Market nessa. Quarterly Newsletter Market Research & Evaluation

WHAT'S NEW:

Hello everyone!

Welcome to another issue of NEEA's quarterly Market Research and Evaluation (MRE) newsletter. There are a number of studies underway, many of which will be posted during the Q4 2023. Look for several market progress evaluation reports (MPERs) in the next few months, including the Luminaire Level Lighting Controls, Heat Pump Water Heater, Retail Product Portfolio, and Manufactured Homes MPERs. These are the annual mixed method evaluations that assess progress toward pre-defined market outcomes by measuring a set of market progress indicators (MPIs).

Earlier this year, the MRE team launched a combined MPER for two commercial HVAC programs – the electric High-Performance HVAC and natural gas Efficient Rooftop Units programs. The study will deliver individual evaluation reports to these two programs, but will create several efficiencies, such as combining recruiting and data collection efforts.

And finally, NEEA recently contracted with Dr. Michael Harnar, Director of the Interdisciplinary PhD in Evaluation at Western Michigan University, to conduct an assessment of MRE's approach to the evaluation of Market Transformation programs. The final report from that assessment is available on neea.org.

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

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At a Glance

MARKET RESEARCH & EVALUATION PROJECTS



DUAL FUEL (Electric & Natural Gas) PROJECTS:



Motor-Driven Products: Commercia-Sector Adjustable-Speed Drive Market Research Study

NATURAL GAS PROJECTS:

Heat Pump Water Heaters: Market Progress Evaluation Report #7

Retail Product Portfolio: Market Progress Evaluation Report #2



*PLANNING: MRE projects from inception through proposal selection *FIELDING: MRE projects from kick-off through the completion of field work *REPORTING: MRE projects in the analysis/synthesis stage through report posting

		PLANNING*	FIELDING*	REPORTING*
Manufactured Homes: Transition Market Progress Evaluation Report				\checkmark
Commercial Codes: Idaho Commercial New Construction Code Evaluation	2/0		√	
Commercial Codes: Montana Commercial New Construction Code Evaluation			√	
Commercial Codes and Residential Codes: Market Progress Evaluation Report #2	2/0		√	
Residential Codes: Idaho Residential Code Compliance Evaluation	2/0		√	
Residential Codes: Oregon Residential Code Compliance Evaluation		√		
Residential Codes: Montana Residential Code Compliance Evaluation			√	
Standards: Non-Weatherized Gas Furnaces and Mobile Home Furnaces Standard Evaluation				
Standards: Battery Chargers Standard Evaluation		√		

DUAL FUEL (Electric & Natural Gas) PROJECTS:



NATURAL GAS PROJECTS:



*PLANNING: MRE projects from inception through proposal selection *FIELDING: MRE projects from kick-off through the completion of field work *REPORTING: MRE projects in the analysis/synthesis stage through report posting

Market Progress Evaluation Report #1

High-Performance HVAC

FIELDING

As of late 2022, NEEA's High Performance HVAC program is actively intervening to transform the market for very high efficiency Dedicated Outside Air Systems (DOAS) for electrically heated commercial buildings across the region. This study will be the first evaluation of the program's Market Transformation efforts. The program's overarching objectives for the study are to:

- 1. Provide timely and actionable formative evaluation findings and recommendations to enable continuous improvement of the program;
- 2. Assess Market Transformation progress as measured by program Market Progress Indicators; and
- 3. Qualitatively assess program influence on observed market transformation.

NEEA contracted with Apex Analytics and NMR Group to conduct the evaluation. NEEA kicked off the High-Performance HVAC evaluation in July. In Q3 2023, the evaluation team plans to interview and survey commercial HVAC system designers. The evaluation will be ongoing through the fall of 2024, with a final report anticipated in Q4 2024. The study will be completed in close coordination with the Market Progress Evaluation for the Efficient RTUs program, which is also being conducted by Apex Analytics and NMR Group.

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Market Progress Evaluation Report #1

Efficient Rooftop Units (RTU)

FIELDING

As of late 2022, NEEA's Efficient RTU program is actively promoting efficient RTUs for gas heated commercial buildings across the region. This study will be the first evaluation of the program's Market Transformation efforts. The program's overarching objectives for the study are to:

- 1. Provide timely and actionable formative evaluation findings and recommendations to enable continuous improvement of the program;
- 2. Assess Market Transformation progress as measured by program Market Progress Indicators; and
- 3. Qualitatively assess program influence on observed market transfomation.

NEEA contracted with Apex Analytics and NMR Group to conduct the evaluation. NEEA kicked off the Efficient RTU evaluation in June. This quarter, the evaluation team plans to interview and survey commercial HVAC contractors, distributors, and manufacturer representatives. The evaluation will be ongoing through the fall of 2024, with a final report anticipated in Q4 2024. This evaluation study will be conducted in close coordination with the Market Progress Evaluation for the High-Performance HVAC program, which is also being completed by Apex Analytics and NMR Group.

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Market Sizing

Luminaire Level Lighting Controls (LLLC)

REPORTING

To determine the viability of including non-municipal exterior lighting as part of its LLLC program, NEEA contracted with Cadeo Group to conduct a study that will inform the potential market size and current market penetration of the product. Study activities will include finding and reviewing secondary resources to address the research objectives. A final report is anticipated in Q4 2023.

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Key Assumptions Review

Luminaire Level Lighting Controls (LLLC)

FIELDING

NEEA contracted with the Cadmus Group to complete a third-party review of key assumptions underlying its energy savings model for its LLLC program. The research objectives for this study are still in development, but will likely include: 1) reviewing estimates of building spaces likely to already have occupancy sensors, 2) creating an estimate of how many older, previously installed commercial lighting control systems are likely to be broken or working not-as-intended, and 3) refining an estimate of combined savings from occupancy sensors and daylighting capabilities to be netted out from new construction projects. The contractor will address the research objectives utilizing their technical expertise and through the selection and review of secondary sources. Research completion and an accompanying final report are anticipated in Q1 2024.

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Market Progress Evaluation Report #2	Market	Progress	Evaluation	Report #2
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Luminaire Level Lighting Controls (LLLC)

REPORTING

NEEA's LLLC program seeks to accelerate the adoption of LLLC in commercial buildings for new construction, major renovation and retrofit projects. NEEA contracted with Cadmus to conduct a second Market Progress Evaluation for the LLLC program.

NEEA launched the study in September, 2022. Interviews and surveys were collected from November 2022 through May of 2023 with stakeholders, manufacturers, installers, designers, specifiers, and decision makers, in order to address the following questions: 1) How do the program documents clarify and align to convey the program's strategy and planned activities to overcome market barriers and drive market changes that will increase LLLC adoption? 2) To what extent has the program progressed toward achieving its short and mid-term outcomes as tracked through its market progress indicators? and; 3) What leads decision makers to purchase LLLC (versus other NLC)? What features (including non-energy benefits) do they value leading up to purchase and after the product is installed? A final report is anticipated in early Q4 2023.

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Commercial Building Market Research

BetterBricks

FIELDING

NEEA is conducting a market research study to inform BetterBricks' support of whole building efficiency. Study research questions are under development but will address this key problem:

Commercial building owners often do not see a clear business case for energy efficiency and do not have easy access to the information and resources needed to consider the impact of energy in their investment decisions. As a result, building owners are often not choosing to invest in operational and capital energy improvements that would enhance their bottom line.

NEEA anticipates kicking off the study in Q3 or Q4 2023.

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Market Progress Evaluation Report #1

Extended Motor Products (XMP)

PLANNING

As of Q2 2022, NEEA's XMP Pumps program is actively engaging with manufacturers' representatives, trade associations, and other market actors to increase adoption of energy-efficient motor-driven products (specifically clean-water pumps and circulators at or below 50 horsepower) across the four-state region. This Market Progress Evaluation Report (MPER) will be the first evaluation of the program's Market Transformation efforts. The program's overarching objectives for the study are to:

- 1. Review the XMP Market Transformation (MT) Theory, Program Logic Model, and Market Progress Indicators (MPIs) to assess their clarity and alignment in conveying (1) the Program's strategy and planned activities to overcome market barriers and drive market changes that will increase efficient clean-water pump and circulator adoption, and (2) NEEA's proposed approach for evaluating XMP market progress.
- 2. Conduct the first year of tracking MPIs to lay the groundwork for year-over-year evaluation, and report progress on several near-term outcomes.

Study methodologies are likely to incorporate surveys of XMP Program participants, surveys and/or interviews with additional market actors, and secondary analysis of existing datasets, reports, and other relevant materials. The request for proposals to conduct this evaluation will be released in early Q4 2023, with an award decision and study kick-off targeted for late Q4 2023. The evaluation will be ongoing through Q3 2024, with a final report anticipated in Q4 2024.

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Fan System Market Characterization

Efficient Fans

FIELDING

NEEA contracted with DNV Energy Insights, Inc., to conduct a Market Characterization study to inform development and planning efforts for the Efficient Fans program, which is in the program development stage of NEEA's <u>Initiative Life Cycle</u>. The program aims to accelerate adoption of efficient fans and fan system products, including motors, drives, and controllers, by working upstream with manufacturers and highlighting efficiency metrics within their selection software. The initial program is in the commercial and industrial sectors.

The objectives for this Market Characterization study include:

- 1. Profiling and sizing of the regional fan system market
- 2. Identifying and prioritizing market barriers
- 3. Documenting market actor motivations and fan system path-to-purchase

A project kick-off was held in February 2023, and data collection with multiple market actor groups (e.g., fan system manufacturers, manufacturers' representatives, distributors, and end users) commenced in Q2 2023 and is scheduled to continue through mid-Q2 2023. The study is expected to conclude by early Q4 2023, and a final report is anticipated by the end of Q4 2023.

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Water Heater Installer Focus Groups

Heat Pump Water Heaters (HPWH)

REPORTING

NEEA contracted with ILLUME Advising in Q4 2022 to conduct qualitative research to better understand any challenges installers and plumbers in the region might face around recommending and installing HPWHs in existing single-family homes. A 2020 survey of HPWH installers in the Northwest identified several factors and specific structural barriers that can complicate a HPWH retrofit, such as, but not limited to wiring constraints, small installation spaces, physical location of the unit, and proximity to condensate drain. This research provided insight as to how installers in the region might overcome these types of challenges and was specifically focused on installers that had experience with installing HPWHs. In this upcoming research, NEEA will include both active HPWH installers and those with little or no prior experience in HPWH installation across the Northwest. The key objectives of the upcoming research are to:

- 1. Identify the underlying reasons why installers and plumbers might be resistant to offering and installing HPWHs to customers seeking a new water heater
- 2. Understand the opinions and thoughts about where and why installers are not recommending and/or installing HPWHs
- 3. Gauge general level of resistance to code and standard changes among installers
- 4. Understand how installers might react to the passage of the proposed federal standard
- 5. Learn about what behaviors they might use to adapt to a new standard

In Q1 and Q2 2023 ILLUME Advising recruited and conducted three virtual focus groups across the region with installers and plumbers that have limited experience with HPWH installation. ILLUME also completed six in-depth virtual interviews with installers that were unable to attend the focus group thereby contributing to more robust information. A final report is anticipated in Q4 2023. Findings will inform future training efforts and help the program improve its messaging campaigns targeted to installers across the region. It should be noted that given some of the overlap in findings between this study and the <u>Cold Climate Demonstration Research project</u>, NEEA will be issuing a combined report of both studies in Q4 2023.



Cold Climate Demonstration Installation Project

Heat Pump Water Heaters (HPWH)

REPORTING

In late Q2 2022, NEEA contracted with ILLUME Advising to conduct an ethnographic study to better understand installer/plumber experiences of installing HPWH in cold climate areas of the Northwest. Recruitment and observation continued from late Q3 2022 through the end of Q1 2023, to best capture actual cold climate installations. The key objectives of the research were to:

- 1. Observe and describe the types of difficult installations that plumbers and installers face in real time
- 2. Identify the solution and problem-solving methods they employed at the time of the installation
- 3. Observe installer-customer interactions; for example, how do installers explain the HPWH's functionality, or answer questions at the time of the installation
- 4. Gauge customer satisfaction immediately following the installation and then 2-3 months after to gauge their on-going satisfaction with the unit; Additionally, understand if there were any performance issues, they needed help with resulting in call backs.

This research effort ran concurrently with the <u>Water Heater Installer Focus groups</u>. Given that there were some overlaps in the findings between the two studies, NEEA decided it is best to combine the learnings into a single report. The combined reports are anticipated in late Q4 2023.



Market Progress Evaluation Report #7

Heat Pump Water Heaters (HPWH)

REPORTING

NEEA contracted with NMR Group in early 2023 to conduct the 7th Market Progress Evaluation Report (MPER) for the HPWH program. The key objectives of this effort are to:

- 1. Ensure the logic model accurately reflects how the current Market Transformation theory for the program is being implemented and assess the market progress indicators (MPIs) for usefulness
- 2. Estimate 2022 penetration of HPWHs in the region with sales broken out by key attributes
- 3. Evaluate the program's performance over the course of 2022 in achieving outcomes by measuring against a subset of MPIs tied to the program's highest priority barriers
- 4. Assess the effectiveness and impact of the "Boring but Efficient" downstream marketing campaign conducted in 2022

In Q2 2023, NMR completed a quantitative survey of general installers in the region, as well as in-depth interviews with a few water heater retail representatives to better measure the program's performance over the past year. Analysis is now underway, and a final report is anticipated in late Q3 2023.



Market Progress Evaluation Report #2

Retail Product Portfolio (RPP)

REPORTING

NEEA's RPP program provides mid-stream incentives to retailers for sales of qualifying efficient products, such as refrigerators and clothes washers, to influence retail assortment and product promotion, obtain access to sales data, and ultimately influence the ENERGY STAR specification or federal standard. NEEA contracted with TRC to conduct the second MPER for RPP to meet the following research objectives:

- 1. Review NEEA's updated RPP logic model and make recommendations for improvement
- 2. Document activities and outputs and assess progress on applicable MPIs for each product in the program's portfolio
- 3. Evaluate NEEA's methodology for extrapolating short-term savings to the full market
- 4. Assess whether and how market "shocks" influence sales of ESRPP-supported product categories

RPP MPER #2 kicked off in July 2022. A final report is expected in late Q3 2023.

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Commercial-Sector Adjustable-Speed Drive Market Research Study

Motor-Driven Products

REPORTING

As part of NEEA's assessment of intervention opportunities in the market for commercial adjustable-speed drives (ASDs, hereinafter referred to simply as "drives"), NEEA contracted with Johnson Consulting Group, LLC, to conduct a market research study. The study sought to understand the market penetration for drives in the alliance's four-state region, particularly as pertaining to drives paired with commercial pumps and fans. This research also provides insight into the decision-making processes and factors underlying market actors' choice to pair drives with commercial pumps and fans. A kickoff meeting took place in October 2022, with sample development completed in January 2023 and data collection activities running through March 2023.

Findings indicate that while ASD pairings with pumps and fans are common in commercial new construction projects, such pairings are less frequent in retrofit and replace-on-burnout scenarios, suggesting possible targeted opportunities for market intervention. The results of this research also suggest that while some dynamics of the ASD pairing process are consistent across commercial pumps and fans, sufficient variation exists to warrant distinction between the markets for these technologies when considering interventions and market actor engagement. A final report was prepared in Q3 2023 and is now available on neea.org.

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Innovation * Action

Transition Market Progress Evaluation Report

Manufactured Homes

REPORTING

NEEA contracted with Apex Analytics, LLC to conduct a transition market progress evaluation of its Manufactured Homes program. This is a key input informing the alliance's decision to transition the program to the Long-Term Monitoring and Tracking (LTMT) phase of the Initiative Life Cycle (ILC) process, where NEEA significantly scales back its investments in the market. In this current evaluation effort, NEEA strives to confirm that NEEM+ homes will remain viable in the Northwest once NEEA transitions the program to LTMT. Key research objectives are to:

- 1. Summarize the initiative's work and achievements since its inception in 2016
- 2. Track key market progress indicators
- 3. Recommend viable approaches to conduct subsequent LTMT efforts, including proposing an evaluation plan to track any updated Diffusion Indicators

Data collection and analysis began in Q2 2023 and a final report is anticipated in the first half of Q4 2023.



Innovation * Action

Idaho Commercial New Construction Code Evaluation

Commercial Code

FIELDING

The Idaho Commercial New Construction Code Evaluation study focuses on (a) assessing the path(s) by which and degree to which code compliance is achieved with the amended 2018 International Energy Conservation Code (IECC) in newly constructed buildings, and (b) measuring the energy performance of a subset of these buildings as compared with the average energy performance of buildings constructed under previous code. The results of the study will provide direction to the development and implementation efforts of the NEEA Codes team and will provide other regional code stakeholders guidance in targeting their energy efficiency work in the commercial new construction sector. NEEA contracted with Opinion Dynamics to undertake this study. The study design and methodology selected for this project focuses on permit data and building plans as the primary sources of construction and compliance information, with virtual or in-person site visits planned for a subsample of participating buildings in order to validate the accuracy of permit data. The project kicked off in mid-Q3 2022, with planning and sample development continuing through Q4 2023. Data collection, including interviews with site contacts, desk review of permit data, and in-person/virtual site visits, are scheduled to commence in Q4 2023 and conclude in Q3 2024. This study includes analysis of billing data; collection of this data is planned to continue through the end of Q3 2023, with analysis and report preparation to follow. A final report is anticipated in Q4 2024.

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Montana Commercial New Construction Code Evaluation

Commercial Codes

FIELDING

The Montana Commercial New Construction Code Evaluation study focuses on (a) assessing the path(s) by which and degree to which code compliance is achieved with the 2018 IECC in newly constructed buildings, and (b) measuring the energy performance of a subset of these buildings as compared with the average energy performance of buildings constructed under previous code. The results of the study will provide direction to the development and implementation efforts of the NEEA Codes team and will provide other regional code stakeholders guidance in targeting their energy efficiency work in the commercial new construction sector. NEEA contracted with Michaels Energy to undertake this study. The study design and methodology selected for this project focuses on permit data and building plans as the primary sources of construction and compliance information, supplemented by telephone or virtual interviews with building owners and operators to contextualize and enrich the results of permit and plan analysis. The study also includes virtual or in-person site visits planned for a subsample of participating buildings in order to validate the accuracy of permit data. The project kicked off in mid-Q2 2022, with planning and sample development continuing through Q1 2023. Data collection, including interviews with site contacts, desk review of permit data, and in-person/virtual site visits, commenced in Q2 2023 and is scheduled to conclude in Q3 2023. This study includes analysis of billing data; collection of this data is planned to continue through Q4 2023, with analysis and report preparation to follow. A final report is anticipated in Q1 2024.

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Innovation * Action

Market Progress Evaluation Report #2

Commercial and Residential Codes

FIELDING

NEEA contracted with ADM Associates to conduct a Market Progress Evaluation Report (MPER) for its Commercial and Residential Codes efforts. ADM will evaluate the logic and clarity of NEEA's updated codes logic model, make recommendations for improvement, and assess outcomes associated with codes training and education and code influence activities. The project kicked off in October 2022, and NEEA expanded the scope to address an assessment of the Code team's code influence activities in April 2023. A report addressing all research objectives is expected in Q4 2023.

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Idaho Residential Code Evaluation

Residential Codes

FIELDING

NEEA contracted with Industrial Economics, Inc. (IEc) to review assumptions underlying its estimation of energy savings resulting from NEEA's and its partners' involvement in the Idaho state code processes. Using data collected through permit review, site visits to residential new construction building sites, and interviews with market actors, this research will address the following objectives:

- 1. Assess statewide compliance with selected code requirements among single-family homes built under IECC 2018 with Idaho amendments
- 2. Develop estimates of statewide energy code compliance and compliance within urban and rural jurisdictions separately using data collected on individual code requirements
- 3. Provide statewide findings regarding primary space and water heating fuel and above-code elements using data collected on individual code requirements

This work kicked off in Q1 2023, and the final evaluation of Idaho's residential energy code is expected in Q4 2023.

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Innovation * Action

Oregon Res	idential	Code Con	<i>ipliance</i>	Evaluation	on
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Residential Codes

PLANNING

NEEA plans to engage a contractor to review assumptions underlying its estimation of energy savings resulting from NEEA's and its partners' involvement in the Oregon state code processes. The team will begin scoping the evaluation in Q3 2023 with the goal of having the project kicked off in Q4 2023.

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Montana Residential Code Evaluation

Residential Codes

FIELDING

NEEA contracted with Industrial Economics, Inc. (IEc) to review assumptions underlying its estimation of energy savings resulting from NEEA's and its partners' involvement in the Montana state code processes. Using data collected through permit review, site visits to residential new construction building sites, and interviews with market actors, this research will address the following objectives:

- 1. Assess statewide compliance with selected code requirements among single-family homes built under IECC 2018 with Montana amendments
- 2. Develop estimates of statewide energy code compliance and compliance within urban and rural jurisdictions separately using data collected on individual code requirements
- 3. Provide statewide findings regarding primary space and water heating fuel and above-code elements using data collected on individual code requirements

This work kicked off in Q1 2023, and the final evaluation of Montana's residential energy code is expected in Q4 2023.

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Innovation * Action

Non-Weather	ized Gas	Furnaces	and M	obile H	ome
Furnaces Sta	ndard Eva	aluation			

Standards

FIELDING

NEEA's Codes and Standards team engaged in efforts to increase the stringency of the standard for non-weatherized gas furnaces and mobile home furnaces. NEEA contracted with Michaels Energy to conduct a qualitative assessment of NEEA's influence on the standards processes and provide a quantitative estimate of the share of savings resulting from the standards that are the result of NEEA and other efficiency organizations' efforts. The project will kick off in September 2023, and Michaels Energy will review NEEA records and publicly available documents and conducted interviews with key stakeholders from NEEA, DOE and other organizations. A final report is anticipated Q2 2024.

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Battery Chargers Standard Evaluation

Standards

FIELDING

NEEA's Codes and Standards team engaged in efforts to increase the stringency of the battery chargers standard. NEEA contracted with Michaels Energy to conduct a qualitative assessment of NEEA's influence on the standards processes and provide a quantitative estimate of the share of savings resulting from the standards that are the result of NEEA and other efficiency organizations' efforts. The project will kick off in September 2023, and Michaels Energy will review NEEA records and publicly available documents and conducted interviews with key stakeholders from NEEA, DOE and other organizations. A final report is anticipated Q2 2024.

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Together We Are Transforming the Northwest





























