

ENERGY STAR Manufactured Homes Version 3 (formerly labelled v2.1) Program Requirements Comments

This is a compilation of all comments received by EPA during the ENERGY STAR Manufactured Homes Version 3 Program Requirements comment period, which was initially referred to as Version 2.1.

The comment period was open from August 1 to August 29, 2022.

The following comments have been compiled from the ENERGY STAR Manufactured Homes Program Requirements, Version 2.1 Stakeholder Comment Forms submitted by respondents. The Environmental Protection Agency is not responsible for any typographical errors or omissions.



ENERGY STAR Manufactured Homes Program Requirements, Version 3 Comments

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ENERGY STAR Manufactured Homes Program Requirements, Version 3 Comments

Organization Name: American Council for an Energy-Efficient Economy, E4TheFuture, Earthjustice, Elevate, Energy-Efficient Codes Coalition, The I'm HOME Network convened by the Lincoln Institute of Land Policy, Institute for Market Transformation, Natural Resources Defense Council, Northwest Energy Efficiency Alliance, RMI, and VEIC

Respondent Last Name: Ungar

Respondent First Name: Lowell

Comments:

Proposed ENERGY STAR Manufactured Homes Version 2.1 Program Requirements

- 1) [Do you have any general feedback on EPA's proposed ENERGY STAR Manufactured Homes Version 2.1 Program Requirements?](#)

We appreciate the thoughtful proposal for strengthening the program requirements in order to ensure savings compared to the new standard. Importantly, it should ensure every ENERGY STAR manufactured home has a reasonable envelope. However, manufactured homes remain significantly less efficient than site built homes under current codes and ENERGY STAR, and we believe more cost-effective savings and emissions reductions are available. We recommend these not as alternatives to the improvements in the draft requirements but as additional measures for an efficient home that deserves the label (10% savings should be a minimum, not a target, given the baseline). While that may add to the initial cost, the large increase in the 45L tax credit for ENERGY STAR manufactured homes to \$2500 will pay for much of the cost, and the energy bill savings to homeowners and renters will be significant. In addition we would note the importance of quality assurance, perhaps even more so as the market share of ENERGY STAR manufactured homes has increased, and would urge consideration of new low-cost verification methods and of independent in-field random sampling to ensure homes are meeting the requirements.

- 2) [Do you have feedback on the proposed Version 2.1 implementation date of May 31, 2023 \(based on the production date\) to coincide with the implementation date of the new code?](#)

We support an implementation date no later than May 31, 2023. The new DOE standard is significantly better than the current ENERGY STAR requirements (while still significantly weaker than the model energy code for site-built homes, 2021 IECC). Homes that just meet this modest standard cannot be considered efficient or worthy of the ENERGY STAR label. A better approach to facilitate rapid transition to the new requirements would be to make version 2.1 in effect by January 1, 2023, with a grace period to transition production in existing plants that allows use of the prior version through May. A January 1, 2023 effective date would facilitate implementation of Inflation Reduction Act programs.

Alternative Energy Efficiency Measures

EPA is interested in stakeholder suggestions for broadly applicable efficiency measures that could be considered as additional or alternative options to those already included in the proposal. These measures could include a higher level of insulation, better window specifications, or more efficient lighting, appliances, and equipment. Please address if a measure is typically included from the factory (either installed in the plant or "shipped loose" with the home).

- 1) [Would high-efficiency LED light bulbs be a suitable efficiency measure to include in the program requirements? Is built-in lighting typically provided in most spaces in manufactured homes? Are light bulbs typically included with the](#)



ENERGY STAR Manufactured Homes Program Requirements, Version 3 Comments

home purchase (either installed directly or included in “ship loose” packaging), as opposed to being an after-market purchase?

LED light bulbs are typically one of the most cost-effective energy savings measures, and all hard-wired fixtures should have integrated LEDs or LED bulbs (ENERGY STAR if applicable).

- 2) Would high-efficiency appliances be suitable efficiency measures to include in the program requirements? Which appliances are typically included with the home (refrigerator, dishwasher, clothes washer, dryer, etc.)? Do manufactured homes typically include makes/models similar to those found in site-built homes or is there a specialty market for appliances in manufactured housing (e.g., to account for compact size requirements)? If high-efficiency appliances were included in the ENERGY STAR Manufactured Homes Version 2.1 Program Requirements, is there any reason not to align the efficiency requirements with the applicable ENERGY STAR product specification for that appliance (e.g., availability of products)?

Those appliances that are included with the home on initial occupancy should be ENERGY STAR certified (unless clearly not cost-justified for a kind of appliance). As for site-built homes, this will typically include the refrigerator and dishwasher, and may include other appliances such as a clothes washer (and heat pumps and ventilation fans per below). Thermostats and doors should also be ENERGY STAR in order to ensure effectiveness and energy savings.

- 3) Would a high-efficiency bathroom exhaust fan (e.g., > 6.3 CFM/W) serving as the whole-home ventilation system be a suitable measure to include in the ENERGY STAR Manufactured Homes Version 2.1 Program Requirements? Do manufacturers currently offer exhaust-only ventilation systems and, if so, in which climate zones?

Ventillation fans should be high efficiency and also should be quiet so that residents will use the fans. ENERGY STAR Residential Ventilating Fans requirements would be a minimum, but many inexpensive fans have much higher CFM/W efficiencies, and ASHRAE 62.2 requires more stringent sound ratings.

- 4) Are there other efficiency measures that EPA should consider for inclusion in the ENERGY STAR Manufactured Homes Version 2.1 Program Requirements?

Furnace option additions: EPA’s modeling of the condensing furnace option for meeting the HVAC requirement suggests that this option yields significantly less savings than the other options in all three climate zones. This may inadvertently encourage relatively inefficient furnaces while creating unequal savings for different options. We recommend that the furnace option include additional energy-saving measures (as well as the tankless water heater). These measures could be drawn from any suggested in these comments that you decide not to require for all homes, or the savings could be achieved with substitution of a heat pump water heater for the tankless one. In addition, it is not clear that a furnace will be a good option for residents in climate zone 1 even with additional efficiency measures; EPA should consider striking this option in CZ 1. We also note that the limited savings from condensing furnaces are likely to disappear when the new DOE standard takes effect.

Continuous insulation: The 2021 IECC requires continuous insulation in colder climate zones. This envelope improvement has significant savings and can also improve the longevity and resilience of the home. We suggest that the wall insulation requirement in climate zones 2 and 3 be upgraded to R 20+5 for all homes.



ENERGY STAR Manufactured Homes Program Requirements, Version 3 Comments

- 5) Assuming alternative efficiency measures can be identified, are there specific measures in the current draft that stakeholders recommend replacing or adjusting to a different performance level? If so, please describe the reason for the recommendation.

HVAC in single section homes: While we recognize that the proposed requirements for single section homes already provide significant savings compared to the weak standard for those homes, we recommend that the same equipment requirements for multi section homes also apply to the single section homes. A home with electric resistance heat or a standard furnace cannot be considered efficient, especially in cold climates. ENERGY STAR must set the bar higher. In addition, significantly different requirements for single section and multi section homes are likely to create confusion in the marketplace about what residents should expect from those homes. The residents of single section homes deserve the same quality ENERGY STAR home features and efficiency as residents of larger manufactured homes.

Heat pumps: We support an emphasis on heat pumps as an effective heating (and cooling) method for manufactured homes. In order to ensure a good experience for residents, as well as to increase savings, we suggest that ENERGY STAR heat pumps should be required. EPA should also consider requiring ENERGY STAR cold climate heat pumps in climate zone 3. In the long run, both heat pumps and heat pump water heaters should be the best option for manufactured homes (with a good shell), and ENERGY STAR should be moving the market in that direction.

Windows: While better than typical current practice, the window specifications do not capture the cost-effective savings available from recent advances. EPA should consider at least adding a requirement for ENERGY STAR storm windows in climate zone 3.

- 6) Do you have additional general feedback on this topic?

Hybrid (Heat Pump) Water Heater Package Availability in Climate Zone 3

- 1) EPA has proposed that the Hybrid (Heat Pump) Water Heater package will not be available in Climate Zone 3 because it only delivers 6% savings in that region, which does not meet the program's 10% savings target. Are there other efficiency measures (such as those identified above or others) that EPA should consider adding to this package so that it could achieve 10% savings and be made available in Climate Zone 3?

While encouraging heat pump water heaters is important, we support making them an alternative to efficient HVAC only if the package provides similar energy savings. Ideally, homes should have both heat pump air heating and heat pump water heaters.

- 2) Do you have additional general feedback on this topic?



ENERGY STAR Manufactured Homes Program Requirements, Version 3 Comments

Organization Name: Bradford White Corporation

Respondent Last Name: Truskoski

Respondent First Name: Eric

Comments:

Comments submitted in letter. See next page.



ENERGY STAR Manufactured Homes Program Requirements, Version 3 Comments



August 29, 2022

United States Environmental Protection Agency (EPA)
ENERGY STAR® Manufactured New Homes
1200 Pennsylvania Avenue NW
Washington, DC 20004
[Electronically submitted to: energystarhomes@energystar.gov]

Re: Proposed ENERGY STAR Manufactured Homes program requirements Version 2.1

Dear Sir or Madam:

On behalf of Bradford White Corporation (BWC), thank you for providing an opportunity to comment on the proposed ENERGY STAR Manufactured Homes program requirements Version 2.1.

BWC is an American-owned, full-line manufacturer of residential, commercial, and industrial products for water heating, space heating, combination heating, and water storage. As a manufacturer of water and space heating products, we have made substantial investments in products that provide significant energy and environmental benefits, such as heat pump water heater (HPWH) technology and Ultra Low NO_x gas water heaters. As a testament to our efforts, we have been recognized as an ENERGY STAR Partner of the Year for three consecutive years. BWC brings to your attention the following proposals.

ENERGY STAR Manufactured Homes are subject to the federal Manufactured Home Construction and Safety Standards contained in 24 CFR 3280. As such, the specifications, standards, and codes of the following organizations are incorporated by reference as related to water heaters:

- ANSI C72.1-1972, section 4.3.1, Household Automatic Electric Storage Type Water Heaters, IBR approved for § 3280.707(d).
- ANSI Z21.10.1-1998, Gas Water Heaters - Volume 1, Storage Water Heaters with Input Ratings of 75,000 BTU per hour or Less, with Addendum Z21.10.1a-2000, IBR approved for §§ 3280.703 and 3280.707(d).
- ANSI/ASME A112.4.1-1993, Water Heater Relief Valve Drain Tubes, IBR approved for § 3280.604(b).
- UL 174-1996, with 1997 revisions, Household Electric Storage Tank Water Heaters, Tenth Edition, IBR approved for § 3280.703.
- UL 1995, 1995, Heating and Cooling Equipment, Second Edition, with 1999 revisions, IBR approved for § 3280.703.

Proposed rules in the Federal Register, Volume 87, No. 137, dated July 19, 2022, would update two new standards for water heaters to be incorporated by reference in 24 CFR 3280:

- ANSI Z21.10.3-2014, Gas-fired Water Heaters Volume 3, Storage Water Heaters with Input Ratings Above 75,000 BTU per Hour, Circulating and Instantaneous.
- ANSI Z21.75-2007, Connectors for Outdoor Gas Appliances and Manufactured Homes.

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We alert you to these specifications, standards, and codes incorporated by reference in 24 CFR 3280, as Underwriter Laboratories (UL) has proposed a current Date of Withdrawal for UL 1995 set for December 31, 2023. Up to this point, manufacturers of unitary HPWHs have typically been testing and certifying their equipment to UL 1995. Manufacturers are either transitioning or in plans to transition the testing and certification of their HPWHs to the UL 60335-2-40 standard, which is detailed below:

- UL 60335-2-40-2019 - Household And Similar Electrical Appliances - Safety - Part 2-40: Particular Requirements for Electrical Heat Pumps, Air-Conditioners and Dehumidifiers

In Exhibit 2 of the proposed program requirements in Version 2.1, it notes Additional Requirements for Multi-Section Certified Manufactured Homes, which lists the minimum energy efficiency rating for a hybrid HPWH as ≥ 3.30 UEF. Manufacturers cannot provide those HPWHs for installation in manufactured homes, as UL 60335-2-40 is not incorporated by reference in the federal Manufactured Home Construction and Safety Standards of 24 CFR 3280. We strongly suggest that the EPA work with the Department of Housing and Urban Development (HUD) and, in particular, the Manufactured Housing Consensus Committee (MHCC) in updating the manufactured home construction and safety standards to incorporate by reference UL 60335-2-40, prior to an effective date for the proposed ENERGY STAR Manufactured Homes program requirements Version 2.1.

Manufactured homes are a critical component of America's housing stock. They represent an affordable housing option for millions of Americans, because they cost less on average than site-built homes and are one of the least expensive forms of housing available without government subsidies. BWC respectfully requests EPA to:

- Elaborate on the analysis completed that supports the water heater efficiency requirements, in this proposed specification, that are higher efficiency levels than those efficiency levels modeled in DRAFT ENERGY STAR Single-Family New Homes National Program Requirements, Version 3.2 (Rev. 11); and
- Provide a greater understanding of the support that the water heater efficiency requirements in the proposed specification are justified to be higher efficiency levels than those modeled in the DOE Zero Energy Ready Home National Program Requirements for Single Family Homes Version 2.0 DRAFT.

The water heater efficiency requirements listed in proposed ENERGY STAR® Manufactured Homes program requirements Version 2.1, and ENERGY STAR Single-Family New Homes National Program Requirements, Version 3.2 (Rev. 11) Draft, and U.S. DOE Zero Energy Ready Home National Program Requirements for Single Family Homes Version 2.0 Draft are summarized in Table 1, below.

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ENERGY STAR Manufactured Homes Program Requirements, Version 3 Comments

Table 1. Current and Proposed Requirements in Homes Programs.

Program	Gas / Propane Water Heater Efficiency Level	Hybrid HPWH Efficiency Level
ENERGY STAR Manufactured Homes (Draft), Version 2.1	≥ 0.93 UEF	≥ 3.30 UEF
ENERGY STAR Single-Family New Homes National (Draft), Version 3.2 (Rev. 11)	0.90 UEF	2.2 UEF
U.S. DOE Zero Energy Ready Home for Single Family Homes (Draft), Version 2.0	EF = 0.95 *	EF = 2.5 *

*Residential water heaters are labeled, as of June 12, 2017, in terms of a Uniform Energy Factor (UEF) and new First Hour Rating.

BWC recommends EPA align water heater efficiency requirements for ENERGY STAR Manufactured Homes with efficiency levels with the following:

- ENERGY STAR Single-Family New Homes National Program Requirements, Version 3.2 (Rev. 11) Draft;
- DOE Zero Energy Ready Home National Program Requirements for Single Family Homes, Version 2.0 Draft; and
- ENERGY STAR Program Requirements for Residential Water Heaters Version 4.0, March 2022

The ENERGY STAR Residential Water Heaters Version 4.0 product performance requirements for electric water heaters, gas-fired storage water heaters, and gas-fired instantaneous water heaters are listed in Table 2, below.

Table 2. ENERGY STAR Residential Water Heaters Specification, Version 4.0.

Water Heater Type	Gallon Capacity	Type	Minimum Efficiency
Gas-fired Storage [First Hour Rating (FHR) ≥51 gallons]	<55 gallons	Medium Draw Pattern	UEF ≥ 0.64
		High Draw Pattern	UEF ≥ 0.68
	>55 gallons	Medium Draw Pattern	UEF ≥ 0.78
		High Draw Pattern	UEF ≥ 0.80
Gas-fired Instantaneous			UEF ≥ 0.87
Electric Storage [First Hour Rating (FHR) ≥45 gallons]		Integrated HPWH	UEF ≥ 3.30
		Integrated HPWH, 120 Volt/15 Amp Circuit	UEF ≥ 2.20
		Split-system HPWH	UEF ≥ 2.20

ENERGY STAR certified homes and apartments are at least 10% more energy efficient than those built to code and achieve a 20% improvement on average while providing homeowners and residents with better

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quality, performance, and comfort.¹ BWC requests EPA to elaborate on how it determined that certain residential water heaters, which meet the performance requirements of the ENERGY STAR Residential Water Heaters Specification, Version 4.0, should be excluded from satisfying the additional requirements for multi-section certified manufactured homes in this proposed specification.

In Table 2, gas-fired storage heaters would not qualify for the additional requirements for multi-section certified manufactured homes even though they meet the requirements of ENERGY STAR Residential Water Heaters Specification, Version 4.0. Integrated HPWHs 120 Volt/15 Amp Circuit and split-system HPWHs, both with UEF \geq 2.20, detailed in Table 2, would not qualify for the additional requirements for multi-section certified manufactured homes even though they meet the requirements of ENERGY STAR Residential Water Heaters Specification, Version 4.0.

All ENERGY STAR certified water heaters should qualify for the additional requirements for multi-section certified manufactured homes. In 2020, the ENERGY STAR Residential New Construction program helped homeowners save 3 billion kilowatt-hours of electricity, avoid \$390 million in energy costs, and achieve 4 million metric tons of greenhouse gas reductions². We strongly recommend EPA collaborate with HUD and MRCC to update the manufactured home construction and safety standards and incorporate by reference UL 60335-2-40. Action is required to ensure HPWHs tested and certified to UL 60335-2-40 are compliant with the federal Manufactured Home Construction and Safety Standards contained in 24 CFR 3280.

Bradford White Corporation thanks the Environmental Protection Agency for the opportunity to provide feedback on proposed ENERGY STAR Manufactured Homes program requirements, Version 2.1. Should you have any questions regarding this submission, please do not hesitate to contact me.

Sincerely,

Bradford White Corporation

Eric Truskoski
Senior Director of Government and Regulatory Affairs

Cc: R. Wolfer; B. Ahee; M. Corbett

¹ EPA, ENERGY STAR Impact, ENERGY STAR for the residential sector, https://www.energystar.gov/about/origins_mission/impacts

² Ibid

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ENERGY STAR Manufactured Homes Program Requirements, Version 3 Comments

Organization Name: Building Efficiency Resources, LLC

Respondent Last Name: Lawrence

Respondent First Name: Noah

Comments:

Proposed ENERGY STAR Manufactured Homes Version 2.1 Program Requirements

- 1) Do you have any general feedback on EPA's proposed ENERGY STAR Manufactured Homes Version 2.1 Program Requirements?

We believe that there should be an added pathway to compliance to meet Certified Homes using an ERI methodology. This would be more aligned with other programs that offer both performance and prescriptive methods to show compliance.

- 2) Do you have feedback on the proposed Version 2.1 implementation date of May 31, 2023 (based on the production date) to coincide with the implementation date of the new code?

No comments

Alternative Energy Efficiency Measures

EPA is interested in stakeholder suggestions for broadly applicable efficiency measures that could be considered as additional or alternative options to those already included in the proposal. These measures could include a higher level of insulation, better window specifications, or more efficient lighting, appliances, and equipment. Please address if a measure is typically included from the factory (either installed in the plant or "shipped loose" with the home).

- 1) Would high-efficiency LED light bulbs be a suitable efficiency measure to include in the program requirements? Is built-in lighting typically provided in most spaces in manufactured homes? Are light bulbs typically included with the home purchase (either installed directly or included in "ship loose" packaging), as opposed to being an after-market purchase?

Yes, LED light bulbs would be a suitable efficiency measure to include in the program. Even if builders are not currently supplying 100% of lighting, it would be a relatively small added cost and LED bulbs should be an ENERGY STAR requirement across the board.

- 2) Would high-efficiency appliances be suitable efficiency measures to include in the program requirements? Which appliances are typically included with the home (refrigerator, dishwasher, clothes washer, dryer, etc.)? Do manufactured homes typically include makes/models similar to those found in site-built homes or is there a specialty market for appliances in manufactured housing (e.g., to account for compact size requirements)? If high-efficiency appliances were included in the ENERGY STAR Manufactured Homes Version 2.1 Program Requirements, is there any reason not to align the efficiency requirements with the applicable ENERGY STAR product specification for that appliance (e.g., availability of products)?

No comment

- 3) Would a high-efficiency bathroom exhaust fan (e.g., > 6.3 CFM/W) serving as the whole-home ventilation system be a suitable measure to include in the ENERGY STAR Manufactured Homes Version 2.1 Program Requirements? Do manufacturers currently offer exhaust-only ventilation systems and, if so, in which climate zones?

No Comments



ENERGY STAR Manufactured Homes Program Requirements, Version 3 Comments

- 4) Are there other efficiency measures that EPA should consider for inclusion in the ENERGY STAR Manufactured Homes Version 2.1 Program Requirements?

The requirements for an R21 wall seems to discriminate against cellulose insulation, which is just below this requirement in a typical 2x6 wall.

- 5) Assuming alternative efficiency measures can be identified, are there specific measures in the current draft that stakeholders recommend replacing or adjusting to a different performance level? If so, please describe the reason for the recommendation.

-The ceiling insulation requirement for CZ3 should be increased to R49 instead of the current R38 requirement. R38 is too low of an insulation requirement for the climates that this zone includes.

-The requirement for buied ducts in an attic should be more specific, such as with a footnote using the 2018/2021 IECC language.

-HSPF2 requirements should be higher in CZ3

- 6) Do you have additional general feedback on this topic?

Hybrid (Heat Pump) Water Heater Package Availability in Climate Zone 3

- 1) EPA has proposed that the Hybrid (Heat Pump) Water Heater package will not be available in Climate Zone 3 because it only delivers 6% savings in that region, which does not meet the program's 10% savings target. Are there other efficiency measures (such as those identified above or others) that EPA should consider adding to this package so that it could achieve 10% savings and be made available in Climate Zone 3?

No comment

- 2) Do you have additional general feedback on this topic?

No comment



ENERGY STAR Manufactured Homes Program Requirements, Version 3 Comments

Organization Name: Clayton Homes

Respondent Last Name: Mabe

Respondent First Name: Gavin

Comments:

Proposed ENERGY STAR Manufactured Homes Version 2.1 Program Requirements

- 1) Do you have any general feedback on EPA's proposed ENERGY STAR Manufactured Homes Version 2.1 Program Requirements?

We feel the overall Uo for both single and multi section homes should only be reduced by 0.001 for each Thermal Zone when compared with either the values from the current version of the MH Energy Star program and new DOE HUD Code requirements. We support a second set of requirements for single section homes that include alternatives to the higher efficiency equipment. We also feel that the window SHGC for Thermal Zone 3 should be 0.33 and the u-factor for Thermal Zone 3 should be consistent with Thermal Zones 1 and 2 at 0.30. A U-factor of 0.30 is already a new window for the MH industry adding another one complicates supply with negligible additional value to the homeowner.

- 2) Do you have feedback on the proposed Version 2.1 implementation date of May 31, 2023 (based on the production date) to coincide with the implementation date of the new code?

We feel that a date of January 1, 2024 is more appropriate to a) ensure that the new code is implemented on May 31, 2023 and b) to allow adequate time to prototype, build, and collect feedback on new items like water fixtures, showerheads, hybrid water heaters, and lower u-value windows and doors. Clayton Homes manufactures windows and there will not be adequate time to produce a 0.28 u-factor window between the time of approval of this version and May 31, 2023.

Alternative Energy Efficiency Measures

EPA is interested in stakeholder suggestions for broadly applicable efficiency measures that could be considered as additional or alternative options to those already included in the proposal. These measures could include a higher level of insulation, better window specifications, or more efficient lighting, appliances, and equipment. Please address if a measure is typically included from the factory (either installed in the plant or "shipped loose" with the home).

- 1) Would high-efficiency LED light bulbs be a suitable efficiency measure to include in the program requirements? Is built-in lighting typically provided in most spaces in manufactured homes? Are light bulbs typically included with the home purchase (either installed directly or included in "ship loose" packaging), as opposed to being an after-market purchase?

Only enclosed LED fixtures. Homeowners may choose not to replace bulbs with high-efficiency LED bulbs. However, if a recessed LED fixture must be replaced it will more than likely be replaced with a similar LED fixture. Most homeowners are installing recessed LED lighting. Light bulbs are also included for each fixture. They are installed in interior fixtures and shipped loose for exterior fixtures.

- 2) Would high-efficiency appliances be suitable efficiency measures to include in the program requirements? Which appliances are typically included with the home (refrigerator, dishwasher, clothes washer, dryer, etc.)? Do manufactured homes typically include makes/models similar to those found in site-built homes or is there a specialty market for appliances in manufactured housing (e.g., to account for compact size requirements)? If high-efficiency



ENERGY STAR Manufactured Homes Program Requirements, Version 3 Comments

appliances were included in the ENERGY STAR Manufactured Homes Version 2.1 Program Requirements, is there any reason not to align the efficiency requirements with the applicable ENERGY STAR product specification for that appliance (e.g., availability of products)?

Yes, high efficiency or Energy Star rated appliances can be included as an alternative option or an additional energy measure with trade-off. Aligning the requirements around Energy Star rated appliances will be more streamlined than aligning with a spec. Homes include a refrigerator and a cooking appliance. Many homeowners also order a microwave and dishwasher. Clayton Homes uses standard size appliances.

- 3) Would a high-efficiency bathroom exhaust fan (e.g., > 6.3 CFM/W) serving as the whole-home ventilation system be a suitable measure to include in the ENERGY STAR Manufactured Homes Version 2.1 Program Requirements? Do manufacturers currently offer exhaust-only ventilation systems and, if so, in which climate zones?

It could be listed as an alternative option. Clayton Homes installs an intake ventilation system in the furnace compartment that conditions the intake air prior to distribution throughout the home.

- 4) Are there other efficiency measures that EPA should consider for inclusion in the ENERGY STAR Manufactured Homes Version 2.1 Program Requirements?

As alternative options or additional energy measures with trade-offs - radiant barrier for walls or roofs. Continuous wall or roof insulation. Sealed and insulated crawlspace.

- 5) Assuming alternative efficiency measures can be identified, are there specific measures in the current draft that stakeholders recommend replacing or adjusting to a different performance level? If so, please describe the reason for the recommendation.

Adjusting the wall or roof insulation R-values or overall Uo when radiant barrier or continuous insulation is installed. Adjusting the floor R-value or overall Uo when sealed and insulated crawlspaces are installed.

- 6) Do you have additional general feedback on this topic?

Clayton Homes supports additional options and alternative energy measure trade-offs to allow more flexibility and combinations of equipment and insulation for compliance.

Hybrid (Heat Pump) Water Heater Package Availability in Climate Zone 3

- 1) EPA has proposed that the Hybrid (Heat Pump) Water Heater package will not be available in Climate Zone 3 because it only delivers 6% savings in that region, which does not meet the program's 10% savings target. Are there other efficiency measures (such as those identified above or others) that EPA should consider adding to this package so that it could achieve 10% savings and be made available in Climate Zone 3?

[Add comments]

- 2) Do you have additional general feedback on this topic?

Homeowners in areas coinciding with IECC Climate Zone 2 typically do not purchase heat pumps with our homes. Therefore, I would expect that they would not want to purchase a heat pump water heater as well. By requiring homes with electric furnaces to include either a heat pump or hybrid water heater we will essentially eliminate Energy Star home sales in these areas. There needs to be other options for homes with electric furnaces beyond either heat pump or heat pump water heater.



ENERGY STAR Manufactured Homes Program Requirements, Version 3 Comments

Organization Name: Manufactured Housing Institute

Respondent Last Name: Lesil

Respondent First Name: Gooch

Comments:

Proposed ENERGY STAR Manufactured Homes Version 2.1 Program Requirements

- 1) [Do you have any general feedback on EPA's proposed ENERGY STAR Manufactured Homes Version 2.1 Program Requirements?](#)

The Manufactured Housing Institute (MHI) is pleased to provide feedback to the Environmental Protection Agency (EPA) in response to its notice of proposed changes to the ENERGY STAR national program requirements, Version 2.1, to Manufactured New Homes. Given the concurrent significant activity from the Department of Energy (DOE) with respect to energy standards in manufactured homes, we are concerned that these ENERGY STAR improvements will not be helpful in increasing the number of ENERGY STAR compliant homes.

MHI is the only national trade association that represents every segment of the factory-built housing industry. Our members include builders, suppliers, retail sellers, lenders, installers, community owners, community managers, and others who serve our industry, as well as 48 affiliated state organizations. In 2021, our industry produced nearly 106,000 homes, accounting for approximately nine percent of new single-family home starts. These homes are produced by 35 U.S. corporations in 143 homebuilding facilities located across the country. Today, MHI members represent over 85 percent of all manufactured homes produced and we are pleased to submit the following comments on behalf of this important industry.

MHI and its members have always supported, and will continue to support, energy conservation efforts and other reasonable environmental protection initiatives. New factory-built homes are as efficient as site-built homes. In 2021 more than 25 percent of manufactured homes shipped were ENERGY STAR certified. Conversely, less than eight percent of single-family site-built homes completed in 2020 were ENERGY STAR certified. Today, manufactured homes continue to offer many energy efficient options and are fitted with energy efficient features that are tailored to the climate demands of the region in which each home will be sited.

Further, the controlled environment of the factory-built process not only offers consumers unmatched quality and affordability due to technological advancements and other advantages, but the industry is a pioneer in the development of processes that value efficiency and reduce waste. Our in-factory home builder members are constantly developing new initiatives and technologies, such as comprehensive recycling programs, to reduce waste. The factory-built process utilizes exact dimensions and measurements for most building materials, eliminating waste. Today's modern manufacturing plants are so efficient that nearly everything is reused or recycled such as cardboard, plastic, carpet padding, vinyl siding, scrap wood and much more.



ENERGY STAR Manufactured Homes Program Requirements, Version 3 Comments

In May 2022, DOE issued a final rule to Establish Energy Conservation Standards for Manufactured Housing, 87 FR 32728-01 (Energy Rule), requiring manufactured homes to comply with the 2021 International Energy Conservation Code (IECC) by May 2023. As set forth in the comments of MHI and numerous private companies to the Energy Rule, this rule imposes substantial additional costs on manufactured homebuyers that will not be recouped and will price thousands out of the market for homeownership. Early estimates of the impact of the Energy Rule predict that it will impose up to an additional \$7,000 per home for certain types of floorplans to comply. Furthermore, these new standards will make manufactured homes the most efficient homes available, far more efficient than any requirements on site-built homes. These DOE standards will hinder the availability of the quality, resilient, and energy efficient affordable housing our industry produces.

Additionally, in July 2022, the DOE issued a Notice of Proposed Rulemaking for Energy Conservation Standards for Consumer Furnaces, 87 FR 40590 (Furnace Rule), requiring gas furnaces in manufactured homes to meet 95 AFUE by July 2028. MHI and other private companies intend to submit substantial comments to the Furnace Rule, as the Furnace Rule will reduce affordability of manufactured homes without providing substantial energy efficiency or cost saving benefits to the vast majority of manufactured homeowners. In fact, in many instances, the Furnace Rule may lead consumers away from energy efficient furnaces and toward less efficient, and sometimes dangerous, heating methods.

Any increase in construction costs, even modest increases in response to new energy conservation standards, could jeopardize homeownership for hundreds of thousands of Americans at a time when there is an affordable housing shortage in the country. The ENERGY STAR changes, combined with the DOE rules, will push quality, affordable, resilient and energy efficient manufactured homes out of reach for consumers. MHI urges you not to move forward with these proposed changes. However, if ENERGY STAR moves forward with this proposal, we strongly urge the following changes to the Version 2.1 Program Requirements:

- 1. The Current Version of the ENERGY STAR Manufactured New Homes Version 2.1 Program Does Not Provide a Compliance Outline for Homes With Both Gas and Electric Heating Units.***

Version 2.1 of the ENERGY STAR Manufactured New Homes Program proposes requirements for homes with a single energy type used for space and hot water heating. Specifically, the proposed revisions establish compliance pathways for both all-electric homes and all-gas homes. However, MHI estimates that a large number of manufactured homes have a combination energy source for space and hot water heating. There is a common equipment type configuration that is made up of a gas furnace coupled with electric water heating. Currently, Version 2.1 of the ENERGY STAR Manufactured New Homes Program does not propose regulations and a solution for homes that use a combination energy source for space and water heating.



ENERGY STAR Manufactured Homes Program Requirements, Version 3 Comments

If the current program version is to be implemented without revision, it would cause manufacturers to either stop building homes that offer both a gas furnace and an electric water heater, or to have to partner with regulatory authorities on a home-by-home basis. This could potentially drive up the costs of each home and/or slow down production significantly, which would disproportionately impact consumers. Therefore, MHI proposes that EPA amend its current proposal to include a compliance pathway for homes with this type of equipment combination.

2. Further Clarification is Needed on Other Items Contained in the ENERGY STAR Manufactured New Homes Version 2.1 Program.

In addition to needing further compliance pathways regarding energy source combination homes, the Version 2.1 of the ENERGY STAR Manufactured New Homes Program does not detail all needed information on a number of other topics. As such, MHI requests that the EPA provide clarification on the elimination of water fixture requirements. Specifically, MHI requests clarification regarding bathroom faucets at less than 1.5 gallons per minute and showerheads at less than 2.0 gallons per minute. Additionally, the current program version does not provide an ENERGY STAR Manufactured Homes Program Requirements, Version 2.1 Stakeholder Comment Form Revised 08/01/2022 Page 3 of 5 option for all-gas homes that do not require instantaneous water heating. As such, MHI would request that the EPA to provide a compliance pathway for homes that fit in that category.

Version 2.1 of the ENERGY STAR Manufactured New Homes Program states that ducts in attics shall be fully buried in attic insulation. To promote proper compliance by manufacturers, MHI would request that the current program version be edited to provide a definition of “fully buried” as a minimum of two inches to blown insulation or R-8 insulation wrapping the duct.

In addition, EPA must adjust the window properties in line with the DOE standards. In order to bring the window requirements closer to products commonly available in the market and improve the cost effectiveness of the Version 2.1 changes, MHI recommends changing the SHGC for Climate Zone 1 to 0.33, and change the window Uvalue for Climate Zone 3 to 0.30.

Further, a pathway should exist for combinations of measures to be approved based on total energy use, unique packages that would be reviewed, verified and approved by the program QAPs. This would open new possibilities to employ emerging technologies and products that may become less costly in the future. Home manufacturers would be able to use a combination of measures not currently approved but one that meets the program performance target.

Manufactured homes remain the most affordable homeownership option available in the U.S. today. Again, given the current DOE rules impacting manufactured housing, MHI strongly reiterates that EPA should not move forward with these proposed changes to the ENERGY STAR Manufactured New Home Program. However, if



ENERGY STAR Manufactured Homes Program Requirements, Version 3 Comments

EPA does proceed, MHI strongly urges the Agency to include the above-referenced revisions and clarifications so that the true intent of the regulations can be implemented without disproportionately affecting the manufactured home industry and its consumers as has already occurred through the passage of the Energy Rule.

Conclusion

Manufactured homes remain the most affordable homeownership option available in the U.S. today. While MHI and its members will always support sensible energy conservation initiatives, overly burdensome regulations that even modestly increase the cost of a manufactured home will price many consumers out of homeownership, and this only hurts the most financially vulnerable among us. Given the uncertainty and regulatory confusion between the DOE rules and the HUD Code, now is not the time to implement additional standard changes. Manufacturers will already be having to deal with conflicting statutes, and if required to try and meet another one, are likely to simply not manufacture ENERGY STAR compliant homes. Consumer demand is high for energy efficient homes. But the combination of these new requirements, including implementing these ENERGY STAR changes, will hinder new manufactured home construction and could reduce consumer demand for these features due to increased costs. We urge you to use caution when updating these standards, and MHI looks forward to serving as a resource to you.

- 2) [Do you have feedback on the proposed Version 2.1 implementation date of May 31, 2023 \(based on the production date\) to coincide with the implementation date of the new code?](#)

The current proposed ENERGY STAR Manufactured New Homes Version 2.1 program requires that any homes produced on or after May 31, 2023, must be certified to the new standards. Because these proposed requirements are in response to the Energy Rule, MHI proposes that the EPA coincide its ENERGY STAR Manufactured New Homes Version 2.1 Program implementation date with the Energy Rule implementation date. ENERGY STAR Manufactured Homes Program Requirements, Version 2.1 Stakeholder Comment Form Revised 08/01/2022 Page 4 of 5 date. Given that the Energy Rule requires manufacturers to completely overhaul their systems and processes, there is a strong possibility the implementation date could be changed. By aligning the new ENERGY STAR requirements date with the Energy Rule implementation date, it will ensure the industry is able to meet these demands.

Alternative Energy Efficiency Measures

[EPA is interested in stakeholder suggestions for broadly applicable efficiency measures that could be considered as additional or alternative options to those already included in the proposal. These measures could include a higher level of insulation, better window specifications, or more efficient lighting, appliances, and equipment. Please address if a measure is typically included from the factory \(either installed in the plant or “shipped loose” with the home\).](#)



ENERGY STAR Manufactured Homes Program Requirements, Version 3 Comments

- 1) Would high-efficiency LED light bulbs be a suitable efficiency measure to include in the program requirements? Is built-in lighting typically provided in most spaces in manufactured homes? Are light bulbs typically included with the home purchase (either installed directly or included in “ship loose” packaging), as opposed to being an after-market purchase?
- 2) Would high-efficiency appliances be suitable efficiency measures to include in the program requirements? Which appliances are typically included with the home (refrigerator, dishwasher, clothes washer, dryer, etc.)? Do manufactured homes typically include makes/models similar to those found in site-built homes or is there a specialty market for appliances in manufactured housing (e.g., to account for compact size requirements)? If high-efficiency appliances were included in the ENERGY STAR Manufactured Homes Version 2.1 Program Requirements, is there any reason not to align the efficiency requirements with the applicable ENERGY STAR product specification for that appliance (e.g., availability of products)?
- 3) Would a high-efficiency bathroom exhaust fan (e.g., > 6.3 CFM/W) serving as the whole-home ventilation system be a suitable measure to include in the ENERGY STAR Manufactured Homes Version 2.1 Program Requirements? Do manufacturers currently offer exhaust-only ventilation systems and, if so, in which climate zones?
- 4) Are there other efficiency measures that EPA should consider for inclusion in the ENERGY STAR Manufactured Homes Version 2.1 Program Requirements?
- 5) Assuming alternative efficiency measures can be identified, are there specific measures in the current draft that stakeholders recommend replacing or adjusting to a different performance level? If so, please describe the reason for the recommendation.
- 6) Do you have additional general feedback on this topic?

Hybrid (Heat Pump) Water Heater Package Availability in Climate Zone 3

- 1) EPA has proposed that the Hybrid (Heat Pump) Water Heater package will not be available in Climate Zone 3 because it only delivers 6% savings in that region, which does not meet the program’s 10% savings target. Are there other efficiency measures (such as those identified above or others) that EPA should consider adding to this package so that it could achieve 10% savings and be made available in Climate Zone 3?
- 2) Do you have additional general feedback on this topic?

Comments also submitted in letter. See next page.



ENERGY STAR Manufactured Homes Program Requirements, Version 3 Comments



August 29, 2022

The Honorable Michael Regan
Administrator
Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

RE: ENERGY STAR Manufactured New Homes - National Program Requirements, Version 2.1

Dear Administrator Regan,

The Manufactured Housing Institute (MHI) is pleased to provide feedback to the Environmental Protection Agency (EPA) in response to its notice of proposed changes to the ENERGY STAR national program requirements, Version 2.1, to Manufactured New Homes. Given the concurrent significant activity from the Department of Energy (DOE) with respect to energy standards in manufactured homes, we are concerned that these ENERGY STAR improvements will not be helpful in increasing the number of ENERGY STAR compliant homes.

MHI is the only national trade association that represents every segment of the factory-built housing industry. Our members include builders, suppliers, retail sellers, lenders, installers, community owners, community managers, and others who serve our industry, as well as 48 affiliated state organizations. In 2021, our industry produced nearly 106,000 homes, accounting for approximately nine percent of new single-family home starts. These homes are produced by 35 U.S. corporations in 143 homebuilding facilities located across the country. Today, MHI members represent over 85 percent of all manufactured homes produced and we are pleased to submit the following comments on behalf of this important industry.

MHI and its members have always supported, and will continue to support, energy conservation efforts and other reasonable environmental protection initiatives. New factory-built homes are as efficient as site-built homes. In 2021 more than 25 percent of manufactured homes shipped were ENERGY STAR certified. Conversely, less than eight percent of single-family site-built homes completed in 2020 were ENERGY STAR certified. Today, manufactured homes continue to offer many energy efficient options and are fitted with energy efficient features that are tailored to the climate demands of the region in which each home will be sited.

Further, the controlled environment of the factory-built process not only offers consumers unmatched quality and affordability due to technological advancements and other advantages, but the industry is a pioneer in the development of processes that value efficiency and reduce waste. Our in-factory home builder members are constantly developing new initiatives and technologies, such as comprehensive recycling programs, to reduce waste. The factory-built process utilizes exact dimensions and measurements for most building materials, eliminating waste. Today's modern manufacturing plants are so efficient that nearly everything is reused or recycled such as cardboard, plastic, carpet padding, vinyl siding, scrap wood and much more.

In May 2022, DOE issued a final rule to Establish Energy Conservation Standards for Manufactured Housing, 87 FR 32728-01 (Energy Rule), requiring manufactured homes to comply with the 2021 International Energy Conservation Code (IECC) by May 2023. As set forth in the comments of MHI and numerous private companies to the Energy Rule, this rule imposes substantial additional costs on manufactured homebuyers that will not be recouped and will price thousands out of the market for homeownership. Early estimates of the impact of the Energy Rule predict that it will impose up to an additional \$7,000 per home for certain types of floorplans to comply. Furthermore, these new standards will make manufactured homes the most efficient homes available, far more efficient than any requirements on site-built homes. These DOE standards will hinder the availability of the quality, resilient, and energy efficient affordable housing our industry produces.



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Additionally, in July 2022, the DOE issued a Notice of Proposed Rulemaking for Energy Conservation Standards for Consumer Furnaces, 87 FR 40590 (Furnace Rule), requiring gas furnaces in manufactured homes to meet 95 AFUE by July 2028. MHI and other private companies intend to submit substantial comments to the Furnace Rule, as the Furnace Rule will reduce affordability of manufactured homes without providing substantial energy efficiency or cost saving benefits to the vast majority of manufactured homeowners. In fact, in many instances, the Furnace Rule may lead consumers *away* from energy efficient furnaces and toward less efficient, and sometimes dangerous, heating methods.

Any increase in construction costs, even modest increases in response to new energy conservation standards, could jeopardize homeownership for hundreds of thousands of Americans at a time when there is an affordable housing shortage in the country. The ENERGY STAR changes, combined with the DOE rules, will push quality, affordable, resilient and energy efficient manufactured homes out of reach for consumers. MHI urges you not to move forward with these proposed changes. However, if ENERGY STAR moves forward with this proposal, we strongly urge the following changes to the Version 2.1 Program Requirements:

1. The Effective Date of the ENERGY STAR Manufactured New Homes Version 2.1 Program Requirements Should Coincide with the Energy Rule.

The current proposed ENERGY STAR Manufactured New Homes Version 2.1 program requires that any homes produced on or after May 31, 2023, must be certified to the new standards. Because these proposed requirements are in response to the Energy Rule, MHI proposes that the EPA coincide its ENERGY STAR Manufactured New Homes Version 2.1 Program implementation date with the Energy Rule implementation date. Given that the Energy Rule requires manufacturers to completely overhaul their systems and processes, there is a strong possibility the implementation date could be changed. By aligning the new ENERGY STAR requirements date with the Energy Rule implementation date, it will ensure the industry is able to meet these demands.

2. The Current Version of the ENERGY STAR Manufactured New Homes Version 2.1 Program Does Not Provide a Compliance Outline for Homes With Both Gas and Electric Heating Units.

Version 2.1 of the ENERGY STAR Manufactured New Homes Program proposes requirements for homes with a single energy type used for space and hot water heating. Specifically, the proposed revisions establish compliance pathways for both all-electric homes and all-gas homes. However, MHI estimates that a large number of manufactured homes have a combination energy source for space and hot water heating. There is a common equipment type configuration that is made up of a gas furnace coupled with electric water heating. Currently, Version 2.1 of the ENERGY STAR Manufactured New Homes Program does not propose regulations and a solution for homes that use a combination energy source for space and water heating.

If the current program version is to be implemented without revision, it would cause manufacturers to either stop building homes that offer both a gas furnace and an electric water heater, or to have to partner with regulatory authorities on a home-by-home basis. This could potentially drive up the costs of each home and/or slow down production significantly, which would disproportionately impact consumers. Therefore, MHI proposes that EPA amend its current proposal to include a compliance pathway for homes with this type of equipment combination.

3. Further Clarification is Needed on Other Items Contained in the ENERGY STAR Manufactured New Homes Version 2.1 Program.

In addition to needing further compliance pathways regarding energy source combination homes, the Version 2.1 of the ENERGY STAR Manufactured New Homes Program does not detail all needed information on a number of other topics. As such, MHI requests that the EPA provide clarification on the elimination of



ENERGY STAR Manufactured Homes Program Requirements, Version 3 Comments

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August 29, 2022

water fixture requirements. Specifically, MHI requests clarification regarding bathroom faucets at less than 1.5 gallons per minute and showerheads at less than 2.0 gallons per minute. Additionally, the current program version does not provide an option for all-gas homes that do not require instantaneous water heating. As such, MHI would request that the EPA to provide a compliance pathway for homes that fit in that category.

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In addition, EPA must adjust the window properties in line with the DOE standards. In order to bring the window requirements closer to products commonly available in the market and improve the cost effectiveness of the Version 2.1 changes, MHI recommends changing the SHGC for Climate Zone 1 to 0.33, and change the window U-value for Climate Zone 3 to 0.30.

Further, a pathway should exist for combinations of measures to be approved based on total energy use, unique packages that would be reviewed, verified and approved by the program QAPs. This would open new possibilities to employ emerging technologies and products that may become less costly in the future. Home manufacturers would be able to use a combination of measures not currently approved but one that meets the program performance target.

Manufactured homes remain the most affordable homeownership option available in the U.S. today. Again, given the current DOE rules impacting manufactured housing, MHI strongly reiterates that EPA should not move forward with these proposed changes to the ENERGY STAR Manufactured New Home Program. However, if EPA does proceed, MHI strongly urges the Agency to include the above-referenced revisions and clarifications so that the true intent of the regulations can be implemented without disproportionately affecting the manufactured home industry and its consumers as has already occurred through the passage of the Energy Rule.

Conclusion

Manufactured homes remain the most affordable homeownership option available in the U.S. today. While MHI and its members will always support sensible energy conservation initiatives, overly burdensome regulations that even modestly increase the cost of a manufactured home will price many consumers out of homeownership, and this only hurts the most financially vulnerable among us. Given the uncertainty and regulatory confusion between the DOE rules and the HUD Code, now is not the time to implement additional standard changes. Manufacturers will already be having to deal with conflicting statutes, and if required to try and meet another one, are likely to simply not manufacture ENERGY STAR compliant homes. Consumer demand is high for energy efficient homes. But the combination of these new requirements, including implementing these ENERGY STAR changes, will hinder new manufactured home construction and could reduce consumer demand for these features due to increased costs. We urge you to use caution when updating these standards, and MHI looks forward to serving as a resource to you.

Sincerely,

Lesli Gooch, Ph.D.
Chief Executive Officer



ENERGY STAR Manufactured Homes Program Requirements, Version 3 Comments

Organization Name: National Association of State Energy Officials (NASEO)

Respondent Last Name:

Respondent First Name:

Comments:

Proposed ENERGY STAR Manufactured Homes Version 2.1 Program Requirements

- 1) [Do you have any general feedback on EPA's proposed ENERGY STAR Manufactured Homes Version 2.1 Program Requirements?](#)

NASEO supports the EPA's work to update the voluntary ENERGY STAR Manufactured Homes program requirements and generally supports the requirements of Version 2.1. NASEO encourages EPA to consider how rebates made available by Sections 50121 and 50122 of the Inflation Reduction Act may reduce the cost and increase energy savings available to buyers and occupants of single and multi-unit manufactured housing. NASEO encourages EPA to include cost effective measures that will allow occupants of manufactured homes to save energy and benefit from a properly ventilated, healthy indoor environment. The voluntary ENERGY STAR Manufactured Housing Standard is the basis for energy efficiency rebates and incentives in some states, and a strong, cost effective ENERGY STAR standard for single and multi-unit homes will help the State Energy Offices reach their energy efficiency, energy affordability, and economic development goals. Importantly, the voluntary ENERGY STAR standard provides an easy-to-understand measure for purchasers of manufactured homes as they consider options. NASEO supports EPA's efforts to keep the 2.1 program update aligned with earlier editions of the standard in order to maintain program simplicity and continuity.

- 2) [Do you have feedback on the proposed Version 2.1 implementation date of May 31, 2023 \(based on the production date\) to coincide with the implementation date of the new code?](#)

An implementation date of January 1, 2023, would better align with the dates outlined in the Inflation Reduction Act, which update the basis by which 45L tax credits for energy efficient homes are issued in Section 13304.

Alternative Energy Efficiency Measures

EPA is interested in stakeholder suggestions for broadly applicable efficiency measures that could be considered as additional or alternative options to those already included in the proposal. These measures could include a higher level of insulation, better window specifications, or more efficient lighting, appliances, and equipment. Please address if a measure is typically included from the factory (either installed in the plant or "shipped loose" with the home).

- 1) [Would high-efficiency LED light bulbs be a suitable efficiency measure to include in the program requirements? Is built-in lighting typically provided in most spaces in manufactured homes? Are light bulbs typically included with the home purchase \(either installed directly or included in "ship loose" packaging\), as opposed to being an after-market purchase?](#)
- 2) [Would high-efficiency appliances be suitable efficiency measures to include in the program requirements? Which appliances are typically included with the home \(refrigerator, dishwasher, clothes washer, dryer, etc.\)? Do manufactured homes typically include makes/models similar to those found in site-built homes or is there a specialty market for appliances in manufactured housing \(e.g., to account for compact size requirements\)? If high-efficiency appliances were included in the ENERGY STAR Manufactured Homes Version 2.1 Program Requirements, is there](#)



ENERGY STAR Manufactured Homes Program Requirements, Version 3 Comments

any reason not to align the efficiency requirements with the applicable ENERGY STAR product specification for that appliance (e.g., availability of products)?

- 3) Would a high-efficiency bathroom exhaust fan (e.g., > 6.3 CFM/W) serving as the whole-home ventilation system be a suitable measure to include in the ENERGY STAR Manufactured Homes Version 2.1 Program Requirements? Do manufacturers currently offer exhaust-only ventilation systems and, if so, in which climate zones?
- 4) Are there other efficiency measures that EPA should consider for inclusion in the ENERGY STAR Manufactured Homes Version 2.1 Program Requirements?
- 5) Assuming alternative efficiency measures can be identified, are there specific measures in the current draft that stakeholders recommend replacing or adjusting to a different performance level? If so, please describe the reason for the recommendation.
- 6) Do you have additional general feedback on this topic?

Hybrid (Heat Pump) Water Heater Package Availability in Climate Zone 3

- 3) EPA has proposed that the Hybrid (Heat Pump) Water Heater package will not be available in Climate Zone 3 because it only delivers 6% savings in that region, which does not meet the program's 10% savings target. Are there other efficiency measures (such as those identified above or others) that EPA should consider adding to this package so that it could achieve 10% savings and be made available in Climate Zone 3?
- 4) Do you have additional general feedback on this topic?



ENERGY STAR Manufactured Homes Program Requirements, Version 3 Comments

Organization Name: Northwest Energy Works, Inc.

Respondent Last Name: Peeks

Respondent First Name: R Brady

Comments:

Proposed ENERGY STAR Manufactured Homes Version 2.1 Program Requirements

- 1) Do you have any general feedback on EPA's proposed ENERGY STAR Manufactured Homes Version 2.1 Program Requirements?

Please see my response to "Alternative Energy Efficiency Measures" question 6, "general feedback."

- 2) Do you have feedback on the proposed Version 2.1 implementation date of May 31, 2023 (based on the production date) to coincide with the implementation date of the new code?

Alternative Energy Efficiency Measures

EPA is interested in stakeholder suggestions for broadly applicable efficiency measures that could be considered as additional or alternative options to those already included in the proposal. These measures could include a higher level of insulation, better window specifications, or more efficient lighting, appliances, and equipment. Please address if a measure is typically included from the factory (either installed in the plant or "shipped loose" with the home).

- 1) Would high-efficiency LED light bulbs be a suitable efficiency measure to include in the program requirements? Is built-in lighting typically provided in most spaces in manufactured homes? Are light bulbs typically included with the home purchase (either installed directly or included in "ship loose" packaging), as opposed to being an after-market purchase?

The Northwest Energy Efficient Manufactured Housing Program (NEEM) currently certifies about 10 percent of homes to its NEEM+ (NEEM ver. 2.0) specifications, which require LED lighting throughout the home, with an exception available for a single fixture if that fixture is not compatible with LED lamps. The program's experience has been that manufacturers routinely ship homes with LED lamps either installed in fixtures or in the ship loose materials.

- 2) Would high-efficiency appliances be suitable efficiency measures to include in the program requirements? Which appliances are typically included with the home (refrigerator, dishwasher, clothes washer, dryer, etc.)? Do manufactured homes typically include makes/models similar to those found in site-built homes or is there a specialty market for appliances in manufactured housing (e.g., to account for compact size requirements)? If high-efficiency appliances were included in the ENERGY STAR Manufactured Homes Version 2.1 Program Requirements, is there any reason not to align the efficiency requirements with the applicable ENERGY STAR product specification for that appliance (e.g., availability of products)?

The Northwest Energy Efficient Manufactured Housing Program (NEEM) currently requires ENERGY STAR qualifying dishwashers and its NEEM+ (NEEM ver. 2.0) specifications also required ENERGY STAR qualifying refrigerators, unless the end customer specifically opts to replace the offered refrigerator with a unit that does not have a comparable model available that is ENERGY STAR qualified.



ENERGY STAR Manufactured Homes Program Requirements, Version 3 Comments

- 3) [Would a high-efficiency bathroom exhaust fan \(e.g., > 6.3 CFM/W\) serving as the whole-home ventilation system be a suitable measure to include in the ENERGY STAR Manufactured Homes Version 2.1 Program Requirements? Do manufacturers currently offer exhaust-only ventilation systems and, if so, in which climate zones?](#)

The NEEM program currently requires the use of low noise (<1.0 sone), low-wattage ceiling exhaust ventilation fans to provide whole-home ventilation (<32 Watts in NEEM ver. 1.1, <17 Watts in NEEM ver. 2.0). All nine participating factories install this system routinely. Homes build by these factories ship throughout the western US—HUD Thermal Zones II & III, and all non-humid climates. In the NEEM program's experience, homes built by participating plants that are not ENERGY STAR certified most commonly make use of a POS system that consists of a duct run from a vent cap on the roof into the furnace closet/cabinet. The NEEM program has tested POS flow and regularly finds that the system introduces between 20 and 30 CFM when the furnace blower operates and otherwise moves too little air to measure with a capture hood and sensitive flow meter. For this system to provide adequate ventilation to the home, the furnace blower needs to operate pretty much continuously. Continuous furnace blower operation is both extremely wasteful of energy and creates noise in the home. Allowing high-efficiency exhaust ventilation—either as bath fans or a central fan—as an alternative measure in appropriate climate zones, would save a lot of energy compared to a POS system operated to accomplish HUD-specified ventilation levels.

- 4) [Are there other efficiency measures that EPA should consider for inclusion in the ENERGY STAR Manufactured Homes Version 2.1 Program Requirements?](#)

The NEEM program visits each plant numerous times during the year, inspecting homes in process, training production staff in insulation and air sealing techniques, assisting the plants with process development and materials selection, etc.. The NEEM program's experience has been that the HUD regulatory process is very good at achieving overall compliance with the construction standards, but it is not well-suited for ensuring “non-critical” details like insulation detailing and air sealing get done optimally. Unless the NEEM program's experience is atypical, there is significant lost opportunity when homes are produced without the benefit of an energy-efficiency inspector as a regular part of the construction process. Some plants “natural” tendency under regular IPIA inspection might be to insulate to Grade 3. A really conscientious production team might achieve Grade 2. In factories that resemble both cases, NEEM inspectors' continual training of new personnel and involvement in the plant QC and QA processes tends to achieve higher quality results in the details that impact energy efficiency. In my estimation, the NEEM program's ongoing presence in the plants (currently six to twelve or more times annually, depending upon production levels and plant practices) results in insulation grading improving by at least one grade compared to practice under the regular IPIA inspection process. I would expect a discernable level of improvement in home and duct tightness as well, but I do not have enough test data from non-NEEM certified homes to suggest specific levels of improvement.

- 5) [Assuming alternative efficiency measures can be identified, are there specific measures in the current draft that stakeholders recommend replacing or adjusting to a different performance level? If so, please describe the reason for the recommendation.](#)

- 6) [Do you have additional general feedback on this topic?](#)

It is understandable why the EPA wishes to present a uniform and streamlined approach to earning the ENERGY STAR for new manufactured homes. It makes the program easy to explain and market. However, there are a variety of construction methods and product types produced by the manufactured housing industry, and the three



ENERGY STAR Manufactured Homes Program Requirements, Version 3 Comments

compliance paths may not be the best fit for every region's homes. Given that there is a very manageable number of recognized QAP entities, it would make sense for EPA to make available its modeling tools or modeling inputs and constraints to the QAPs. The QAPs could then custom tailor compliance paths that achieve EPA's savings targets. At the very least, it would be helpful if the EPA could give the QAPs a list of measures with the energy saved by each one and allow the QAPs to "mix and match" measures to create paths that best suit different builders' processes and product lines.

Hybrid (Heat Pump) Water Heater Package Availability in Climate Zone 3

- 1) EPA has proposed that the Hybrid (Heat Pump) Water Heater package will not be available in Climate Zone 3 because it only delivers 6% savings in that region, which does not meet the program's 10% savings target. Are there other efficiency measures (such as those identified above or others) that EPA should consider adding to this package so that it could achieve 10% savings and be made available in Climate Zone 3?

The Northwest Energy Efficient Manufactured Housing Program (NEEM) currently certifies homes to its NEEM+ (NEEM ver. 2.0) specifications, which exceed the requirements of ENERGY STAR New Manufactured Homes ver. 2 "all envelope" path by about 10%. Combining this envelope package with a heat pump water heater that draws its air from the crawlspace and ejects it to outdoors should achieve EPA's desired savings target.

- 2) Do you have additional general feedback on this topic?



ENERGY STAR Manufactured Homes Program Requirements, Version 3 Comments

Organization Name: Next Step Network

Respondent Last Name: Epperspon

Respondent First Name: Stacey

Comments:

Proposed ENERGY STAR Manufactured Homes Version 2.1 Program Requirements

- 1) [Do you have any general feedback on EPA's proposed ENERGY STAR Manufactured Homes Version 2.1 Program Requirements?](#)

On behalf of Next Step Network, I am pleased to provide comments on EPA's proposed new version of the ENERGY STAR Manufactured Homes program requirements, Version 2.1. We are pleased that EPA has decided to propose a core set of standards that apply to both single- and multi-section manufactured homes and is anticipated provide 10-18 percent cost savings to homeowners. DOE's final rule Energy Conservation Standards for Manufactured Homes will create a bifurcated market, whereby less costly, single-section homes that languish behind the efficiency standard of multi-sections homes will continue to dominate in underserved communities and persistent poverty regions. Typically, single-section homes are priced lower, and lower-income homebuyers will purchase these homes. Those who can least afford to pay high energy bills would continue to needlessly waste thousands of dollars on energy costs and live in draftier, less safe, and less comfortable homes for decades to come. Additionally, the lesser quality of these homes will reduce resale value, perpetuating cycles of poverty for families – as opposed to creating the opportunity to build generational wealth. Moreover, these homes are more likely to be shipped into manufactured housing communities, persistent poverty regions, and lower-income rural areas, contributing to an already existing glut of older, poor-quality housing stock. The application of much a more stringent ENERGY STAR standard for single-section homes, outperforming the baseline envelope standard set by DOE by 25 percent, will serve as the most effective tool to ensure that buyers in these communities have the opportunity for a more comfortable, healthier, and more energy efficient home. Additionally, we are pleased that EPA is committed to retaining the successful core program structure of ENERGY STAR Manufactured Homes Version 2 (June 2019). EPA has helped build tremendous momentum in increasing the market share for ENERGY STAR-certified manufactured homes, as simplified processes for participating manufacturers will help support market growth.

- 2) [Do you have feedback on the proposed Version 2.1 implementation date of May 31, 2023 \(based on the production date\) to coincide with the implementation date of the new code?](#)

While Next Step remains opposed to a tiered system for manufactured housing energy standards that will disproportionately impact residents living in manufactured housing communities, persistent poverty regions, communities of color, and underserved rural areas, we respect that the DOE rule is final with compliance required starting May 31, 2023. After years of delayed rulemaking, we cannot allow for a similar delay to effective compliance and enforcement of the final rule. Implementation of EPA's proposed new version of the ENERGY STAR Manufactured Homes program requirements, Version 2.1, should coincide with DOE's implementation date of May 31, 2023

Alternative Energy Efficiency Measures

EPA is interested in stakeholder suggestions for broadly applicable efficiency measures that could be considered as additional or alternative options to those already included in the proposal. These measures could include a higher level of



ENERGY STAR Manufactured Homes Program Requirements, Version 3 Comments

insulation, better window specifications, or more efficient lighting, appliances, and equipment. Please address if a measure is typically included from the factory (either installed in the plant or “shipped loose” with the home).

- 1) Would high-efficiency LED light bulbs be a suitable efficiency measure to include in the program requirements? Is built-in lighting typically provided in most spaces in manufactured homes? Are light bulbs typically included with the home purchase (either installed directly or included in “ship loose” packaging), as opposed to being an after-market purchase?

Next Step’s home specifications are market-leading in the energy efficiency space for manufactured homes. Our specifications call for an appliance package that includes LED bulbs. LED bulbs are a safer choice (using 95 percent of their energy to emit light as opposed to heat energy) and can save American households \$1,000 over a ten-year period, per the Consumer Federation of America.

- 2) Would high-efficiency appliances be suitable efficiency measures to include in the program requirements? Which appliances are typically included with the home (refrigerator, dishwasher, clothes washer, dryer, etc.)? Do manufactured homes typically include makes/models similar to those found in site-built homes or is there a specialty market for appliances in manufactured housing (e.g., to account for compact size requirements)? If high-efficiency appliances were included in the ENERGY STAR Manufactured Homes Version 2.1 Program Requirements, is there any reason not to align the efficiency requirements with the applicable ENERGY STAR product specification for that appliance (e.g., availability of products)?

Next Step would recommend that an ENERGY STAR appliance package be available for consumers purchasing an ENERGY STAR manufactured home. Per the Manufactured Home Construction and Safety Standards (HUD Code), a home shipped from a factory must include a working oven/range, and all other appliances (e.g., dishwasher, refrigerator, clothes washer, dryer) are available for consumer purchase as a package from the factory at a discounted price. These products are the same brands, makes, and models that can be purchased at any home appliance retailer for a site-built home.

- 3) Would a high-efficiency bathroom exhaust fan (e.g., > 6.3 CFM/W) serving as the whole-home ventilation system be a suitable measure to include in the ENERGY STAR Manufactured Homes Version 2.1 Program Requirements? Do manufacturers currently offer exhaust-only ventilation systems and, if so, in which climate zones?

- 4) Are there other efficiency measures that EPA should consider for inclusion in the ENERGY STAR Manufactured Homes Version 2.1 Program Requirements?

Next Step would recommend the inclusion of ENERGY STAR certified furnace and water heater. Additionally, there should be an optional ENERGY STAR appliance package available for consumers to purchase from the factory (e.g., dishwasher, refrigerator, clothes washer, dryer).

- 5) Assuming alternative efficiency measures can be identified, are there specific measures in the current draft that stakeholders recommend replacing or adjusting to a different performance level? If so, please describe the reason for the recommendation.

EPA should consider HVAC use in single-section homes. While we recognize that the proposed requirements for single-section homes already provide significant savings compared to the weak standard for those homes, we



ENERGY STAR Manufactured Homes Program Requirements, Version 3 Comments

recommend that the same equipment requirements for multi-section homes also apply to the single section homes. A home with electric resistance heat or a standard furnace cannot be considered efficient, especially in cold climates. In addition, significantly different requirements for single-section and multi section homes is likely to create confusion in the marketplace about what residents should expect from those homes. The residents of single section homes deserve the same quality ENERGY STAR home features and efficiency as residents of larger manufactured homes. Additionally, we support an emphasis on heat pumps as an effective heating (and cooling) method for manufactured homes. In order to ensure a good experience for residents, as well as to increase savings, we suggest that ENERGY STAR heat pumps should be required. In the long run, both heat pumps and heat pump water heaters should be the best option for manufactured homes (with a good shell), and ENERGY STAR should be moving the market in that direction.

- 6) Do you have additional general feedback on this topic?

Hybrid (Heat Pump) Water Heater Package Availability in Climate Zone 3

- 1) EPA has proposed that the Hybrid (Heat Pump) Water Heater package will not be available in Climate Zone 3 because it only delivers 6% savings in that region, which does not meet the program's 10% savings target. Are there other efficiency measures (such as those identified above or others) that EPA should consider adding to this package so that it could achieve 10% savings and be made available in Climate Zone 3?
- 2) Do you have additional general feedback on this topic?



ENERGY STAR Manufactured Homes Program Requirements, Version 3 Comments

Organization Name: Pleasant Valley Homes, Inc.

Respondent Last Name: Williard

Respondent First Name: Shannon

Comments:

Proposed ENERGY STAR Manufactured Homes Version 2.1 Program Requirements

- 1) Do you have any general feedback on EPA's proposed ENERGY STAR Manufactured Homes Version 2.1 Program Requirements?

The proposed changes are going to add about \$2,000 to the cost of a HUD home built by our factory. Gas water heaters and high efficiency furnaces are expensive. Many consumers and/or communities don't want gas water heaters in their homes. These two issues combined are most likely going to force us to produce substantially fewer energy star qualified units. At the moment, EVERY HUD home we build is energy star – if these changes take effect, we will be forced to make energy star an option, not a standard.

- 2) Do you have feedback on the proposed Version 2.1 implementation date of May 31, 2023 (based on the production date) to coincide with the implementation date of the new code?

Many manufacturers in our industry have substantial backlogs which extend out past a year. Implementing the changes May 31, 2023 will cause issues with homes currently on order.

Alternative Energy Efficiency Measures

EPA is interested in stakeholder suggestions for broadly applicable efficiency measures that could be considered as additional or alternative options to those already included in the proposal. These measures could include a higher level of insulation, better window specifications, or more efficient lighting, appliances, and equipment. Please address if a measure is typically included from the factory (either installed in the plant or "shipped loose" with the home).

- 1) Would high-efficiency LED light bulbs be a suitable efficiency measure to include in the program requirements? Is built-in lighting typically provided in most spaces in manufactured homes? Are light bulbs typically included with the home purchase (either installed directly or included in "ship loose" packaging), as opposed to being an after-market purchase?

Light bulbs are NOT included with our homes. They are provided on-site by the homeowner. This should not be a requirement of the program.

- 2) Would high-efficiency appliances be suitable efficiency measures to include in the program requirements? Which appliances are typically included with the home (refrigerator, dishwasher, clothes washer, dryer, etc.)? Do manufactured homes typically include makes/models similar to those found in site-built homes or is there a specialty market for appliances in manufactured housing (e.g., to account for compact size requirements)? If high-efficiency appliances were included in the ENERGY STAR Manufactured Homes Version 2.1 Program Requirements, is there any reason not to align the efficiency requirements with the applicable ENERGY STAR product specification for that appliance (e.g., availability of products)?

At this time, appliance manufacturers are making limited models, styles, and colors of appliances. Many times we have backorders from Whirlpool and are unable to get certain items. I feel it would be difficult for manufacturers to be required to supply certain appliance types/styles when the supply chain is already difficult to deal with.



ENERGY STAR Manufactured Homes Program Requirements, Version 3 Comments

- 3) Would a high-efficiency bathroom exhaust fan (e.g., > 6.3 CFM/W) serving as the whole-home ventilation system be a suitable measure to include in the ENERGY STAR Manufactured Homes Version 2.1 Program Requirements? Do manufacturers currently offer exhaust-only ventilation systems and, if so, in which climate zones?

We do not currently offer whole house ventilation systems.

- 4) Are there other efficiency measures that EPA should consider for inclusion in the ENERGY STAR Manufactured Homes Version 2.1 Program Requirements?

No. The less regulation, the better. We are at a point where pricing is extremely sensitive. If you continue to add standards and requirements, you're taking something that was affordable and making it impossible for the average homebuyer to purchase. Factory built housing is supposed to be affordable and it isn't.

- 5) Assuming alternative efficiency measures can be identified, are there specific measures in the current draft that stakeholders recommend replacing or adjusting to a different performance level? If so, please describe the reason for the recommendation.

- 6) Do you have additional general feedback on this topic?

You really need to reconsider the requirements for the high efficiency furnace and gas water heaters.

Hybrid (Heat Pump) Water Heater Package Availability in Climate Zone 3

- 1) EPA has proposed that the Hybrid (Heat Pump) Water Heater package will not be available in Climate Zone 3 because it only delivers 6% savings in that region, which does not meet the program's 10% savings target. Are there other efficiency measures (such as those identified above or others) that EPA should consider adding to this package so that it could achieve 10% savings and be made available in Climate Zone 3?
- 2) Do you have additional general feedback on this topic?



ENERGY STAR Manufactured Homes Program Requirements, Version 3 Comments

Organization Name: Systems Building Research Alliance

Respondent Last Name: Levy

Respondent First Name: Emanuel

Comments:

Proposed ENERGY STAR Manufactured Homes Version 2.1 Program Requirements

- 1) Do you have any general feedback on EPA's proposed ENERGY STAR Manufactured Homes Version 2.1 Program Requirements?

See attached

- 2) Do you have feedback on the proposed Version 2.1 implementation date of May 31, 2023 (based on the production date) to coincide with the implementation date of the new code?

See point 1 in attached

Alternative Energy Efficiency Measures

EPA is interested in stakeholder suggestions for broadly applicable efficiency measures that could be considered as additional or alternative options to those already included in the proposal. These measures could include a higher level of insulation, better window specifications, or more efficient lighting, appliances, and equipment. Please address if a measure is typically included from the factory (either installed in the plant or "shipped loose" with the home).

- 1) Would high-efficiency LED light bulbs be a suitable efficiency measure to include in the program requirements? Is built-in lighting typically provided in most spaces in manufactured homes? Are light bulbs typically included with the home purchase (either installed directly or included in "ship loose" packaging), as opposed to being an after-market purchase?

Bulbs are a viable efficiency option that can be installed in the plant, shipped loose or distributed through retailers. SBRA has run programs using all methods. High efficiency bulbs can be cost effective and reliable.

- 2) Would high-efficiency appliances be suitable efficiency measures to include in the program requirements? Which appliances are typically included with the home (refrigerator, dishwasher, clothes washer, dryer, etc.)? Do manufactured homes typically include makes/models similar to those found in site-built homes or is there a specialty market for appliances in manufactured housing (e.g., to account for compact size requirements)? If high-efficiency appliances were included in the ENERGY STAR Manufactured Homes Version 2.1 Program Requirements, is there any reason not to align the efficiency requirements with the applicable ENERGY STAR product specification for that appliance (e.g., availability of products)?

Appliances (notably refrigerators and dishwashers) are indeed an option and could be ENERGY STAR labeled although many plants do not furnish clothes washers and dryers.

- 3) Would a high-efficiency bathroom exhaust fan (e.g., > 6.3 CFM/W) serving as the whole-home ventilation system be a suitable measure to include in the ENERGY STAR Manufactured Homes Version 2.1 Program Requirements? Do manufacturers currently offer exhaust-only ventilation systems and, if so, in which climate zones?

Some manufacturers include exhaust-only ventilation, but many use other solutions. High efficiency exhaust fans could be implemented by some manufacturers but should not be a mandatory component of the requirements because it would exclude a large portion of the industry.



ENERGY STAR Manufactured Homes Program Requirements, Version 3 Comments

- 4) Are there other efficiency measures that EPA should consider for inclusion in the ENERGY STAR Manufactured Homes Version 2.1 Program Requirements?

See attached.
- 5) Assuming alternative efficiency measures can be identified, are there specific measures in the current draft that stakeholders recommend replacing or adjusting to a different performance level? If so, please describe the reason for the recommendation.

See attached.
- 6) Do you have additional general feedback on this topic?

See attached.

Hybrid (Heat Pump) Water Heater Package Availability in Climate Zone 3

- 1) EPA has proposed that the Hybrid (Heat Pump) Water Heater package will not be available in Climate Zone 3 because it only delivers 6% savings in that region, which does not meet the program's 10% savings target. Are there other efficiency measures (such as those identified above or others) that EPA should consider adding to this package so that it could achieve 10% savings and be made available in Climate Zone 3?

See attached.
- 2) Do you have additional general feedback on this topic?

See attached.

More comments submitted in letter. See next page.



ENERGY STAR Manufactured Homes Program Requirements, Version 3 Comments



Comments on ENERGY STAR Manufactured Homes National Program Requirements, Version 2.1

1. Sync “Effective date” with Standards enactment

- a. **Proposed requirement:** Manufactured homes produced on or after May 31, 2023, must be certified to these ENERGY STAR Manufactured New Homes Version 2.1 program requirements. Manufactured homes produced prior to May 31, 2023, are permitted to be certified according to Version 2 of the program requirements.
- b. **Issues/concerns:** One of the reasons for modifying the ENERGY STAR requirements is to maintain a meaningful separation between the HUD standards and the ENERGY STAR program. The relative improvement in performance needs to be balanced against the cost difference; too great a cost difference will reduce the ability of buyers to qualify for ENERGY STAR. As a result, the change to V2.1 should coincide with the enforcement of the DOE thermal standards. Currently, the implementation date for the new standards is May 31, 2023, but this may change.
- c. **Proposed revision:** Manufactured homes produced on or after the enforcement date of HUD approved enhanced energy requirements must be certified to these ENERGY STAR Manufactured New Homes Version 2.1 program requirements. Manufactured homes produced prior to this enforcement date are permitted to be certified according to Version 2 of the program requirements.

2. Expand options for qualifying single section homes

- a. **Proposed requirement:** With the bifurcation in the DOE standards, EPA is proposing V2.1 single section requirements that are less stringent than those for multi-section homes, not requiring that single section compliance include higher efficiency equipment.
- b. **Issues/concerns:** One consequence of this provision is there is no incentive to encourage the inclusion of high efficiency space conditioning equipment in single section homes and adding high levels of insulation may be cost prohibitive and present construction hurdles.
- c. **Proposed revision:** Add a heat pump and high efficiency gas furnace option for single section homes. Table 1 below suggests a package of equivalent performance with the V2.1 envelope only measures.



ENERGY STAR Manufactured Homes Program Requirements, Version 3 Comments

Table 1. Envelope/equipment packages for single section homes

Zone	Features	Envelope only	Heat pump or high eff. gas furnace
CZ-1	U _o -value	0.076	0.085
	C-W-F-G	33-13-22-0.30	33-13-19-0.50
	Equipment Requirements	NA	≥ 7.5 HSPF2 / 14.3 SEER2 or 14.3 SEER2, 95% AFUE
CZ-2	U _o -value	0.065	0.085
	C-W-F-G	33-21-22-0.30	33-13-19-0.50
	Equipment Requirements	NA	≥ 7.5 HSPF2 / 14.3 SEER2 or 14.3 SEER2, 95% AFUE
CZ-3	U _o -value	0.056	0.072
	C-W-F-G	38-21-33-0.28	38-13-28-0.35
	Equipment Requirements	NA	≥ 7.5 HSPF2 / 14.3 SEER2 or 14.3 SEER2, 95% AFUE

3. Add pathway for multi section homes with gas heat and electric water heating

- a. **Proposed requirement:** The requirements as proposed provide compliance pathways for all-electric and all-gas homes only, that is, with a single energy type used for space and hot water heating.
- b. **Issues/concerns:** A common equipment type configuration consists of a gas furnace coupled with electric water heating. However, the V2.1 proposal does not have a solution for this equipment combination.
- c. **Proposed revision:** For homes with this combination of equipment, consider requiring a high efficiency gas / propane furnace (AFUE ≥ 96) coupled with either other efficiency measures (lighting, appliances, etc.).

4. Define ‘fully buried’ for ducts in attics

- a. **Proposed requirement:** The proposal stipulates that ducts in the attic should be “buried.”
- b. **Issues/concerns:** The term buried is vague and does not insure minimum insulation coverage. Furthermore, height limitations impact space available for burying ducts in attics.
- c. **Proposed revision:** Add additional language defining “fully buried” as a minimum of two inches of blown insulation during home manufacture or R-8 insulation wrapping the duct.

5. Allow for performance trade-offs that achieve the target energy savings



ENERGY STAR Manufactured Homes Program Requirements, Version 3 Comments

- a. **Issues/concerns:** As the requirements to qualify for the ENERGY STAR label are made more stringent, the cost of compliance rises precipitously and more opportunities for trade-offs among energy features is needed.
- b. **Proposed revision:** A pathway should exist for combinations of measures to be approved based on total energy use, unique packages that would be reviewed, verified, and approved by the program QAPs. This would open new possibilities to employ emerging technologies and products that may become less costly in the future. Home manufacturers would be able to use a combination of measures not currently approved but one that meets the program performance target (e.g., a gas/propane water heater with an UEF of 0.91 and a gas / propane furnace with an AFUE of 0.96, as shown on Table 2 below).

Table 2. Alternate equipment packages for multi-section homes

Climate zone	DOE Baseline		EPA Proposal, ESMH v2.1			Proposed Option		
	Equipment	Energy Cost	Equipment	Energy Cost	% improve over DOE	Equipment	Energy Cost	% improve over DOE
HUD 1 (CZ-2) Houston, TX	Gas furnace AFUE 0.8 + AC, gas storage hot water heater UEF 0.58	\$1,300	Gas furnace AFUE 0.9 + AC, gas instant hot water heater UEF 0.93	\$1,146	12%	Gas furnace AFUE 0.96+ AC, gas storage hot water heater, UEF 0.91	\$1,152	11%
HUD 2 (CZ-3) Charlotte, NC	Gas furnace AFUE 0.8 + AC, gas storage hot water heater UEF 0.58	\$1,297	Gas furnace AFUE 0.95 + AC, gas instant hot water heater UEF 0.93	\$1,161	10%	Gas furnace AFUE 0.96+ AC, gas storage hot water heater, UEF 0.91	\$1,173	10%
HUD 3 (CZ-5) Detroit, MI	Gas furnace AFUE 0.8 + AC, gas storage hot water heater UEF 0.58	\$1,720	Gas furnace AFUE 0.95 + AC, gas instant hot water heater UEF 0.93	\$1,497	13%	Gas furnace AFUE 0.96+ AC, gas storage hot water heater, UEF 0.91	\$1,532	11%

Notes:

1. Assumptions are based on the DOE Technical Support Document (TSD) for Final Rule.
2. Ekotrope is the modeling software used to simulate performance.
3. Energy costs were taken from EIA, using 2021 national averages.

6. Adjust the window properties in line with the DOE standards

- a. **Proposed revision:** The proposed revisions are intended to bring the window requirements in line with products commonly available in the market and improve the cost effectiveness and value proposition of the v2.1 changes.
 1. Change SHGC for zone 1 to 0.33 (consistent with the DOE rule).
 2. Change window U-value for climate zone 3 to 0.30. A product with a lower U-value is not commonly available in the manufactured home market.



ENERGY STAR Manufactured Homes Program Requirements, Version 3 Comments

Organization Name: URBAN HABITAT INITIATIVES INC.

Respondent Last Name: VERMEER

Respondent First Name: KIMBERLY

Comments:

Proposed ENERGY STAR Manufactured Homes Version 2.1 Program Requirements

- 1) [Do you have any general feedback on EPA's proposed ENERGY STAR Manufactured Homes Version 2.1 Program Requirements?](#)

Urban Habitat Initiatives (UHI) is pleased to offer comments on the proposed ENERGY STAR Manufactured Homes Version 2.1 Program. UHI is committed to high quality construction standards for manufactured housing and is monitoring implementation of recent updates to codes and standards for manufactured housing. An option for ENERGY STAR Homes certification offers even more value for home purchasers by ensuring greater energy savings. UHI commends EPA for coordinating updates to the program requirements for ENERGY STAR Manufactured Homes with the implementation of the new DOE energy conservation standards. UHI supports the new proposed program structure of requiring all homes, regardless of the number of sections, to meet the requirements for Envelope & Glazing, Water Fixtures, and Thermostat & Ductwork shown in Exhibit 1. This requirement will ensure additional energy savings, especially for single-section homes, relative to the recently finalized DOE Energy Conservation Standards for Manufactured Homes. This proposed requirement has at least two benefits. First, it will facilitate manufacturer implementation by having one standard that applies to all ENERGY STAR certified homes. Second, it will deliver higher energy savings (estimated to be as much as 25%) to single-section home purchasers. Typically these purchasers are lower-income households that will benefit from greater energy savings. UHI also supports the “package” approach to mechanical equipment included in Exhibit 2 for multi-section homes as a method for streamlining program adoption by manufacturers. UHI supports EPA's decision to propose program updates that are well-aligned with the successful program structure and manufacturer and QAP relationships from Program Version 2.

- 2) [Do you have feedback on the proposed Version 2.1 implementation date of May 31, 2023 \(based on the production date\) to coincide with the implementation date of the new code?](#)

UHI supports EPA's goal of aligning the ENERGY STAR MH program with implementation of the DOE standards. This alignment will enable manufacturers, inspectors, QAPs, and the materials and equipment supply chain to develop procedures and prepare for implementation of the DOE standards and the ENERGY STAR program simultaneously. Parallel preparation for the new standards and the new ENERGY STAR program may encourage faster adoption of the ENERGY STAR program by manufacturers.

Alternative Energy Efficiency Measures

EPA is interested in stakeholder suggestions for broadly applicable efficiency measures that could be considered as additional or alternative options to those already included in the proposal. These measures could include a higher level of insulation, better window specifications, or more efficient lighting, appliances, and equipment. Please address if a measure is typically included from the factory (either installed in the plant or “shipped loose” with the home).

- 1) [Would high-efficiency LED light bulbs be a suitable efficiency measure to include in the program requirements? Is built-in lighting typically provided in most spaces in manufactured homes? Are light bulbs typically included with the](#)



ENERGY STAR Manufactured Homes Program Requirements, Version 3 Comments

home purchase (either installed directly or included in “ship loose” packaging), as opposed to being an after-market purchase?

UHI supports inclusion of LED light bulbs as an efficiency measure to be included in the program requirements. LED lighting is now widely available and offers additional energy savings to homebuyers.

- 2) Would high-efficiency appliances be suitable efficiency measures to include in the program requirements? Which appliances are typically included with the home (refrigerator, dishwasher, clothes washer, dryer, etc.)? Do manufactured homes typically include makes/models similar to those found in site-built homes or is there a specialty market for appliances in manufactured housing (e.g., to account for compact size requirements)? If high-efficiency appliances were included in the ENERGY STAR Manufactured Homes Version 2.1 Program Requirements, is there any reason not to align the efficiency requirements with the applicable ENERGY STAR product specification for that appliance (e.g., availability of products)?

The ENERGY STAR Homes certification requirements for single-family site-built and multifamily new construction include ENERGY STAR qualified refrigerators and dishwashers (also ceiling fans for single-family). For program comparability it is desirable to extend this requirement to manufactured housing. And ENERGY STAR appliances would offer additional savings to home purchasers. However, the added cost and the need to increase the purchase price may be too much for manufacturers if ENERGY STAR appliances are required for certification. Broad adoption of the ENERGY STAR MH program by manufacturers and consumers is the goal. Appliance requirements may interfere with achieving that goal. EPA might consider requiring manufacturers to offer an ENERGY STAR appliance package that purchasers could opt to add to their homes.

- 3) Would a high-efficiency bathroom exhaust fan (e.g., > 6.3 CFM/W) serving as the whole-home ventilation system be a suitable measure to include in the ENERGY STAR Manufactured Homes Version 2.1 Program Requirements? Do manufacturers currently offer exhaust-only ventilation systems and, if so, in which climate zones?

Exhaust-only ventilation is problematic as a whole-home approach. If homes are not well air-sealed, the supply air is pulled through uncontrolled holes and leaks in the building envelope. This can introduce pollutants from building materials into the homes. If homes are well air-sealed, exhaust-only systems can depressurize the home. If gas-fired combustion appliances (furnaces, ranges, water heaters) are present, the depressurizing can cause back drafting. Back drafting also introduces pollutants (combustion by-products), and can be harmful or fatal if the back drafting causes carbon monoxide exposure. If EPA would like to include ventilation recommendations, balanced whole-house systems with both supply and exhaust are preferable.

- 4) Are there other efficiency measures that EPA should consider for inclusion in the ENERGY STAR Manufactured Homes Version 2.1 Program Requirements?

Although we recognize the challenge of including them, given the manufacturing and inspection process, the proposed program requirements do not appear to include air sealing for the building envelope or blower door testing to measure air tightness.

- 5) Assuming alternative efficiency measures can be identified, are there specific measures in the current draft that stakeholders recommend replacing or adjusting to a different performance level? If so, please describe the reason for the recommendation.

No comments.

- 6) Do you have additional general feedback on this topic?



ENERGY STAR Manufactured Homes Program Requirements, Version 3 Comments

DOE's Zero Energy Ready Home program is currently developing standards for ZERH for manufactured housing. Perhaps EPA could consider a recommended "Moving toward ZERH" add-on package of measures that would offer additional efficiencies and encourage manufacturers and home purchasers to consider that next step in home energy performance.

Hybrid (Heat Pump) Water Heater Package Availability in Climate Zone 3

- 1) EPA has proposed that the Hybrid (Heat Pump) Water Heater package will not be available in Climate Zone 3 because it only delivers 6% savings in that region, which does not meet the program's 10% savings target. Are there other efficiency measures (such as those identified above or others) that EPA should consider adding to this package so that it could achieve 10% savings and be made available in Climate Zone 3?

During the Webinar presentation, EPA explained that the heat pump water heater was not included in the package for Climate Zone 3 because it did not achieve the 10% energy use reduction target needed to qualify for ENERGY STAR. However, including Hybrid heat pump water heaters in Climate 3 homes would offer additional energy savings. Perhaps this could be re-labeled as "Not Required" and the associated Note could recommend, but not require, inclusion. Would inclusion of heat recovery or energy recovery ventilation be feasible and generate additional savings?

- 2) Do you have additional general feedback on this topic?

No comments.