Consortium for Energy Efficiency

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June 10, 2024

Ms. Abigail Daken
1200 Pennsylvania Ave. NW, MC 6202A
Washington, DC 20460

Dear Ms. Daken:

The Consortium for Energy Efficiency (CEE) respectfully submits the following comments in response to the ENERGY STAR® Version 5.0 Draft 1 Specification for Furnaces, as well as the request for feedback on a potential new ENERGY STAR focus on dual fuel systems, released by the US Environmental Protection Agency on April 16, 2024.

CEE is the binational organization of energy efficiency program administrators. Historically, the CEE Board of Directors determined to throw its support behind a single brand for efficiency and elected to create standing for the ENERGY STAR program rather than advance the name recognition of CEE or other endeavors that existed at that time. The ENERGY STAR program adopted specifications supported by CEE and program administrators, providing the confidence that utility ratepayer programs needed to invest in incentives in association with ENERGY STAR. This was a conscious investment and contribution of equity and the sanctioned obligations of utility members, which include responsibility for delivering safe, reliable, and affordable service. The staff and membership of the Consortium continue to perform diligence relative to the ENERGY STAR brand promise and associated performance specifications, given the very serious obligations entrusted to US and Canadian utilities as well as others sanctioned with advancement of voluntary market transformation efforts.

CEE members are responsible for ratepayer-funded efficiency programs in 38 US states, the District of Columbia, and four Canadian provinces. In 2021, CEE members directed approximately 60% of the $9.0 billion in energy efficiency and demand response program expenditures in the two countries. CEE highly values the role ENERGY STAR plays in differentiating energy efficient products and services that the CEE membership supports locally throughout the US and Canada. These comments are offered in support of the local activities CEE members carry out to actively leverage the ENERGY STAR brand. CEE consensus comments are offered in the spirit of strengthening ENERGY STAR, so it may continue to serve as the national marketing platform for energy efficiency. We appreciate the opportunity to provide this feedback.

CEE Commends EPA for Continuing to Recognize Residential Furnaces as Part of the ENERGY STAR Portfolio at this Time

CEE thanks US EPA for revisiting the consideration to sunset residential furnaces and instead update the specification through a Version 5.0 revision. As noted in our July 2023 comments, we believe it is premature to completely eliminate the category for several reasons, including the remaining potential for energy savings and carbon reduction, customer bill savings, limited availability of replacement technology, and insufficient levels of heat pump expertise amongst contractors and installers.

Many CEE members continue to manage programs for gas furnaces, with 38 organizations promoting this measure in 2023, as shown in Table 1 below. This product type remains a fundamental offering within many natural gas and dual fuel utility members' residential portfolios. Accordingly, CEE specifications continue to offer multiple gas furnace tier options to serve these program administrators. Program administrators, particularly in colder climate zones and localities, continue to see an opportunity for cost-effective energy savings that they support with regulator-approved prescriptive programs and the need for product differentiation with residential furnaces.

Table 1. **CEE Members Offering Natural Gas Furnace Programs, 2023***

Ameren Illinois	New Jersey Natural Gas
Avista—Idaho	New Mexico Gas Company
Avista—Washington	Nicor Gas
Berkshire Gas	Public Service Electric & Gas
Connecticut Natural Gas	Puget Sound Energy
Consumers Energy	Rhode Island Energy
Dominion Energy Utah	SoCalGas
DTE Energy	South Jersey Gas
Elizabethtown Gas	Southern Connecticut Gas
Enbridge Gas Distribution—Quebec	Southern Minnesota Municipal Power Agency
Energy Trust of Oregon—Oregon	TECO Peoples Gas
National Grid—New York Upstate	United Illuminating Company
Energy Trust of Oregon—Washington	Vectren Corporation—Ohio

Eversource—Connecticut	Vermont Gas
Eversource—Eastern Massachusetts	Xcel Energy—Colorado
FortisBC	Xcel Energy—Michigan
National Grid—Downstate Long Island	Xcel Energy—Minnesota
National Grid—Massachusetts	Xcel Energy—North Dakota
National Grid—New York City Downstate	Xcel Energy—Wisconsin

* This data reflects programs that were active in 2023, however we note that some of these members may not be promoting furnaces in their program offerings as of 2024

Version 5.0 Draft 1 Specification Criteria Effectively Serves to Distinguish the Highest Performing Furnaces

DOE's proposed rule[1] from 2022 to raise the minimum performance standard to 95%, which will apply five years after the final rulemaking, will create an important market role for the ENERGY STAR label to differentiate products, at least until the new federal standard takes effect.

CEE supports and endorses the proposed increase in efficiency to ≥ 97.0% AFUE for Version 5.0. This level aligns with the current CEE Tier 3, which went into effect in January 2021. As with the ENERGY STAR Version 5.0 Draft 1 proposal, CEE does not distinguish for a regional split, nor do we include a warranty requirement. To date, many members are already actively promoting CEE Tier 3, which aligns with the proposed Version 5.0 Draft 1 specification. Despite the noted low model availability rate of 4.5%, there are at least 22 CEE program administrators who are offering incentives for furnaces with ≥ 97.0% AFUE. Further, this level is consistent with ENERGY STAR representing the top performing products in the market, and alignment between ENERGY STAR and the CEE Tier 3 specification will help to accelerate market transformation toward the highest efficiency gas products.

Table 2. **CEE Members Promoting Gas Furnace CEE Tier 3 Levels, 2023***

Berkshire Gas	Public Service Electric & Gas
Consumers Energy	Rhode Island Energy
Dominion Energy Utah	SoCalGas
DTE Energy	South Jersey Gas
Elizabethtown Gas	Southern Minnesota Municipal Power Agency
Eversource—Eastern Massachusetts	Vectren Corporation—Ohio
FortisBC	Vermont Gas
National Grid—Massachusetts	Xcel Energy—Michigan

[1] US Department of Energy, Appliance and Equipment Standards Rulemakings and Notices, https://www1.eere.energy.gov/buildings/appliance_standards/standards.aspx?productid=59&action=viewlive#current_standards.

New Jersey Natural Gas	Xcel Energy—Minnesota
New Mexico Gas Company	Xcel Energy—North Dakota
Nicor Gas	Xcel Energy—Wisconsin

* This data reflects programs that were active in 2023, however we note that some of these members may not be promoting furnaces in their program offerings as of 2024

Additional Opportunities to Achieve Savings from Residential Forced Hot Air through Gas Heat Pump Technologies

Gas heat pumps provide a high-performance option for residential gas space heating and should be recognized through the ENERGY STAR label. CEE has been engaged in the past several years across both residential and commercial equipment committees, in coordination with relevant external market actors, to support and accelerate development and deployment of fuel neutral and technology neutral solutions. This work includes iterative consensus-driven processes to develop impactful programs, paying particular attention to performance specifications, test procedures, engineering analysis, proper sizing/installation, and support for trade allies. In recent years, CEE committees have developed equipment specifications for gas heat pumps in multiple market transformation initiatives, as shown in the table below. CEE actively positions technology with exceptional performance within the Advanced Tier of numerous specifications, a differentiation that acknowledges the need to meet cost-effective energy saving goals in the near term while also signaling future market direction.

From 2019 – 2021, the CEE Residential HVAC Committee worked on specification revisions to our gas and electric HVAC specifications. Through robust conversations and deliberations, we ultimately added new performance specifications that recognize gas heat pump technologies exceed 100% efficiency. Published in January 2021, our residential gas furnace specification was renamed to be the residential forced hot air specification, and introduced an Advanced Tier, as detailed below.

Table 3. **CEE Gas-Fired Forced Hot Air Specification** (effective Jan 15, 2021)

Scope: Input rating <225,000 BTU/h
Optional distinction for units ≤40,000 BTU/h

Level	AFUE*
CEE Tier 1	≥ 92%
CEE Tier 2	≥ 95%
CEE Tier 3	≥ 97%

Level	AFUE**
Advanced Tier	≥ 120%

*10 CFR Appendix N to Subpart B of Part 430 - *Uniform Test Method for Measuring the Energy Consumption of Furnaces and Boilers*
** ANSI Z21.40.4 *Performance Testing and Rating of Gas-Fired, Air Conditioning and Heat Pump Appliances*, designated for Region IV

Advanced Tier Additional Reporting Metrics (where applicable)
Include the air dry bulb temperature and water supply temperature for the relevant ratings below:

- **System Type** – absorption, IC engine driven/vapor, adsorption, thermal compression
- **Refrigerant/Working Fluid(s)** – water, ammonia, R410a, R134a, carbon dioxide, helium, other
- **Target Applications (all that apply) –** residential, commercial, space heating, hot water, cooling
- **Heat Rejection or Acceptance** – air, water, geothermal
- **Heating Capacity (kBtu/h)** (at 47°F air dry bulb temperature and 95°F return water temperature)
- **Input Modulation Range** (MBH)
- **Maximum Supply Water Output Temperature** (Heating °F)
- **Cooling Capacity** (Tons)
- **$COP_{gas\ HHV}$** (at 17°F air dry bulb temperature and 95°F return water temperature)
- **$COP_{cooling}$** (at 95°F air dry bulb temperature and 55°F return water temperature per ANSI Z21.40.4)
- **Annual Electric Power** (kWh)
- **Percentage of Rated Heating Capacity** (at 17°F air dry bulb temperature and 95°F return water temp)
- **Maximum Number of Units that Can be Interconnected**
- **Noise** (dBA) – note standard or methodology used

Residential Gas Heat Pumps Serve as a High-Performance Option for Natural Gas Space Heating

While still relatively nascent in the US and Canadian markets, members are very interested in promoting gas heat pump products through local offerings as models become more widely available in North America. We recognize that the relevant test method for gas heat pumps is different from that used for traditional furnaces and boilers, however both tests yield an “AFUE” performance value. CEE strives for technology neutral specifications that allow customers to make accurate comparisons when selecting heating and cooling equipment. While we recognize that the AFUE values are not directly comparable between the furnace test method (10 CFR Appendix N to Subpart B of Part 430 - *Uniform Test Method for Measuring the Energy Consumption of Furnaces and Boilers*) and the gas heat pump test method (ANSI Z21.40.4 *Performance Testing and Rating of Gas-Fired, Air Conditioning and Heat Pump Appliances*), many conversations to date with manufacturers of gas heat pumps indicate that they are highly analogous and have many similarities. Some industry players have expressed uncertainty about the comparability of these values, yet CEE members that have conducted field testing indicate the performance of a gas heat pump will exceed the efficiency of the most efficient gas furnaces even in very cold temperatures when sized correctly. While the two test methods may not be entirely comparable, they both yield AFUE outputs, with gas heat pumps substantially outperforming their furnace counterparts. **Regardless of how EPA chooses to incorporate gas heat pumps in this specification (either as part of the same category that utilizes a different test method, or as a different category type with different requirements), CEE asserts that gas heat pumps should be included and recognized by the ENERGY STAR label.**

Interest in ENERGY STAR Recognition and Promotion of Residential Gas Heat Pump Solutions

There may be several pathways or channels through which US EPA can recognize residential gas heat pumps within the ENERGY STAR platform, including:

- Inclusion of ANSI Z21.40.4 as a viable test method for compliance within the ENERGY STAR Furnace Version 5.0 Specification (and renaming of the product category to Residential Gas-Fired Forced Hot Air Specification)
- Creation of an ENERGY STAR Most Efficient category for Gas Heat Pumps
- Award of residential gas heat pumps through the Emerging Technologies platform

CEE encourages EPA to explore the most appropriate means by which to promote and recognize gas heat pump solutions through the ENERGY STAR label. Our members ultimately decided that categorizing gas heat pumps within the same framework as gas furnaces is the most appropriate mechanism to recognize forced hot air solutions across a continuum, rather than as distinct product classifications. For these reasons, **we believe the establishment of an ENERGY STAR recognition that aligns with the CEE Residential Gas-Fired Forced Hot Air Advanced Tier is a critical step toward supporting the adoption of high-performance residential gas space heating options that advance decarbonization objectives.**

A New ENERGY STAR Dual Fuel Specification Has the Potential to Help Residential Customers Decarbonize their Homes

CEE members report that dual fuel solutions, which combine a right sized high-efficiency furnace with an electric heat pump, are an increasingly common residential solution to balance customer, grid, and environmental needs for affordable, accessible, low-carbon comfort. For this reason, members believe that there remains a strong opportunity for EPA to continue differentiating the most efficient systems in the market. Voluntary efficiency programs strive to accommodate the diverse needs and conditions encountered across regions and support the continued use of high-efficiency options to replace inefficient alternatives as a primary heat source, or provide efficient, cost-effective auxiliary heating where necessary. We believe ENERGY STAR can play an important role in these situations.

Given the ENERGY STAR brand provides customers with clear recognition of high performing products that will help them reduce energy use and save money, CEE concurs that a recognition for dual fuel systems is a ripe opportunity for the ENERGY STAR label to differentiate high performance solutions in the market.

CEE Offers Support to Collaborate in Defining and Scoping Future Dual Fuel Opportunities within the ENERGY STAR Program

CEE committees are actively addressing some of the opportunities and challenges associated with multiple heating solutions and fuels within a given home and have initial resources and findings to share with EPA. One publicly available document that CEE published in 2024 that might help inform the direction of this work is a Two System Controls Guide (Homeowner Version) (Contractor Version) document that describes integrated controls, best practices, and their value proposition.

Controls are an important piece of two-fuel systems, but equipment definitions and metrics of performance are also needed to enable like-for-like comparison of performance, potentially including both energy and emissions performance, and customer capital and operating costs. CEE is well positioned to help develop performance criteria based on historical experience with both gas and electric HVAC equipment and use this work to provide input to EPA.

CEE committees are working with industry and other relevant market actors to use existing CEE performance specifications for gas and electric HVAC equipment as a basis for combined system performance. Members are already in discussions of how this equipment operates independently, what considerations are necessary for coordination across multiple systems in order to optimize performance, and what key terminology needs further definitions. For example, in conversations to date, we note that there may be multiple different temperature points that are worth parsing out for various applications:

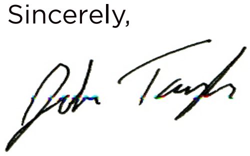
- **"System Balance Point"** – the temperature at which the central heat pump component of the system is no longer able to provide the BTUh required to maintain the thermostat setpoint; therefore the controls typically call for the heat pump to cease operation and the furnace to operate to satisfy the thermostat. An ACCA Manual J Load Calculation and/or other data may be required to determine the System Balance Point with accuracy.

- **"Economic Balance Point"** – the temperature at which the "economic man" would set up dual-fuel heat pump controls to cease operation of the central heat pump and operate the furnace instead based on the difference in the cost of electricity vs. gas.
- "**Cutover Temperature"** – the temperature at which an HVAC contractor, or the customer typically, sets a dual-fuel heat pump control to switch between operation of the central heat pump and the furnace based on any number of criteria – company policy, customer preference, prior experience, training, trial and error, etc. In contrast to the System Balance Point or Economic Balance Point, the determination of a cutover temperature by a contractor generally does not rely on data and math but is instead more likely focused primarily on customer comfort and reducing or eliminating customer callbacks.

CEE's active and multifaceted efforts in this space can help inform EPA on utility program considerations and priorities for dual-fuel systems, drawing from the recent work on system controls and CEE's longstanding initiatives and equipment specifications for gas and electric residential HVAC equipment. In the second half of 2024, the Natural Gas Program Strategy Committee will coordinate with the CEE ETC and Residential HVAC committees to develop recommendations on how to build from existing CEE equipment specifications, including criteria and performance metrics, to potentially address dual-fuel systems. CEE committees will engage with EPA through appropriate channels to help inform federal specifications. We look forward to coordination with EPA staff and engaging in additional discussions in the upcoming months to help inform the direction of future ENERGY STAR developments for dual fuel recognition.

CEE would once again like to thank EPA for the opportunity to comment on the ENERGY STAR Version 5.0 Draft 1 Specification for Furnaces and considerations for addressing dual fuel systems in the future. Please contact CEE Deputy Director, Alice Rosenberg at arosenberg@cee1.org with any questions about these comments.

Sincerely,



John Taylor
Executive Director