demands to some degree during each code cycle process. That adaptability and state-specific work is missing from the logic model, even though the ADM Team's evaluation shows that NEEA works to adapt to changing code cycles, state and national policies, and organizational processes.

6.2 Detailed Recommendations

Table 6 presents the ADM Team's observations of each logic model element and suggested changes, if any, for that element. The table also reports if the activity, output, or outcome pertains to NEEA's support of training and education, code influence work, or other code-related work. In line with the general observations described in Section 6.1 and the state differences described in Section 3, the ADM Team suggests that the logic model may need supplemental information that could come from developing state-specific plans that describe NEEA's strategy in each state and their desired outputs and outcomes for each state. The ADM Team notes where a state-specific document would especially help a reader understand what is happening across the region.

Table 6: Logic Model Element Review

Existing Logic Model Element	Observation	Suggested Change
Barriers		
Lack of sufficient government investment in codes to sustainably advance and maintain codes and compliance.	Interviews with staff and market actors indicate these barriers exist in all states in which NEEA operates; however, the ways in which and degree to which they manifest differs by state.	Use state-specific plans to describe the state-specific barriers.
Market actors do not value code changes.		
Market actors don't always have the capability to comply with code.		
Lack of consistent and timely compliance feedback to confidently advance code stringency.		
Uncertainty how to structure code to meet goal.		
Opportunities		
State/national policies for decarbonization.	Interviews with staff and market actors indicate these opportunities exist in varying degrees in each state. For example, Washington has policies in place to limit carbon emissions whereas other states do not.	Use state-specific plans to describe the state-specific opportunities.
Emergence of performance-based approaches.		
Public process for code changes.	While there is a public process in place in each state, the processes vary by state.	
Strategic Interventions		
Facilitate education and training with builders, market actors, building officials, utilities. (Training)	NEEA clearly supports this activity in all four states.	None. This is a critical activity NEEA conducts in the region.
Coordinate with market actors and efficiency groups to develop code proposals. (Code Development & Adoption Influence)	This activity does happen at a high level. However, "develop code proposals" means different things in each state and this description does not capture the significant differences in how NEEA coordinates with market actors and develops proposals in each state. This description seems to best describe the Washington process and does not clearly indicate how IECC influences states, especially Idaho and Montana.	Make it clear that coordination and code development occur very differently in each state. Suggested edit: "Coordinate with market actors, efficiency groups, and national code organizations to develop code proposals appropriate to each state." Additionally, use state-specific plans to describe how this activity occurs in each state.
Participate in public code processes within each state, nationally, and with ASHRAE. (Code Development & Adoption Influence)	NEEA clearly participates in the public code process in each state as much as each state process allows.	None

Existing Logic Model Element	Observation	Suggested Change
Collect and share data and technical materials from NEEA programs, Emerging Technology, market research, and engagement with the market. (Code Development & Adoption Influence)	Code officials and market actors are likely not very aware of the data and technical materials NEEA provides, especially outside of Washington. In places without requirements for code stringency it is unclear why code officials or market actors would seek or pay attention to NEEA's work.	Make it clearer that this activity pertains to states able to receive it. Additionally, use state-specific documents to describe how this activity occurs in each state.
Explore alternative frameworks for code. (Other)	It is not clear what is meant by "alternative frameworks to code."	Suggested edit: "Explore alternative frameworks to code that unlock further energy saving opportunities." This could include prescriptive and performance-based code approaches or other approaches.
Coordinate and test tools to streamline code implementation and compliance. (Training, Code Development & Adoption Influence, Other)	This element does not capture all the ways the tools NEEA supports could impact the market. Interviews with staff and market actors indicate NEEA's web-based compliance tool in Washington could be used for a range of code-supporting activities beyond just implementation and compliance.	Suggested edit: "Support tool development that can support code implementation, compliance, influence, and training activities." Where applicable, specify tools in state-specific plans.
Develop code strategies to support NEEA programs and state and national needs/opportunities. (Code Development & Adoption Influence)	It is not clear from document review or staff interviews how the NEEA Codes Team coordinates with other NEEA programs/ initiatives. This was not a focus of this evaluation.	Document how the Codes Team supports other programs.
Outputs		
Technical publications, curriculums, trainings completed, website updated, newsletters, hotlines. (Training, Code Development & Adoption Influence)	NEEA supports curricula, trainings, websites, newsletters, and hotlines in each state. The technical publications may be relevant region-wide, but they appear to be more relevant to NEEA's work in Washington and with IECC.	Suggested edit: "State-specific technical publications, curricula, trainings completed, website updated, newsletters, hotlines." Make it clear that there may need to be differences in the types of outputs delivered to each state.
Completed code proposals including proposals that support NEEA programs; Meetings with market actors and efficiency groups. (Code Development & Adoption Influence)	NEEA works to draft proposals and support others' proposals in Washington and to a lesser degree in Oregon and with IECC. NEEA meets with market actors and efficiency groups in all states including the TAG in Washington, and other groups in Idaho, Montana, and Oregon.	There are two outputs listed here. Separate the outputs into one about code proposals and another about meetings with market actors and efficiency groups.
Attendance at public meetings, proposals submitted, public testimony. (Code Development & Adoption Influence)	NEEA attends public meetings and provides testimony in all states. They submit proposals in Washington, Oregon, and at IECC meetings.	There are three outputs here, and they manifest themselves differently in each state. Separate these activities into three outputs: 1) Public meetings, 2) Proposals submitted, 3) Public testimony.
Product specifications, market data, analysis provided by programs. Completed market research. Meetings with builders, green labels, manufacturers, etc. (Code Development & Adoption Influence)	NEEA supports work that creates all of these outputs. However, these outputs may have a more immediate and obvious effect in some states than others.	Make it clear which of these outputs are most applicable to each state using state-specific plans.

Existing Logic Model Element	Observation	Suggested Change
Reports from researching performance-based codes and alternative pathways to code compliance. **(Code Development & Adoption Influence)**	The results that come from producing these kinds of reports are similar to the output "Product specifications, market data, analysis provided by programs. Completed market research. Meetings with builders, green labels, manufacturers, etc."	Suggest merging this output with the output "Product specifications, market data…"
Reports about effectiveness of available tools (ex. Web based compliance checker, TSPR). Data from tools. Development of new tools. Maintenance of existing tools. **(Training)**	It is unclear if NEEA has produced reports about the effectiveness of these tools and how these tools can be used. Interviews with staff and market actors suggest there are many ways these tools and resulting data could be used to inform training, influence, and compliance activities.	Document how the Codes Team supports reports that demonstrate the effectiveness of these tools.
Policy strategies available for programs with codes in their logic models. **(Other)**	It is not clear from document review or staff interviews how the NEEA Codes Team coordinates with other NEEA programs/initiatives. This was not a focus of this evaluation.	None. The ADM Team did not collect enough information to assess whether this output needs to change.
Outcomes		
Efficiency partners and market actors submit proposals that support efficiency. **(Code Development & Adoption Influence)**	This is happening in all states either through partners' proposals submitted to state decision makers or via proposals going through IECC and then to states. Multiple people and organizations propose code changes that increase efficiency as a direct result of NEEA's work.	Indicate in state-specific plans that the proposal paths vary by state and that NEEA's influence on code stringency can be limited or enhanced by the executive and legislative branches of government in each state.
NEEAs proposals and proposals impacted by NEEA collaboration influence final code. **(Code Development & Adoption Influence)**	This is largely happening in Washington and to a lesser degree in Oregon. That is, NEEA and its partners bring energy code proposals to state agencies for consideration.	
Code officials and other participants in the code process understand the value of energy code and how to achieve their goals. **(Training, Code Development & Adoption Influence)**	Code officials are one or two steps removed from NEEA's code influence activities. Code officials do not work directly with NEEA other than through the third-party trainings NEEA support and if an official contacts a hotline with questions. The ADM Team is unsure if this is a realistic outcome.	Consider linking this element exclusively to training and hotline activities.
Public process leads to increased stringency in codes. **(Code Development & Adoption Influence)**	The processes in each state vary with some states having a more robust approach by working to develop their own codes beyond national codes like IECC (Washington and Oregon) and others relying on national codes (Idaho and Montana). Policy realities in each state determine code stringency and NEEA adapts to those realities.	Suggested edit: "Maintain code, increase stringency, and avoid rollbacks in code." State-specific plans can also specify how this outcome should look for each state.

Existing Logic Model Element	Observation	Suggested Change
Codes remain clear, simple, and enforceable. (Training, Code Development & Adoption Influence)	This outcome assumes that energy codes are already clear, simple, and enforceable. Market actors did not report that existing codes are clear, simple, and enforceable. They also noted that codes are getting increasingly complex. NEEA clearly supports people that work to make code clear, simple, and enforceable via technical assistance hotlines and the monitoring of those hotlines for questions signaling confusion or code ambiguities coming from market actors.	Suggested edit: "Codes are as clear and simple as possible making compliance and enforceability more likely."
Utility programs offer incentives to encourage above code construction. (Other)	No observations	None
Voluntary certifications help builders differentiate their homes. (Other)	No observations.	None
States are able to progress towards their building sector energy/climate goals. (Other)	No observations.	None
Market actors (builders, manufacturers, supply chain) understand requirements of code. (Training)	This outcome is evaluable using trainee surveys, code compliance studies, and data from technical assistance hotlines.	None
Market actors neutral toward or value energy codes. (Training)	The outcome does not specify which market actors are affected. Language "neutral toward or value" is difficult to understand. It is not clear how this outcome is an effect of outcome, "Market actors…understand requirements of code."	Suggested edit: "Builders have at least neutral attitude toward energy codes." Outcome should flow directly down from output "Technical publications…" Both this outcome and "Market Actors… understand requirements of code" should flow to long-term outcome "Builders meet… code…"
Increased builder understanding of product availability and use of or application of new products. (Training)	It is not clear how this outcome is an effect of outcome, "Market Actors neutral toward or value energy code." It is not clear if this outcome is something the Codes Team should include in the logic model as product availability and application of new products is not something trainers typically train about.	If this outcome is kept, it should flow directly from output "Technical publications…" If this outcome is kept, it should flow to long-term outcome "Builders meet… code…"
Code officials and other participants in the code process understand the value of energy code and how to achieve their goals. (Training)	"Other participants in the code process" is not specified. "Goals" is not specified. Not clear how goals are set.	Merge this element with the outcome "Market actors neutral toward or value energy code." Specify "goals" and consider adding a new element that clearly explains what goals code officials have and are trying to achieve.

7 Conclusions and Recommendations

This research had three objectives: 1) Review NEEA's code influence activities, 2) Review NEEA's training and education activities, and 3) Review the current Codes logic model. This section presents the key conclusions and, where applicable, recommendations related to each of these objectives.

Code Influence

Conclusion #1: NEEA is filling gaps in each state's energy code process that would likely go unfilled or inadequately filled without their involvement. By filling those gaps and working in and around an increasingly contentious code development environment, NEEA is contributing to a more robust energy code regionally and nationally**.** Specifically, NEEA is:

- **Funding and disseminating nationally respected data-driven and vetted research** that enables NEEA and its partners to inform decision makers about the importance of a code change. There are few, if any, other groups that play this role in the region. This work is vital to supporting laws in Oregon and Washington that require the states to achieve emissions and energy savings targets, respectively. Without NEEA's support, it is not clear that the states, especially Washington, would have the resources needed to conduct the research that justifies changes to energy code. Furthermore, NEEA's support of the IDL's research and the Idaho Code Collaborative's distribution of research findings was vital to the maintenance of energy code in the state during their most recent code cycle discussions.
- **Participating and contributing to energy code groups and organizations**. Specifically, NEEA is active with the TAGs in Washington, the Energy Collaboratives in Montana and Idaho, the Oregon Department of Energy stakeholder meetings, and IECC committees. NEEA directly influences code by preparing its own proposals and partnering on others' proposals that eventually make their way into final code. NEEA's proposal development work on the IECC connects to Idaho and Montana because those states adopt IECC as their state code. NEEA has carved out an important role in each of these organizations by increasing the number and quality of energy code proposals, facilitating discussions around energy code changes, and being a valued voice in each of these groups.
- **Cross-pollinating energy code change ideas across the region and the nation**. As an entity active in multiple places, NEEA staff see varying degrees of energy code stringency and varying processes for implementing energy code. Therefore, they can share information, ideas, and best practices across the places where they are active. Furthermore, NEEA's code change proposals and their partners' proposals in Washington, a state with some of the most stringent energy codes in the nation, eventually influence IECC and other state's energy codes to become more stringent.

  Recommendation #1.1: Continue to look for ways to fill gaps within each state's energy code process. That could mean funding state-specific research, convening a new group of stakeholders, improving awareness of energy codes, or some other activity that fills a gap supporting the development and maintenance of energy codes.

  Recommendation #1.2: Continue developing more stringent and cost-effective energy code changes and providing these proposals to Oregon, Washington, and IECC decision makers.

Continue to look for other places or opportunities to contribute to energy code changes, such as ASHRAE.

Recommendation #1.3: Continue supporting and sharing data-driven and vetted research that NEEA and its partners can use to demonstrate energy savings and cost-effectiveness that result from potential changes to energy code.

Code Training and Education

Conclusion #2: Most trainees reported that NEEA-supported training influenced at least one aspect of their knowledge, behaviors, or attitudes related to energy codes, and opportunities exist for NEEA to get more regular feedback on trainings that would inform them about changes in the market.

Recommendation #2.1: Consider developing a standardized survey that trainers could deploy after each training session to provide more regular feedback about the impact of training on trainees' attitudes and behavior and collect information to guide improvements or future training offerings. Consider using a model such as the Kirkpatrick Model of Evaluation to guide the development of this standardized instrument. This model assesses a trainee's reaction, learning, and behavior resulting from the training and can help NEEA determine if the training is having the desired effect. Tracking these responses over time could help quantify more fully the respondents' interest in code training topics and their perceptions of the new code.

Conclusion #3: Data from the technical assistance hotlines NEEA supports could be better used to inform NEEA and its partners about training topics to deploy, code language that could be improved, and general understanding of code among market actors. NEEA staff noted they have limited insight into how the technical assistance hotlines are contributing to improved understanding of codes. Trainers reported the hotlines gave them a sense of topics that are important to the market. However, it was less clear if hotline staff in each state logged hotline data in a way that would enable a trainer or NEEA staff to identify trends about a specific topic that would inform them about ways to adjust training or develop code proposals that could make code language clearer.

Recommendation #3.1: Consider developing a systematic method for logging data from the hotlines in each state that would capture themes and trends from the questions.

Conclusion #4: Many trainees reported that training improved their view of energy code. This relatively positive view of energy code and training among many trainees indicates NEEA is positively influencing the market's view of energy code and that NEEA should continue to evaluate this over time.

Recommendation #4.1: As part of the post-training survey identified in Conclusion #2, ask trainees about the degree to which they value energy code.

Conclusion #5: Trainees generally reported high satisfaction with all modes of training, the technology used to present the training, the training topics, the instructors, and the presentation of the material. Trainees also reported a few items that would improve training, including more tangible resources such as handouts and hands-on learning opportunities, training on more advanced building science topics (for example, grey water systems, solar, and battery

systems), and an opportunity to interact more with peers and trainers. Because most training in the timeframe the ADM Team assessed was online due to the pandemic, the opportunity to interact with peers and trainers was limited in a way it may not have been had more trainings been held in-person.

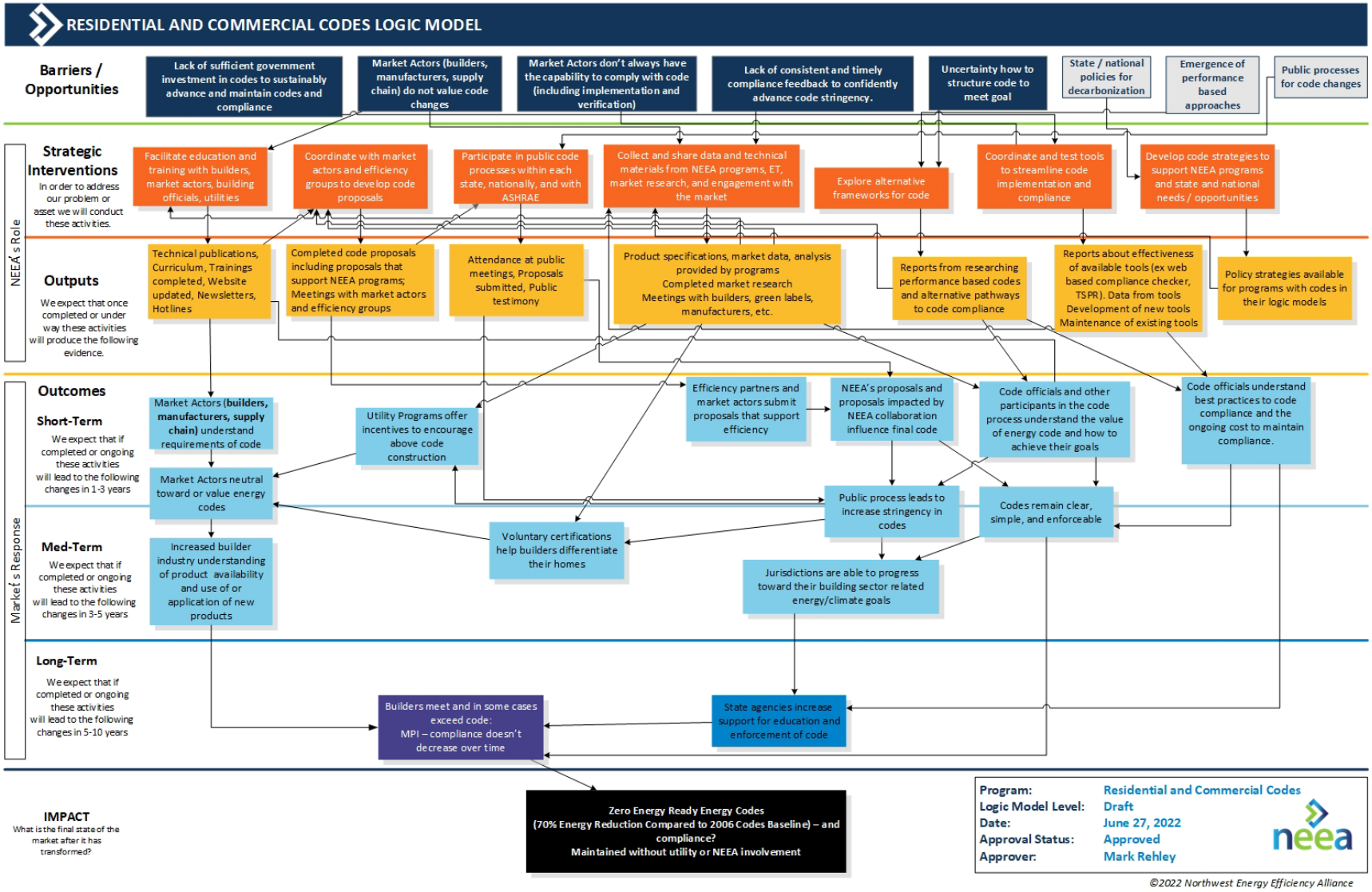
> Recommendation #5.1: Work with trainers to develop more in-person trainings that would enable opportunities for market actors to interact with and learn from peers and trainers. Good candidates for in-person training would be topics that benefit from hands-on training such as working with a specific tool or learning steps for how to install a measure.
>
> Recommendation #5.2: As part of the post-training survey identified in Conclusion #2, ask trainees to specify advanced topics they would like to see included in training.

Logic Model

Conclusion #6: The logic model largely captures NEEA's training and education activities, but it does not fully capture the extent of NEEA's work to influence energy codes. The ADM Team's evaluation shows clearly that NEEA works to adapt to changing code cycles, state and national policies, and organizational processes, but the logic model misses some key distinctions and nuances needed to fully capture the nature of the Codes Team's work. Separate state- and code cycle-specific plans that draw from the broader strategies captured in the logic model may serve as more appropriate reference points for future evaluations.

> Recommendation #6.1: Develop state- and code cycle-specific plans that identify how NEEA's tailored strategy can influence an individual code cycle.
>
> Recommendation #6.2: Edit the logic model to reflect the changes described in Section 6.

Appendix A: Program Logic Model



Appendix B: Trainee Respondent Characteristics

This Appendix shows key characteristics of trainee survey respondents by sector (commercial and residential) and breaks out differences by state when those differences were statistically significant.

Appendix Table 1: Commercial respondent characteristics, multiple responses allowed

	Oregon (*n*=34)	Washington (*n*=47)	Total (n=81)
Respondent Role			
Architect/Designer	56%	34%	43%
Engineer	26%	38%	33%
Consultant	12%	9%	10%
Building planner/reviewer	3%	11%	7%
Building code official	0%	2%	1%
Manufacturer rep.	0%	2%	1%
General contractor	0%	2%	1%
Home builder or trades	0%	2%	1%
Program contractor	3%	0%	1%
Sectors Worked In			
Commercial	85%	92%	89%
Residential	50%	51%	51%
Government	32%	47%	41%
Education	24%	40%	33%
Industrial	32%	34%	33%
Agricultural	3%	6%	5%
Medical	3%	2%	3%
Time in Field			
Less than one year	0%	0%	0%
One to two years	3%	9%	6%
Three to five years	3%	19%	12%
Six to 10 years	18%	28%	24%
More than 10 years	**77%***	45%	58%

*p<.05 using Z-test of proportions.

Appendix Table 2: Training use and awareness - commercial

	Oregon (*n*=34)	Washington (*n*=47)	Total (n=81)
Learn About Training			
Online	47%	26%	35%
Email	***41%****	*11%*	*24%*
Notice on Website	*6%*	*15%*	*11%*
Social networking site	*0%*	*0%*	*0%*
Personal relationship	18%	26%	22%
Word of mouth	*18%*	*23%*	*21%*
Contractor	*0%*	*2%*	*1%*
Mail	24%	21%	22%
Newsletter	*24%*	*19%*	*21%*
Postcard or mailing	*0%*	*2%*	*1%*
Other training	3%	13%	9%
Advertisements	3%	6%	5%
Not sure	6%	9%	7%
Motivation for Training			
Better understand code	94%	83%	88%
Expand tech. knowledge	85%	79%	82%
Earn CEUs	77%	32%	51%
Personal interest	29%	34%	32%
Improve qualifications	21%	30%	26%
Learn to teach others	15%	17%	16%
Network	3%	6%	5%
Required by employer	3%	4%	4%
Training Mode			
Live webinar	100%	98%	99%
In-Person	0%	2%	1%
On-demand	0%	0%	0%

*p<.05 using Z-test of proportions.

Appendix Table 3: Residential respondent characteristics, multiple responses allowed

	Idaho/Montana (*n*=31)	Oregon (*n*=49)	Washington (*n*=44)	Total (*n*=124)
Respondent Role				
Architect/Designer	13%	33%	25%	25%
Consultant	3%	6%	9%	10%
Building official	13%	2%	14%	9%
Home builder or trades	13%	10%	14%	6%
Energy rater	13%	6%	14%	6%
Building code official	3%	2%	5%	6%
General contractor	0%	14%	2%	5%
Engineer	6%	0%	9%	3%
Energy services provider	19%*	0%	2%	2%
Non-profit staff	10%	4%	2%	2%
Realtor	0%	6%	0%	2%
Man. representative	0%	2%	2%	2%
Program contractor	3%	0%	0%	2%
Home inspector	0%	4%	0%	2%
Student	0%	2%	0%	2%
Utility staff member	3%	2%	0%	1%
Equipment contractor	0%	2%	2%	1%
Sectors Worked In				
Residential	81%	94%	84%	87%
Commercial	39%	45%	43%	43%
Government	29%	12%	21%	19%
Education	16%	10%	5%	10%
Industrial	10%	6%	9%	8%
Agricultural	7%	2%	5%	4%
Time in Field				
Less than one year	26%	2%	9%	11%
One to two years	7%	14%	14%	12%
Three to five years	13%	20%	25%	20%
Six to 10 years	16%	22%	9%	16%
More than 10 years	39%	41%	43%	41%

*$p<.05$ using Z-test of Proportions. In this case, due to the small numbers of respondents, the significance of this is questionable, so, interpret this difference with caution.

Appendix Table 4: Training use and awareness – residential

	Idaho/Montana (*n*=31)	Oregon (*n*=49)	Washington (*n*=44)	Total (*n*=124)
Learn About Training				
Online	19%	27%	36%	28%
Email	*16%*	*12%*	*30%*	*19%*
Notice on Website	*3%*	*14%*	*5%*	*8%*
Social networking site	*0%*	*0%*	*2%*	*1%*
Personal relationship	65%	35%	16%	36%
Word of mouth	***55%****	*31%*	*16%*	*32%*
Contractor	*10%*	*4%*	*0%*	*4%*
Mail	7%	18%	32%	20%
Newsletter	*7%*	*16%*	*30%*	*19%*
Postcard or mailing	*0%*	*2%*	*2%*	*2%*
Other training	0%	6%	9%	6%
Advertisements	0%	6%	0%	2%
Not sure	10%	8%	7%	8%
Motivation for Training				
Better understand code	65%	63%	89%	73%
Expand tech. knowledge	71%	74%	73%	73%
Personal interest	32%	**71%***	39%	50%
Earn CEUs	13%	**57%***	14%	31%
Improve qualifications	26%	43%	27%	33%
Learn to teach others	23%	20%	14%	19%
Network	**36%***	16%	7%	18%
Required by employer	16%	6%	2%	7%
Training Mode				
Live webinar	87%	65%	73%	73%
On-demand	0%	35%	27%	23%
In-Person	13%	0%	0%	3%

**p*<.05 using Z-test of Proportions.

Appendix C: Progress Indicator Assessment

In consultation with the NEEA Team, the evaluation Team identified 12 PI (PIs) that assess progress towards the four training and education outcomes identified in the Codes Team's logic model.

Appendix Table 5 identifies the PIs for each outcome and the survey questions used to assess each PI, together with an explanation of how each PI is assessed. Each PI is assessed as a dichotomous (1/0) variable. For example, if a respondent shared information from the training with their colleague, they would be assigned a "1" and those that did not share the information were assigned a "0". The indicator would be the count of those with a "1" divided by the total of all respondents, thus providing a percentage that NEEA can use to compare results over time. Some PIs are assessed with a single survey item. In such cases, the table shows the criterion response that defines a positive value for those PIs. Several PIs are assessed with multiple items. In those cases, the table shows how the responses to the multiple items are used together to define a positive value.

Appendix Table 5: Assessment of PI (PIs)

Training Outcome	PI (PIs)	Survey Questions Used to Assess PI	Definition of PI
1: Market actors (builders, manufacturers, supply chain) understand requirements of code	1.1 Percentage of market actors indicating NEEA-supported trainings increased understanding of code requirements	Four questions: ▪ How much did the training increase your understanding of the relevant energy code(s)? ▪ How much did the training increase your mastery of the training's subject in general? ▪ To what degree has your training improved your ability to identify current energy code requirements for equipment upgrade or replacement projects? ▪ To what degree has your training improved your ability to identify current energy code requirements for new construction projects? Scale = 1 (not at all) to 5 (a great deal), with a "not applicable" option.	PI 1.1 = 1 if rating is 4 or 5 or "not applicable" for at least three items. PI 1.1 = 0 otherwise.
	1.2 Percentage of market actors indicating NEEA-supported trainings helped them implement new strategies for working with energy code changes	One question: ▪ The training helped me implement new strategies for working with code change. Scale = 1 (strongly disagree) to 5 (strongly agree).	PI 1.2 = 1 if rating is 4 or 5. PI 1.2 = 0 otherwise.

	1.3 Percentage of market actors indicating they are sharing information from NEEA-supported trainings with colleagues	One question: ▪ Since taking the training, have you shared information from the training with your colleagues? Yes/No response.	Definition of PI: PI 1.2 = 1 if yes. PI 1.2 = 0 otherwise.
2: Builders have at least a neutral attitude toward energy codes	2.1 Percentage of respondents reporting at least neutral attitude toward energy code and that training improved their view of energy code	Two questions: ▪ It is valuable to have energy codes in place. ▪ The training improved my view of the importance of energy codes. Scale = 1 (strongly disagree) to 5 (strongly agree).	Definition of PI: PI 2.1 = 1 if rating is 3, 4, or 5 ("at least neutral") for first item and rating is 4 or 5 ("agree") to second item. PI 2.1 = 0 otherwise.
	2.2 Percentage of non-code officials that report advocating for energy saving policies because of training	Two questions: ▪ Since taking the training, have you advocated for, or changed, any other practices that would reduce your organization's energy use because of what you learned through the training? ▪ Since taking the training, have you advocated for, or changed, any other work practices to help *customers or clients* reduce energy use because of what you learned through the training? Yes/No response.	Definition of PI: PI 2.2 = 1 if yes to either item. PI 2.2 = 0 otherwise.
3: Increased builder industry understanding of product availability and use of or application of new products	3.1 Percentage of respondents indicating training increased understanding of product availability, related to energy code measures.	One question: ▪ How much did the training increase your knowledge of new product availability? Scale = 1 (not at all) to 5 (a great deal), with a "not applicable" option.	Definition of PI: PI 3.1 = 1 if rating is 4 or 5. PI 3.1 = 0 otherwise.
	3.2 Percentage of respondents indicating training increased understanding of applications of new technology, as introduced in the energy code	Three questions: ▪ How much did the training increase your knowledge of best practices in the construction of new buildings? ▪ How much did the training increase your understanding of new product applications? ▪ To what degree has your training improved your ability to estimate energy savings from upgrades? Scale = 1 (not at all) to 5 (a great deal), with a "not applicable" option.	Definition of PI: PI 3.2 = 1 if rating of >3 or "not applicable" to at least two questions. PI 3.2 = 0 otherwise.

4: Code officials and other participants in the code process understand the value of energy code and how to achieve their code compliance goals	4.1 Percentage of code officials indicating training increased ability to assess code compliance	One question: ▪ To what degree has this training improved your ability to assess code compliance?? Scale = 1 (not at all) to 5 (a great deal), with a "not applicable" option.	Definition of PI: PI 4.1 = 1 if rating is 4 or 5. PI 4.1 = 0 otherwise.
	4.2 Percentage of code officials that share information from training with others	One question: ▪ Since taking the training, have you shared information from the training with your colleagues? Yes/No response.	Definition of PI: PI 4.2 = 1 if yes. PI 4.2 = 0 otherwise.
	4.3 Percentage of code officials indicating they recommended training to anyone else	One question: ▪ Since taking the training, have you recommended this training to anyone else? Yes/No response.	Definition of PI: PI 4.3 = 1 if yes. PI 4.3 = 0 otherwise.
	4.4 Percentage of code officials that changed procedures as a result of training (exclude those that changed type of work)	One question: ▪ Since taking the training, have you recommended changed your procedures when conducting inspections? Yes/No response.	Definition of PI: PI 4.4 = 1 if yes. PI 4.4 = 0 otherwise.
	4.5 Percentage of code officials indicating NEEA-supported trainings increased understanding of code requirements.	One question: ▪ How much did the training increase your understanding of the relevant energy code(s)? Scale = 1 (not at all) to 5 (a great deal), with a "not applicable" option.	Definition of PI: PI 4.5 = 1 if rating is 4 or 5. PI 4.5 = 0 otherwise.

Appendix D: Trainee Survey

Variables Used in Survey

Variable	Description
TRAINING	Training title
DATE	Date of training
ORG	Name of training organization sponsoring training
MODE	In-person (1), live webinar (2), on-demand (3)
TYPE	Code official (1), Non-code official (2)

Recruitment Letter

Subject Line: Tell us about your experience with [TRAINING] and we'll thank you with a gift card

Dear [CONTACT],

The Northwest Energy Efficiency Alliance (NEEA) supports energy code trainings throughout the Northwest, including the [TRAINING] conducted this past year through [ORG]. As part of its efforts to assess these trainings, NEEA is asking for feedback about your experience with this and other codes-related trainings you may have attended.

NEEA has hired ADM Associates, a leading evaluation research company, to get your valuable feedback. This survey should take about 15 minutes to complete, and we'll thank you with a $35 gift card. Your responses will be held in confidence. We will report only aggregate information to NEEA and will not share your name or organization with NEEA or other training sponsors.
For additional information about this survey, please feel free to contact Meghan Bean, mbean@neea.org, 503-688-5413, or Ryan Bliss, ryan.bliss@admenergy.com, 971-401-0758.

Click Here to Start the Survey

You can also copy and paste the link below into your browser to access the survey.
[SURVEY LINK]

Thank you and we look forward to hearing from you,

ADM Associates, Contractor to NEEA
www.neea.org

Follow up Recruitment Letter

Subject Line: There's still time to tell us about your experience with [TRAINING] and receive a gift card as our thanks.

Codes Market Progress Evaluation Report (MPER) #5

Dear [CONTACT],

We recently emailed you to ask if you'd share your experience with the [TRAINING] conducted this past year through [ORG]. The Northwest Energy Efficiency Alliance (NEEA) supported that training and, as part of its efforts to assess these trainings, NEEA is asking for feedback about your experience with this and other codes-related trainings you may have attended.
NEEA is still looking for people like you to complete this survey.

NEEA has hired ADM Associates to conduct this survey. It should take about 15 minutes to complete, and we'll thank you with a $35 gift card. Your responses will be held in confidence. We will report only aggregate information to NEEA and will not share your name or organization with NEEA or other training sponsors.

For additional information about this survey, please feel free to contact Meghan Bean, mbean@neea.org, 503-688-5413, or Ryan Bliss, ryan.bliss@admenergy.com, 971-401-0758.
Click Here to Start the Survey

You can also copy and paste the link below into your browser to access the survey.
[SURVEY LINK]

Thank you and we look forward to hearing from you,

ADM Associates, Contractor to NEEA
www.neea.org

Instrument

Screening

Q1. Our records indicate that you attended the [TRAINING] training on or around [DATE] sponsored by [ORG] within the past year. Is this correct?

1. Yes
2. No
3. Not sure

[DISPLAY IF Q2 =2 OR 98]
Q2. Have you taken any training that was related to energy codes in the last year?

1. Yes
2. No [TERMINATE]
3. Not sure [TERMINATE]

[DISPLAY IF Q3=1]
Q3. What was the name of the training and who sponsored the training? [OPEN END]

Q4. Did you take the training as a live webinar, where the instructor interacted with the trainees, or did you view a recorded version of it?

1. Live webinar

2. Recorded

[IF Q5 = 1, MODE2 = 2, IF Q5 = 2, MODE2 = 3]

Background

Q5. Which one of the following best describes your professional role?

1. Architect/Designer
2. Building code official
3. Building official/plan reviewer/inspector
4. Consultant
5. Energy rater
6. Energy services provider
7. Engineer
8. Equipment contractor or vendor
9. Equipment manufacturer representative
10. General contractor
11. Home builder or related trades
12. Home inspector
13. Non-profit organization staff member
14. Utility staff member
15. Program implementation contractor staff member
16. Something else (please describe) [OPEN END]

Q6. What sector(s) do you work in? Please select all that apply. [MULTISELECT]

1. Commercial
2. Industrial
3. Agricultural
4. Government
5. Education
6. Residential
7. Other (please specify) [OPEN-END]

Q7. Have you made a change in the type of work you do since you took the training(s)?

1. Yes
2. No

[DISPLAY IF Q7= 1]

Q8. What change(s) did you make?

Q9. How long have you worked in an area related to energy code compliance? This would include your current work and any previous work in building design or construction as well as in code development or enforcement.

1. Less than one year
2. One to two years
3. Three to five years
4. Six to 10 years

5. More than 10 years

Q10. How did you first learn about the [TRAINING] training? [RANDOMIZE ORDER OF 1-10]

1. Newsletter
2. A postcard or other mailing
3. Notice on a website
4. A contractor
5. An advertisement
6. Social networking site such as Facebook or Twitter
7. Word of mouth from a colleague
8. Another training
9. A webinar
10. In some other way (Please specify)
11. Don't know

Q11. Q11. Why did you choose to take this training? Select all that apply. [MULTISELECT] [RANDOMIZE ORDER OF 1-7]

1. Expand technical knowledge
2. Better understand energy code
3. Improve qualifications
4. Personal interest
5. Required by employer
6. Network with others
7. Learn to teach others
8. Earn Continuing Education Units (CEUs)
9. Other (please specify)
10. Don't know

Q12. From which of the following organizations have you taken other energy codes-related trainings since the beginning of 2021? Please select all that apply. [MULTISELECT]

1. Association of Idaho Cities
2. Building Officials Associations (IDABO, OBOA, WABO)
3. Earth Advantage
4. Energy Trust of Oregon
5. Evergreen Technology Consulting
6. The Idaho Codes Circuit Rider (Dave Freelove)
7. Montana Department of Environmental Quality
8. National Center for Appropriate Technology (NCAT)
9. Oregon Department of Energy
10. Oregon Home Builders Association
11. Washington State University Energy Program
12. Other, please specify: [OPEN END]

[DISPLAY IF ANY ITEM SELECTED IN Q12]

Q13. How influential were those previous trainings on your decision to take the [TRAINING] training with [ORG]?

1. 1 - Not all influential
2. 2
3. 3
4. 4
5. 5 – Extremely influential

Change in Knowledge

[DISPLAY TEXT IF ANY RESPONSE IN Q13 IS SELECTED]
Unless otherwise stated, when answering all remaining questions about training, please consider all codes-related trainings you have taken in 2021 and 2022 from any of NEEA's code training partners listed above. Again, these are:

- Association of Idaho Cities
- Building Officials Associations (IDABO, OBOA, WABO)
- Earth Advantage
- Energy Trust of Oregon
- Evergreen Technology Consulting
- The Idaho Codes Circuit Rider (Dave Freelove)
- Montana Department of Environmental Quality
- National Center for Appropriate Technology (NCAT)
- Oregon Department of Energy
- Oregon Home Builders Association
- Washington State University Energy Program

Q14. How much did the training increase….

[SCALE: 1 = Not at all, 2 = A little, 3 = A moderate amount, 4 = A lot, 5 = A great deal, 97 = Not applicable]

1. [NON-CODE OFFICIALS ONLY] Your knowledge of best practices in the construction of new buildings
2. Your understanding of the relevant energy code(s)
3. [NON-CODE OFFICIALS ONLY] Your knowledge of new product availability
4. [NON-CODE OFFICIALS ONLY] Your understanding of new product applications
5. Your mastery of the training's subject in general

[DISPLAY Q15 IF NON-CODE OFFICIAL]

Q15. To what degree has your training improved your ability to do the following?

[SCALE: 1 = Not at all, 2 = A little, 3 = A moderate amount, 4 = A lot, 5 = A great deal, 97 = Not applicable]

1. Assess energy savings opportunities
2. Identify appropriate energy saving equipment
3. Identify appropriate energy savings practices
4. Estimate energy savings from upgrades

5. Identify current energy code requirements for equipment upgrade or replacement projects
6. Identify current energy code requirements for new construction projects

[DISPLAY Q18 IF CODE OFFICIAL]
Q16. To what degree has this training improved your ability to assess code compliance? [SCALE: 1 = Not at all, 2 = A little, 3 = A moderate amount, 4 = A lot, 5 = A great deal, 97 = Not applicable]

Q17. Since taking the training, have you…. [1=Yes, 2=No]

1. Shared information from the training with your colleagues?
2. Recommended this training to anyone else?
3. Recommended any other [ORG] supported training to anyone else?
4. [NON-CODE OFFICIALS ONLY] Advocated for, or changed, equipment purchasing processes because of what you learned about energy code?
5. [NON-CODE OFFICIALS ONLY] Advocated for, or changed, any other practices that would reduce your organization's energy use because of what you learned through the training?
6. [NON-CODE OFFICIALS ONLY] Advocated for, or changed, any other work practices to help customers or clients reduce energy use because of what you learned through the training?
7. [CODE OFFICIALS ONLY] Changed your procedures when conducting inspections?

Q18. Q19. Have you encountered any challenges to applying what you learned at [TRAINING] in your day-to-day job?

1. Yes
2. No

[DISPLAY IF Q20= 1]
Q20. What challenges have you encountered?

Training Impact

[DISPLAY Q22 IF TYPE=2 (NON-CODE OFFICIAL)]
Q19. Please indicate your level of agreement with the following statements.

[INSERT SCALE: 1 = STRONGLY DISAGREE, 2 = SOMEWHAT DISAGREE, 3 = NEUTRAL, 4 = AGREE, 5 = STRONGLY AGREE] [RANDOMIZE]

1. 1. It is valuable to have energy codes in place.
2. 2. The training positively changed my view of energy efficiency.
3. 3. The training helped me implement new strategies for working with code changes.
4. 4. The training improved my view of the importance of energy codes.

Q20. How likely are you to recommend trainings sponsored by [ORG] to other colleagues? [NPS]

[INSERT SCALE: 0 = NOT AT ALL LIKELY, 1 =1, 2 = 2, 3 = 3, 4 = 4, 5 = 5, 6 = 6, 7 = 7, 8 = 8, 9 = 9, 10 = VERY LIKELY, 98 = DON'T KNOW]

Q21. Do you/did you need additional assistance after this training to implement what you learned?

1. Yes
2. No

[DISPLAY IF Q24= 1]
Q22. What additional assistance do or did you need? [OPEN END]

Training Satisfaction

Please answer the remaining questions specifically with respect to the [TRAINING] training you took through [ORG].

[DISPLAY IF (MODE =1, IN PERSON TRAINING]
Q23. How satisfied were you with the…

[SCALE OF 1 TO 5 WITH 1 = VERY DISSATISFIED, 2 = SOMEWHAT DISSATISFIED, 3 = NEUTRAL, 4 = SOMEWHAT SATISFIED, 5 = VERY SATISFIED]

1. …amount of time it took to travel to the training site
2. … training site's accommodations
3. …ease of finding the training site
4. …instructor's knowledge of the training topic
5. … instructor's presentation of the information
6. …materials that accompanied the training
7. …allocation of time to various topics within the training
8. …length of the training

[DISPLAY IF (ANY Q23<3]
Q24. You indicated some dissatisfaction with elements of the training you received. What was it that made you dissatisfied?

[DISPLAY IF (MODE =2, LIVE WEBINAR]
Q25. How satisfied were you with the…

[SCALE OF 1 TO 5 WITH 1 = VERY DISSATISFIED, 2 = SOMEWHAT DISSATISFIED, 3 = NEUTRAL, 4 = SOMEWHAT SATISFIED, 5 = VERY SATISFIED]

1. …ease of accessing the training
2. …technology used to deliver the training
3. …instructor's knowledge of the training topic
4. … the instructor's presentation of the information
5. …materials that accompanied the training
6. …allocation of time to various topics within the training
7. …time needed to complete the training

[DISPLAY IF (ANY Q25<3]

Q26. You indicated some dissatisfaction with elements of the training you received. What was it that made you dissatisfied?

[DISPLAY IF (MODE =3, ON-DEMAND TRAINING]

[SCALE OF 1 TO 5 WITH 1 = VERY DISSATISFIED, 2 = SOMEWHAT DISSATISFIED, 3 = NEUTRAL, 4 = SOMEWHAT SATISFIED, 5 = VERY SATISFIED]

1. …ease of accessing the training
2. …technology used to deliver the training
3. …instructor's knowledge of the training topic
4. … the instructor's presentation of the information
5. …materials that accompanied the training
6. …allocation of time to various topics within the training
7. …time needed to complete the training

[DISPLAY IF (ANY Q26<3]

Q27. You indicated some dissatisfaction with elements of the training you received. What was it that made you dissatisfied?

[DISPLAY IF MODE =2 OR 3 LIVE WEBINAR OR ON DEMAND]

Q28. Did you experience any technical difficulties before, during or after the virtual training?

1. Yes
2. No
3. Don't recall

[DISPLAY IF Q33 = 1]

Q29. What technical difficulties did you experience?

Q30. How could the training have been better? Please select all that apply. [MULTISELECT] [RANDOMIZE ORDER OF 1-8]

1. More advanced instruction
2. More experienced instructor
3. Shorter duration
4. Longer duration
5. More hands-on activity
6. More handouts / take home materials
7. More peer networking opportunities
8. More interaction with trainer
9. Other (please specify)
10. No suggestions
11. Don't know

Q31. What proportion of the information covered in the training was new to you?

1. All or almost all
2. About three-quarters

3. About half
4. About one-quarter
5. None or almost none
6. Don't know

Q32. Please rate how well the instructor met your expectations on the following.

[INSERT SCALE: 1 = FELL FAR SHORT OF EXPECTATIONS, 2 = FELL SOMEWHAT SHORT OF EXPECTATIONS, 3 = MET EXPECTATIONS, 4 = SOMEWHAT EXCEEDED EXPECTATIONS, 5 = FAR EXCEEDED EXPECTATIONS, 98 = DON'T KNOW]

1. The instructor's preparation.
2. The instructor's knowledge of the training topic(s).
3. [IF MODE= 1 OR 2] The instructor's response to questions and comments.
4. The ease of understanding the instructor.
5. [IF MODE= 1 OR 2] The instructor's incorporation of interactive activities to help me learn the material.
6. The instructor's presentation skills.
7. [IF MODE= 2 OR 3] The instructor's use of the online platform in the training.

Q33. Please rate how well the following components of the training met your expectations. [INSERT SCALE:

[INSERT SCALE: 1 = FELL FAR SHORT OF EXPECTATIONS, 2 = FELL SOMEWHAT SHORT OF EXPECTATIONS, 3 = MET EXPECTATIONS, 4 = SOMEWHAT EXCEEDED EXPECTATIONS, 5 = FAR EXCEEDED EXPECTATIONS, 98 = DON'T KNOW]

1. How challenging the training session was.
2. [IF MODE= 1 OR 2] The time allowed to ask questions or discuss concepts.
3. [IF MODE= 1 OR 2] The time allowed to network and interact with other attendees.
4. The agenda (topics covered in the course).
5. The level of detail of the information presented.

Q34. How well did the content of the training meet your professional development needs?

1. Not at all
2. 2
3. 3
4. 4
5. Completely

Q35. How could the content have better addressed your needs? [OPEN-ENDED]

Q36. What training topics would you like to see offered in the future? [OPEN END]

Q41. What suggestions or recommendations do you have to improve future training opportunities? [OPEN END]

Appendix E: Trainer Interview Guide

Script

Hello, My name is _____ and I am working on the MPER – Market Progress Evaluation Report for NEEA's codes work. I am reaching out to you because I understand you organize and/or conduct training and education activities for the NEEA Codes Team.

Our focus as third party evaluators is on understanding the outcomes related to training and education activities. Therefore, we would like to ask you some questions about:

- The training activities alignment with the desired outcomes
- Training topic identification
- Training approaches, modalities, duration and platforms.
- Training topics that should be added or removed to better support NEEA's desired outcomes
- Trainer recruitment and selection
- Feedback about trainings from trainees.
- Progress toward training outcomes and measurement of progress

I anticipate this interview will last about 45 minutes. I'll start with some introduction/background questions and then get into questions about the desired outcomes of this initiative
.
This is really designed to be a conversation so please don't hesitate to ask questions or clarify things as we go through the questions.

I will be taking notes throughout the call, but I would also like to record our conversation to make sure I capture what you are telling me accurately. The recording is confidential. Is it ok that I record the call?

1. [IF YES] Start recording
2. [IF NO] Take notes

Background and Context

To start with, I'd like to get a little background about your work relating to the code-related trainings that NEEA supports.

[ASK ALL]
Q1. Please describe your title and role with your organization.

[ASK ALL]
Q2. How long have you been working with NEEA on training and education activities?

[ASK ALL]
Q3. How did you initially get involved with the NEEA on training and education activities?

[ASK ALL]
Q4. What is your role relating to the trainings? Do you….

1. Organize and implement the trainings – advertise, find locations, enroll trainees
2. Deliver the trainings – prepare course materials, present the trainings in-person or via web
3. Something else:_____

[ASK IMPLEMENTERS Q4=1]
Q5. Who do you typically interact with at NEEA and generally speaking, what are you typically talking to that staffperson(s) about?

[ASK IMPLEMENTERS Q4=1]
Q6. Which trainers do you work with?

[ASK IMPLEMENTERS Q4=1]
Q7. How did you find and select the trainers you work with?

[ASK TRAINERS Q4=2]
Q8. What other organizations and individuals do you interact with in planning and executing the trainings, and what are those interactions about?

[ASK TRAINERS Q4=2]
Q9. What kind of preparation or input did you receive about how to conduct the trainings? [PROBE ABOUT: Goals or objectives of the training]

Training Topics

The next few questions are about the topics you cover in the trainings you administer and deliver.

[ASK ALL]
Q10. For what topics have you provided NEEA-supported training in the last year?

[ASK ALL]
Q11. How were those topics identified as the ones the market needed training on?

[ASK ALL]
Q12. What was your role in identifying that training(s)? [Probe: Did NEEA support training you were already providing? Did you develop a curriculum based on feedback from NEEA? Were you consulted on topics that would be most appropriate to train on?]

[ASK ALL]
Q13. What training topics, if any, do you feel should be added to the list of NEEA-supported trainings? Why?

[ASK ALL]
Q14. What training topics, if any, do you feel should be removed from the list of NEEA-supported trainings? Why?

Training Modalities

From looking at the list of trainings NEEA has supported over the last few years, I noticed that trainings are delivered in three modes. There are in-person trainings, live webinars, and on-demand web-based training using pre-recorded information. My next few questions are about these training modes.

[ASK ALL]
Q15. What modes have you or your organization delivered training in the last year?

1. In-person
2. Live webinars
3. On-demand web-based training
4. Something else: _____

[ASK IF DELIVER IN-PERSON TRAINING, Q15=1]
Q16. What is working well with delivering NEEA supported training in-person?

[ASK IF DELIVER IN-PERSON TRAINING, Q15 =1]
Q17. What is not working well with delivering NEEA supported training in-person?

[ASK IF DELIVER LIVE WEBINARS TRAINING, Q15 =2]
Q18. What is working well with delivering NEEA supported training via a live webinar?

[ASK IF DELIVER LIVE WEBINARS TRAINING, Q15 =2]
Q19. What is not working well with delivering NEEA supported training via a live webinar?

[ASK IF DELIVER ON-DEMAND TRAINING, Q15 =3]
Q20. What is working well with delivering NEEA supported training via on-demand web-based platforms?

[ASK IF DELIVER ON-DEMAND TRAINING, Q15 =3]
Q21. What is not working well with delivering NEEA supported training via on-demand web-based platforms?

Measuring Progress towards Desired Outcomes

The NEEA Codes Team has short-, medium-, and long-term outcomes they desire to achieve through their support of training and education activities. I would like to spend most of the rest of this conversation reviewing these outcomes. To facilitate that conversation, I am sharing the logic model the NEEA Codes Team is using to show how their work, and yours, leads to the desired outcomes. I would like to talk about the outcomes highlighted in the red boxes in the diagram.

[ASK ALL]
Q22. Let's start with the short-term outcome: Market actors (contractors, designers, builders, code officials) understand requirements of code. What training activity that you administer or deliver, if any, do you believe is focused on this outcome?

[ASK ALL]
Q23. What data, if any, are you collecting from these training activities that could inform the team about progress related to this outcome?

[ASK ALL]
Q24. How would you know you and the Codes Team have been successful in helping market actors (better) understand code requirements?

[ASK ALL]
Q25. I'd now like to talk about the outcome: Market actors (contractors, designers, builders, code officials) neutral toward or value energy codes. What training activity that you administer or deliver, if any, do you believe is focused on this outcome?

[ASK ALL]
Q26. What data, if any, are you collecting from your training activities that could inform the team about progress related to this outcome?

[ASK ALL]
Q27. How would you know you and the Codes Team has been successful in helping market actors to place (greater) value on energy code?

[ASK ALL]
Q28. I'd now like to talk about the outcome: Increased builder industry understanding of product availability and use of or application of new products. What training activity that you administer or deliver, if any, do you believe is focused on this outcome?

[ASK ALL]
Q29. What data, if any, are you collecting from your training activities that could inform the team about progress related to this outcome?

[ASK ALL]
Q30. How would you know you and the Codes Team has been successful in helping building industry professionals to (better) understand the use of and availability of new (efficient) products?

[ASK ALL]
Q31. I'd now like to talk about the outcome: Code officials and other participants in the code process understand the value of energy code and how to achieve their goals. What training activity that you administer or deliver, if any, is focused on this outcome?

[ASK ALL]
Q32. What data, if any, are you collecting from your training activities that could inform the team about progress related to this outcome?

[ASK ALL]
Q33. How would you know you and the Codes Team has been successful in helping building code officials to understand the value of energy code and how it could help them achieve their energy saving goals?

Feedback Trainers Heard from Trainees

[ASK ALL]
Q34. What feedback do you receive from trainees about the training you provide? [PROBE: Do you hear about the quality of the training, location of training, expectations about how they can apply the training in their work, new topics they would like to receive training about]?

[ASK ALL]
Q35. What format do you use to receive feedback from trainees? [PROBE: For example, do you administer a survey post training? Do you reach out to trainees several months later to ask about their use of training in their job]

[ASK ALL]
Q36. How, if at all, has feedback from trainees about your NEEA-supported trainings differed by trainee group? For example, have HVAC technicians provided different feedback compared to general contractors or code officials? Or, as another example, do code officials appear satisfied with the trainings and HVAC technicians are less satisfied?

Conclusion

[ASK ALL]
Q37. What else, if anything, should we know about your activities as they relate to NEEA's efforts to support the residential and commercial codes market?

[ASK ALL]
Q38. Finally, what would you most like to learn from this evaluation effort that would help you in your role?

Those are all the questions I have. Thanks for your time.

Appendix F: Market Actor Interview Guide

Recruitment Script

Hello, My name is _____ and I am working with NEEA – the Northwest Energy Efficiency Alliance – on a research project related to understanding their influence on energy codes in the region. I am reaching out to you because I understand you are familiar with NEEA's work relating to code development and education in [STATE] and that you have a role in helping develop codes and/or educating the market about energy code in [STATE].

Do you have about 60-75 minutes sometime in the next week or so when I could talk to you about your work with NEEA and the code process in [STATE]?

Background and Context

Thanks for agreeing to speak with me today about your work with NEEA on your state's code development and education process. If it is ok with you, I would like to record this call for my notes. Is that ok with you? This recording and notes will not be shared with anyone outside of my research team at ADM Associates.

1. [IF YES] Start recording.
2. [IF NO] Take notes.

To start with….

[ASK ALL]
Q1. Please describe how you are involved with maintaining or enhancing energy code in [STATE] and/or nationally (IECC or ASHRAE). What types of activities do you conduct?

[ASK ALL]
Q2. What organizations, if any, are you involved with that work to [FOR IDAHO: "maintain and/or"] enhance building energy code?

[ASK ALL]
Q3. What organizations, if any, are you involved with that look to make energy codes clear, simple, and enforceable?

[ASK ALL]
Q4. In your opinion, what aspects of energy code in [STATE] have most needed revision or updating over the past several years, and why?

[ASK ALL]
Q5. Please describe how you are involved with NEEA and its work maintaining or enhancing energy code in [STATE] and/or nationally (IECC or ASHRAE).

[ASK ALL]
Q6. At the [STATE/NATIONAL level], do you work on maintaining or enhancing energy code in the commercial, residential, or both sectors? [IF BOTH] How, if at all, does your work vary between the sectors?

Recent Code Cycle Activities

[ASK ALL]
Q7. In what ways did you participate in [STATE/NATIONAL]'s most recently adopted code cycle (see list below)? For example, did you draft code changes, research how a code change would affect the market, conduct technical or market analysis, etc.?

- Washington -WSEC 2021
- Oregon - 2021
- Idaho - IECC 2018 with Idaho amendments
- Montana - IECC 2021 with Montana Amendments

[ASK ALL]
Q8. How did those activities differ from previous code cycles?

[ASK ALL]
Q9. In what ways, if any, were your efforts during the most recently adopted energy code cycle aimed at enhancing the [STATE/NATIONAL] energy code?

[ASK IF IDAHO RESPONDENT if needed]
Q10. In what ways, if any, were your efforts during the most recently adopted code cycle aimed at maintaining existing the [STATE/NATIONAL] energy code?

[ASK ALL]
Q11. Who would you consider your key partners (individual people and/or organizations) in [FOR IDAHO: "maintaining and/or"] enhancing energy code in [STATE]?

[ASK ALL]
Q12. What assistance, if any, do you receive from NEEA to support your work with energy code in [STATE]? [PROBE: This assistance could be financial, technical, administrative or anything else you consider supporting your work.]

[ASK ALL]
Q13. How did you participate in [STATE/NATIONAL]'s most recently adopted code cycle process to make energy code clearer? Simpler? More Enforceable? (Probe on each)

[ASK ALL]
Q14. How, if at all, are you involved with NEEA's support of training and education activities related to energy code?

[ASK ALL]
Q15. QAre you aware of any resources your state uses to make interpreting codes easier for the end-user? If so, who provides that resource? If so, how are those resources distributed?

Assessment of NEEA's Influence

The next few questions are about your assessment of how NEEA's activities have influenced code officials and other market actors that are not focused specifically on building codes (e.g., spec builders, builder associations).

[ASK ALL]
Q16. How, if at all, do you think the code trainings offered by NEEA influenced energy code development at the local level? At the state level?

[ASK ALL]
Q17. How, if at all, do you think code trainings offered by NEEA influence code enforcement at the local level?

[ASK ALL]
Q18. How, if at all, has training provided by NEEA changed local inspection procedures in the state?

[ASK ALL]
Q19. How, if at all, has training provided by NEEA changed procedures among non-energy focused market actors in the state?

[ASK ALL]
Q20. How, if at all, has technical information (research reports, documents, some of which are in Table 4 above) provided by NEEA influenced code officials' ability to assess code compliance? [Probe: for local code officials - information that supports enforcement; For State code officials: information that supports decision-making]

[ASK ALL]
Q21. How, if at all, has technical information provided by NEEA influenced the non-energy focused market actors' (e.g., builders, architects, and engineers) assess code compliance?

[ASK ALL]
Q22. How, if at all, has technical information provided by NEEA been shared among local code officials?

[ASK ALL]
Q23. How, if at all, has technical information provided by NEEA been shared among non-energy focused market actors' (e.g., builders, architects, and engineers) understanding of code? (See Table 2)

[ASK ALL]
Q24. How, if at all, has technical information provided by NEEA increased understanding of energy codes among local code officials?

[ASK ALL]
Q25. How, if at all, has technical information provided by NEEA influenced the understanding of energy codes among non-energy focused market actors' (e.g., builders, architects, and engineers)? (See Table 2)

[ASK ALL]
Q26. On a scale of one to five where one is not at all clear and five is very clear, how clear is the existing code language to those who need to understand it? Please elaborate.

[ASK IF RESPONDENT IS FROM MONTANA]
Q27. Are you aware of a booklet or document that NEEA supports that summarizes the energy code for market actors?

[ASK IF Q27 = YES]
Q28. In your opinion, do the NEEA supported summary documents make the code simpler and more understandable? [PROBES: Are market actors using these often? market actors firms distribute these documents to their staff?]

Measuring Success

[ASK ALL]
Q29. Are you aware of any data collection activities that could help inform NEEA about its influence in code maintenance or enhancement? If so, what are they?

[ASK ALL]
Q30. How would you measure success in influencing code development?

[ASK ALL]
Q31. Are there any challenges specific to assessing how much influence NEEA is having on maintaining and enhancing energy code on a national (IECC) level? If so, what are those unique challenges? What ideas do you have for overcoming those challenges?

[ASK ALL]
Q32. Is there anything else the Team should know about your work on energy code on a national level?

[ASK ALL]
Q33. Do you have any suggestions for how NEEA could improve their support for local code development in your area?

Those are all the questions I have. Thanks for your time.

Memorandum

October 29, 2024

TO: Meghan Bean, Principal MRE Scientist, NEEA

FROM: Mark Rehley, Director Codes, Standards, New Construction and Emerging Technology

SUBJECT: Response to Codes Market Progress Evaluation Report #5 (2023 – 2024)

NEEA posted a Market Progress Evaluation Report (MPER) for the Codes program on April 18, 2024. The purpose of this memorandum is to summarize the Codes team's response to the major findings and associated recommendations of the MPER. This memo outlines the team's anticipated adoption and timeline for making the recommended program strategy and activity changes. NEEA programs are not required to accept every MPER recommendation. In instances where the program chooses to reject (or accept with caveats) an MPER recommendation, this memo provides a rationale.

Code Influence

Recommendation #1.1: Continue to look for ways to fill gaps within each state's energy code process. That could mean funding state-specific research, convening a new group of stakeholders, improving awareness of energy codes, or some other activity that fills a gap supporting the development and maintenance of energy codes.

The Codes team accepts this recommendation and plans to work with local stakeholders in each state to continue to develop code influence strategies that fit within each state's code adoption processes.

Recommendation #1.2: Continue developing more stringent and cost-effective energy code changes and providing these proposals to Oregon, Washington, and IECC decision makers. Continue to look for other places or opportunities to contribute to energy code changes, such as ASHRAE.

The Codes team accepts this recommendation and plans to work with experts in the region to develop more stringent and cost-effective code proposals, while also focusing on making the codes clearer, simpler, and easier to enforce.

Recommendation #1.3: Continue supporting and sharing data-driven and vetted research that NEEA and its partners can use to demonstrate energy savings and cost-effectiveness that result from potential changes to energy code.

The Codes team accepts this recommendation with a caveat. Many states include cost effectiveness analysis as part of the code development and adoption process. For those states, NEEA will support those analysis efforts as necessary. For states where cost analysis is not a built-in part of the system, NEEA will

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attempt to work with stakeholders in those states to provide data and cost-effectiveness analyses in support of code adoption and submit to code adoption entities via the public processes.

Code Training and Education

Recommendation #2.1: Consider developing a standardized survey that trainers could deploy after each training session to provide more regular feedback about the impact of training on trainees' attitudes and behavior and collect information to guide improvements or future training offerings. Consider using a model such as the Kirkpatrick Model of Evaluation to guide the development of this standardized instrument. This model assesses a trainee's reaction, learning, and behavior resulting from the training and can help NEEA determine if the training is having the desired effect. Tracking these responses over time could help quantify more fully the respondents' interest in code training topics and their perceptions of the new code.

The Codes team accepts this recommendation and plans to include development of a standardized survey as part of an upcoming training Request for Proposal (RFP). NEEA will work with the selected contractor to develop the survey and will consider utilizing the Kirkpatrick Model as recommended.

Recommendation #3.1: Consider developing a systematic method for logging data from the hotlines in each state that would capture themes and trends from the questions.

The Codes team accepts this recommendation and plans to work with existing technical assistance teams within each state to develop a more systematic method for tracking hotline questions.

Recommendation #4.1: As part of the post-training survey identified in Conclusion #2, ask trainees about the degree to which they value energy code.

The Codes team accepts this recommendation and plans to incorporate this question in the standardized post-training survey.

Recommendation #5.1: Work with trainers to develop more in-person trainings that would enable opportunities for market actors to interact with and learn from peers and trainers. Good candidates for in-person training would be topics that benefit from hands-on training such as working with a specific tool or learning steps for how to install a measure.

The Codes team accepts this recommendation and plans to incorporate development and delivery of more in-person and region- or state-specific trainings that include hands-on training elements as part of the above-mentioned training RFP.

Recommendation #5.2: As part of the post-training survey identified in Conclusion #2, ask trainees to specify advanced topics they would like to see included in training.

The Codes team accepts this recommendation and will develop a question to add to the developed survey.

Logic Model

Recommendation #6.1: Develop state- and code cycle-specific plans that identify how NEEA's tailored strategy can influence an individual code cycle.

The Codes team accepts this recommendation and will develop state- and code-specific roadmaps for each state.

Recommendation #6.2: Edit the logic model to reflect the changes described in Section 6.

The Codes team partially accepts this recommendation. The team will review the recommended Logic Model changes and decide which of the changes to incorporate as part of the next MPER effort.

In conclusion: The Codes Team acknowledges the importance of regular evaluations as: 1) a demonstration of our fiduciary duty to our funders and other stakeholders, 2) a way to assess progress toward our market transformation goals, and 3) a tool for adaptive management of the program efforts. We appreciate the opportunity to reflect on these evaluation results and to leverage them in the ongoing effort to improve our efforts and hasten progress toward our market transformation goals. If you have any questions about the Codes Team's response to the findings of MPER #5, please contact Mark Rehley at mrehley@neea.org.