



July 7, 2023

Ann Bailey, Director
ENERGY STAR® Labeling Branch
U.S. Environmental Protection Agency
1200 Pennsylvania Ave NW
Washington, DC 20460

Dear Director Bailey:

This is in response to the notice issued by the EPA regarding the “sunsetting” of non-heat pump type boilers from ENERGY STAR®. The Oilheat Manufacturers Association (OMA) represents manufacturers and distributors of liquid fuel and biofuel powered heating and hot water systems. OMA disagrees with the decision announced by ENERGY STAR® to desist in partnering with boiler companies to provide ENERGY STAR® labels. At this time, air to water heat pumps are not in direct competition with liquid fueled boilers, and because of this it would be more appropriate to have two classes of hydronic heating systems. In support, OMA respectfully submits the following.

OMA understands ENERGY STAR®’s desire to rapidly reduce carbon in the heating sector. The heating sector is the largest consumer of energy in the typical American home and as such, provides a vital opportunity to reduce carbon emissions. ENERGY STAR®’s notice indicates a desire to focus on new and unproven expensive technology that is unlikely at this time to have a major impact on total energy consumption in American homes. At the same time, ENERGY STAR® would no longer evaluate and label gas and and liquid- and bio-fueled boilers ignoring the most common and affordable heating appliances that will be purchased by American consumers and will potentially have the largest impact on total household energy consumption and pollution.

OMA would encourage ENERGY STAR® to evaluate heat pump boilers and to consider a separate category for them.

OMA would discourage ENERGY STAR® from suspending its evaluation of liquid- biofuel-fueled and gas fired boilers. We believe suspending such an evaluation is premature, will result in ENERGY STAR® losing relevance in the home heating market and eliminate a tool relied upon by consumers for a quick evaluation of products.

Statutory Guidance on ENERGY STAR®

Providing information to consumers on energy use has a long and rich history. In 1975, The *Energy Policy and Conservation Act* delegated to the Administrator of the Federal Energy Administration the task of evaluating appliances used in the home and in cooperation with the Commissioner to label products with the goal of conserving energy. This was amended in 2005 and the current authorization for ENERGY STAR® was established. Section 324A of the Energy Policy and Conservation Act states:

“SEC. 324A. (a) IN GENERAL. —There is established within the Department of Energy and the Environmental Protection Agency a voluntary program to identify and promote energy-efficient products and buildings to reduce energy consumption, improve energy security, and reduce pollution through voluntary labeling of, or other forms of communication about, products and buildings that meet the highest energy conservation standards.

OMA was particularly surprised to see the following statement in its background document:

EPA sees an unprecedented opportunity for the ENERGY STAR® program to support the national transition to the most energy efficient equipment available. The Agency recognizes an important responsibility to guide consumers to the choices **that support the efficient electrification (emphasis added)** of residential space conditioning.

Only through a very strained reading of 324A and this paragraph can one interpret the two goals and requirements to be in harmony. Clearly in 324A, Congress was focused on promoting energy efficient products. However, ENERGY STAR® has transformed that goal into an electrification transition. OMA acknowledges that in many cases, this might increase efficiency in a particular home. However, ignoring the millions of homes that will not electrify, nor cannot electrify leaves tremendous opportunities to save energy on the table.

OMA is interested in any studies done by ENERGY STAR® that indicates endorsing novel and likely expensive technologies will lead to more energy conservation than endorsing well understood and more economical technologies, and over what time frame such advantages would accrue. Additionally, since the mandate for the ENERGY STAR® program is to improve energy conservation, OMA was surprised that there was no discussion of source energy use, are those available as background documents? Additionally, it is OMA’s understanding and based on ENERGY STAR®’s background document that these technologies are not in widespread use. The question becomes, by endorsing and labeling a new technology that may save energy in a limited number of homes, and foregoing technologies that will save energy in millions of homes, is ENERGY STAR® meeting its requirement to “reduce energy consumption”?

In the Inflation Reduction Act of 2022, Congress in establishing appropriate tax credits for equipment for home energy use specifically referenced ENERGY STAR® efficiency ratings. The language adopted in section 13301 states;

- “(C) Any oil furnace or hot water boiler which--
 - “(i) is placed in service after December 31, 2022, and before January 1, 2027, and--
 - “(I) meets or exceeds 2021 Energy Star efficiency criteria, and
 - “(II) is rated by the manufacturer for use with fuel blends at least 20 % of the volume of which consists

of an eligible fuel, or
` (ii) is placed in service after December 31,
2026, and--
` (I) achieves an annual fuel
utilization efficiency rate of not less
than 90, and

` (II) is rated by the manufacturer
for use with fuel blends at least 50
% of the volume of which consists
of an eligible fuel.

We would note that the statute used ENERGY STAR® ratings for the period 2023-2026, but subsequently used a hard measure of efficiency and the AFUE efficiency test adopted by DOE, for tax credits beginning in 2027.

OMA believes that examining this statute provides a useful guide to the ENERGY STAR® program. First, looking at the carbon intensity of fuel and appliances that can use alternative/renewable/low carbon fuels is a useful way to reduce the emissions of global warming gases. Second, Congress understands that focusing on widespread technology is vital to reducing emissions and focusing tax credits on novel or emerging technologies will not provide the emissions reductions that are necessary. And third, ENERGY STAR® is not pushing the envelope on what equipment qualifies as high efficiency, and thus, for liquid products, they established an AFUE minimum. However, more concerning, is that for gas and electric appliances, they chose to use the Consortium for Energy Efficiency, a non-government organization of utilities, state and provincial energy offices, government agencies, and non-utility program administrators, for establishing appropriate efficiency standards.

OMA believes the steps that ENERGY STAR® are now taking are likely to make ENERGY STAR® less relevant to policymakers in Washington, the states, and consumers. Instead, OMA would encourage ENERGY STAR® to revitalize its efforts and look at the need to have better energy ratings, to look beyond the AFUE of a unit, but also to look at the energy going into the unit as a way to reduce pollution and conserve energy.

Understanding Consumer Behavior and Financial Limitations

Since ENERGY STAR® is a voluntary program, it depends on the cooperation and enthusiasm of both contractors and consumers. Ensuring the label is relevant and useful to both groups is necessary for ENERGY STAR® to have a role. OMA notes that energy consumed in homes is approximately 20% of all energy consumed in the United States, and space heating is nearly 50% of that. Thus, how Americans heat their home may represent nearly 10% of all energy consumption. It is critical that ENERGY STAR® play a role in the selection of heating equipment in homes and plays an active role with both contractors and consumers. By focusing on novel and sophisticated equipment, ENERGY STAR® will be withdrawing from the most significant area where it should be working.

OMA would note the significant limitations on what consumers will do with their heating appliance. First, service professionals understand that the heating appliance is not a marquis item in the home, as a remodeled kitchen, a patio or deck or even a bathroom. No one invites the neighbors to see a newly installed furnace or boiler. Consumers view the appliance as a necessary item in the house, but certainly

not one blow the budget on. Additionally, most consumers lack expertise on their heating system, and realistically, they lack the desire to gain expertise.

Second, the appliance is usually replaced shortly before the heating season begins. A homeowner may be aware that the appliance has outlived its useful life or prices have escalated, and they are seeking a new and more efficient replacement. However, in such a situation, they are still interested in making a quick decision on the new boiler. Most homeowners do not want installation personnel in the house for an extended period nor do they entertain extended conversations about alternate types of heating which often require extended absences from work.

Additionally, appliances often fail during the heating season. In these cases, the appliance must be replaced immediately. For hydronic systems, allowing the house to get too cold can result in water pipes or heating pipes that are likely to be in outside walls, to freeze causing catastrophic damage to the home. In these cases, speed of replacement is critical.

Service professionals and contractors have indicated to OMA that in both situations, either the service professional or salesman provides the homeowner with three options, *good*, *better* and *best*. These may be characterized by efficiency, reputation of company, or expected longevity of equipment. These transactions typically last less than an hour, in some cases the selection takes less than ten minutes. OMA believes that this is where ENERGY STAR® can and should be critical. The best appliance and the most efficient one in this trio should be labeled ENERGY STAR®, providing the consumer a rapid decision-making tool that could be crucial in this short conversation.

Finally, and perhaps most importantly, what can consumers afford to pay. In the core hydronics territory (New England, New York, New Jersey, Pennsylvania) for liquid heating fuels, the median household income ranges from \$63,000 annually in Maine to \$88,000 annually in New Hampshire. Thus, the price of the appliance and its installation cost will be critical to most consumers. As ENERGY STAR® noted, there is limited information on pricing, and OMA suspects that true costs will be high. ENERGY STAR® may be abandoning the core heating market to participate in a specialty market; essentially abandoning the Walmart shopper for the Barney's shopper.

Converting a Home to a Heat Pump Boiler

As previously indicated, these boilers are novel and new. OMA applauds ENERGY STAR® for trying to develop cost information on these items. The cost of installation and the appliance cost will be critical.

ENERGY STAR® posed the question whether these will be suitable in cold climates, and whether they will be suitable in retrofit situations.

OMA would note that if they are not suitable in a retrofit situation, then rating them in lieu of standard boilers would be nonsensical. In new construction, the home and its appliances will typically be specified by a builder or architect. These are sophisticated customers who have the ability to specify products, design the house to fit those products, and do a professional installation. It is unlikely that they will need ENERGY STAR® information to inform their decision making.

On the retrofit question, which is the majority of homes installing liquid fuels and hydronics, there are a number of issues that OMA would highlight.

First, and foremost, will this technology adequately heat the home and each room in the home. The amount of heat transfer and radiation is usually determined when the house is constructed. Since that time, the house's energy efficiency may have been upgraded with new windows or insulation, or it may have not had any upgrades. Thus, in delivering heat, an assessment of the radiation system must be determined to decide whether there will be adequate heat transfer in the home with a lower temperature water being distributed. OMA would note that adding radiation would likely be unacceptable due to costs, aesthetics of the home and limitations on places to add radiation.

OMA further notes that while output temperatures on a boiler will range between 160°F and 180°F, service professionals can increase those temperatures if necessary to provide sufficient heat to either a particular rooms or the entire house. An air to water heat pump will not have that capacity. Without a detailed analysis, a homeowner who installs such a unit may find that the home is inadequately heated, or a room or room is not heated adequately. If this occurs, the homeowner will blame the contractor, the appliance, and if he sees the ENERGY STAR® label on the unit, may also blame ENERGY STAR®. In today's environment, he is likely to inform all his neighbors and friends of this issue, and with the internet he will be able to inform the world.

ENERGY STAR® also describes alternative systems, backup systems, to overcome some of these problems. These are not clear, but for the purpose of these comments, we assume that one of these solutions would be electric resistance in the boiler. If the heat pump is not adequate to the task of the amount of radiation in the house, or outside temperatures, then the advantages of being a heat pump may result in the customer essentially purchasing an electric water heater. Such a system will likely put additional demands on the grid during cold snaps and would likely require the grid to use higher levels of fossil fuels to meet peak demand. Again, how will this impact the conservation of source energy?

ENERGY STAR® also discusses combination systems that would use both heat pump technology and a backup burner. ENERGY STAR® notes that this technology is now entering the market. OMA would note that essentially, this would require the customer to buy two appliances at the same time. Perhaps these will be less costly than two separate appliances, and installation costs will likely be lower than installing two appliances. However, the appliance is likely to be much more expensive than a single appliance (a gas or liquid fueled boiler) and as such be outside the abilities of most consumers to afford. Such an approach would also require the consumer to continue to have a relationship with the utility and thus pay monthly service fees.

Due to the novelty and complexity of these systems, and the complications of their installation, it is likely that they will be installed in unique places, and under the guidance of well-trained, and well-informed contractors. The question then becomes what value does labeling these products with ENERGY STAR® provide. At this time, the answer is very little, but at the same time consumers who may need to rely on ENERGY STAR® will be getting no information.

Decarbonizing benefits

As recognized by ENERGY STAR®, the need to decarbonize American homes is critical. As noted previously, in Congress' last action on energy efficiency and decarbonization, the need to make appliances biofuel ready was specifically called out for energy credits. OMA would note that a critical step in widespread adoption of new fuels is having the infrastructure in place to use these new fuels. OMA would encourage

ENERGY STAR® to work with its partner companies to develop standards for E ENERGY STAR® that advance this movement to a biofuels-ready economy.

Our industry recognizes the critical role that we play in greenhouse gas emissions and as a result have focused on improving emissions of appliances while developing alternative liquids with a lower carbon intensity that can be implemented seamlessly into our distribution system. Liquid fuel and biofuel powered furnaces (currently categorized by ENERGY STAR® as “Fuel Type-Oil”) have the current capacity to immediately reduce greenhouse gas emissions using either blends of biodiesel or 100% biodiesel as the fuel choice. Biodiesel is an *Advanced Biofuel* as defined by the Department of Energy and as such its use reduces atmospheric carbon emissions. For each gallon of biofuels used, carbon intensity falls by 60-80%.

Reducing carbon with biodiesel powered boilers has multiple advantages. There are no major changes to the system needed. Introducing biodiesel into an existing furnace yields an immediate carbon reduction. As the blend ratio increases, the reductions increase also. This immediate benefit is a high value proposition while the “greening” of the electric grid progresses. As carbon reduction is crucial to the country’s continued wellbeing and is the policy of the Administration, liquid fuel appliance’s ability to immediately accomplish this should be an important factor when considering their continued inclusion in ENERGY STAR®.

OMA believes that a conversion to biodiesel/bioheat provides the most efficient and rapid way to lower the carbon intensity of the residence. First, it can be done immediately and does not rely on the natural life cycle of appliances which may be 15-25 years. Second, the capital costs to the homeowner are likely to be negligible. Third, a rapid conversion of 100% of the homes will reduce carbon emissions much more quickly than the occasional home that switches to electricity—presuming that the electricity for that home comes from a renewable resource, which is unlikely in most areas of the country. It is unfortunate that ENERGY STAR® did not provide leadership in converting appliances to being bio-ready. If such efforts had been made 15 years ago, a high percentage of appliances in the field would now be ready for high blends of biofuels and would be labeled to that effect.

Such a conversion to low carbon fuels is now occurring and has largely happened based on the independent efforts and investments made by appliance manufacturers. Until passage of the Inflation Reduction Act, these efforts were not being rewarded, but were still viewed by the industry as the best and most responsible path forward. The appliance manufacturers have been working to ensure such a conversion is smooth. The National Oilheat Research Alliance (NORA) has been conducting research on biofuels for decades, both to develop new fuels and ensure the fuels flowing into the market work successfully. Similarly, burner and appliance manufacturers have invested time and research dollars to develop appliances that can burn 100% biodiesel without incident. OMA is extremely disappointed that ENERGY STAR® instead of rewarding these efforts, chooses to ignore these efforts and accomplishments.

In closing, the liquid heating fuels industry has made a significant commitment to carbon reduction. This is demonstrated by:

- **Public statement of commitment:** In September 2019 at a meeting of the National Energy and Fuel Institute, liquid fuel retail companies, state associations and equipment manufacturers voted unanimously to take the upgraded step to voluntarily reduce greenhouse emissions culminating in net zero fuel in 2050. The goal was to do this in a series of steps

reducing the carbon intensity of the fuel. Additionally, the view was this would be done in cooperation with state governments either through mandates or incentive programs.

- **Heating appliance compatibility:** Liquid fuel heating appliance manufacturers have been on the path to incorporate the use of biodiesel in their product for many years. Through engineering and testing, most liquid fueled appliances are 20% biodiesel compatible and 100% biodiesel products have just been approved for the market.
- **Currently in action:** The inclusion of carbon reducing biodiesel liquid heating fuel is not aspirational as millions of homes are currently using some blend of biodiesel in their home heating.
- **Financial Commitment:** Millions of dollars have been spent by industry stakeholders to demonstrate the efficacy of biodiesel powered appliances and to encourage its industry-wide adoption.

OMA is referencing several studies on biofuels that ENERGY STAR® should review. OMA would encourage ENERGY STAR® to work with our industry to develop the appropriate labeling for biofuel ready appliances. This would both fit within ENERGY STAR®'s requirements for a voluntary program to improve energy efficiency and to reduce pollution.

During ENERGY STAR®'s virtual meeting on June 21st, ENERGY STAR® representatives stated that working with biofuels would not be effective as a carbon reduction strategy as homeowners and sellers could move back and forth between petroleum and bio-based fuels. OMA recognizes that for widespread adoption of technologies for the combustion of biofuels the technology must be able to use both fuels. However, we understand that ENERGY STAR® would prefer that the appliances that they certify do not use petroleum fuels. OMA understands that concern.

OMA has worked with state policy makers to encourage the use of biofuels. The liquid fuel industry has aggressively pursued state legislators to mandate the use of biodiesel blends in home heating. Massachusetts, New York, Connecticut and Rhode Island in conjunction with the liquid fuel heating industry have developed schedules and mandates for the implementation of biofuels. Other states are actively considering ways to lower the carbon intensity of the fuel that their citizens use. OMA would note that a major hesitancy with moving to higher blend mandates in these states is the availability of equipment certified to use higher blends. ENERGY STAR® should be partnering with OMA, and the states to ensure that is not the case in the future, and thus will be helping to pave a path for the use of high blend or low carbon intensity fuels.

Efficiency and Ratings

ENERGY STAR® in its document states:

Furthermore, market penetration of ENERGY STAR® boilers remains high with no meaningful improvements in efficiency on the horizon.

OMA believes that this statement is not accurate. Although ENERGY STAR® has relied on AFUE as its sole criteria for rating boilers, nowhere in the statute is there a requirement for the use of AFUE, and there are no limits on what other criteria can be used to differentiate an ENERGY STAR® boiler from alternatives. It is our understanding that any boiler with an AFUE of 87% or higher is eligible to be classified as an ENERGY STAR® appliance.

OMA would note that in 2007, Brookhaven National Laboratory completed a study on efficiency of combination boilers¹. This indicated that idle loss was a significant factor in the actual efficiency of boilers. This was developed into an app-based calculator² for service technicians and customers to use to evaluate equipment and find the savings from using high efficiency equipment. In 2023 NORA published a test protocol “Idle Loss Test for Combination Hydronic Systems”³. It is OMA’s understanding that the American Society for Heating Refrigeration and Air Conditioning Engineers (ASHRAE) are working on a similar standard with expected completion in 2023.

The NORA completed a study in 2021⁴ to evaluate the efficacy of its heating equipment rebate program. This study examined actual reductions in fuel consumption at homes after the boiler was replaced. The study described three older boiler class types that were being replaced.

Class “a” – AFUE 84% or greater. Indirect tank with thermal purge to tank.

Class “b” AFUE 80% or greater. Can be tankless coil or indirect. Boiler has insulation 1 ½ inch or greater. Boiler does not have large metal burner mount.

Class “c” AFUE < 80% or unknown. All units over 40 years old. Tankless coil. Poorly insulated. All units which have large metal burner mounts.

NORA then evaluated the replaced boilers against newer replacement boiler types which were divided into the following categories:

Class “A” – AFUE 87% or greater. Indirect tank with boiler thermal purge to tank. Boiler insulation 1 ½ inch or greater. Control of heating season idle losses through outdoor reset, other weather responsive control, or thermal purge. Boiler does not remain hot under no-load state.

Class “B” – AFUE 86% or greater. Can be tankless coil or indirect. Boiler has insulation 1½ inch or greater. Boiler does not have large metal burner mount.

Class “C” – AFUE 84% or greater. Tankless coil without outdoor reset control. Minimal insulation. No controls to reduce boiler temperature under low load conditions.

NORA used 86% AFUE as its Class “B” boiler, instead of an 87% AFUE boiler as described by ENERGY STAR®. However, based on AFUE, one would expect the difference between Class “A” and Class “B” to provide a savings of 1.2%. However, on an in-use basis, the reduction of fuel use was 7.25% (class “c”), 5.72% (class “b”) and 5.2% (class “a”), or an average of 6.04%. For an average home using 800 gallons per year for twenty years, these savings between the ENERGY STAR® rated boiler and Class “A” boiler would save nearly a year’s worth of fuel. At a price of \$4 per gallon, these higher efficiency boilers would save a consumer approximately \$4,000 and 11 tons of carbon dioxide emissions over the life of the appliance. This proves

¹ *Performance of Integrated Hydronic Heating Systems*, December 2007:

<https://files.norareport.org/NORA/research/Studies/May%202007-Performance%20of%20Integrated%20Hydronic%20Systems.pdf>

² NORA Fuel Savings Analysis Calculator: <https://noraweb.org/fsa/>

³ NORA Idle Loss for Combustion Hydronic Systems, March 2, 2022: <https://f542d7.p3cdn1.secureserver.net/wp-content/uploads/2023/03/Idle-Loss-Test-for-Combination-Hydronic-Systems.pdf>

⁴ Report on Equipment Upgrade Incentive Project, December 2021: <https://f542d7.p3cdn1.secureserver.net/wp-content/uploads/2021/11/NORA-Rebate-Report-Nov-2021-1.pdf>

that the current ENERGY STAR® rating system is not fully evaluating the gains that can be made with an excellent boiler replacement.

ENERGY STAR®, instead of focusing on new and complex technologies, would provide better information to consumers and service professionals on well-established technologies that accomplish ENERGY STAR® goals.

Undermining Partnerships

OMA would note that the liquid fuels industry has been working to develop more energy efficient appliances and products that can use low carbon fuels.

To this end, NORA, liquid fuel companies, the Clean Fuels Alliance America (CFAA) and OMA have been working for nearly two decades to position the industry to use low carbon fuels. It should be noted that the intent has been to have a uniform low carbon fuel. To this end, the liquid fuel heating industry has:

- 1) Worked with ASTM to establish the standards and specifications for liquid renewable fuels.
- 2) Worked with UL to develop test procedures to evaluate the safety of equipment when using biofuels.
- 3) Tested biofuels in the field to establish if there were service issues associated with biofuels use.
- 4) Manufacturers and NORA have redesigned equipment to ensure that the fuels will work.
- 5) Installed heated storage and blending equipment at many terminals in the northeast to ensure biofuels can be stored.
- 6) Developed additives and other strategies to ensure biofuels can be stored and transported at low temperatures.
- 7) Developed protocols to enable the industry to transition to these new fuels.
- 8) Evaluated alternatives to biodiesel, such as ethyl levulinate, to find a zero-carbon fuel.

These efforts have culminated with U.S. liquid fuel heating manufacturers announcing that they are currently bringing B-100 products to market. With burners that are certified by UL and cost competitive with other burners in the market, the expectation is that B-100 products will be the only ones sold.

ENERGY STAR®'s movement to electrification provides neither recognition nor reward for these efforts. Instead of working with companies and an industry that are eager to improve its greenhouse gas emissions in approximately 5 million homes, ENERGY STAR® is focused on technology that may only work in new homes, or that may be unaffordable or unusable for the majority of existing homes.

Respectfully Submitted,



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