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Non-Weatherized and Mobile Home Gas Furnaces Standard Evaluation

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Contents

Executive Summary

The Northwest Energy Efficiency Alliance (NEEA) contracted with Michaels Energy (the evaluation team) to conduct an independent evaluation to:

1) Assess NEEA and its partner energy efficiency organizations' influence in the update to the non-weatherized gas furnaces (NWGF) and mobile home gas furnaces (MHGF) standards, documented in docket EERE–2014–BT–STD–0031 and
2) Estimate the total share of savings resulting from the adoption of the standards due to the efforts of all energy efficiency organizations, including NEEA.

The NEEA Codes and Standards team supports standards development and rulemaking processes for a variety of product classes. The NEEA Codes and Standards team tracks their efforts throughout the standards development process and identifies which standards have the highest potential for energy savings. Evaluations are conducted by independent contractors to assess NEEA and its partners' efforts and their overall influence on the adoption of the standards.

This analysis pertains to the Notice of Proposed Rulemaking (NOPR) published on July 7, 2022,[1] through which the U.S. Department of Energy (DOE) proposed amending the existing standards for NWGFs and MHGFs to 95% annual fuel utilization efficiency (AFUE) and adopting new standby mode and off mode requirements for NWGFs and MHGFs to 8.5 W.[2] The Final Rule (published in the Federal Register on December 18, 2023) adopted a 95% minimum AFUE standard for NWGFs and MHGFs, but did not include standby mode and off mode requirements.[3]

To evaluate NEEA and its partners' influence on the NWGF and MHGF standards, Michaels Energy reviewed the materials submitted to the proceeding docket as well as files not in the public domain that NEEA provided. Documentation included letters, reports, and analyses submitted to the docket, and proposed and final rules. The evaluation team then interviewed a sample of stakeholders who were active in the rulemaking process.

Following the analysis, the evaluation team estimates that the total share of savings influenced by NEEA and its partners' activities associated with the adoption of the NWGF and MHGF standards is 18.6%.

During the rulemaking process, some manufacturers opposed the proposed standards for a variety of reasons, primarily the proposed standby mode and off mode requirements, which they argued would affect the functionality of controls common in higher efficiency, more technologically advanced models. The DOE ultimately removed these requirements from the Final Rule.

The strongest opposition to the standards, expressed by gas industry organizations and some manufacturers, centered around the fact that the proposed standards would effectively

[1] 87 FR 40590
[2] Standards for oil, electric, and weatherized gas furnaces were not considered in this rulemaking.
[3] 88 Fed. Reg. 87502-87649

eliminate non-condensing furnaces. Opposing parties argued the standards would impose higher furnace replacement costs on those consumers who need to replace a non-condensing furnace with a condensing model, because some installations may require new exhaust vents. They argued multifamily and low-income consumers would face disproportionately higher replacement costs if significant modifications were required. Further, industry trade organizations expressed concern about the data accuracy and modeling methodology of the DOE's life cycle cost (LCC) analysis reflective of consumers' choices when faced with a furnace replacement decision.

This evaluation found that collaboration among NEEA and its partners was effective at ensuring consensus and alignment among advocacy organizations in support of DOE's proposed standards. Further, NEEA's comments, which cited market studies and countered opposition claims, were determined to be influential on the Final Rule. Notably, a 2019 study, sponsored by NEEA, estimated a low share (5%) of "difficult" furnace replacements, and a 2022 HVAC market study estimated a market share of 95% AFUE furnaces to be 65% of sales in the Northwest region, indicating the market is ready for more stringent standards. DOE cited NEEA's comments and these findings in support of the standards in its Final Rule.

1 Introduction

1.1 Purpose of the Study

NEEA's Codes and Standards team supports the development and adoption of efficiency standards and test procedures by advocating for the most stringent, technologically feasible, and economically justified standards to maximize energy savings.

This report presents the independent evaluation of NEEA and its partners' work concerning federal minimum energy efficiency standards for non-weatherized gas furnaces (NWGF) and mobile home gas furnaces (MHGF). This evaluation pertains to the Notice of Proposed Rulemaking (NOPR) published on July 7, 2022,[4] through which the U.S. Department of Energy (DOE) proposed to amend the existing standards for NWGFs and MHGFs to 95% AFUE and adopt new standby mode and off mode standards for NWGFs and MHGFs to 8.5 W. It is important to note that standards for oil, electric, and weatherized gas furnaces were not considered in this rulemaking.

The Final Rule (published in the Federal Register on December 18, 2023) adopted a 95% minimum AFUE standard for NWGFs and MHGFs but did not include standby mode and off mode requirements.[5]

This study assessed the influence of NEEA and its partner organizations on the new standards and estimated the share of savings influenced by their efforts. The evaluation team investigated the challenges and barriers to adopting the standards and the activities conducted by NEEA and its partners to push forward the most stringent, technologically feasible, and economically viable standards. The evaluation team conducted two assessments:

1) A qualitative assessment of NEEA and its partners' influence on the standards using NEEA's Standards Logic Model (Figure 2) as a guide and
2) A quantitative determination of the proportion of total energy savings that resulted from NEEA and its partners' influence.

This report summarizes the evaluation team's assessment, including 1) the barriers to the adoption of the standards, 2) the effectiveness of the activities of NEEA and its partners during the rulemaking in overcoming the barriers, and 3) the role of NEEA and its partners in each identified activity relative to other stakeholders.[6]

[4] 87 FR 40590

[5] 88 Fed. Reg. 87502-87649

[6] For the purpose of this evaluation, we define a NEEA partner as an organization that meets the following criteria:

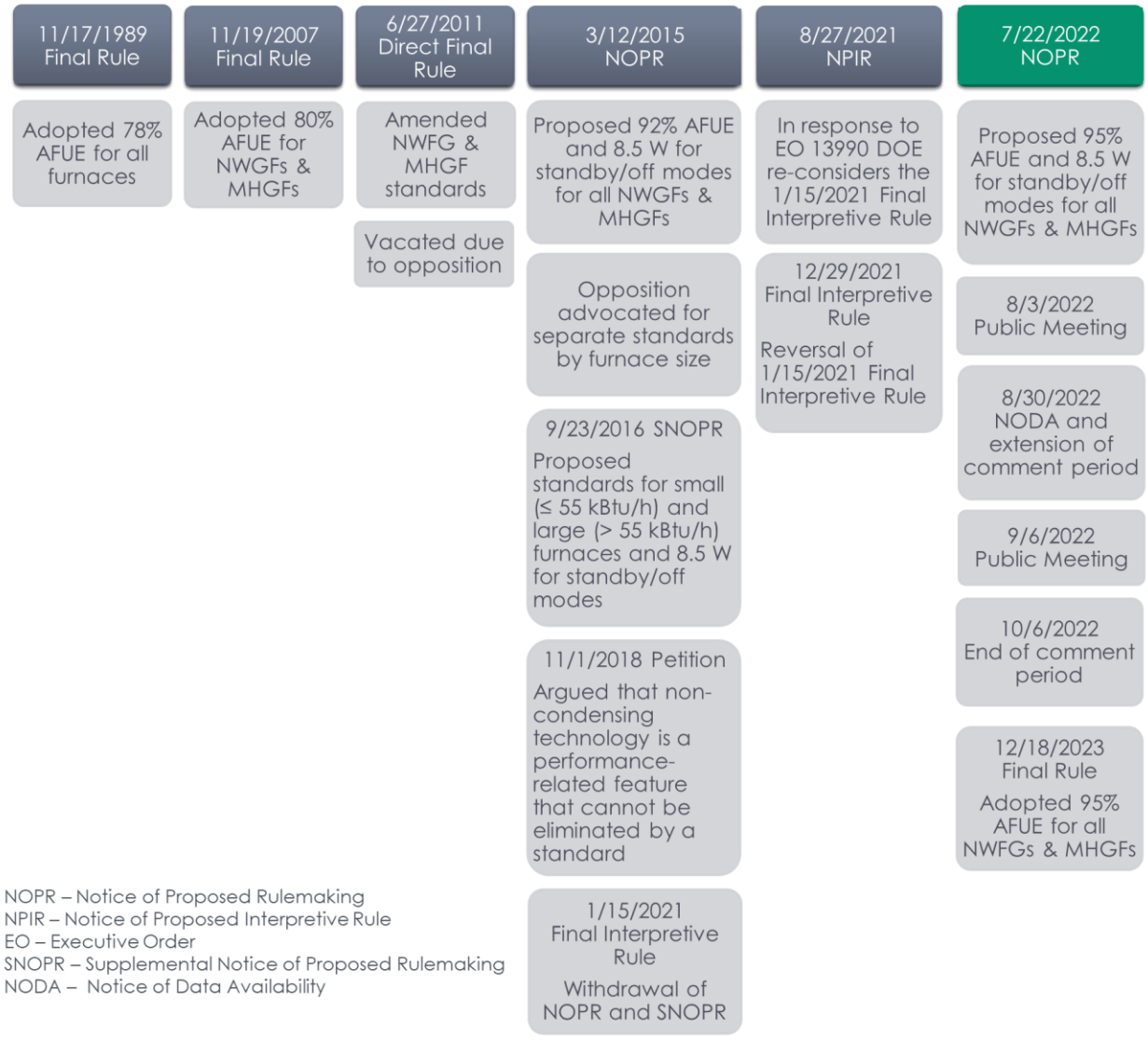
1) Having a shared goal to influence the adoption of the standard *and* 2) Had direct and intentional communication with NEEA about the standard (emails, meetings, documented conversations, etc.). *or* 3) Had taken specific actions with NEEA to influence the standard (submitted joint comments, commissioned a study, spoke at meetings, press releases, etc.).

1.2 Consumer Furnace Standards History

Due to the lengthy statutory history of consumer furnace standards, this section briefly summarizes the history of the furnace standards rulemaking relating to the NWGF and MHGF product classes.[7]

As summarized in Figure 1, the minimum standard of 80% AFUE for both NWGFs and MHGFs was adopted in 2007. The new minimum standards of 95% AFUE for both NWGFs and MHGFs – the focus of this evaluation – were published in December 2023; compliance with the Final Rule is required by December 18, 2028.

Figure 1. Overview of the NWGF and MHGF Standards



[7] 87 FR 40599-40607

Additional details are provided below:

November 17, 1989, Final Rule: DOE established a minimum standard of 78% AFUE for all furnaces without regard to input capacity.[8]

November 19, 2007, Final Rule: DOE adopted a minimum standard of 80% AFUE for NWGFs and MHGFs without regard to input capacity. In response to litigation, from the State of New York and other parties following this Final Rule,[9] the DOE filed a motion that it would revisit its conclusions in a future rulemaking, including considering separate standards based on regionality.[10]

June 27, 2011, Direct Final Rule (DFR): DOE amended the standards for NWGFs and MHGFs (and non-weatherized oil furnaces). The American Public Gas Association (APGA) subsequently sued DOE to exclude the rule for NWGFs. Negotiations resulted in a March 14, 2014 motion to vacate the rule, and the standards established by the June 2011 DFR for NWGFs and MHGFs did not go into effect. The standards established in the November 2007 Final Rule remained in effect.

March 12, 2015, NOPR: DOE proposed a national standard of 92% AFUE and a maximum energy use requirement of 8.5 W for the standby mode and off mode for all NWGFs and MHGFs. In response, some stakeholders suggested separate furnace product classes based on input capacity, with a lower minimum AFUE standard for smaller furnaces. The rationale for this approach was that low-income customers typically live in smaller homes and, therefore, have furnaces with lower input capacities. Parties that advocated for this approach posited that a lower AFUE standard for smaller furnaces would reduce the incidence of the number of low-income consumers switching to electric heat to forego the higher installation cost of switching from a non-condensing model to a higher efficiency (condensing) model.

September 14, 2015, Notice of Data Availability (NODA): DOE published its analysis for maintaining the 80% AFUE standard for a small NWGF product class (45 kBtu/h – 65 kBtu/h) and increasing the standard for larger NWGFs.

September 23, 2016, Supplemental Notice of Proposed Rulemaking (SNOPR): DOE proposed separate standards for small (≤ 55 kBtu/h) and large (> 55 kBtu/h) NWGFs as well as a maximum energy use requirement of 8.5 W for the standby mode and off mode for all NWGFs and MHGFs.

November 1, 2018, Petition for Rulemaking: This petition filed by gas industry organizations asked the DOE to issue an interpretive rule and to withdraw previously adopted standards. The petition argued that non-condensing technology (and related venting) is a performance-related feature that cannot be eliminated as a result of an energy conservation standard.

[8] Upon passing of the original standard of 75% AFUE for mobile home furnaces and 78% for all other furnaces, DOE was directed to establish separate standards based on the input capacity. The November 17, 1989 Final Rule, however, established standards for small furnaces to be the same as all other furnaces.

[9] Petition for Review, State of New York, et al. v. Department of Energy, et al., Nos. 08-0311-ag(L); 08-0312-ag(con) (2d Cir. filed Jan. 17, 2008)

[10] The Energy Policy and Conservation Act (EPCA) allows DOE to consider regional energy conservation standards for furnaces.

Numerous parties submitted comments to the docket regarding this petition, including NEEA and its partners:[11]

- ASAP et al. Joint Comment: Appliance Standards Awareness Project (ASAP), American Council for an Energy-Efficient Economy (ACEEE), Alliance to Save Energy (ASE), Consumer Federation of America (CFA), National Consumer Law Center (NCLC)
- NCLC/CFA Joint Comment: NCLC and CFA
- NEEA/NEEP/PG&E/National Grid Joint Comment: Northwest Energy Efficiency Alliance (NEEA), Northeast Energy Efficiency Partnership (NEEP), Pacific Gas and Electric (PG&E), and National Grid

Following a public comment period, DOE granted this request for an interpretive rule and published a Notice of Proposed Interpretive Rule (NOPIR) on July 11, 2019.

January 15, 2021, Final Interpretive Rule: DOE determined that non-condensing technology (and related venting) is a performance-related feature that cannot be eliminated as a result of an energy conservation standard. Accordingly, DOE withdrew the March 2015 NOPR and the September 2016 SNOPR for NWGFs and MHGFs.

Among other interested parties, NEEA partners – ASAP and the NCLC – submitted comments in response to the withdrawal of the September 2016 SNOPR.

January 25, 2021, Executive Order 13990:[12] The White House directed federal agencies to review and align regulations and actions during the previous four years with public health and environmental objectives, including those that reduce greenhouse gas emissions and strengthen resilience to the impacts of climate change.

August 27, 2021, NOPIR: In response to EO 13990, DOE reconsidered the conclusion of the January 15, 2021 Final Interpretive Rule. Among the interested parties that submitted comments were NEEA and ASAP et. al. (ASAP, ACEEE, CFA, Evergreen Action, Fsi Engineers, Green Energy Consumers Alliance, Midwest Energy Efficiency Alliance, NCLC, Rocky Mountain Institute, Southwest Energy Efficiency Project).[13]

December 29, 2021 Final Interpretive Rule: DOE reverted to its initial stance that non-condensing technology and associated venting is not a performance-related feature and that concerns and potential negative impacts of certain installations "could be addressed by other means."

July 7, 2022, NOPR: DOE proposed a minimum 95% AFUE standard as well as the 8.5 W standby mode and off mode requirements for both NWGF and MHGF product classes. DOE held a public webinar on August 3, 2022, and later published a NODA with a revised life cycle cost (LCC) analysis. DOE held a second public meeting related explicitly to the LCC spreadsheet on September 6, 2022.

[11] 84 FR 33012
[12] E.O. 13990 of Jan 20, 2021. Accessed at: Federal Register :: Protecting Public Health and the Environment and Restoring Science To Tackle the Climate Crisis.
[13] 86 FR 73947

December 18, 2023, Final Rule: DOE adopted the 95% minimum AFUE standard for NWGFs and MHGFs but did not include the standby mode and off mode requirements.

This history provides important context for the analysis presented in this memo. First, there were considerable analyses and opportunities for stakeholder questions and comments in the years *prior to* the July 2022 NOPR that DOE considered in the rulemaking. As DOE stated in the July 2022 NOPR,

> *"the rulemaking for consumer furnaces has been subject to multiple rounds of public comment, including public meetings, and extensive records have been developed in the relevant dockets … Consequently, the information obtained through those earlier rounds of public comment, information exchange, and data gathering have been considered in this rulemaking, and DOE is building upon the existing record through further analysis and further notice and comment. DOE has tentatively found that the relevant furnaces market has stayed sufficiently similar since the time of these past rulemakings such that much of the previously-collected feedback and data continue to be relevant." (87 FR 40604)*

Further, when asked about key barriers to adopting the standards, several interview respondents explained that barriers were a lot stronger and significantly addressed or "worked through" *before* the July 2022 NOPR. A common sentiment expressed during the interviews was that most of the hard work had already been done; one respondent posited that it was a foregone conclusion that the proposed AFUE standards would be adopted in the Final Rule.

Second, it is important to acknowledge that some interview respondents participated in or observed the proposed rulemakings prior to the July 2022 NOPR. They, therefore, had difficulty considering only the barriers and NEEA and its partner activities *after* the July 2022 NOPR was published. In the analysis, the evaluation team considered interview comments and the docket that explicitly pertained to the July 2022 NOPR period but also acknowledge that NEEA and its partners were actively engaged in the previous proceedings.

2 Methodology

This section describes the methodology used to evaluate NEEA and its partners' influence on the federal standards for the NWGF and MHGF product classes. The data collection approach and its limitations are described first, followed by the methodologies for the qualitative and quantitative assessments.

2.1 Data Collection Approach

To estimate NEEA and its partners' share of savings associated with adopting the NWGF and MHGF standards, the evaluation team reviewed documentation and comments on the docket and interviewed a sample of stakeholders who participated in the rulemaking process.

2.1.1 Document Review

The evaluation team reviewed the following materials associated with adopting the standard:

- Comments submitted by NEEA, NEEA partners, and other stakeholders during the July 2022 NOPR request for comment periods
- Transcripts of the public meetings held by DOE on August 3, 2022, and September 6, 2022
- The NOPR published on July 7, 2022
- The Final Rule published on December 18, 2023
- Email correspondence and documents not in the public domain that NEEA provided to Michaels Energy for this analysis

For each document reviewed, the evaluation team aimed to answer three key research questions: 1) Who were the main players, and what were their roles? 2) What were the challenges to developing and adopting the standards? 3) What activities did the organizations undertake to overcome these challenges?

The document review helped to identify major barriers to adopting the standards and activities conducted by stakeholders to overcome these barriers. The information learned from the document review also informed the in-depth interviews.

2.1.2 In-depth Interviews

Using the information collected during the document review, the evaluation team developed a list of potential interviewees based on stakeholders' participation in the adoption and rulemaking processes. The evaluation team created this list to gather various perspectives, including those of manufacturer associations and energy-efficiency organizations involved in the rulemaking.

The evaluation team developed a purposive (that is, non-probability) sample frame of manufacturers, energy efficiency organizations, and other stakeholders engaged in the standards adoption process. The sample frame was compiled from various sources, including the document review, public meeting attendee lists and transcripts, and recommendations from NEEA staff. The final sample frame of potential interviewees included 273 individuals representing 186 organizations.

The 273 individuals were assigned a high, medium, or low priority based upon their involvement in the standards making process. Individuals in the high priority group were contacted first according to a randomly assigned number. After five outreach attempts, the evaluation team removed the individual from the sample and began outreach to the next individual.

As summarized in Table 1, the evaluation team interviewed 11 individuals from 10 different organizations. Collectively, the interview respondents represent a cross-section of types of stakeholders who provided insight from different perspectives on the standards process.

Table 1. Completed In-depth Interviews

Category	# Interviews
Manufacturer	2
Efficiency/environmental advocate *	3
Trade association	3
Utility (consultant)	1
Consumer advocate	1
State agency	1
Total Respondents	**11**
Total Organizations	**10**

* Two respondents were consultants representing efficiency/advocacy organizations.

The evaluation team created an interview guide, incorporating the barriers and activities identified during the document review. The guide contained structured and unstructured questions to gather in-depth insight and ratings of barriers and NEEA activities to support the quantitative analysis. In-depth interviews were the preferred method over an online survey, as they enabled the evaluation team to probe the interviewee for additional information and ask clarifying questions. Interviewees were asked about various barriers to establishing the standards identified during the document review and about any other barriers not yet identified. After adding additional barriers mentioned by the interviewee, the interviewer asked the respondent to rank each barrier on a scale of 0 to 5, with 0 meaning not applicable and 5 meaning the barrier was extremely challenging to overcome. Then, interviewees were asked to comment on each specific activity that NEEA and its partners undertook and if they knew of any other actions NEEA and its partners took that impacted the adoption or rulemaking. The interviewer asked interviewees to describe the role of NEEA and its partners in each identified activity, the outcomes corresponding to each activity, and the extent of NEEA and its partners' influence on the adopted standards.

2.2 Limitations

As with any evaluation, it is important to acknowledge the study limitations that might affect its results.

As summarized above, the procedural history of the NWGF and MHGF standards extends at least a decade prior to the July 2022 NOPR, well beyond the scope of this evaluation. It is important to acknowledge that NEEA and its partners contributed to the docket prior to 2022, which is noted in this evaluation to the extent that such contributions were specifically mentioned during the in-depth interviews and noted in the Final Rule.

The volume of comments submitted to the docket was extensive – 3,988 comments dating back to March 2015. The evaluation team reviewed comments submitted after the July 2022 NOPR and excluded all form letters.

The in-depth interview sampling approach was non-random and, therefore, insights gained from the interview respondents may not be construed as statistically representative of the population of interested parties or stakeholders for the NWGF and MHGF proceedings. Further, representatives of organizations listed as parties in the lawsuit against the DOE were removed from the sample.

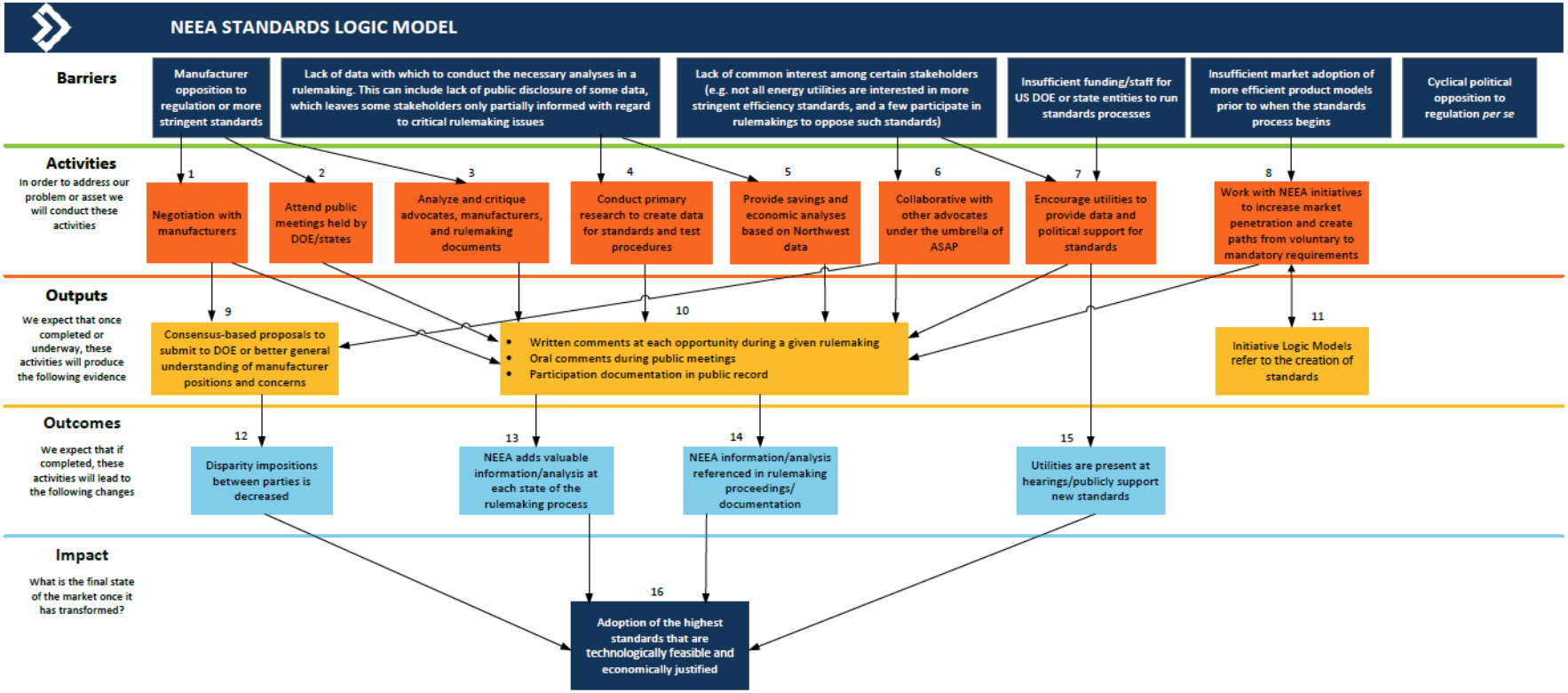
During the interviews the evaluation team provided examples and prompts when interviewees needed help remembering the details of the rulemaking. This may have introduced bias into interviewees' responses.

2.3 Methodology to Assess NEEA and Partners' Influence

To determine NEEA and its partners' influence on the adoption and rulemaking process, the evaluation team used the NEEA Standards Initiative Logic Model, shown in Figure 2, as a framework. Each box in the logic model was numbered, starting at the Activities level and moving down to the Outcomes and Impact.

Based upon the document analysis and in-depth interviews, the evaluation team determined whether NEEA and its partners participated in the activities and if those activities resulted in the outputs and outcomes shown in the logic model.

Figure 2. NEEA Standards Initiative Logic Model



2.4 Methodology to Estimate Share of Energy Savings from NEEA and Partners' Efforts

To estimate the share of savings influenced by NEEA and its partners' activities, the evaluation team followed a framework developed by NEEA and its stakeholders that was used for past standards evaluations. The key inputs created through the framework to calculate the share of savings are:

a) Significance of the Barrier
b) Effectiveness and Significance of Activity in Addressing the Barrier
c) Effectiveness of Activity Relative to All Barriers
d) NEEA and its Partners' Role in the Activity
e) Relative Savings Influenced by the Activity

Where:

a x b = c and c x d = e

The steps taken by the evaluation team to develop these inputs are summarized below.

2.4.1 NEEA Standards Evaluation Framework

1. **Identified all barriers** to the standard's development and adoption through a document review and stakeholder interviews. All the barriers aligned with the NEEA Standards Initiative Logic Model.
2. **Estimated barrier significance and assigned a percent significance to each barrier**, including the barriers not addressed by energy-efficiency organizations. The sum of the percentages for all the barriers is 100%. The evaluation team used ratings from the interviews and professional judgment to determine the percentage for each barrier.
3. **Identified all activities** undertaken by the energy-efficiency organizations, the associated outcomes, and which barriers they addressed.
4. **Estimated each activity's effectiveness and significance** by assigning a percentage to each activity. The following assignments were used: high effectiveness = 60%, medium effectiveness = 40%, and low effectiveness = 20%. The evaluation determined the percentages for each effectiveness level (high, medium, and low). The assigned percentages are consistently used for each rating, with exceptions made for activities that may have had a much larger or much smaller impact on overcoming the intended barrier. Rationale is provided if the percentages deviate from the standard.
5. **Estimated the effectiveness of each activity relative to all the other activities** by multiplying the significance of each barrier (2) by the significance of each associated activity (4). This calculation estimated the effectiveness of each activity relative to all efficiency organization activities to overcome all barriers.
6. **Quantified the energy-efficiency organizations' role in each activity relative to all participants by applying a specified percentage to primary, major, or minor roles**. In past evaluations, the percentages were defined as follows: primary (led effort to support the NWGF and MHGF standards) = 50%, major (did not lead but contributed significantly) = 30%, and minor (did not contribute significantly) = 15%. The evaluation team used

information gathered through the interviews and their professional judgment to determine the percentages for each role (primary, major, and minor). The assigned percentages are consistently used for each role, with exceptions made only if energy-efficiency organizations played a much greater or smaller role. The rationale is provided if the percentages deviate from the standard.

7. **Calculated the share of savings from efficiency organizations' activities** by multiplying the results of the effectiveness of each activity (5) by the relative role of energy-efficiency organizations (6). This calculation estimated the savings from each activity as a percentage of total savings from the standard. Summing these percentages resulted in the total savings (as a percentage) influenced by NEEA and its partners' activities.

2.4.2 Rationale for Scoring

The overall share of energy savings was determined using the methodology covered in Section 2.4.1. The significance of each barrier to the standards development, adoption, and rulemaking strongly impacts the resultant percentage of energy savings. Lower-rated barriers will lead to lower activity effectiveness relative to all barriers and the relative savings influenced by the activity scores. For example, a barrier rated with a 10% significance, high-rated effectiveness (60%), and a primary role (50%) for the activity will account for less overall relative savings compared to a barrier with a 20% significance with the same effectiveness and role percentages. The significance of the barrier is the driving force behind the energy savings influenced by the activity.

2.4.3 Rationale for Rating the Significance of Barriers

Based on the information gathered in the interviews and interviewees' rankings of the importance of the barriers in the logic model, the evaluation team assigned a percentage to represent the significance of the energy savings of each barrier. The evaluation team determined the significance of the barriers by assigning a percentage significance to each, including the barriers not addressed by NEEA and its partners. The sum of the percentages for all barriers equals 100%. The following addresses the rationale for the significance of each barrier.

2.4.4 Rationale for Rating the Significance of Activities Relative to Each Barrier

Before analyzing the effectiveness of each identified activity, the evaluation team determined its significance relative to its corresponding barrier. When there was only one barrier, the significance of the activity to the barrier was set equal to the significance of the barrier. When there was more than one activity that addressed the same barrier, the evaluation team used information collected through our document review and interviews, along with our professional judgment, to assign a percentage to the significance of each activity relative to its barrier. The sum of the percentages for each activity equals the percent significance of the barrier.

2.4.5 Rationale for Rating the Effectiveness of Activities and Rating the Role of NEEA and its Partners in Each Activity

Using information gathered from the interviews and the document review, the evaluation team determined what activities NEEA and its partners undertook to overcome the identified barriers. The evaluation team then assessed the effectiveness of each activity in overcoming the barrier by reviewing the information gathered in our interviews and re-reviewing documents to see if the action resulted in the desired outcome in the Final Rule. The evaluation team assigned each activity an effectiveness rating of high, medium, low, or not effective. The percentages assigned and a description for each activity effectiveness rating are described in Table 2 below.

Table 2. Activity Effectiveness Designations

Activity Effectiveness	Percent Assigned	Description
High	60%	Achieved the desired outcome(s).
Medium	40%	Achieved some of the desired outcomes, but not all.
Low	20%	Achieved very little of the desired outcome(s) or achieved outcomes with little impact on energy savings.
Not effective	0%	Did not achieve any of the desired outcomes during this rulemaking.

The evaluation team also rated the role of NEEA and its partner organizations in each activity as "primary," "major," or "minor." Information from the interviews and document reviews was used to make these assessments. A "primary" role means that NEEA and its partners either led the effort themselves or led an effort to support the DOE. A "major" role means that NEEA and its partners did not lead but contributed significantly to an activity. A "minor" role means that NEEA and its partners contributed, but not significantly, to an activity. Based on the precedent set in previous standards evaluations, the evaluation team assigned a percentage weight to each role rating representing NEEA and its partners' relative role in an activity compared to other stakeholders. Table 3 shows these role designations and their corresponding percentages, followed by the rationale for the ratings.

Table 3. Role of NEEA and its Partner's Designations

Role of NEEA and Partners	Percent Assigned	Description
Primary	50%	NEEA and its partners either led the effort themselves or led an effort to support the standard.
Major	30%	NEEA and its partners did not lead but contributed significantly to an activity.
Minor	15%	NEEA and its partners contributed, but not significantly, to an activity.

3 Results

3.1 NEEA and Partners' Influence

This section presents the results of the qualitative assessment conducted by the evaluation team using the methodology described in Section 2.

Table 4 presents NEEA and its partners' influence on the NWGF and MHGF standards using the NEEA Standards Initiative Logic Model as a guide. The most significant influence NEEA and its partners had on the NWGF and MHGF standards was submitting comments and attending the DOE public webinar in support of the standard.

In addition to comments that NEEA and its partners submitted in previous proposed rulemakings (as noted in Section 1.2), NEEA submitted comments to the docket (October 3, 2022) that referenced market data on the installation barriers and costs for condensing gas furnaces and the market share of 95% AFUE furnaces in the Northwest. Industry trade organizations expressed concern about the data accuracy and modeling methodology of the DOE's life cycle cost (LCC) analysis. The two market studies addressed stakeholder opposition and provided valuable data needed to substantiate DOE's analyses in the NOPR. One interview respondent specifically explained that without the data NEEA provided, the lack of data would have been a barrier to adopting the standard.

The NCLC's written and oral comments focused on the benefits of the proposed standards and reduced energy burden on low-income households. ASAP's written and oral comments discussed the net benefits to consumers, particularly low-income households, and the environmental and health benefits associated with the higher standard.

Prior to submitting their comments to the docket, NEEA and its partners collaborated by sharing their respective interpretations of the rulemaking, circulating their draft comments, and asking partner organizations to sign on to each other's comment letters.

Table 4. Qualitative Analysis of NEEA and its Partners' Influence - Activities

Box # in Logic Model	Element	Description	Did NEEA and its partners have a role in these activities?	Findings
1	Activity	Negotiation with manufacturers	N/A	While one interviewee suggested that NEEA attempted to reach out to a manufacturer, there was no evidence that NEEA negotiated with manufacturers after the July 2022 NOPR was published.
2	Activity	Attend public meetings held by DOE	Yes	NEEA and its partners attended the August 3, 2022 and September 6, 2022 public meetings.
3	Activity	Analyze and comment on advocates, manufacturers, and rulemaking documents	Yes	NEEA's partners made verbal comments during the public meetings. NEEA and its partners submitted written comments to the docket that primarily supported DOE's analysis and proposed standards and countered the opposition.
4	Activity	Conduct primary research to create data for standards	Yes	NEEA's comments (October 3, 2022) cited the results of two relevant market studies that addressed stakeholder opposition: a 2019 study on installation barriers and costs, sponsored by NEEA and other stakeholders, and a 2022 study on HVAC sales trends in the Pacific Northwest.
5	Activity	Provide savings and economic analyses based on Northwest data [14]	Yes	NEEA's comments (October 3, 2022) cited the results of two relevant market studies that addressed stakeholder opposition: a 2019 study on installation barriers and costs, sponsored by NEEA and other stakeholders, and a 2022 study on HVAC sales trends in the Pacific Northwest.

[14] For this evaluation we considered the provision of any regional data or studies as NEEA and its partners having influence. We have done this because NEEA acts in conjunction with its partners and its partners are not all from the Northwest. We recommend reconsidering the wording of this activity in the next revision of the logic model.

Box # in Logic Model	Element	Description	Did NEEA and its partners have a role in these activities?	Findings
6	Activity	Collaboration with other advocates	Yes	NEEA and its partners shared their draft comments to align their commenting and stakeholder engagement strategies. NEEEA held meetings with various partners, such as ASAP, and attempted to meet with the American Gas Association. ASAP held a press conference and created a fact sheet about the standards that was shared on their website and with partners.
7	Activity	Encourage utilities to provide data and political support for standards	N/A	There was no NEEA initiative for NWGFs or MHGFs during the rulemaking process.
8	Activity	Work with NEEA initiatives to increase market penetration and create paths from voluntary to mandatory requirements	N/A	There was no NEEA initiative for NWGFs or MHGFs during the rulemaking process.

Table 5. Qualitative Analysis of NEEA and its Partners' Influence - Outputs

Box # in Logic Model	Element	Description	Did NEEA and its partners provide any outputs?	Findings
9	Output	Consensus-based proposals to submit to DOE or better general understanding of manufacturer positions and concern	Partial	Manufacturers and their representatives submitted their comments, as did NEEA and its partners. There were no consensus-based proposals or joint statements made by NEEA and its partners with manufacturers. There was, however, strong consensus in generally supporting the standard among advocates and some manufacturers.
10	Output	Written comments and each opportunity during a rulemaking Oral comments during public meetings Participation documented in public record	Yes	NEEA's partners made verbal comments during the public meetings. NEEA and its partners submitted written comments to the docket supporting the standards and addressing various opposing arguments.
11	Output	Initiative logic models refer to the creation of standards	N/A	There was no NEEA initiative for NWGFs or MHGFs during the rulemaking process.

Table 6. Qualitative Analysis of NEEA and its Partners' Influence - Outcomes

Box # in Logic Model	Element	Description	Is there evidence that NEEA and its partners influenced these outcomes?	Findings
12	Outcome	Disparity in positions between parties is decreased	Partial	Despite the passage of the standards and general consensus among most interested parties, some interested parties strongly opposed the proposed standards and the Final Rule. DOE adopted the proposed standards despite this opposition.
13	Outcome	NEEA adds valuable information/analysis at each stage of the rulemaking process [15]	Yes	NEEA and its partners submitted comments to the docket at all opportunities during the rulemaking.
14	Outcome	NEEA information/analysis referenced in rulemaking proceedings/documentation [16]	Yes	The DOE referenced information provided by NEEA and its partners in the Final Rule.
15	Outcome	Utilities are present at hearings/publicly support new standards	N/A	While utility representatives may have been present at public meetings and publicly supported the proposed standards, the evaluation team did not find evidence that NEEA directly engaged with the utilities to support the standard.

[15] For this evaluation the evaluation team considers NEEA to be NEEA and its partners. The evaluation team recommends reconsidering the wording of this activity in the next revision of the logic model.

Table 7. Qualitative Analysis of NEEA and its Partners' Influence - Impact

Box # in Logic Model	Element	Description	Is there evidence that NEEA and its partners impacted the adoption of the standard?	Findings
16	Impact	Adoption of the highest standards that are technologically feasible and economically justified	Yes	NEEA and its partners collaborated to develop a unified strategy in support of the 95% AFUE standards for NWGFs and MHGFs. The DOE excluded the standby mode and off mode requirements from the Final Rule due to technology concerns that the requirement would adversely affect furnace ancillary controls functionality.

3.2 Share of Energy Savings from NEEA and Partners' Efforts

This section presents the quantitative analysis of the significance of the barrier to passing these standards, the effectiveness of the activities NEEA and its partners participated in, and NEEA and its partners' role in each activity. Table 8 presents the share of savings influenced by NEEA and its partners' activities during the most recent standard rulemaking process for NWGFs and MHGFs. **As shown in Table 8, the evaluation team estimates that the total share of savings influenced by NEEA and its partners' activities for NWGFs and MHGFs is 18.6%.**

The remainder of this section summarizes the rationale for quantifying each barrier's significance, each activity's effectiveness, and NEEA and its partners' role.

3.2.1 Barrier 1: Manufacturer Opposition

Significance: **Low** (21%)

Rationale and Findings:

- As summarized in the December 2023 Final Rule, some manufacturers opposed the proposed standards for a variety of reasons, including technical feasibility concerns (for space-constrained and through-the-wall installations for examples), higher installation costs for retrofits that require significant modifications for venting, safety issues, and the desire for regional instead of uniform national standards. Interview respondents recalled that some manufacturers echoed concerns posed by gas industry associations regarding the potential installation costs of some retrofit installations and the elimination of non-condensing furnaces (that is, restricting customer choice).
- The strongest opposition from manufacturers was related to the 8.5 W standby mode and off mode requirements. The DOE excluded these requirements from the December 2023 Final Rule, which alleviated most manufacturer opposition.

  "there was some flexibility by the manufacturers" (interview respondent)

  "the manufacturers have generally moved from a position of trying to oppose those standards" (interview respondent)

- Overall, manufacturer opposition was limited, and some manufacturers supported the proposed standards. The manufacturer representatives interviewed for this analysis commented that they were confident the new standards were technologically feasible, and models that meet the proposed standard were already available in the market.
- Further, one manufacturer representative interviewed for this evaluation explained that manufacturer opposition to the standard was alleviated after the 95% AFUE furnace standard was enacted in Canada in June 2019.[16]

  "… given that we have transitioned to an all condensing standard in Canada for several years now… there may have been some issues as largely been overcome… as time has evolved and our experience in Canada kind of became more apparent … we've moved to supporting [this] rule." (interview respondent)

[16] 88 FR 87516

Table 8. Estimated Share of Savings

	Barrier	Manufacturer Opposition	Lack of Data	Lack of common interest among stakeholders			Insufficient funding/staff DOE	Insufficient market adoption of more efficient options	Cyclical political opposition
a	Relative significance for energy savings	Low	Medium	Medium			N/A	N/A	N/A
	Significance of barrier (%)	21%	42%	37%			N/A	N/A	N/A
	Significance of activity relative to the barrier (%)	21%	42%	4%	18%	15%	N/A	N/A	N/A
b	Activity	NEEA and partners submitted comments and attended the public webinar in support of the standard.	NEEA's comments provided market data on the installation barriers and costs for condensing gas furnaces and the market share of 95% AFUE furnaces.	NEEA's partners held a Lunch & Learn to educate stakeholders and answer questions about the proposed standards.	NEEA and partners submitted comments and attended the public webinar in support of the standard.	NEEA and partners collaborated to align their strategies and messaging.	N/A	N/A	N/A
	Effectiveness of activity in addressing barrier	Medium	High	Low	Medium	Low	N/A	N/A	N/A
	Effectiveness of activity in addressing barrier (%)	40%	60%	20%	40%	20%	N/A	N/A	N/A
c	Effectiveness of activity relative to ALL barriers (a x b) (%)	8.4%	25.2%	0.8%	7.2%	3.0%	N/A	N/A	N/A
d	NEEA and its partners' role compared to other stakeholders	Major	Primary	Primary	Major	Major	N/A	N/A	N/A
	NEEA and its partners' relative role in activity (%)	30%	50%	50%	30%	30%	N/A	N/A	N/A
e	Relative savings influenced by the activity (c x d) (%)	2.5%	12.6%	0.4%	2.2%	0.9%	N/A	N/A	N/A
								Total Savings %	**18.6%**

3.2.1.1 Activity 1-1: NEEA and partners submitted comments and attended the DOE public webinar in support of the standard.

NEEA submitted comments (October 3, 2022) in support of the standard, which addressed some manufacturers' opposition. NEEA's comments cited the high net present value of benefits and related societal health benefits. They summarized market data to refute opposition relating to installation difficulties and costs, and market availability of 95% AFUE models.

The NCLC's written and oral comments focused on the benefits of the proposed standards and reduced energy burden on low-income households. ASAP's written and oral comments discussed the net benefits to consumers, particularly low-income households, and the environmental and health benefits associated with the higher standard.

Prior to submitting comments to the docket, NEEA and its partners collaborated by sharing their respective interpretations of the rulemaking, circulating their draft comments, and asking partner organizations to sign on to each other's comment letters.

Effectiveness: **Medium**.

- The in-depth interviews suggest low manufacturer opposition through the rulemaking covered by this evaluation. While NEEA and its partners' comments strongly supported DOE's proposed standards and refuted claims of high installation costs associated with replacements of non-condensing to condensing furnaces, their comments did not address the standby mode and off mode requirements that were the primary concern of manufacturers. According to the December 2023 Final Rule, manufacturers (for example, Carrier, Lennox, Trane, Nortek, Daikin recommended removing the standby mode and off mode requirements. Manufacturers presented several technical issues regarding the 8.5 W requirement, stating, for example, that 8.5 W is only feasible for lower-efficiency furnaces and that the requirement would inhibit furnace safety, communicating controls, and other features. Manufacturers recommended that DOE exclude the standby mode and off mode requirements until further testing and analysis could be completed.
- While NEEA and partners submitted comments and attended the public webinar in support of the standard, they did not address manufacturers' opposition to the DOE's proposed standby mode and off mode requirements.
- As noted previously, manufacturers opposed the standard for a variety of other reasons, including technical feasibility for smaller spaces, higher installation costs, safety issues, and the desire for regional standards. NEEA's comments mainly addressed manufacturers' concerns about installation barriers and cost impacts on consumers.
- Despite little concern from manufacturers about the transition timing for the effective date of the proposed standards, the Final Rule noted that NEEA's comments explained the "5-year transition time would allow sufficient time for manufacturers to convert their production and close the remaining sales gap." (88 FR 87520)

Role of NEEA and its Partners: **Major**
NEEA and its partners had a major role in this activity relative to other stakeholders. One interview respondent specifically called out the NCLC as having a leading role and being particularly influential.

Savings from Activity: **2.5%**

3.2.2 Barrier 2: Lack of Data

Significance: **Medium** (42%)

Rationale and Findings:

- Even though significant technical analyses were conducted and reviewed *before* the July 2022 NOPR, industry trade organizations expressed concern about the data accuracy and modeling methodology of the DOE's life cycle cost (LCC) analysis. Specifically, some stakeholders disagreed with the Monte Carlo simulations of 10,000 households and assumptions of consumer economic behavior for furnace replacement decisions.
- This opposition can be found in stakeholder comments submitted to the docket, statements made during public meetings, and insights provided by some interview respondents.

3.2.2.1 Activity 2-1: NEEA's comments provided market data on the installation barriers and costs for condensing gas furnaces and the market share of 95% AFUE furnaces.

NEEA's comments (October 3, 2022) cited the results of two relevant market studies that addressed stakeholder opposition: a 2019 study on installation barriers and costs, sponsored by NEEA and other stakeholders,[17] and a 2022 study on HVAC sales trends in the Pacific Northwest.[18] NEEA's comments state, "… the evidence is clear that the market is ready for a condensing furnace standard" [19] and that the market share of 95% AFUE furnaces was 65% of sales in 2020 in the Northwest region. Further, NEEA reiterated the 2019 study findings that installation difficulties associated with condensing furnaces would occur in 5% of furnace installations and could be overcome with other alternatives.[20]

Effectiveness: **High**

- NEEA's comments and the market studies NEEA cited provided valuable data needed to substantiate DOE's analyses in the NOPR. One interview respondent specifically explained that without the data NEEA provided, the initial lack of data would have been a barrier to adopting the standard.
- In the December 2023 Final Rule, DOE stated:

  "NEEA supported DOE's finding in the July 2022 NOPR that implementing a 95-percent AFUE standard for NWGFs and MHGFs would lead to significant, cost-effective energy savings. (NEEA, No. 368 at pp. 1–2) NEEA stated that the consumer furnace market is ready for a furnace standard set at a condensing level, as evidenced by the market maturity and the lack of insurmountable barriers. (Id. at pp. 2–3) NEEA noted that condensing furnaces make up the majority of sales in the Northwest and their market share is growing. (Id.) NEEA stated that a study commissioned by NEEA and other

[17] Memo: Investigation of Installation Barriers and Costs for Condensing Gas Appliances. Submitted to DOE 2019-02- 28. Accessed at: https://www.regulations.gov/comment/EERE-2018-BT-STD-0018-0062.
[18] https://www.bpa.gov/-/media/Aep/energy-efficiency/momentum-savings/2016-2020-hvac-sales-datasummary.pdf, p.8.
[19] Comment Response to the Published Notice of Proposed Rulemaking and Request for Comment. Submitted to DOE 2022-10-03. Accessed at: https://www.regulations.gov/comment/EERE-2014-BT-STD-0031-0368.
[20] Ibid.

stakeholders demonstrated the lack of barriers as would prevent a condensing furnace installation. (Id.) Additionally, NEEA commented that a 5-year transition time would allow sufficient time for manufacturers to convert their production and close the remaining sales gap. (Id.)" (88 FR 87520)

Role of NEEA and its Partners: **Primary**
NEEA led the effort to identify and ensure the relevant market data was submitted to the docket for this rulemaking.

Savings from Activity: **12.6%**

3.2.3 Barrier 3: Lack of Common Interest Among Stakeholders

For this analysis, the evaluation team considered a "stakeholder" as an organization or company that could have been affected by the outcome of the Final Rule, or that had a specific vested interest in adopting the proposed standard. Stakeholders, therefore, refers to a large and diverse group of organizations and market actors, including (but not limited to) the following:

- Efficiency/environmental advocacy organizations
- Consumer advocacy organizations
- Gas industry organizations
- Manufacturers and supply chains
- Trade allies and service providers and representing organizations

Significance: **Medium** (37%)

Rationale and Findings:

- Despite universal support for the standards among NEEA, its partners, efficiency advocacy organizations, some consumer advocacy organizations, and some manufacturers, there remained significant opposition from gas industry associations, some manufacturers, and representatives of some trade associations.
- Stakeholders opposing the standard argued that some customers needing to replace an existing non-condensing furnace with a condensing furnace would incur considerable costs associated with venting configuration complications.
- Some stakeholders, particularly gas industry associations, expressed concern that the new standard would restrict consumer choice because it effectively eliminates the non-condensing furnace product category.
- One interview respondent commented that the proposed standards overlapped with existing regulations for manufactured housing under the Department of Housing and Urban Development (HUD) oversight. The December 2023 Final Rule highlights comments from industry organizations relating to manufactured housing:

  "Nortek, AHRI, and MHI encouraged DOE to consider regional standards that align with the U.S. Department of Housing and Urban Development (''HUD'') zones. (Nortek, No. 406 at p. 6; AHRI, No. 414–2 at pp. 3–4; MHI, No. 365 at pp. 1–2) MHI commented that the HUD code for manufactured homes prescribes energy efficiency features that are specific to the region where the home will be sited"

"Manufactured home designs must be approved by an accepted third-party inspection agency, as required by the U.S. Department of Housing and Urban Development, to ensure compliance with the HUD Code (24 CFR 3282.203), which requires sealed combustion system appliances. MHGFs cannot be commonly vented with other gas-fired equipment (such as a gas-fired water heater) (24 CFR 328.709)." (88 FR 87520-87521)

3.2.3.1 Activity 3-1: NEEA's partners held a Lunch & Learn to educate stakeholders and answer questions about the proposed standards.

The NW Energy Coalition organized a Lunch & Learn in August 2022 to educate stakeholders and answer questions about the proposed standards. The Lunch & Learn was held virtually with a short presentation and time for questions. The presentation provided an overview of the proposed ruling, the potential climate and economic impacts, and information on how stakeholders could share their thoughts.

Effectiveness: **Low**

- One interview respondent was "vaguely familiar" with the event and believed it was useful. Most of the interview respondents did not attend or recall the event.
- Although this event sought to disseminate information on the benefits of the proposed standards to attendees, it was not effective in finding common ground with gas industry organizations. Gas industry organizations maintained their opposition to the standards prior to and throughout the July 2022 NOPR.

Role of NEEA and its Partners: **Primary**
The NW Energy Coalition organized the Lunch & Learn, and asked NEEA to present on NEEA's involvement with the standard development. NEEA provided brief comments during the webinar. ASAP also presented at the event.

Savings from Activity: **0.40%**

3.2.3.2 Activity 3-2: NEEA and partners submitted comments and attended the public webinar in support of the standard.

NEEA submitted comments (October 3, 2022) in support of the standard. NEEA's comments cited the high net present value of benefits and related societal health benefits, and summarized market data to refute opposition relating to installation difficulties and costs, and market availability of 95% AFUE models.

The NCLC's written and oral comments focused on the benefits of the proposed standards and reduced energy burden on low-income households. ASAP's written and oral comments discussed the net benefits to consumers, particularly low-income households, as well as the environmental and health benefits associated with the higher standard.

Prior to submitting their comments to the docket, NEEA and its partners collaborated by sharing their respective interpretations of the rulemaking, circulating their draft comments, and asking partner organizations to sign on to each other's comment letters.

Effectiveness: **Medium**

- Some interview respondents acknowledged comments submitted by NEEA and its partners to the docket as being influential throughout the rulemaking process. Moreover, during the July 2022 NOPR, the alignment between energy efficiency and consumer advocates demonstrated broad support for DOE and the proposed standards; this support was considered by some interview respondents to be an important factor in the adoption of the standards.
- Several interviewees mentioned that comments by NEEA are held in higher regard compared to individual comment submissions due to its reputation for collaboration and high-quality research.
- Comments submitted by NEEA and its partners, however, were not effective in finding common ground with the gas industry organizations that opposed the standards. Gas industry organizations maintained their opposition to the standards prior to and throughout the July 2022 NOPR.

Role of NEEA and its Partners: **Major**

NEEA and its partners had a major role in this activity relative to other stakeholders. One interview respondent specifically called out the NCLC as having a leading role and being particularly influential.

Savings from Activity: **2.2%**

3.2.3.3 Activity 3-3: NEEA and partners collaborated to align their strategies and messaging.

This activity pertains to various initiatives NEEA and its partners engaged in to coordinate their strategies and messaging to counter opposition and show support for DOE on the proposed standards.

As noted previously, NEEA and its partners, such as ASAP and NCLC, submitted written comments and attended the public webinar in support of the standard. Even though NEEA submitted its own comments without other signatures, NEEA and its partners shared their draft comments with each other to align their commenting and stakeholder engagement strategies.

Through our document review and in-depth interviews, we identified the following examples of collaboration among NEEA and its partners to find common interests among stakeholders:

- NEEA attempted to meet with the American Gas Association (AGA), a gas industry association that strongly opposed the proposed standards.
- NEEA held a meeting with ASAP to strategize and align on issues each organization would address in their comments.
- ASAP held a press conference and created a fact sheet about the standards that was provided to partners and posted on the ASAP website. ASAP fact sheets are used by other advocacy organizations to support standards advancements.

Effectiveness: **Low**

- While it is clear from the docket record and our in-depth interviews that NEEA, its partners, and other stakeholders shared interest in adopting the proposed standards, there remained significant opposition by gas industry associations.

> *"[T]he gas industry was just entrenched in their positions and really wasn't allowing for what I would call any level of meaningful negotiation. … And it's still that way."*
> *(interview respondent)*

- Indeed, immediately following the publication of the Final Rule in December 2023, a consortium of gas industry associations and one manufacturer filed a lawsuit with the U.S. Court of Appeals, citing that the standard effectively eliminates all non-condensing natural gas furnaces and that some disadvantaged consumers, such as seniors, low-income households, and small businesses will experience higher costs.

Role of NEEA and its Partners: **Major**

NEEA and its partners played a major role in unifying the voices of stakeholders that supported the proposed standards. Even though they could not find common ground with gas industry stakeholders, NEEA and its partners demonstrated their collective support of the proposed standards and DOE's analyses.

> *"… there was significant alignment between the energy efficiency groups as well as the consumer groups to support these standards." (interview respondent)*

Savings from Activity: **0.90%**

3.2.4 Barrier 4: Insufficient Staffing and Funding by the DOE

Significance: Not applicable

Rationale and Findings: There was no evidence that a lack of sufficient DOE staffing or funding was a barrier to the adoption of the standard. As such, this barrier is excluded from the share of savings analysis.

3.2.5 Barrier 5: Insufficient Market Adoption of More Efficient Options

Significance: Not applicable

Rationale and Findings: There was no evidence that insufficient market adoption of more efficient options was a barrier to the adoption of the standard. As such, this barrier is excluded from the share of savings analysis.

3.2.6 Barrier 6: Cyclical Political Opposition

Significance: Not applicable

Rationale and Findings: There was no evidence that cyclical political opposition was a barrier to the adoption of the standard. As such, this barrier is excluded from the share of savings analysis.

4 Savings Duration

Currently, NEEA assumes the savings resulting from its work on a standard have a duration of ten years. This duration of savings assumes that the market would have independently arrived at the same efficiency specified in the standard ten years after the standard's compliance date. In 2019, a third-party analysis was conducted for NEEA's internal use. This review did not identify any compelling evidence that supports the use of a different savings duration. Likewise, no evidence was found in the present research to suggest that a different duration of savings should be used for NWGF and MHGF standards. The evaluation team supports ten years for a reasonable duration for the savings from these standards.

5 Future Energy Savings

The evaluation team found that NEEA and its partners conducted some activities that "set the stage" for increased savings from amending furnace standards through future rulemakings. The evaluation team has identified the following opportunities:

One in-depth interview respondent noted that the 95% AFUE NWGF and MHGF minimum standards are approaching the maximum limit and, therefore, potential future energy savings from increasing furnace fuel efficiency could be limited. However, future proposed standards could address standby mode and off mode requirements that were excluded from the December 2023 Final Rule. Adopting the standby mode and off mode requirements may result in future energy savings.

The evaluation team recommends that NEEA evaluate NWGF and MHGF standards if and when the DOE completes a subsequent rulemaking process. Doing so could capture savings influenced by activities that occurred during the rulemaking covered by this evaluation as well as savings influenced by NEEA and its partners in a next rulemaking.

6 Conclusion and Recommendations

6.1 Conclusion

Based on the information collected and the evaluation team's analysis, this evaluation concludes that NEEA and its partner organizations moderately influenced the NWGF and MHGF standards.

The evaluation team identified some manufacturer opposition, lack of data, and lack of common interest among stakeholders as key barriers to the adoption of the NWGF and MHGF standards. The most influential activity conducted by NEEA was their submitted comments to the docket on record that cited two market studies: a 2019 study that estimated a low share (5%) of "difficult" furnace replacements, and a 2022 HVAC market study estimated a market share of 95% AFUE furnaces to be 65% of sales in the Northwest region. These studies substantiated DOE's LCC analysis assumptions, and DOE cited NEEA's comments and these findings in support of the standards in its Final Rule.

Table 9 summarizes activities completed by NEEA and its partners to overcome the identified barriers, along with the evaluation team's assessment of the effectiveness.

Table 9. Summary of Activities to Address Barriers

Barrier	Activity	Effectiveness
Manufacturer opposition	NEEA and partners submitted comments and attended the DOE public webinar in support of the standards.	Medium
Lack of data	NEEA's comments provided market data on the installation barriers and costs for condensing gas furnaces and the market share of 95% AFUE furnaces.	High
Lack of common interest among stakeholders	NEEA's partners held a Lunch & Learn to educate stakeholders and answer questions about the proposed standards.	Low
	NEEA and partners submitted comments and attended the public webinar in support of the standards.	Medium
	NEEA and partners collaborated to align their strategies and messaging.	Low

Overall, the total share of savings from NEEA and its partners' activities for NWGFs and MHGFs is 18.6%.

6.2 Recommendations

The evaluation team offers two recommendations for NEEA to consider:

- Standards evaluations should be conducted as soon as possible after a Final Rule is published to increase the likelihood that individuals who were involved in the rulemaking will be available and willing to participate in the evaluation research and the likelihood they will recall critical details about rulemaking process. The evaluation team was successful in recruiting interview participants for this evaluation, which can be attributed at least in part to the fact that the study was conducted immediately following the Final Rule.
- To account for NEEA's engagement in standards development that may have occurred prior to the rulemaking covered by the evaluation, NEEA should consider sharing any historical documentation of their advocacy work on standards that occurred before the adopted standard's rulemaking. While NEEA shared documentation from their work on the current standard, additional documentation such as comments, emails, meeting minutes, and research conducted prior to the standard would give the evaluation team a historical view of their advocacy efforts and enable the evaluation team to explicitly inquire about NEEA's role.

Appendix A | Description of the DOE Federal Standard Adoption Process

The U.S. Department of Energy (DOE) is the federal agency that develops national appliance energy standards. The general standards adoption process is summarized below.[21]

The DOE publishes a **Request for Information (RFI)** for the upcoming rulemaking. Stakeholders, including manufacturers, energy-efficiency organizations, utilities, end-users, industry organizations, and others, can respond with written comments and provide data.

The DOE publishes a **Framework Document**. Stakeholders can submit written comments and provide data.

The DOE may form an **Appliance Standards and Rulemaking Federal Advisory Committee (ASRAC) working group**, which will meet regularly throughout the rulemaking process.

The DOE publishes a **Preliminary Technical Support Document (TSD)**. Stakeholders can submit written comments and provide data.

The DOE holds a public meeting.

The DOE publishes a **Notice of Proposed Rulemaking (NOPR)**. Stakeholders may make written comments and provide data.

The DOE holds a public meeting.

If applicable, the DOE publishes a **Notice of Data Availability (NODA)** and **Supplementary Notice of Proposed Rulemaking (SNOPR)**. Stakeholders can submit written comments and provide data.

The DOE holds a public meeting.

The DOE publishes the **Final Rule.**

The development of a test procedure requires a separate rulemaking that follows a similar process.

[21] See also: Standards Development and Revision | Department of Energy and The Rulemaking Process (federalregister.gov)