

## **ENERGY STAR Residential New Construction Roadmap Comments**

This is a compilation of all comments received by EPA during and after the ENERGY STAR Residential New Construction Roadmap comment period.

*The following comments have been compiled from the ENERGY STAR New Homes Proposed Guidelines Comment Forms submitted by respondents. The Environmental Protection Agency is not responsible for any typographical errors or omissions.*



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# ENERGY STAR Residential New Construction Roadmap Comments

**Organization Name:** Brian Shanks

**Respondent Last Name:** Shanks

**Respondent First Name:** Brian

**Comments:**

## General

Thank you to the entire EPA ENERGY STAR® Residential and Multi-family teams that pulled together these program updates and for the opportunity to comment on them.

### National Transition to SFNH v3.1/MFNC v1.1

Will the proposed date of January 1, 2023 (based on permit date) provide partners with sufficient time to prepare for the transition to SFNH Version 3.1 and MFNC Version 1.1?

Unlike the SFNH V3.0 and V3.1 programs that have been in practice for several years, MFNC V1.0 was only introduced in 2019, where until July 1, 2021 dwelling units could be certified with SFNH V3.0 or V3.1 program requirements.

Builders/Contractors, until as recent as four-months ago, could choose to follow the SFNH program. If the January 1, 2023 effective date for MFNC V1.1 is implemented there will have only been an 18-month period between the July 01, 2021 effective date and its next major update, certainly not enough time for the program to mature, be fully understood and effectively utilized by Builders/Contractors. The MFNC V1.1 effective date should be pushed back by at least twelve-months to allow Builders/Contractors more time to adapt their projects to meet the V1.1 requirements.

### Introduction of New Certification Label to Accelerate Construction of Next Generation of Homes & Apts.

#### Energy Efficiency Prerequisite

Are EPA's proposed energy efficiency requirements at an appropriate level for the new certification?

Introducing a new complimentary program with the proposed V3.2 efficiency requirements will likely stifle early adoption of the new certification program. Linking the efficiency requirement to the proposed national implementation of V3.1 will promote broader acceptance and quicker roll-out. Better is better.

### ENERGY STAR Certified Connected Heat Pumps

EPA is proposing that all installed heat pumps must use the HVAC Grading Track and achieve Grade I for all elements. Is mandatory HVAC grading and achieving Grade I in homes an appropriate requirement for the new certification?

To date I am unaware of broad use of HVAC Grading (ANSI/RESNET/ACCA 310-2020) and have heard from one multi-state rater organization of their challenges and cost to implement. Until data is available supporting the ability to achieve Grade I in all climate zones and during all seasons it is too early to make this a program requirement. Once enough data has been collected, this requirement can be rolled into the program through a revision. This should remain an optional path for any ENERGY STAR certification.

EPA is proposing that all installed heat pumps must meet EPA's 'connected' criteria or use an ENERGY STAR smart thermostat. Are these connected options appropriate requirements?

Due to ongoing supply-chain constraints, with many suggesting those challenges will be with us into 2023 and possibly beyond, it is difficult to embrace technology that isn't currently manufactured at scale (ASHP) due to component availability.



# ENERGY STAR Residential New Construction Roadmap Comments

Currently the technology exists but the productivity doesn't, whether smart thermostat or ASHP. With the weight of customer satisfaction (on-time delivery) in mind I am not a current proponent of any "connected" heat pump, whether ASHP or HPWH.

## **ENERGY STAR Certified Heat Pump Water Heaters**

EPA is proposing minimum tank size requirements to help ensure that the heat pump is used as the primary water heating source, rather than the electric resistance backup coil. Is this advisable, and are the proposed tank sizes appropriate?

Most of the single-family homes I am familiar with fall into the three- or four-bedroom category. A 65 or 80-gallon HPWH would be required in those examples. Due to size, weight, venting and condensate consideration placing a HPWH isn't a "easy-button" solution. Increasing the capacity and in turn the size of the unit will lead to complex plan redesign where the HPWH will be competing with the Air Handler and HRV/ERV located in the same space. The additional 30-60% capacity isn't necessary where the proposed requirement of HPWH alone should deliver the intended efficiency gain. The larger capacity units would lead to costly redesign of many plans.

EPA is proposing that heat pump water heaters will be mandatory to earn the new certification for all types of new construction, including multifamily. Should EPA consider allowing conventional electric water heaters while the market develops new heat pump water heater solutions?

As mentioned in prior comment, same category, HPWH require a fair amount of design considerations where they are not always a practical solution for multi-family product with limited space and in many cases no attached garage to utilize for HPWH location. It is prudent to allow conventional electric water heaters while the industry develops more efficient small-space solutions.

## **Induction/Electric Cooking**

Should EPA also consider allowing conventional electric cooktops in market-rate housing as an alternative to induction?

Induction cooking is currently an expensive first-cost product where it should not matter if market-rate or government-subsidized housing. The EPA should include conventional electric cooktops no matter the housing type distinction.

## **Electric Vehicle Charging Capability**

Are EPA's proposed requirements for private EV-Ready spaces and/or installed EV chargers and EV-Capable parking spaces appropriate?

In a recent online article (Mihalascu) it was noted that EV sales in the first half of 2021 more than doubled in the US but in absolute numbers made up only 2.5% of the overall car market. Future-proofing the dwelling unit seems to be premature where, by the time demand supports need the charging technology will have surpassed the proposed EV Ready infrastructure. Think too soon to include this requirement.



# ENERGY STAR Residential New Construction Roadmap Comments

**Organization Name:** Building Efficiency Resources (BER)

**Respondent Last Name:** Rosendaul

**Respondent First Name:** Matt

**Comments:**

## Introduction of National SFNH Version 3.2 and MFNC Version 1.2 Program Requirements

Is the proposed more stringent thermal backstop for SFNH Version 3.2 and MFNC Version 1.2, aligned with the 2021 IECC, appropriate and achievable?

Aligning to the 2021 IECC instead of the 2018 may be too great a stretch for many builders in a short time period.

For SFNH Version 3.2, is the proposed more stringent alternative backstop for homes with low infiltration, defined as  $\leq 115\%$  of the total UA resulting from the U-factors in the 2021 IECC, appropriate and achievable? Should this alternative backstop be restructured to better target the types of homes most likely to use it (e.g., homes with ducts in an unvented attic)?

Yes, appropriate and achievable. The DOE ZE/ZER program already includes many of these same specifications.

Should EPA maintain its previous policy of requiring that the new version of the program be used to certify homes and apartments permitted one year after the date of implementation of the state's new code for the proposed SFNH Version 3.2 and MFNC Version 1.2 program requirements?

Yes.

In the new MFNC Reference Design, EPA is proposing to include a 1.2 EF water heater. This efficiency level falls between what is available for electric tank products and heat pump products and was selected to require apartments with electric water heating to install heat pump water heaters when using the Prescriptive Path, while not making it prohibitively difficult to achieve the ERI target for those using the ERI Path. Is this an appropriate level of water heater efficiency for EPA to include in the proposed new MFNC Reference Design?

No, the water heater UEF should be 2.0 which is the Federal Min for HPWH equipment.

## Introduction of New Certification Label to Accelerate Construction of Next Generation of Homes & Apts.

### General

Do you have general feedback on this topic?

What is Energy Star hoping to accomplish with this new certification? The DOE ZE/ZER program already includes many of these same specifications.

### Energy Efficiency Prerequisite

Are EPA's proposed energy efficiency requirements at an appropriate level for the new certification?

This new certification should be available to version 3.0 and 3.1 homes as well as 3.2

## ENERGY STAR Certified Connected Heat Pumps

EPA is proposing that all installed heat pumps must use the HVAC Grading Track and achieve Grade I for all elements. Is mandatory HVAC grading and achieving Grade I in homes an appropriate requirement for the new certification?



# ENERGY STAR Residential New Construction Roadmap Comments

No, there are not enough raters participating in the HVAC Grading Track.

EPA is proposing that all installed heat pumps must meet EPA's 'connected' criteria or use an ENERGY STAR smart thermostat. Are these connected options appropriate requirements?

Yes, inappropriate thermostats have a drastic effect on the system performance. Connected thermostats can also be used more with demand/response utility programs.

EPA is proposing that cold climate heat pumps be required in Climate Zones 5-8. Are these the most appropriate areas for requiring these systems? Should any Climate Zones be added or any eliminated?

Yes, those systems are being commonly installed in those zones already.

## **ENERGY STAR Certified Heat Pump Water Heaters**

EPA is proposing minimum tank size requirements to help ensure that the heat pump is used as the primary water heating source, rather than the electric resistance backup coil. Is this advisable, and are the proposed tank sizes appropriate?

The sizing should be based on typical sizes available in the marketplace such as 50 gallon or 75 gallon.

EPA is proposing that heat pumps installed in occupiable space have a sound rating of  $\leq 55$  dBA. Is this an appropriate threshold?

Yes, there are options on the market which operate at that sound level or better.

EPA is proposing that heat pump water heaters will be mandatory to earn the new certification for all types of new construction, including multifamily. Should EPA consider allowing conventional electric water heaters while the market develops new heat pump water heater solutions?

Yes. HPWH technology is changing rapidly and better options will be available in the future but may not be ideal for some situations yet.

## **Induction/Electric Cooking**

EPA is proposing an exemption from the certification requirement for induction cooktops and ranges in government-subsidized affordable housing projects, where conventional electric cooktops will be allowed as an alternative. Is this allowance appropriate and advisable for affordable housing?

Yes, induction appliances and the cookware is more expensive. In addition the savings are marginal.

Should EPA also consider allowing conventional electric cooktops in market-rate housing as an alternative to induction?

Yes, the savings from induction cooktops is marginally small anyway.

## **Electric Vehicle Charging Capability**

Are EPA's proposed requirements for private EV-Ready spaces and/or installed EV chargers and EV-Capable parking spaces appropriate?

Yes, to be EV ready, but not the charger installed. A 40A 208/240V outlet is appropriate.



# ENERGY STAR Residential New Construction Roadmap Comments

EPA is proposing to cap the number of required EV-chargers for a development at five (5). Is this an advisable limit?

Requirement should be a percentage of units with no max cap.

Some concern has been expressed that the addition of an EV charging circuit would require a costly upgrade to 400-amp service. EPA believes this will be a relatively rare occurrence (and may become even rarer with emerging tech solutions that could eliminate the need for upgrades). Is EPA underestimating the frequency with which this might occur, and if so, should the requirement be changed?

No, the upgrade will not need to be done often, and when it is required, the homes must install the additional panel capacity to achieve the new certification label.

EPA is not proposing to relax the EV-Ready or EV-Charging requirements for government-subsidized affordable housing. Should EPA consider setting alternative EV charging infrastructure requirements (or have no EV requirements) for affordable housing?

The requirement should not be relaxed for affordable housing. As EVs continue to be adopted, residents in affordable housing need access to the charging capabilities.



# ENERGY STAR Residential New Construction Roadmap Comments

**Organization Name:** Elevate, Evergreen Action, NY-GEO, Rewiring America, and RM

**Respondent Last Name:**

**Respondent First Name:**

**Comments:**

*Comments submitted in letter. See next page.*





November 15, 2021

Mr. Jonathan Passe  
U.S. Environmental Protection Agency  
1201 Constitution Ave NW  
Washington, DC 20004  
Submitted via email to [energystarhomes@energystar.gov](mailto:energystarhomes@energystar.gov)

**Re: Comments on Proposed ENERGY STAR Residential New Construction Program Roadmap and Framework Document**

Dear Mr. Passe:

Thank you for the opportunity to comment on the proposed ENERGY STAR Residential New Construction Program Roadmap and Framework Document (Framework). Elevate, Evergreen Action, NY-GEO, Rewiring America, and RMI are strong supporters of the ENERGY STAR program and EPA's use of it to drive innovation and emissions reductions in the residential new construction sector. The widespread construction of efficient homes with zero direct emissions is essential to achieving the Biden Administration's energy, climate, and health goals, including cutting greenhouse gas emissions 50-52 percent by 2030 and reaching net zero emissions by 2050.<sup>1</sup> We support EPA's efforts to update the Single-Family New Homes (SFNH) and Multifamily New Construction (MFNC) ENERGY STAR programs. We also commend EPA for introducing a new certification to recognize single-family and multifamily homes that incorporate the most efficient technologies available: modern electric space heating and cooling, water heating, cooking, and vehicle charging. In this letter, we offer recommendations to bolster the proposed changes for SFNH, MFNC, and the new electric certification.

To fully align the ENERGY STAR Residential New Construction Program with the Administration's clean-energy ambitions and the program's core pillars<sup>2</sup>, we urge EPA to revise SFNH Version 3.2 and MFNC Version 1.2 to exclude fossil-fuel fired appliances. Electrification is the most efficient, cost-effective, and cleanest option for the vast majority of American households, especially when combined with the insulation and weatherization elements of the

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<sup>1</sup> White House Fact Sheet: *President Biden Sets 2030 Greenhouse Gas Pollution Reduction Target Aimed at Creating Good-Paying Union Jobs and Securing U.S. Leadership on Clean Energy Technologies* (April 22, 2021), <https://www.whitehouse.gov/briefing-room/statements-releases/2021/04/22/fact-sheet-president-biden-sets-2030-greenhouse-gas-pollution-reduction-target-aimed-at-creating-good-paying-union-jobs-and-securing-u-s-leadership-on-clean-energy-technologies/>.

<sup>2</sup> The ENERGY STAR Residential New Construction Program's core pillars are energy efficiency, quality, performance and comfort. ENERGY STAR Residential New Construction Program Roadmap Framework Document for Stakeholder Feedback 2 (October 18, 2021), <https://www.energystar.gov/sites/default/files/asset/document/ENERGY%20STAR%20Residential%20New%20Construction%20Program%20Roadmap.pdf>.



SFNH and MFNC. For American households, electrification is the new efficiency. There is no reason to delay the adoption of electrification as the gold standard for efficient new homes.

We urge EPA to adopt this standard nationally. Allowing some (or all) of the country to meet ENERGY STAR standards with dirty, inefficient methane-gas appliances will only incentivize the continued build-out of fossil-fuel infrastructure at a time when EPA should be promoting a transition away from fossil fuels and towards efficient, healthful, clean electrified residential new construction.

### **Recommendation I: Electrification is Essential to Meeting ENERGY STAR’s Efficiency and Pollution Goals**

The ENERGY STAR program’s statutory mandate is to “reduce energy consumption, improve energy security, and reduce pollution.”<sup>3</sup> For decades, efficiency has been the program’s touchstone. Today, to continue maximizing efficiency requires electrification. EPA has elsewhere recognized this essential fact.<sup>4</sup> The ENERGY STAR standards for residential new construction must reflect that electrification is the most efficient way for households to reduce energy consumption, improve energy security, and reduce pollution.

The benefits of electrification are particularly stark when it comes to heating our homes and the water we use in them. Simply put, methane gas-fired appliances cannot compete with efficient electric appliances. For example, the most efficient air source heat pump currently on the market is over four times more efficient than the most efficient condensing gas furnace.<sup>5</sup> That is because

<sup>3</sup> 49 U.S.C. § 6294a(a); *see also id.* § 6294a(c)(1) (describing EPA and DOE’s duties to promote technologies to achieve energy efficiency and reduce pollution).

<sup>4</sup> U.S. EPA, Understanding and Choosing Metrics for Building Performance Standards and Zero-Carbon Recognition at 12 (Draft May 14, 2021), [https://www.energystar.gov/sites/default/files/asset/document/BPS-White\\_paper\\_v14May2021.pdf](https://www.energystar.gov/sites/default/files/asset/document/BPS-White_paper_v14May2021.pdf). This is true whether homes are compared by site or source efficiency. *See id.*

<sup>5</sup> The most efficient furnaces recognized in 2021 by ENERGY STAR Most Efficient 2021 — Furnaces, [https://www.energystar.gov/products/most\\_efficient/furnaces](https://www.energystar.gov/products/most_efficient/furnaces). The most efficient air source heat pump recognized in 2021 achieved a Heating Seasonal Performance Factor (HSPF) of 14.2. *See* ENERGY STAR Most Efficient 2021— Central Air Conditioners and Air Source Heat Pumps, [https://www.energystar.gov/products/most\\_efficient/central\\_air\\_conditioners\\_and\\_air\\_source\\_heat\\_pumps](https://www.energystar.gov/products/most_efficient/central_air_conditioners_and_air_source_heat_pumps). As explained in prior comments, HSPF is expressed in units of Btu of heat output per Watt hour of energy consumption, and can be converted to a unitless average heating season Coefficient of Performance (COP) by dividing by 3.412. This gives a heating season COP of 4.16 for the best air source heat pumps, which is 4.2 times more efficient than a 98.7% AFUE furnace. *See* Letter from RMI et al. to Ann Bailey, Director, ENERGY STAR Product Labeling (Aug. 19, 2021), <https://www.energystar.gov/sites/default/files/2022%20Energy%20Star%20Most%20Efficient%20Comments%20-%20RMI%20NRDC%20Rewiring%20America%20BlocPower%20Earthjustice%20Sierra%20Club.pdf>. Another heat pump recently available on the market achieves a HSPF of 15. *See* AHRI, Certificate of Product Ratings, Ref. No. 206330207 (Nov. 11, 2021) (certifying Innovair heat pump). A more efficient furnace is also recently available, but it achieves only 99% efficiency, *see* Energy Star, Lennox - SLP99V Variable-Capacity Gas Furnace Series : SLP99UH090XV60C-\*,



heat pumps, unlike conventional fossil fuel combustion, deliver *more* heat energy than the electrical energy that goes into them. Air source heat pumps readily available on the market today are better than 300% efficient, and ground source heat pumps can achieve even greater efficiencies. This is compared to conventional fossil-fuel combustion that tops out at approximately 97% efficiency.<sup>6</sup> ENERGY STAR-certified heat-pump water heaters boast Uniform Energy Factors of 3.45--three or four times more efficient than gas-fired water heaters.<sup>7</sup>

ENERGY STAR's criteria for Most Efficient products demonstrate EPA's recognition that electric appliances are more energy efficient than gas-fired appliances. In response to comments from, among others, these groups, EPA removed gas-fired appliances from its Most Efficient standards.<sup>8</sup> EPA was right to limit the Most Efficient category to electric appliances. As it updates SFNH and MFNC standards, it should again limit the ENERGY STAR label to the most efficient options available for residential new construction.

Cost-wise, all-electric new construction is already the most affordable choice for the vast majority of American households since it avoids the capital cost of gas infrastructure.<sup>9</sup> On an operational basis, this is especially true when electrification is paired with building envelope improvements. Analysis by Rewiring America, among others, has shown that heat pump water heaters and/or heat pumps for space heating or cooling can reduce monthly energy bills for over 85 percent of American households, including 45.6 million low- and moderate-income households.<sup>10</sup> Lastly, by requiring electrification in SFNH 3.2 and MFNC 1.2, ENERGY STAR would also help drive down costs for all American households by spurring greater market demand and lowering the cost of electric appliances for everyone.<sup>11</sup>

As we have noted before, gas-fired appliances are a major contributor to climate-destabilizing and health-harming pollution. Nationwide, residential and commercial gas combustion directly emitted 460 million metric tons of CO<sub>2</sub>e climate pollution in 2018; including the associated upstream methane leakage could double this figure.<sup>12</sup> More efficient gas appliances may

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<https://www.energystar.gov/productfinder/product/certified-furnaces/details/2357822>, meaning that the most efficient heat pump is still more than 4 times (4.4 times) more efficient.

<sup>6</sup> Peter Alstone, Evan Mills, Jerome Carman & Alejandro Cervantes, *Toward Carbon-Free Hot Water and Industrial Heat with Efficient and Flexible Heat Pumps* 7 (Aug. 2021), <http://schatzcenter.org/pubs/2021-heatpumps-R1.pdf>.

<sup>7</sup> See Energy Star, Certified Water Heaters, <https://www.energystar.gov/productfinder/product/certified-water-heaters/results>.

<sup>8</sup> See Letter from Ann Bailey, Director, Energy Star Product Labeling, to Energy Star Partners and Stakeholders (Sept. 28, 2021), [https://www.energystar.gov/sites/default/files/ENERGY%20STAR%20Most%20Efficient%202022%20Final%20Criteria%20Memo\\_0.pdf](https://www.energystar.gov/sites/default/files/ENERGY%20STAR%20Most%20Efficient%202022%20Final%20Criteria%20Memo_0.pdf).

<sup>9</sup> RMI, *The New Economics of Electrifying Buildings* (2020), <https://rmi.org/insight/the-new-economics-of-electrifying-buildings/>.

<sup>10</sup> Rewiring America, *Bringing Infrastructure Home: A 50-State Report on U.S. Home Electrification* (July 2021), <https://www.rewiringamerica.org/policy/bringing-infrastructure-home-report>.

<sup>11</sup> See *id.* at 7.

<sup>12</sup> RMI, *The Impact of Fossil Fuels in Buildings: A Fact Base* 7 (Dec. 2019), <https://rmi.org/insight/the-impact-of-fossil-fuels-in-buildings/>.



incrementally reduce this pollution, but they cannot eliminate the inherent climate and health impacts of burning fossil fuels in our homes and buildings.<sup>13</sup> Indeed, numerous studies have highlighted the danger to indoor air quality from gas stoves.<sup>14</sup> Notably, gas stove use in homes increases the risk of childhood asthma by 42 percent.<sup>15</sup> Furthermore, using electric heat pumps instead of gas furnaces and water heaters significantly reduces lifetime climate emissions in every U.S. region, even after accounting for upstream emissions from electricity generation.<sup>16</sup> The only path to zero-emissions homes is electrification. We urge EPA to consider adopting electric-only standards for SFNH 3.2 and MFNC 1.2.

We also urge EPA to require adherence to such an electric-only standard nationwide. Allowing some of the country to meet ENERGY STAR standards with continued fossil-fuel use in new construction will only serve to incentivize builders in those states to continue building homes that rely on fossil fuels. For all the reasons discussed above, the ENERGY STAR certification should be promoting the transition to electrified homes, not encouraging further build-out of gas infrastructure that may become obsolete in the near future.<sup>17</sup> Additionally, allowing part of the country to meet ENERGY STAR standards with continued methane-gas use while the rest of the country embraces the transition to electrification risks creating or exacerbating inequities across regional lines.<sup>18</sup> A national, electric-only standard is the best way to meet ENERGY STAR's goals.

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<sup>13</sup> Even if gas appliances were as efficient as electric—which they can never be—they would still prevent a transition to an emissions-free future. Claims that zero-emitting pipeline fuels, like green hydrogen, will ever be widely available for use in buildings are highly speculative, and many analyses indicate this approach will be prohibitively expensive. *See, e.g.*, California Energy Commission, *The Challenge of Retail Gas in California's Low-Carbon Future* iii (Apr. 2020) (finding that “building electrification is likely to be a lower-cost, lower-risk long-term strategy compared to renewable natural gas (RNG, defined as biomethane, hydrogen and synthetic natural gas, methane produced by combining hydrogen and carbon)”), <https://www.energy.ca.gov/sites/default/files/2021-06/CEC-500-2019-055-F.pdf>; David Roberts, *The False Promise of “Renewable Natural Gas”*, Vox (Feb. 20, 2020) (collecting sources), <https://www.vox.com/energy-and-environment/2020/2/14/21131109/california-natural-gas-renewable-socialgas>.

<sup>14</sup> RMI, *Gas Stoves: Health and Air Quality Impacts and Solutions* (2020), <https://rmi.org/insight/gas-stoves-pollution-health/>.

<sup>15</sup> *See id.* at 13.

<sup>16</sup> Theresa Pistoichini, *Greenhouse Gas Emission Forecasts for Electrification of Space Heating in Residential Homes in the United States*, UC Davis Western Cooling Efficiency Center, slides 21-24 (Apr. 20, 2021) (finding that electrifying residential space heating will produce “[s]ignificant emissions reductions ... in all regions,” whether or not methane and refrigerant leakage are included and regardless of the global warming potential used), <https://ucdavis.app.box.com/s/dqja4itdlh1wwicyjh6wag5yswwf97tc>; *see also* Claire McKenna, Amar Shah & Mark Silberg, RMI, *It's Time to Incentivize Residential Heat Pumps* (June 8, 2020) (“As of 2020, replacing a gas furnace with a heat pump will reduce carbon emissions in 46 of 48 states (99 percent of US households).”), <https://rmi.org/its-time-to-incentivize-residential-heat-pumps/>; Rachel Golden & Cara Bottonoff, Sierra Club, *New Analysis: Heat Pumps Slow Climate Change in Every Corner of the Country* (Apr. 23, 2020), <https://www.sierraclub.org/articles/2020/04/new-analysis-heat-pumps-slow-climate-change-every-corner-country>.

<sup>17</sup> *See, e.g.*, Sherri Billimoria, Leia Guccione, Mike Henchen & Leah Louis-Prescott, RMI, *The Economics of Electrifying Buildings* 52 (2018), [https://rmi.org/wp-content/uploads/2018/06/RMI\\_Economics\\_of\\_Electrifying\\_Buildings\\_2018.pdf](https://rmi.org/wp-content/uploads/2018/06/RMI_Economics_of_Electrifying_Buildings_2018.pdf).

<sup>18</sup> Not only will continued fossil-fuel construction saddle those households with less-efficient and less-healthful appliances, but it also imposes a significant risk that these households will bear the costs of gas-distribution infrastructure that becomes stranded in an electrified future. *See id.*



## **Recommendation II. Baseline Improvements to ENERGY STAR Residential New Construction Standards**

If the ENERGY STAR Residential New Construction standards do not require full electrification, the standards should nevertheless be strengthened relative to the proposed SFNH 3.2 and MFNC 1.2. Specifically, the proposed standards do not require that water heating equipment meet ENERGY STAR standards. But as the Framework document itself recognizes,

*ENERGY STAR certified heat pump water heaters (HPWHs), also commonly referred to as hybrid electric water heaters, are more than twice as efficient as the most efficient gas water heaters and use 70% less electricity to make the same hot water as a standard electric model.<sup>19</sup>*

We know of no reason--and the Framework provides none--why SFNH 3.2 and MFNC 1.2 should not require ENERGY STAR-certified heat pump water heaters. As EPA recognizes, such water heaters are far more efficient than gas- or conventional-electric heat pumps.

Finally, if SFNH 3.2 and MFNC 1.2 are adopted without excluding fossil fuels, we encourage EPA to promptly revisit those standards and adopt fully electric standards.

## **Recommendation III. Suggested Modifications to Proposed Electrification Certification**

While we urge the adoption of electric standards for SFNH and MFNC versions 3.2 and 1.2, we nevertheless commend EPA for introducing a new electric-specific certification. As discussed above, electrification is the best way for American homes to reduce their energy consumption and greenhouse gas emissions. The proposed electrification certification could be improved, however, as detailed below.

We encourage EPA to reconsider the exemption for non-dwelling spaces in multifamily buildings. Multifamily buildings should not have high-efficiency, zero-emission heat pumps providing space heating to the dwelling units while inefficient, expensive, emission-generating gas furnaces provide space heating to the non-dwelling spaces. To earn EPA's electrification certification, a multifamily building should be *fully electrified*. New electric construction should not be burdened by the unnecessary cost of installing gas service lines, nor reliant in any part on that outmoded technology.

With regard to water heating, EPA should maintain its proposed requirement that all new construction install connected heat pump water heaters to qualify for the electrification certification. Heat pump water heaters are three to four times more efficient than conventional electric water heaters, and connected heat pump water heaters can provide valuable grid services,

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<sup>19</sup> Framework at 38.



such as the integration of renewable energy.<sup>20</sup> As EPA recognizes, these products are available now, and would save residents thousands of dollars over the products' lifespans.<sup>21</sup> Further, we support EPA's decision to require minimum tank sizes sufficient to ensure that heat pump water heaters serve as the primary source of water heating.

#### **Recommendation IV. Clarify that New Construction Includes Substantial Rehabilitations and Deep Energy Retrofits**

The proposed revised SFNH and MFNC standards do not specify whether substantial rehabilitations and deep energy retrofits are eligible for the programs. In earlier versions, the Energy Star New Construction program has included substantial rehabilitations if the resulting building is able to meet all program requirements.<sup>22</sup> We recommend that EPA clarify that the new standards continue to include substantial rehabilitation (i.e., unoccupied gut rehabs). Moreover, the definition of substantial rehabilitation should be expanded to allow for deep-energy retrofits--that is, buildings that are insulated and air sealed from the exterior to achieve deep savings and can remain occupied during construction--so long as the retrofitted building is able to meet all program requirements.

Given the urgent need to decarbonize existing housing in the US, especially low-income housing, owners and builders should be encouraged to renovate these buildings to ambitious ENERGY STAR SFNH and MFNC standards, when feasible. Furthermore, allowing for deep energy retrofits means less disruption for residents during construction, which is especially important for low-income tenants. Including deep energy retrofits is consistent with goals of other building-efficiency programs, including the DOE's Advanced Building Construction (ABC) Initiative.<sup>23</sup> Furthermore, the embodied carbon impact of redeveloping an existing structure is 50% to 75% lower than the impact of constructing a new building.<sup>24</sup> Such retrofits should be encouraged through ENERGY STAR SFNH and MFNC.

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ENERGY STAR's revisions to the Residential New Construction standards present an opportunity to advance the Biden Administration's decarbonization agenda. The best way to decarbonize American homes, save American households money, reduce emissions, and reduce energy consumption is to electrify American homes. We commend EPA for adopting a new

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<sup>20</sup> See Pierre Delforge & Ben Larson, *HPWH Demand Flexibility Study Preliminary Results*, <https://www.aceee.org/sites/default/files/pdf/conferences/hwf/2018/2a-delforge.pdf>.

<sup>21</sup> See Energy Star, Certified Water Heaters, <https://www.energystar.gov/productfinder/product/certified-water-heaters/details/2358806>.

<sup>22</sup> ENERGY STAR, Residential New Construction Program Requirements, [https://www.energystar.gov/partner\\_resources/residential\\_new/program\\_reqs/mfhr/program](https://www.energystar.gov/partner_resources/residential_new/program_reqs/mfhr/program).

<sup>23</sup> U.S. Dep't of Energy, Advanced Building Construction Initiative, <https://www.energy.gov/eere/buildings/advanced-building-construction-initiative>.

<sup>24</sup> RMI, *Reducing Embodied Carbon in Buildings: Low-Cost, High-Value Opportunities* (Jul. 2021).



certification program intended to recognize fully electrified homes. But we also encourage EPA to reconsider its decision to adopt new SFNH and MFNC standards that allow for inefficient, costly, and dirty fossil-fuel fired appliances. Instead, in all cases and in every state, a home should qualify for an ENERGY STAR certification if its construction reflects the cleanest, most efficient appliances and building standards available. For both single-family and multifamily homes, electrification meets that requirement, especially when paired with greater insulation and building envelope practices, providing a safe, healthy, and comfortable home environment for residents while simultaneously providing cost savings for millions of American families.

Thank you for considering these comments.

Sincerely,

Anne McKibbin, Principal Director - Policy  
Elevate

Nate Kinsey, Policy Advisor  
Evergreen Action

Bill Nowak, Executive Director  
NY-GEO (Geothermal Energy Organization)

Rachael Grace, Director of Strategic Policy Initiatives  
Gabriel Daly  
Rewiring America

Mark Kresowik, Federal Policy Manager  
RMI



# ENERGY STAR Residential New Construction Roadmap Comments

**Organization Name:** EPX

**Respondent Last Name:** Technical Committee

**Respondent First Name:** [Add first name]

**Comments:**

## National Transition to SFNH v3.1/MFNC v1.1

Will the proposed date of January 1, 2023 (based on permit date) provide partners with sufficient time to prepare for the transition to SFNH Version 3.1 and MFNC Version 1.1?

YES

Do you have additional general feedback on this topic?

Many builders are getting a small incentive payment now for ENERGY STAR, but have not really had to change their construction practice to get it. With costs continuing to drive decisions, when SFNHv3.1 increases cost, builders will drop.

## Introduction of National SFNH Version 3.2 and MFNC Version 1.2 Program Requirements

Are there any available data or analyses to indicate that EPA's proposed SFNH Version 3.2 and MFNC Version 1.2 program requirements are not warranted or that the proposed efficiency levels are not achievable or cost-effective?

We have not done any of this analysis because the software does not have a 3.2 reference home yet. Based off what is proposed vs the 2021 IECC, we don't anticipate huge issues.

Is the proposed more stringent thermal backstop for SFNH Version 3.2 and MFNC Version 1.2, aligned with the 2021 IECC, appropriate and achievable?

Yes, it is. There is some concern that states could amend this table (some more heavily than others) but still call their code the 2021 IECC. Then, the backstop may be higher unless there is a protocol in place for how to handle amended codes, especially heavily amended ones. A great example of this is IN, they adopted the "2018 IECC" but amended the insulation table all the way back down to the 2009 IECC levels. This then makes ENERGY STAR a bigger jump from a state code built home in IN than in IL who didn't amend the insulation table.

For SFNH Version 3.2, is the proposed more stringent alternative backstop for homes with low infiltration, defined as  $\leq 115\%$  of the total UA resulting from the U-factors in the 2021 IECC, appropriate and achievable? Should this alternative backstop be restructured to better target the types of homes most likely to use it (e.g., homes with ducts in an unvented attic)?

We don't see any issues with this.

Should EPA maintain its previous policy of requiring that the new version of the program be used to certify homes and apartments permitted one year after the date of implementation of the state's new code for the proposed SFNH Version 3.2 and MFNC Version 1.2 program requirements?

1 year is plenty of time to get clients up to speed.

In the new MFNC Reference Design, EPA is proposing to include a 1.2 EF water heater. This efficiency level falls between what is available for electric tank products and heat pump products and was selected to require apartments with electric





# ENERGY STAR Residential New Construction Roadmap Comments

water heating to install heat pump water heaters when using the Prescriptive Path, while not making it prohibitively difficult to achieve the ERI target for those using the ERI Path. Is this an appropriate level of water heater efficiency for EPA to include in the proposed new MFNC Reference Design?

We think this is fine considering most Heat Pump WH are in the 3's. However, we recommend this be listed as a UEF minimum considering that is what everything is now labeled with and is what the current testing standard is based off of.

Do you have additional general feedback on this topic?

It makes sense to update the ENERGY STAR requirements for the new code considering the efficiency jump. Without the update, there would be very minimal energy savings between a base code home and an ENERGY STAR home.

## **Introduction of New Certification Label to Accelerate Construction of Next Generation of Homes & Apts. Energy Efficiency Prerequisite**

Are EPA's proposed energy efficiency requirements at an appropriate level for the new certification?

Requiring that a project meet 3.2 to engage in this new program will add a second level of difficulty for builders working in states that have not adopted the 2021 IECC.

## **ENERGY STAR Certified Connected Heat Pumps**

EPA is proposing that all installed heat pumps must use the HVAC Grading Track and achieve Grade I for all elements. Is mandatory HVAC grading and achieving Grade I in homes an appropriate requirement for the new certification?

This is difficult to address because this is currently a new process for most rating firms and there hasn't been a large number of homes that have undergone HVAC Grading. Does EPA have information on number of projects that have taken the HVAC Grading track for SFNH or MFNC?

EPA is proposing that all installed heat pumps must meet EPA's 'connected' criteria or use an ENERGY STAR smart thermostat. Are these connected options appropriate requirements?

Smart thermostats have been difficult to implement in new construction and high performance homes. While we have no direct proof of this, experience leads us to believe that the logic within smart thermostats works best in older homes or in homes with oversized HVAC equipment that can experience large temperature shifts throughout the day. In modern higher performance homes that maintain closer to a steady state through a better envelope and properly sized equipment intended to run longer and more frequently, smart thermostats can lead to large comfort issues. Many homeowners have been wary to enroll in demand management programs involving their HVAC equipment. Smart thermostats that work better with newer homes and can help customers prioritize their needs are vital.

EPA is not proposing to include space conditioning or connected requirements for non-dwelling unit spaces in multifamily buildings. Is this an appropriate and advisable exemption?

Common spaces that fall under commercial code requirements for economizers will be able to more cost effectively heat and cool the spaces without the use of smart or connected equipment. If units are utilizing all heat pump equipment it will be cost effective for the common space to utilize similar equipment and an additional requirement will not be necessary.

## **ENERGY STAR Certified Heat Pump Water Heaters**



# ENERGY STAR Residential New Construction Roadmap Comments

EPA is proposing that heat pumps installed in occupiable space have a sound rating of  $\leq 55$  dBA. Is this an appropriate threshold?

This is a reasonable requirement. Most modern HPWHs can easily achieve this requirement.

EPA is proposing that heat pump water heaters will be mandatory to earn the new certification for all types of new construction, including multifamily. Should EPA consider allowing conventional electric water heaters while the market develops new heat pump water heater solutions?

There hasn't been large market adoption of HPWHs in cold climates, having some more time as equipment improves and there is a greater understanding of their impact in cold climates would be helpful.

## Induction/Electric Cooking

EPA is proposing an exemption from the certification requirement for induction cooktops and ranges in government-subsidized affordable housing projects, where conventional electric cooktops will be allowed as an alternative. Is this allowance appropriate and advisable for affordable housing?

Conventional electric cooktops should be allowed in all housing.

Should EPA also consider allowing conventional electric cooktops in market-rate housing as an alternative to induction? Allowing conventional electric while induction equipment gains market share and comes down in price is reasonable and appropriate.

## Electric Vehicle Charging Capability

EPA is proposing to cap the number of required EV-chargers for a development at five (5). Is this an advisable limit?

As long as there are additional requirements, this is fine.

Some concern has been expressed that the addition of an EV charging circuit would require a costly upgrade to 400-amp service. EPA believes this will be a relatively rare occurrence (and may become even rarer with emerging tech solutions that could eliminate the need for upgrades). Is EPA underestimating the frequency with which this might occur, and if so, should the requirement be changed?

Not our area of expertise, but our experience has been that this only happens on the largest of homes that can better absorb the cost impact of a larger service. What will happen more frequently will be smaller homes or townhomes that a currently utilizing a 150-amp service will need to go to a 200-amp service or larger. This increase is lower in cost compared to a 400-amp service.

EPA is not proposing to relax the EV-Ready or EV-Charging requirements for government-subsidized affordable housing. Should EPA consider setting alternative EV charging infrastructure requirements (or have no EV requirements) for affordable housing?

You should not. Electric car costs are coming down and electric car ownership is closer to a reality of those at all income levels.



# ENERGY STAR Residential New Construction Roadmap Comments

**Organization Name:** Greengurus LLC

**Respondent Last Name:** Marston

**Respondent First Name:** Thomas

**Comments:**

## General

I have advocated for Energy Star since 1997 when my former business partner, Ed Minch, and I signed on as partners. We were recognized as POY for providing support for improving standards and expanding market share in Delaware where incentives did not exist. Incremental costs were reasonable and shared a burden with educating builders and partners.

This revision does not change the mandatory requirements, unless we consider Standard 310, HVAC grading. Version 3.2 is significantly changing the building costs when affordably priced housing is not prepared for this price shock. The building industry is not understanding the ability to use savings to finance the marginal price increases associated more efficient buildings. In addition, the Appraisal Industry lacks the skilled and certified appraisers who hold credentials to validate Green & Energy Efficient buildings.

V.3.2 is coming to the market because ICC has released 2021 IECC with a significant increase to the previous energy code. 2021 thermal improvements are not cost effective, and this requires Energy Star to match these burdensome costs in the Reference Design. States like Maryland that are early adopters of the IECC are looking for solutions that provide more reasonable costs while maintaining equivalent energy performance solutions.

I have included an analysis of DOE's single-family model, comparing 2021 IECC to alternative paths and highlighted the difficulty for the 21' energy code to remain cost effective. This single model does permit us to understand smaller homes on slab, townhomes, and multi-family housing. Similar energy modeling should consider how to develop cost-effective solutions for these types of housing.

## National Transition to SFNH v3.1/MFNC v1.1

[Are there any available data or analyses to indicate that a national transition to SFNH Version 3.1 and MFNC Version 1.1 is not warranted at this time?](#)

I support the phasing out of v.3.0 because i have found that the marginal costs to reach v.3.1 are reasonable. Builders of mid-size and larger housing have multiple paths for compliance and can avoid the specific thermal requirements of 12', 15' or 18' IECC, which is the basis for V.3.1. Small slab-on-grade and townhomes will not have as many options if their current designs include ducts and air handlers in attic spaces. This additional cost to comply has a greater change when compared to overall costs of an affordable home than it has in market-rate homes. If efficient housing is important in all price points install measures that enable leveraging the savings to finance the additional investment.

[Will the proposed date of January 1, 2023 \(based on permit date\) provide partners with sufficient time to prepare for the transition to SFNH Version 3.1 and MFNC Version 1.1?](#)

A 12-month lead time is reasonable. And if final adoption of this change is delayed, adjust the adoption date for a minimum 12-month window. This may not be acceptable for MFNC projects where my specific knowledge with respect to timeline is limited.



# ENERGY STAR Residential New Construction Roadmap Comments

Do you have additional general feedback on this topic?

Lean into supporting the develop of the financing and Appraisal industry’s ability to recognize and facilitate justifying the economic value of owning energy efficient homes that includes 3<sup>rd</sup> party certification such as Energy Star. Current market conditions align financing costs with expected savings and prevent inflating the homeowner’s housing budget. Introduce and apply this practice while this condition exists. Expanding market share now should lower building construction costs and offset an expected rise in financing costs.

## Introduction of National SFNH Version 3.2 and MFNC Version 1.2 Program Requirements

Are there any available data or analyses to indicate that EPA’s proposed SFNH Version 3.2 and MFNC Version 1.2 program requirements are not warranted or that the proposed efficiency levels are not achievable or cost-effective?

Consider with #2

Is the proposed more stringent thermal backstop for SFNH Version 3.2 and MFNC Version 1.2, aligned with the 2021 IECC, appropriate and achievable?

*I have prepared economic modeling that considers a single house-type, 1188 square foot single-family home over a basement, known as the DOE model. This shape and size home enables builders to apply reasonable solutions to increasing energy performance when mandatory requirements of v.3.2 thermal package does not require alignment with 2021 IECC as the backstop. This modeling assumes favorable pricing to purchase and install additional insulation. With this assumption the savings to investment not fit inside the life of the 30-year mortgage. Instituting 21’ thermal performance into the model obligates builders to consider these costs as well as the more reasonable measures of moving ducts inside and improving equipment performance, which do show much better savings to investment results.*

<b>2021 Baseline + .95 UA, .38 SHGC:</b> 40% attic Ducts @ 4% LTO	<b>DOE 2018 Mod.R20 wall, R49 attic:</b> 40% attic Ducts @ 4% LTO	<b>DOE 2018 Mod.R20 wall, R49 attic:</b> Ducts inside, 1% LTO	<b>DOE 2018 Mod.R20 wall, R49 attic:</b> Ducts inside, 1% LTO, 9.2 HSPF / 16 SEER HP
<ul style="list-style-type: none"> <li>• \$1,870 annual cost.</li> <li>• UA 304.4</li> <li>• ERI 62</li> </ul> Comments: Based on DOE’s reference house, 1188 square foot, 2-	<ul style="list-style-type: none"> <li>• \$1,998 annual cost.</li> <li>• UA 337.1</li> <li>• ERI 63</li> </ul> Comments Modified DOE reference house increases operating costs \$128 or 6.8%.	<ul style="list-style-type: none"> <li>• \$1,784 annual cost.</li> <li>• UA 337.1</li> <li>• ERI 57</li> </ul> Comments Moved ducts inside, held thermal features at modified levels, thus no change in UA	<ul style="list-style-type: none"> <li>• \$1,748 annual cost.</li> <li>• UA 337.1</li> <li>• ERI 56</li> </ul> Comments: Combined ducts and HVAC equipment. Savings is 6.5% as compared to DOE baseline



# ENERGY STAR Residential New Construction Roadmap Comments

<p>sty over basement. Glass at 15% floor area.</p> <p>R408 measure UA at .95 and .38 SHGC was included, which allows comparison to all R408 Additional measures</p>	<p>Associated building costs</p> <p>Sheathing: 73 x \$50 = \$3,650</p> <p>Attic: 1188 x \$.42 = \$500</p> <p>Energy benefit: \$4,150 / \$128 = 32.42 years</p> <p>Appraisers may have to discount these features due to &gt; 30 mortgage</p>	<p>Operating costs reduced 4.6% as compared DOE baseline. Covered change from modifying thermal features.</p> <p>Energy benefit: Reduced thermal costs may offset increased framing costs to consider floor framing changes</p> <p>Appraisers and lenders can support reduced building costs that generate greater savings.</p>	<p>\$122 annual energy savings for equipment and ducts</p> <p>Energy benefit: Equipment is estimated at \$1,200 marginal cost vs. 14/8.5 heat pump.</p>
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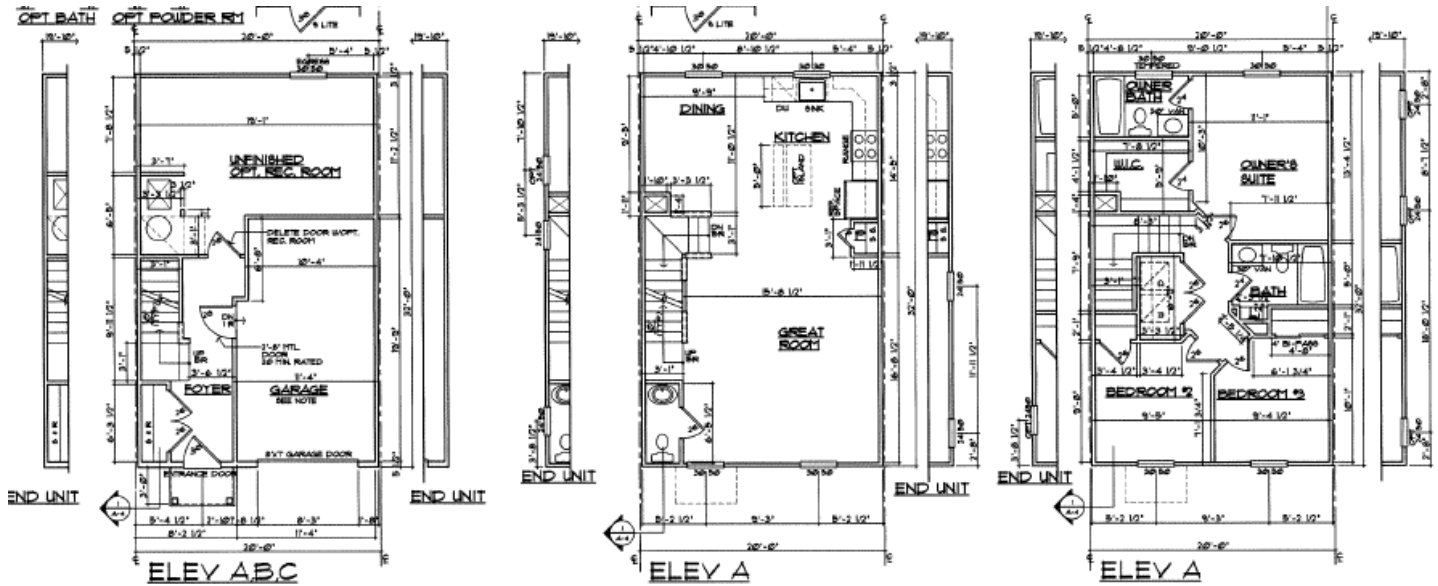
**Note:** This operating-cost analysis is for a specific single-family house type and size, 2376 square foot living space over an 1188 square foot conditioned basement. These results cannot describe single-story, slab homes and townhome performance. REM/Rate 15.8 modeling software.

*Previous versions of Energy Star aligned the thermal backstop with the code that was in place prior to the update. We used 09' as the backstop for v.3.0 & v.3.1. V.3.2 is assigning thermal backstop that is the code it aligns with. I have already shown that these thermal measures are not cost-justified when applying reasonable pricing to purchase and install. I am not optimistic that "reasonable pricing" will exist in 2023 when builders must consider continuing with Energy Star in Maryland.*

*In addition, the requirement to exceed 21' code by 10% is also forcing the Reference Design to include three of the optional measures in 21' IECC R408. The interior townhome has limited first floor footprint and will struggle to locate a hybrid electric water heater and maintain comfort in the surrounding rooms during winter. This equipment if located with the air handler will amplify background noise to unreasonable levels. Offsetting the energy requirement if standard electric units are installed will require additional thermal features and installing currently optional appliances, which are rated Energy Star.*



# ENERGY STAR Residential New Construction Roadmap Comments



Should EPA maintain its previous policy of requiring that the new version of the program be used to certify homes and apartments permitted one year after the date of implementation of the state's new code for the proposed SFNH Version 3.2 and MFNC Version 1.2 program requirements?

Maryland is considering amendments to 21' IECC, which address cost-effectiveness and ability to apply additional measures required in R408 in order to meet the overall energy performance of 2021 IECC. 12 months may not provide enough time for the building industry to evaluate the cost-effectiveness of various thermal packages. In addition, analysis of affordable housing such as townhomes and homes built on slab is not studied as thoroughly as the DOE single-family Model. As was the case in 2012, many permits were purchased prior to 2012 application date and this created a significant delay in seeing 2012 code application. I expect the same case will occur when 21' is finalized and adopted by Counties.

In the new MFNC Reference Design, EPA is proposing to include a 1.2 EF water heater. This efficiency level falls between what is available for electric tank products and heat pump products and was selected to require apartments with electric water heating to install heat pump water heaters when using the Prescriptive Path, while not making it prohibitively difficult to achieve the ERI target for those using the ERI Path. Is this an appropriate level of water heater efficiency for EPA to include in the proposed new MFNC Reference Design?

As is the case with townhomes and slab housing, electrically heated housing will struggle with the current technology for highly efficient water heating equipment. Energy Star has previously recognized equipment that shows an ability to resolve capturing btu's from the ambient space that is part of active interior space. This technology should be pursued for small building applications and rolled out to builders like the rollout of Thermal Enclosure Checklist.

## Introduction of New Certification Label to Accelerate Construction of Next Generation of Homes & Apts.

### General

Do you have general feedback on this topic?

I suspect this will compete with DOE ZER program. If it is introduced, it must include financial solutions that allow building owners to use energy savings to offset added financing. In addition, these measures reduce carbon purchase, which is a benefit to society. Society should support the building owner's commitment to carbon reduction.



## ENERGY STAR Certified Connected Heat Pumps

EPA is proposing that all installed heat pumps must use the HVAC Grading Track and achieve Grade I for all elements. Is mandatory HVAC grading and achieving Grade I in homes an appropriate requirement for the new certification?

We have found that this standard has a steep learning curve. We are determining how to measure and record the field data, which requires interaction between installer and Rater when we use the non-invasive refrigerant check. We are also learning that modeling software is not creating the same Index/HERS improvement as was advertised. Mandating this requirement may have the same results as version 7 had with the Rater and HVAC industry. This process should remain optional until a significant group of experts show proficiency and modeling results are more predictable.

## ENERGY STAR Certified Heat Pump Water Heaters

EPA is proposing minimum tank size requirements to help ensure that the heat pump is used as the primary water heating source, rather than the electric resistance backup coil. Is this advisable, and are the proposed tank sizes appropriate?

I feel this should be a recommendation to the builder. I see some alignment to family size and expected high demand for hot water when this is a consumer option. Although the examples are limited in my market. Homeowners will modify the system by switching it to "least efficient" mode when it's operation influences comfort and hot water output. This may have less to do with tank size and more a part of where it is located in the building.

EPA is proposing that heat pumps installed in occupiable space have a sound rating of  $\leq 55$  dBA. Is this an appropriate threshold?

If an unfinished basement is provided an exception, then the equipment will become a noise complaint when the active living zone moves to the basement. Enable the marketplace and industry to...

I feel this issue should be addressed through the marketplace and not a mandate.

In all cases where I see HPWH they are in basements and away from the active living spaces of the home. In my case of an existing home, we renovated a basement around the existing water heater and then upgraded to AO Smith HPWH. I am not sure if I would have considered the noise level. I know I considered the ambient temperature issue. And for that reason, I believe it is a mistake for EPA to align the ERI path to HPWH in all v.3.2 sfh and townhomes. If you are concerned about the noise, have much more concern for temperature around these units in winter.

EPA is proposing that heat pump water heaters will be mandatory to earn the new certification for all types of new construction, including multifamily. Should EPA consider allowing conventional electric water heaters while the market develops new heat pump water heater solutions?

I am hearing builders refuse to install this product because of significant service issues in previously built homes. Other builders are reversing their use due to customer comfort and operation complaints. My own experience shows that my living zone near the mechanical closet is chilly in winter. I now supply conditioned air to the room to offset this experience. Mandatory adoption in all buildings will create negative experiences that will amplify through early adopters and create resistance to adoption by the core market. I suspect this will follow the path of "The Heat Pump" when it was rolled out in the 80's. Even today's better equipment cannot overcome the negative experience of consumers.

## Induction/Electric Cooking



# ENERGY STAR Residential New Construction Roadmap Comments

EPA is proposing an exemption from the certification requirement for induction cooktops and ranges in government-subsidized affordable housing projects, where conventional electric cooktops will be allowed as an alternative. Is this allowance appropriate and advisable for affordable housing?

New products like induction cooking forced on low- and moderate-income homebuyers is unfair to the family that must replace existing cooking equipment. A more favorable path is to demonstrate, educate and offer this product an option. If I decided to upgrade my home and became informed of the costs and burdens to apply and would build positive experiences about this cooking equipment. "Justify my decision based on emotional facts".

Should EPA also consider allowing conventional electric cooktops in market-rate housing as an alternative to induction?

Yes. For the reasons stated above.

## Electric Vehicle Charging Capability

Are EPA's proposed requirements for private EV-Ready spaces and/or installed EV chargers and EV-Capable parking spaces appropriate?

I do not see builders in my market pursuing this feature. Government is mandating it in some cases and the early adopter new home buyer is requesting the feature. Allow this measure to appear in communities that promote multiple layers of green features. Allows builders to hear buyers to ask for the feature and create sub-neighborhoods that have EV charging equipment designated lots

EPA is proposing to cap the number of required EV-chargers for a development at five (5). Is this an advisable limit?

Follow the marketplace and support early adopter builders

EPA is not proposing to relax the EV-Ready or EV-Charging requirements for government-subsidized affordable housing. Should EPA consider setting alternative EV charging infrastructure requirements (or have no EV requirements) for affordable housing?

Offer carrots rather than wave sticks at the developer. We do not know how subsidized housing will accept electric vehicles. My first examples seen by developers includes shared vehicles parked at the community center and charged from community solar





# ENERGY STAR Residential New Construction Roadmap Comments

**Organization Name:** Home Ventilating Institute

**Respondent Last Name:** Donner

**Respondent First Name:** Jacki

**Comments:**

## General

### Home Ventilating Institute General Comments on Energy Star Single Family New Homes V3.2

As Energy Star Single Family New Homes considers updates to their specifications for inclusion in V3.2 of the program, there are several opportunities to improve indoor air quality through ventilation rates, as well as removing barriers to the most efficient balanced ventilation options available. These update opportunities are currently found in the National HVAC Design Report, and the National Rater Field Checklist. While updating the requirements and stringency of the specification, it is important to also improve the language currently in place for whole-house and dwelling unit ventilation systems.

Energy Star Single Family New Homes program is the primary avenue by which ASHRAE 62.2 rates are introduced in new homes across the country. With over 120,000 new certified homes in 2020,<sup>1</sup> Energy Star far surpasses the number of homes in the few jurisdictions that require 62.2 ventilation rates. As the leading voluntary program in ventilation rates, Energy Star has an opportunity during its V3.2 update to reference up-to-date guidance on minimum ventilation rates in ASHRAE standards, while also eliminating existing barriers in program documents that hinder the use of Heat Recovery Ventilators (HRVs) and Energy Recovery Ventilators (ERVs) from use in certified homes.

Residential ventilation rates in the US are lower than requirements in most European countries, even when referencing the 2019 version of ASHRAE 62.2.<sup>2</sup> For Energy Star to maintain its leadership position establishing minimum ventilation rates for energy efficient homes, the program should, at a minimum, reference ASHRAE 62.2-2019, and could even consider enhanced ventilation rates beyond minimum requirements.

Our comments recommend updating to the ASHRAE 62.2 2016 or 2019 ventilation rates for design purposes, and also updating all ASHRAE 62.2 definition references to the 2019 version of the standard. In addition, we recommend adding exceptions to the Sone rating requirement that currently prevents the use of HRVs and ERVs in Energy Star homes. Finally, there are several items related to ventilation terminations that could be improved to better align with current codes, standards, and best practices.

### HVI Comments on Energy Star Single Family New Homes National HVAC Design Report

Section 2.1 Ventilation airflow design rate & run-time meet the requirements of ASHRAE 62.2-2010, 2013, or 2016 or 2019. *ASHRAE 62.2-2019 Rationale: As the leading avenue for 62.2 rates in the country, Energy Star has the important opportunity to ensure that energy efficient homes in the U.S. include the most comprehensive ventilation approach possible. The National HVAC Design Report continues to reference older versions of ASHRAE 62.2 including 8-year-old and 11-year-old*

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<sup>1</sup>[https://www.energystar.gov/about/origins\\_mission/energy\\_star\\_overview/about\\_energy\\_star\\_residential\\_sector#:~:text=Today%2C%20the%20nation's%20twenty%20largest,than%20120%2C000%20in%202020%20alone.](https://www.energystar.gov/about/origins_mission/energy_star_overview/about_energy_star_residential_sector#:~:text=Today%2C%20the%20nation's%20twenty%20largest,than%20120%2C000%20in%202020%20alone.)

<sup>2</sup> Brelih, N. and Seppänen, O. 2011. Ventilation rates and IAQ in European standards and national regulations. Proceedings of the 32nd AIVC Conference and 1st TightVent Conference in Brussels, Belgium.



# ENERGY STAR Residential New Construction Roadmap Comments

editions while newer more comprehensive standards exist. In addition to improved ventilation rates, more up to date versions of the standard also include a more comprehensive analysis, adjusting rates based on filtration, infiltration, and whether or not the system is balanced. As other above-code programs, including EPA's Indoor airPLUS program, obtain their ventilation requirements through Energy Star's reference of ASHRAE 62.2, it is important that Energy Star references an up-to-date version of the standard. Ideally, the 2019 version of the standard would be the point of reference throughout the document. Allowing either the 2016 or 2019 standards would provide some flexibility, and would also be acceptable. At a minimum, allowing 2019 as an option seems necessary although HVI still strongly recommends against continuing to reference the 2013 and 2010 versions of the standard, which have now been superseded by multiple versions of the standard.

Footnote 1: Update reference to ASHRAE 62.2-2016 / 2019, for example "This report is designed to meet ASHRAE 62.2-2010 / 2013 / 2016/2019 and..." OR "...ASHRAE 62.2-2016 or -2019..."

*Rationale: See ASHRAE 62.2-2019 Rationale Above*

Footnote 9: Update reference to ASHRAE 62.2 2016 / 2019. For example: "Airflow design rates and run-times shall be determined using ASHRAE 62.2-2019-2010 or later. Designers are permitted, but not required, to use published addenda and/or the 2013 or 2016 version of the standard to assess compliance. ..." OR "...ASHRAE 62.2-2016 or -2019..."

*Rationale: See ASHRAE 62.2-2019 Rationale Above*

Footnote 11: Update reference to ASHRAE 62.2-2019. For example, "...Per ASHRAE 62.2-2010 2019, habitable spaces..." OR "...ASHRAE 62.2-2016 or -2019..."

*Rationale: See ASHRAE 62.2-2019 Rationale Above. Text in definition of habitable space stays the same, but now points to the most up to date standard.*

## **HVI Comments on Energy Star Single Family New Homes National Rater Field Checklist**

### New Section 7.8

7.8 Dwelling Unit Ventilation Systems shall be tested and listed according to HVI 916 or 920, as applicable depending on system type.

*Rationale: HVI maintains the primary certification program for flow rates of residential and light commercial ventilation equipment including bathroom exhaust fans, inline fans, kitchen range hoods, and Heat & Energy Recovery Ventilators ("Fans"). Fans certified according to HVI Publication 916 or 920 have gone through rigorous testing based on industry-approved consensus standards and their performance is verified on an annual basis. HVI 916 and HVI 920 use consensus test standards ASHRAE 51 / AMCA 210 and CSA C439. Fans not listed in the HVI Certified Products Directory (CPD)<sup>3</sup> lack the assurance that they have been tested and certified by an independent ISO-accredited laboratory and Certification Body to perform according to their advertised flow rates. For this reason, builders and designers selecting fans can better rely on HVI certified products to ensure they will meet the required flow rates. Depending on the type of system, a fan may have been tested according to HVI 916 or HVI 920, so both references are necessary.*

Section 7.4 and Footnote 51:

<sup>3</sup> <https://www.hvi.org/hvi-certified-products-directory/>



# ENERGY STAR Residential New Construction Roadmap Comments

7.4 System fan, other than ducted Heat or Energy Recovery Ventilators and remote-mounted fans, rated  $\leq 3$  sones if intermittent and  $\leq 1$  sone if continuous, or exempted.

Footnote 51: Dwelling Unit Mechanical Ventilation System fans shall be rated for sound at no less than the airflow rate in Item 2.3 of the National HVAC Design Report. Fans exempted from this requirement include HVAC air handler fans, remote-mounted fans, ducted Heat or Energy Recovery Ventilators and intermittent fans rated  $\geq 400$ CFM. To be considered for this exemption, a remote-mounted fan must be mounted outside the habitable spaces, bathrooms, toilets, and hallways and there shall be  $\geq 4$  ft. of ductwork between the fan and intake-ventilation grille. Per ASHRAE 62.2-~~2010~~2019, habitable spaces are intended for continual human occupancy; such space generally includes areas used for living, sleeping, dining, and cooking but does not generally include bathrooms, toilets, hallways, storage areas, closets, or utility rooms.

*HRV/ERV Exemption Rationale: HRVs and ERVs are not currently tested and rated for sound levels. The same is true for many remote mounted fans, such as in-line supply fans. Although some systems may be exempted from this requirement due to location exemptions in Footnote 51, we request that Energy Star explicitly state that these systems are exempt. With the current language there is a barrier where the most efficient balanced ventilation systems (HRVs and ERVs) could technically be prohibited from acting as the whole-house or dwelling unit ventilation system in an Energy Star Home because the fans do not receive a Sone rating. If not actually prohibited, installers of these systems will have to pay close attention to location requirements to figure out whether or not the system is exempt. Finally, we are concerned that raters may never look past the checklist requirement to the footnote details, eliminating some HRVs or ERVs that may be exempt based on location. For builders and HVAC contractors who already may hesitate based on cost or complexity concerns of advanced ventilation systems, this will serve as a barrier to inclusion of HRVs or ERVs in Energy Star homes.*

*Consistent with our other comments, we also recommend updating the ASHRAE 62.2 reference to the 2019 version of the standard. The definition of habitable space is unchanged but this change, if accepted, should be consistent in always referencing the most recent version of the standard.*

Section 7.7.2: Inlet is  $\geq 2$  ft. above grade or roof deck;  $\geq 10$  ft. of stretched-string distance from known contamination sources not exiting the roof, and  $\geq 3$  ft. of stretched-string distance from known contamination sources ~~distance from dryer exhausts and sources~~ exiting the roof.<sup>56</sup>Exception: separation is not required between ventilation intake and exhaust where an approved factory-built intake/exhaust combination termination fitting is used to separate the air streams in accordance with the manufacturer's instructions.

Footnote 56: Known contamination sources include, but are not limited to, stacks, vents, exhausts (bathroom, kitchen, clothes dryer, etc.), and vehicles.

*Rationale: Separating exhaust terminations and supply air inlets is, in general a good idea. However, new factory-built intake/exhaust combination termination fittings provide a solution for locating both inlet and exhaust terminations together while maintaining separation between the streams. Similar exceptions are located in both ASHRAE 62.2-2019 and the 2021 International Mechanical Code, Section 401.4.*

Section 7.7.3: Inlet is provided with rodent / insect screen with 0.375 inch  $<$  mesh  $\leq$  0.5 inch mesh.



# ENERGY STAR Residential New Construction Roadmap Comments

*Rationale: If mesh coverings have openings that are too small, blockage can quickly occur, obstructing fresh air intake. For this reason, we recommend a range of 0.375 inches up to 0.5 inches for mesh openings, rather than only a maximum. HVI recently provided public comment to the California Energy Commission citing research supporting limiting minimum mesh screening openings.<sup>4</sup>*

Footnote 31: Update ASHRAE 62.2 reference to 2016 / 2019, for example “This report is designed to meet ASHRAE 62.2-~~2010 / 2013 / 2016~~/2019 and...” OR “...ASHRAE 62.2-2016 or -2019...”

*Rationale: Consistent with our other comments in referencing up-to-date versions of ASHRAE 62.2*

Footnote 57: Update ASHRAE 62.2 reference to 2016 / 2019. For example, “...Per ASHRAE 62.2-~~2010~~/2019, an exhaust system...” OR “...ASHRAE 62.2-2016 or -2019...”

*Rationale: The definitions in this footnote remain unchanged but a consistent reference to ASHRAE 62.2-2019 definitions should be maintained throughout.*

Footnote 60: Update ASHRAE 62.2 reference to 2016 / 2019. For example, “...Alternatively, the prescriptive duct sizing requirements in Table 5.3 of ASHRAE 62.2-~~2010 / 2013 / 2016~~-2019...” OR “...ASHRAE 62.2-2016 or -2019...”

*Rationale: Consistent with our other comments in referencing up-to-date versions of ASHRAE 62.2*

Footnote 62: Update ASHRAE 62.2 reference to 2016 / 2019. For example, “Based upon ASHRAE 62.2-~~2010~~-2019, ducted mechanical systems, ...” OR “...ASHRAE 62.2-2016 or -2019...”

*Rationale: The definitions in this footnote remain unchanged but a consistent reference to ASHRAE 62.2-2019 definitions should be maintained throughout.*

Footnote 67: Update ASHRAE 62.2 reference to 2016 / 2019. For example, “This item only applies to fireplaces located within the home’s pressure boundary. Naturally drafted fireplaces are allowed within the home’s pressure boundary if the Rater has verified that, based on fan ratings, the net rated exhaust flow of the two largest exhaust fans (excluding summer cooling fans) is  $\leq 15$  CFM per 100 sq. ft. of occupiable space when at full capacity. If the net exhaust flow exceeds the allowable limit, it shall be reduced or compensating outdoor airflow provided. Per ASHRAE 62.2-~~2010~~/2019, ~~the term~~ “net ~~rated~~ exhaust flow” is defined as the flow through an exhaust fan minus the compensating outdoor airflow through any supply fan that is interlocked to the exhaust fan. Per ASHRAE 62.2-~~2010~~/2019, the term “occupiable space” is defined...”

*Rationale: The definitions in this footnote remain unchanged except for substituting “system” for “fan” but a consistent reference to ASHRAE 62.2-2019 definitions should be maintained throughout. While the definition is substantially the same, “Net Rated Exhaust Flow” is not a defined term in ASHRAE 62.2 and this recommendation shifts to net exhaust flow.*

<sup>4</sup> <https://efiling.energy.ca.gov/GetDocument.aspx?tn=237741&DocumentContentId=70973>



# ENERGY STAR Residential New Construction Roadmap Comments

## Home Ventilating Institute General Comments on Multifamily New Construction V1.2

As Energy Star Multifamily New Construction considers updates to their specifications for inclusion in V1.2 of the program, there are several opportunities to improve indoor air quality by improving ventilation rates, as well as removing barriers to the most efficient balanced ventilation options available. These update opportunities are currently found in the National HVAC Design Report, and the National Rater Field Checklist. While updating the requirements and stringency of the specification, it is important to also improve the language currently in place for whole-house and dwelling unit ventilation systems.

Energy Star Multifamily New Construction program is the primary avenue by which ASHRAE 62.2 rates are introduced in dwelling units across the country. As the leading voluntary program in ventilation rates, Energy Star has an opportunity during its V1.2 update to reference up-to-date guidance on minimum ventilation rates in ASHRAE standards, while also eliminating existing barriers in program documents that hinder the use of Heat Recovery Ventilators (HRVs) and Energy Recovery Ventilators (ERVs) from use in certified dwelling units.

Residential ventilation rates in the US are lower than requirements in most European countries, even when referencing the 2019 version of ASHRAE 62.2.<sup>5</sup> For Energy Star to maintain its leadership position establishing minimum ventilation rates for energy efficient dwelling units, the program should, at a minimum, reference ASHRAE 62.2-2019, and could even consider enhanced ventilation rates beyond minimum requirements.

Our comments recommend updating to the ASHRAE 62.2 2016 or 2019 ventilation rates for design purposes, and also updating all ASHRAE 62.2 definition references to the 2019 version of the standard. In addition, we recommend adding exceptions to the Sone rating requirement that currently prevents the use of HRVs and ERVs in Energy Star dwelling units. Finally, there are several items related to ventilation terminations that could be improved to better align with current codes, standards, and best practices.

## HVI Comments on Energy Star Multifamily New Construction National Rater Design Review Checklist

Section 4a.3 Prescriptive Path: Dwelling Unit Mechanical Ventilation is ~~<150% of ASHRAE 62.2 2013 requirements~~ airflow design rate & run-time meet the requirements of ASHRAE 62.2 2016 or 2019.

*Rationale: In addition to our comments on the National Rater Field Checklist recommending Updating the ASHRAE 62.2 reference, it is important to remove prescriptive requirements limiting maximum ventilation rates. With a significant body of research pointing to the benefits of higher ventilation rates, as well as the relatively low ventilation rates in the U.S. compared to European countries, maximum ventilation rates run counter the purposes of a program that promotes energy efficiency and good indoor air quality. In a recent public comment to the California Energy Commission, HVI pointed to a variety of research studying the health benefits of increased ventilation rates. These studies included:*

- *Sundell et al. 1994. Sick Building Syndrome (SBS) in Office Workers and Facial Skin Symptoms among VDT-Workers in Relation to Building and Room Characteristics: Two Case-Referent Studies. Indoor Air, 4: 83-94.*
- *Milton et al. 2000. Risk of Sick Leave Associated with Outdoor Air Supply Rate, Humidification, and Occupant Complaints. Indoor Air, 10:212-221.*

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<sup>5</sup> Brelih, N. and Seppänen, O. 2011. Ventilation rates and IAQ in European standards and national regulations. Proceedings of the 32nd AIVC Conference and 1st TightVent Conference in Brussels, Belgium.



# ENERGY STAR Residential New Construction Roadmap Comments

- *Bornehag, C & Sundell, Jan & Hägerhed, Linda. (2003). Asthma and allergy among children and the association to ventilation rate at home, a case control study. Epidemiology. 14. 10.1097/00001648-200309001-00224.*
  - *Seppänen, O. A., and W. Fisk. 2006. Some quantitative relations between indoor environmental quality and work performance or health. HVAC&R Research 12 (4):957–73. doi:10.1080/10789669.2006.10391446.*
  - *Lawrence Berkeley National Lab. Indoor Air Quality Scientific Findings Resource Bank. Building Ventilation*
- For these reasons we recommend against any maximum ventilation limit.*

Section 4b.2.1 Prescriptive Path: Dwelling Unit Mechanical Ventilation is ~~<150%~~ airflow design rate & run-time meet the requirements of ASHRAE 62.2 2016 or 2019.

*Rationale: See Rational for 4a.3*

Footnote 12: Delete

*Rationale: See rational for 4a.3*

## **HVI Comments on Energy Star Multifamily New Construction National Rater Field Checklist**

7.2 Rater-measured ventilation rate is within either  $\pm 15$  CFM or  $\pm 15\%$  of dwelling unit design values (2.7), and meets or exceeds rates required by ASHRAE 62.2-~~2010~~2016 or 2019.

*ASHRAE 62.2-2019 Rationale: As the leading avenue for 62.2 rates in the country, Energy Star has the important opportunity to ensure that energy efficient dwelling units in the U.S. include the most comprehensive ventilation approach possible. The National HVAC Design Report continues to reference older versions of ASHRAE 62.2 including 8-year-old and 11-year-old editions while newer more comprehensive standards exist. In addition to improved ventilation rates, more up to date versions of the standard also include a more comprehensive analysis, adjusting rates based on filtration, infiltration, and whether or not the system is balanced. As other above-code programs, including EPA's Indoor airPLUS program, obtain their ventilation requirements through Energy Star's reference of ASHRAE 62.2, it is important that Energy Star references an up-to-date version of the standard. Ideally, the 2019 version of the standard would be the point of reference throughout the document. Allowing either the 2016 or 2019 standards would provide some flexibility, and would also be acceptable. At a minimum, allowing 2019 as an option seems necessary, although HVI still strongly recommends against continuing to reference the 2013 and 2010 versions of the standard, which have now been superseded by multiple versions of the standard.*

*In addition to updating the standard for the purpose of ventilation rates, there is currently a conflict between the dwelling units within the scope of Energy Star Multifamily New Construction, and the dwelling units within the scope of the ASHRAE 62.2-2010 standard. Energy Star Multifamily New Construction covers multifamily buildings of any height. The 2016 version of ASHRAE 62.2 was the first version of the standard in which all multifamily buildings of any height were covered rather than being split with ASHRAE 62.1. For this reason, dwellings in a multifamily building certified under Energy Star Multifamily New Construction might need to use ventilation rates for ASHRAE 62.2-2010 for program certification while those units were technically covered by ASHRAE 62.1-2010. The 62.2 standard has been reworked in later versions adding language appropriate to multifamily. The 2010 version of the standard does not include this guidance.*

Section 7.3: Measured ventilation rate is within either  $\pm 15$  CFM or  $\pm 15\%$  of common space design values (2.9), and meets or exceeds rates required by ASHRAE 62.1-~~2010~~2016 or 2019.



# ENERGY STAR Residential New Construction Roadmap Comments

*Rationale: to be consistent with updated reference to ASHRAE 62.2 for dwelling units.*

New Section 7.11

7.11 Dwelling Unit Ventilation Systems shall be tested and listed according to HVI 916 or 920, as applicable depending on system type.

*Rationale: HVI maintains the primary certification program for flow rates of residential and light commercial ventilation equipment including bathroom exhaust fans, inline fans, kitchen range hoods, and Heat & Energy Recovery Ventilators ("Fans"). Fans certified according to HVI Publication 916 or 920 have gone through rigorous testing based on industry-approved consensus standards and their performance is verified on an annual basis. HVI 916 and HVI 920 use consensus test standards ASHRAE 51 / AMCA 210 and CSA C439. Fans not listed in the HVI Certified Products Directory (CPD) lack the assurance that they have been tested and certified by an independent ISO-accredited laboratory and Certification Body to perform according to their advertised flow rates. For this reason, builders and designers selecting fans can better rely on HVI certified products to ensure they will meet the required flow rates. Depending on the type of system, a fan may have been tested according to HVI 916 or HVI 920, so both references are necessary.*

Section 7.4 and Footnote 60:

7.6 If located in the dwelling unit, system fan, other than ducted Heat or Energy Recovery Ventilators and remote-mounted fans, rated  $\leq 3$  sones if intermittent,  $\leq 2$  sones if continuous, or exempted.

Footnote 60: Dwelling-unit mechanical ventilation fans shall be rated for sound at no less than the airflow rate in Item 2.7 of the National HVAC Design Report. Fans exempted from this requirement include HVAC air handler fans, remote-mounted fans, ducted Heat or Energy Recovery Ventilators and intermittent fans rated  $\geq 400$ CFM. To be considered for this exemption, a remote-mounted fan must be mounted outside the habitable spaces, bathrooms, toilets, and hallways and there shall be  $\geq 4$  ft. ductwork between the fan and ~~intake~~ ventilation grille. Per ASHRAE 62.2-~~2010~~ 2019, habitable spaces are intended for continual human occupancy; such space generally includes areas used for living, sleeping, dining, and cooking but does not generally include bathrooms, toilets, hallways, storage areas, closets, or utility rooms.

*HRV/ERV Exemption Rationale: HRVs and ERVs are not currently tested and rated for sound levels. The same is true for many remote mounted fans, such as in-line supply fans. Although some systems may be exempted from this requirement due to location exemptions in Footnote 51, we request that Energy Star explicitly state that these systems are exempt. With the current language there is a barrier where the most efficient balanced ventilation systems (HRVs and ERVs) could technically be prohibited from acting as the whole-house or dwelling unit ventilation system in an Energy Star dwelling unit because the fans do not receive a Sone rating. If not actually prohibited, installers of these systems will have to pay close attention to location requirements to figure out whether or not the system is exempt. Finally, we are concerned that raters may never look past the checklist requirement to the footnote details, eliminating some HRVs or ERVs that may be exempt based on location. For builders and HVAC contractors who already may hesitate based on cost or complexity concerns of advanced ventilation systems, this will serve as a barrier to inclusion of HRVs or ERVs in Energy Star dwelling units.*

*Consistent with our other comments, we also recommend updating the ASHRAE 62.2 reference to the 2019 version of the standard. The definition of habitable space is unchanged but this change, if accepted, should be consistent in always referencing the most recent version of the standard.*



# ENERGY STAR Residential New Construction Roadmap Comments

Section 7.10.2: Inlet(s) are  $\geq 2$  ft. above grade or roof deck;  $\geq 10$  ft. of stretched-string distance from known contamination sources not exiting the roof, and  $\geq 3$  ft. of stretched-string distance from known contamination sources ~~distance from dryer exhausts and sources~~ exiting the roof.

Exception: separation is not required between ventilation intake and exhaust where an approved factory-built intake/exhaust combination termination fitting is used to separate the air streams in accordance with the manufacturer's instructions.

Footnote 65: Known contamination sources include, but are not limited to, stacks, vents, exhausts (bathroom, kitchen, clothes dryer, etc.), and vehicles.

*Rationale: Separating exhaust terminations and supply air inlets is, in general a good idea. However, new factory-built intake/exhaust combination termination fittings provide a solution for locating both inlet and exhaust terminations together while maintaining separation between the streams. Similar exceptions are located in both ASHRAE 62.2-2019 and the 2021 International Mechanical Code, Section 401.4.*

Section 7.10.3: Inlet(s) are provided with rodent / insect screen with 0.375 inch < mesh  $\leq$  0.5 inch mesh.

*Rationale: If mesh coverings have openings that are too small, blockage can quickly occur, obstructing fresh air intake. For this reason, we recommend a range of 0.375 inches up to 0.5 inches for mesh openings, rather than only a maximum. HVI recently provided public comment to the California Energy Commission citing research supporting limiting minimum mesh screening openings.<sup>6</sup>*

Footnote 37: Update ASHRAE 62.1 reference to ASHRAE 62.2 reference to 2016 / 2019. For example: "This Checklist is designed to meet ASHRAE ~~62.1~~ 62.2-2016 / 2019 and..." OR "...ASHRAE 62.2-2016 or -2019..."

*Rationale: Consistent with our other comments in referencing up-to-date versions of ASHRAE 62.2 and with referencing 62.2 instead of 62.1 which no longer applies to multifamily dwelling units in up-to date versions.*

Footnote 56: Update ASHRAE 62.2 reference to 2016 / 2019. For example: "the dwelling-unit ventilation rates required by ASHRAE ~~62.2-2016~~ 2019.... Where local codes do not permit dwelling-unit ventilation to exceed ASHRAE ~~62.2-2016~~ 2019 rates, Rater-measured ventilation rate is permitted to be 0-15 CFM less than rates required by ASHRAE ~~62.2-2016~~ 2019..." OR "...ASHRAE 62.2-2016 or -2019..."

*Rationale: Consistent with our other comments in referencing up-to-date versions of ASHRAE 62.2*

Footnote 66: Update ASHRAE 62.2 reference to 2019. For example: "...Per ASHRAE ~~62.2-2016~~ 2019, an exhaust fan system is ... Per ASHRAE ~~62.2-2016~~ 2019, a bathroom is any room containing a bathtub, shower, spa, or similar source of moisture...." OR "...ASHRAE 62.2-2016 or -2019..."

*Rationale: The definitions in this footnote remain unchanged except for substituting "system" for "fan" but a consistent reference to ASHRAE 62.2-2019 definitions should be maintained throughout.*

<sup>6</sup> <https://efiling.energy.ca.gov/GetDocument.aspx?tn=237741&DocumentContentId=70973>





# ENERGY STAR Residential New Construction Roadmap Comments

Footnote 69: Update ASHRAE 62.2 reference to 2016 / 2019. For example: "...the prescriptive duct sizing requirements in Table 5.3 of ASHRAE 62.2-~~2010~~ 2019 are permitted to be used for kitchen exhaust fans..." OR "...ASHRAE 62.2-2016 or -2019..."

*Rationale: Consistent with our other comments in referencing up-to-date versions of ASHRAE 62.2*

Footnote 71: Update ASHRAE 62.2 reference to 2019. For example: "...Based upon, ASHRAE 62.2-~~2010~~ 2019, ducted mechanical systems are those that supply air to an occupiable..." OR "...ASHRAE 62.2-2016 or -2019..."

*Rationale: The definitions in this footnote remain unchanged but a consistent reference to ASHRAE 62.2-2019 definitions should be maintained throughout.*



# ENERGY STAR Residential New Construction Roadmap Comments

**Organization Name:** JKP Energy Inspections, LLC

**Respondent Last Name:** Lancman

**Respondent First Name:** Jenna

**Comments:**

## General

The company has reviewed the proposals and we agree with what the EPA is proposing at this time.



# ENERGY STAR Residential New Construction Roadmap Comments

**Organization Name:** Kalamazoo Valley Habitat for Humanity

**Respondent Last Name:** Tishler

**Respondent First Name:** Tom

**Comments:**

## National Transition to SFNH v3.1/MFNC v1.1

Are there any available data or analyses to indicate that a national transition to SFNH Version 3.1 and MFNC Version 1.1 is not warranted at this time?

No

Will the proposed date of January 1, 2023 (based on permit date) provide partners with sufficient time to prepare for the transition to SFNH Version 3.1 and MFNC Version 1.1?

Yes

Do you have additional general feedback on this topic?

Please keep requirements as stringent as possible

## Introduction of National SFNH Version 3.2 and MFNC Version 1.2 Program Requirements

Are there any available data or analyses to indicate that EPA's proposed SFNH Version 3.2 and MFNC Version 1.2 program requirements are not warranted or that the proposed efficiency levels are not achievable or cost-effective?

No

Is the proposed more stringent thermal backstop for SFNH Version 3.2 and MFNC Version 1.2, aligned with the 2021 IECC, appropriate and achievable?

Yes

For SFNH Version 3.2, is the proposed more stringent alternative backstop for homes with low infiltration, defined as  $\leq 115\%$  of the total UA resulting from the U-factors in the 2021 IECC, appropriate and achievable? Should this alternative backstop be restructured to better target the types of homes most likely to use it (e.g., homes with ducts in an unvented attic)?

Yes. There should be no ducts in attics.

Should EPA maintain its previous policy of requiring that the new version of the program be used to certify homes and apartments permitted one year after the date of implementation of the state's new code for the proposed SFNH Version 3.2 and MFNC Version 1.2 program requirements?

Yes

In the new MFNC Reference Design, EPA is proposing to include a 1.2 EF water heater. This efficiency level falls between what is available for electric tank products and heat pump products and was selected to require apartments with electric water heating to install heat pump water heaters when using the Prescriptive Path, while not making it prohibitively difficult to



# ENERGY STAR Residential New Construction Roadmap Comments

achieve the ERI target for those using the ERI Path. Is this an appropriate level of water heater efficiency for EPA to include in the proposed new MFNC Reference Design?

Yes, however there should still be (for now) an allowance for natural gas high-efficiency (<95%) water heaters.

Do you have additional general feedback on this topic?

Right now it is difficult to use HPWH's in a small home on a slab due to the cooling effect in the home during cold months.

## Introduction of New Certification Label to Accelerate Construction of Next Generation of Homes & Apts.

### General

Do you have general feedback on this topic?

No

### Energy Efficiency Prerequisite

Are EPA's proposed energy efficiency requirements at an appropriate level for the new certification?

Yes

### ENERGY STAR Certified Connected Heat Pumps

EPA is proposing that all installed heat pumps must use the HVAC Grading Track and achieve Grade I for all elements. Is mandatory HVAC grading and achieving Grade I in homes an appropriate requirement for the new certification?

Yes

EPA is proposing that all installed heat pumps must meet EPA's 'connected' criteria or use an ENERGY STAR smart thermostat. Are these connected options appropriate requirements?

This might be tricky if the thermostat is matched to certain equipment that is not Wi-Fi enabled, although most are now.

EPA is not proposing to include space conditioning or connected requirements for non-dwelling unit spaces in multifamily buildings. Is this an appropriate and advisable exemption?

Not enough knowledge to comment

EPA is proposing that cold climate heat pumps be required in Climate Zones 5-8. Are these the most appropriate areas for requiring these systems? Should any Climate Zones be added or any eliminated?

No, not until we start producing electricity with renewables. CCHP's are great, but can be costly for low-income families to run in cold months, plus the electricity we use now is created by burning coal or gas, then sending it through an outdated grid that loses 60% of the power between creation and use, so are they really more efficient with our current grid?

### ENERGY STAR Certified Heat Pump Water Heaters

EPA is proposing minimum tank size requirements to help ensure that the heat pump is used as the primary water heating source, rather than the electric resistance backup coil. Is this advisable, and are the proposed tank sizes appropriate?

Yes, but there still needs to be an option for natural gas tankless water heaters for now (<95% AFUE).



# ENERGY STAR Residential New Construction Roadmap Comments

EPA is proposing that heat pumps installed in occupiable space have a sound rating of  $\leq 55$  dBA. Is this an appropriate threshold?

Yes

EPA is proposing that heat pump water heaters will be mandatory to earn the new certification for all types of new construction, including multifamily. Should EPA consider allowing conventional electric water heaters while the market develops new heat pump water heater solutions?

Not enough knowledge to comment, especially about multifamily

## Induction/Electric Cooking

EPA is proposing an exemption from the certification requirement for induction cooktops and ranges in government-subsidized affordable housing projects, where conventional electric cooktops will be allowed as an alternative. Is this allowance appropriate and advisable for affordable housing?

I would potentially add other non-profit affordable builders as well

Should EPA also consider allowing conventional electric cooktops in market-rate housing as an alternative to induction?

Possibly...but induction is more efficient

## Electric Vehicle Charging Capability

Are EPA's proposed requirements for private EV-Ready spaces and/or installed EV chargers and EV-Capable parking spaces appropriate?

Yes

EPA is proposing to cap the number of required EV-chargers for a development at five (5). Is this an advisable limit?

Depends on the size of the development. A larger development will need more in the future.

Some concern has been expressed that the addition of an EV charging circuit would require a costly upgrade to 400-amp service. EPA believes this will be a relatively rare occurrence (and may become even rarer with emerging tech solutions that could eliminate the need for upgrades). Is EPA underestimating the frequency with which this might occur, and if so, should the requirement be changed?

Not an issue for single-family homes; might be an issue with a large multifamily unit, but it will have to be added in the future when electric cars are the norm, so it's easier to install it now than later.

EPA is not proposing to relax the EV-Ready or EV-Charging requirements for government-subsidized affordable housing. Should EPA consider setting alternative EV charging infrastructure requirements (or have no EV requirements) for affordable housing?

No, the cost is not that high and low-income families are the least able to add the circuits later at their own expense.



# ENERGY STAR Residential New Construction Roadmap Comments

**Organization Name:** KB Home

**Respondent Last Name:** Atalla

**Respondent First Name:** Jacob

**Comments:**

## **Introduction of New Certification Label to Accelerate Construction of Next Generation of Homes & Apts.**

### **Energy Efficiency Prerequisite**

Are EPA's proposed energy efficiency requirements at an appropriate level for the new certification?

At the time the new certification label is rolled out, it is very likely that there will be communities / homes that would still use ENERGY STAR V3.1 (national) or V3.2 (California), based on their permit date. Why exclude them from participating in the new all-electric certification program?

### **Induction/Electric Cooking**

Should EPA also consider allowing conventional electric cooktops in market-rate housing as an alternative to induction?

Yes, because cost difference between the two cooking appliances is sizable (over \$500) and kWh reduction is marginal. Keep in mind that conventional electric cooktops fulfil the goal of electrification and improved indoor air quality, just as induction cooktops do. Builders that offer an upgrade program for kitchen appliances can elect to offer an upgrade to induction cooking.



# ENERGY STAR Residential New Construction Roadmap Comments

**Organization Name:** Leading Builders of America

**Respondent Last Name:** Hickman

**Respondent First Name:** Amanda

**Comments:**

## General

Leading Builders of America (LBA) represents twenty of the largest builders in the U.S. They produce nearly 40% of the new homes constructed annually. While there are other areas of concern in the proposed changes included in the 3.2 version, LBA will focus our comments on the 2021 envelope backstop.

## Introduction of National SFNH Version 3.2 and MFNC Version 1.2 Program Requirements

Is the proposed more stringent thermal backstop for SFNH Version 3.2 and MFNC Version 1.2, aligned with the 2021 IECC, appropriate and achievable?

As documented in the Energy Star framework, the largest 20 builders have come to support and rely on the Energy Star for Homes program. One of the central reasons large-scale production builders partnered with the program was because of the flexibility it offered. Production builders could produce above-code homes in a cost-effective performance-based manner. In fact, the framework of the program clearly states that “a key aspect of the program was the use of independent energy rating companies, who worked with builders to identify the most cost-effective strategies to achieve the program’s requirements and provided third-party verification of the measures required by EPA.”

Unfortunately, it seems that with version 3.2, the Energy Star for Homes program will have utterly abandoned this basic tenet, making Energy Star completely untenable for production builders to utilize. Adding a thermal envelope backstop in the form of the 2021 IECC results in high costs with low benefits.

The insulation increases that were pushed through into the 2021 IECC are egregious and contrary to home affordability, with some of the measures having longer than 100-year pay-backs. For example, the ceiling insulation requirement in climate zone 2 would result in a 177-year payback<sup>1</sup>. Moreover, every other methodology used to evaluate these measures confirms a high cost with low benefit result.

Setting a backstop to the 2021 envelope levels is inappropriate and misguided. In addition to not being cost effective, it doesn’t allow for any flexibility in the program, which completely undermines its purpose.

LBA strongly opposes including the high cost low benefit 2021 IECC envelope measures as a backstop into version 3.2 of Energy Star for Homes. A much more reasonable and acceptable envelope backstop to consider would be to move from the 2009 IECC (set in version 3.1) to the 2015 or 2018 IECC.

1. <https://www.homeinnovation.com/-/media/Files/Reports/2021-IRC-Cost-Analysis.pdf>



# ENERGY STAR Residential New Construction Roadmap Comments

**Organization Name:** MaGrann Associates

**Respondent Last Name:** Adams

**Respondent First Name:** Ben

**Comments:**

## General

The residential new construction team at MaGrann Associates applauds and support this initiative to update the ENERGY STAR SFNH and MFNC programs. We appreciate EPA providing this opportunity for stakeholder input.

### National Transition to SFNH v3.1/MFNC v1.1

Are there any available data or analyses to indicate that a national transition to SFNH Version 3.1 and MFNC Version 1.1 is not warranted at this time?

No

Will the proposed date of January 1, 2023 (based on permit date) provide partners with sufficient time to prepare for the transition to SFNH Version 3.1 and MFNC Version 1.1?

Yes

Do you have additional general feedback on this topic?

No

### Introduction of National SFNH Version 3.2 and MFNC Version 1.2 Program Requirements

Are there any available data or analyses to indicate that EPA's proposed SFNH Version 3.2 and MFNC Version 1.2 program requirements are not warranted or that the proposed efficiency levels are not achievable or cost-effective?

No

Is the proposed more stringent thermal backstop for SFNH Version 3.2 and MFNC Version 1.2, aligned with the 2021 IECC, appropriate and achievable?

Yes

For SFNH Version 3.2, is the proposed more stringent alternative backstop for homes with low infiltration, defined as  $\leq 115\%$  of the total UA resulting from the U-factors in the 2021 IECC, appropriate and achievable? Should this alternative backstop be restructured to better target the types of homes most likely to use it (e.g., homes with ducts in an unvented attic)?

No

Should EPA maintain its previous policy of requiring that the new version of the program be used to certify homes and apartments permitted one year after the date of implementation of the state's new code for the proposed SFNH Version 3.2 and MFNC Version 1.2 program requirements?

Yes





# ENERGY STAR Residential New Construction Roadmap Comments

In the new MFNC Reference Design, EPA is proposing to include a 1.2 EF water heater. This efficiency level falls between what is available for electric tank products and heat pump products and was selected to require apartments with electric water heating to install heat pump water heaters when using the Prescriptive Path, while not making it prohibitively difficult to achieve the ERI target for those using the ERI Path. Is this an appropriate level of water heater efficiency for EPA to include in the proposed new MFNC Reference Design?

Since heat pump technology implementation is not yet widely understood in multifamily buildings, a 1.2 EF water heater requirement might make it too difficult to achieve ERI target for multifamily.

Do you have additional general feedback on this topic?

No

## Introduction of New Certification Label to Accelerate Construction of Next Generation of Homes & Apts.

### General

Do you have general feedback on this topic?

No

### Energy Efficiency Prerequisite

Are EPA's proposed energy efficiency requirements at an appropriate level for the new certification?

Yes

### ENERGY STAR Certified Connected Heat Pumps

EPA is proposing that all installed heat pumps must use the HVAC Grading Track and achieve Grade I for all elements. Is mandatory HVAC grading and achieving Grade I in homes an appropriate requirement for the new certification?

Yes

EPA is proposing that all installed heat pumps must meet EPA's 'connected' criteria or use an ENERGY STAR smart thermostat. Are these connected options appropriate requirements?

Yes

EPA is not proposing to include space conditioning or connected requirements for non-dwelling unit spaces in multifamily buildings. Is this an appropriate and advisable exemption?

Yes

EPA is proposing that cold climate heat pumps be required in Climate Zones 5-8. Are these the most appropriate areas for requiring these systems? Should any Climate Zones be added or any eliminated?

Yes, No

### ENERGY STAR Certified Heat Pump Water Heaters

EPA is proposing minimum tank size requirements to help ensure that the heat pump is used as the primary water heating source, rather than the electric resistance backup coil. Is this advisable, and are the proposed tank sizes appropriate?



# ENERGY STAR Residential New Construction Roadmap Comments

See #3.

EPA is proposing that heat pumps installed in occupiable space have a sound rating of  $\leq 55$  dBA. Is this an appropriate threshold?

See #3.

EPA is proposing that heat pump water heaters will be mandatory to earn the new certification for all types of new construction, including multifamily. Should EPA consider allowing conventional electric water heaters while the market develops new heat pump water heater solutions?

We recommend delaying the mandatory requirement that multifamily buildings incorporate heat pump water heaters to earn the new certification, given that heat pump integration for multifamily buildings is not yet widely understood in this market.

## Induction/Electric Cooking

EPA is proposing an exemption from the certification requirement for induction cooktops and ranges in government-subsidized affordable housing projects, where conventional electric cooktops will be allowed as an alternative. Is this allowance appropriate and advisable for affordable housing?

If necessary, consider phasing the requirement in based on market conditions (availability etc.) closer to the time of implementation. Keep in mind that induction cooktops are safer in addition to the lower cost to operate.

Should EPA also consider allowing conventional electric cooktops in market-rate housing as an alternative to induction?

See #1.

## Electric Vehicle Charging Capability

Are EPA's proposed requirements for private EV-Ready spaces and/or installed EV chargers and EV-Capable parking spaces appropriate?

We encourage EPA to consider the equity ramifications for low/moderate income residents. Currently, more than 90% of multifamily new construction units are for rental occupancy and the majority of those will be for low/moderate income households (whether officially designated low income or not). These residents will generally not be in a position to compel the property owner to install an EV charger for their use or to pay for it independently. We consider it highly likely that the majority of such spaces will therefore never see an actual charger installed on them. Yet access to the EVs themselves seems likely to improve in the short to medium term. Once the currently pandemic used car pricing bubble has past, increasing numbers of used EVs may become available at prices comparable with conventional used cars. State and federal incentives appear poised to promote the affordability of new EVs, with more lower priced options emerging rapidly into the market. These vehicles also carry a substantially lower operating cost, further enhancing the value proposition for LMI owners. However, without the property providing access to chargers actually installed on site for overnight charging, they are unlikely to consider this option. At a minimum, consider changing "OR" to "AND" in: "OR have an ENERGY STAR certified EV charger installed for at least 10% of parking spaces (up to five chargers) ...".

EPA is proposing to cap the number of required EV-chargers for a development at five (5). Is this an advisable limit?

It would be difficult to justify mandating more than five spaces at this time, but this should be re-evaluated regularly.



# ENERGY STAR Residential New Construction Roadmap Comments

Some concern has been expressed that the addition of an EV charging circuit would require a costly upgrade to 400-amp service. EPA believes this will be a relatively rare occurrence (and may become even rarer with emerging tech solutions that could eliminate the need for upgrades). Is EPA underestimating the frequency with which this might occur, and if so, should the requirement be changed?

Possibly. Our own experience of installing 6 charging stations (3x2-shared) with no service upgrade at our office facility indicates this concern may be overblown.

EPA is not proposing to relax the EV-Ready or EV-Charging requirements for government-subsidized affordable housing. Should EPA consider setting alternative EV charging infrastructure requirements (or have no EV requirements) for affordable housing?

See #1



# ENERGY STAR Residential New Construction Roadmap Comments

**Organization Name:** National Association of Home Builders

**Respondent Last Name:** Kochkin

**Respondent First Name:** Vladimir

**Comments:**

## General

NAHB appreciates the opportunity to provide comments on the ENERGY STAR Residential New Construction Roadmap. NAHB is a federation of more than 700 state and local home builder associations nationwide that work to ensure that housing remains a national priority and that all Americans have access to safe, decent, and affordable homes. The organization's membership includes over 140,000 firms engaged in land development, single and multifamily residential construction, design, remodeling, multifamily ownership and management, building material trades, building products manufacturing and supply, and commercial and light industrial construction projects. Over 95 percent of NAHB's members are classified as "small businesses," as defined by the U.S. Small Business Administration (SBA). NAHB members collectively employ over 3.4 million people nationwide. Four out of every five new homes are built by NAHB members.

NAHB thanks EPA program staff for developing the Roadmap document to inform stakeholders about the proposed changes. While NAHB has serious concerns about specific decisions (e.g., envelope backstop) and certain information (e.g., cost estimates for achieving compliance), we recognize and appreciate EPA's effort in communicating the decision-making process. We also value EPA's willingness to listen to and understand stakeholders' input. Many of our members participate in above-code energy programs including energy rating designations such as ERI or HERS, National Green Building Standard, ENERGY STAR, and several others. NAHB members design, build, and often offer financing for homes and multifamily buildings that achieve above-code energy performance. Our members understand firsthand the associated impacts on the construction process, consumer's interest in various features, and home buyer's ability to finance products priced at an increased premium. NAHB requests that the EPA affirms and continues its commitment to ensuring that the ENERGY STAR Residential program focuses on increasing consumers' access to housing which is affordable to purchase or rent, operate, and maintain.

We include several specific comments in the form below which focus primarily on the single-family aspects of the Energy Star program. We encourage the EPA to adhere to the following principles as it continues to operate and grow the ENERGY STAR program:

- Continue to emphasize performance and flexibility in achieving the increasing energy performance levels – a hallmark of the ENERGY STAR program since its inception
- Recognize that the flexibility that was available to builders through trade-offs will have diminished significantly because of the increased stringency of the baseline performance and take steps to mitigate the impact
- Ensure choice reflected in consumer preferences regarding certain technologies (e.g., heat pump water heaters) and provide reasonable compliance paths for cases where these technologies are not specified in the building design



# ENERGY STAR Residential New Construction Roadmap Comments

- Offer a program that emphasizes growth beyond its current market share of about 10 percent and does not become unattainable to even high performance builders – a particularly critical issue if ENERGY STAR will become the basis for federal incentives
- Ground requirements in cost-effectiveness metrics acceptable to the consumer and based on costs that are representative of the market, justified, documented, itemized, and comprehensive.

Questions without responses should not be considered as supportive or unsupportive positions by NAHB.

## National Transition to SFNH v3.1/MFNC v1.1

[Are there any available data or analyses to indicate that a national transition to SFNH Version 3.1 and MFNC Version 1.1 is not warranted at this time?](#)

Unlike the single-family market where ENERGY STAR claims 10% market share, the MFNC program has a low market acceptance. The case for transitioning presented in the framework is based primarily on single-family homes. It's recommended that EPA conducts a comprehensive, independent third-party review of the MFNC program and its implementation to better understand the lack of market traction before making significant changes to the program.

[Will the proposed date of January 1, 2023 \(based on permit date\) provide partners with sufficient time to prepare for the transition to SFNH Version 3.1 and MFNC Version 1.1?](#)

To apply for a permit, the code requires that the construction document contain the full range of information on all systems of the buildings including all aspects of compliance with the energy code (refer to IBC and IECC for further details on construction documentation requirements). For complex multifamily and mixed-use residential buildings that require extensive planning, estimating, and securing of financing before a permit application can be submitted, 12 months may not be sufficient for developers to transition. It's recommended that for the MF program the transition be extended to 18 months.

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

[Comment regarding this statement:](#)

For the 17 states that have not transitioned to the 2012 or later IECC, NAHB recommends that EPA conduct additional training and educational campaigns to ensure that the transition from SFNH 3.0 and MFNC 1.0 to 3.1 and 1.1, respectively, does not result in improper execution of the stricter program requirements. Additional education for builders in those areas who are unfamiliar with the differences between the two program versions will be important to facilitate the transition to version 3.1 (particularly for the areas that were found to be more than 2 points from meeting the Version 3.1 ERI target).

## Introduction of National SFNH Version 3.2 and MFNC Version 1.2 Program Requirements

[Are there any available data or analyses to indicate that EPA's proposed SFNH Version 3.2 and MFNC Version 1.2 program requirements are not warranted or that the proposed efficiency levels are not achievable or cost-effective?](#)

Please refer to the detailed study done by Home Innovation Research Labs on cost effectiveness of the 2021 IECC:

[https://www.homeinnovation.com/trends\\_and\\_reports/featured\\_reports/2021\\_irc\\_cost\\_analysis](https://www.homeinnovation.com/trends_and_reports/featured_reports/2021_irc_cost_analysis)

The analysis shows that many changes in the 2021 IECC exceed reasonable cost-effectiveness metrics. Some of the changes (see more on that in the next comment) have a simple payback over 100 years – a number that is “off-the-charts” by



# ENERGY STAR Residential New Construction Roadmap Comments

any cost effectiveness criteria (e.g., a positive net present value typically corresponds to a simple payback of less than 25 years). Therefore, EPA is encouraged to review the cost effectiveness of the 10% performance threshold relative to the 2021 IECC across a wide range of dwelling configurations and geographies. NAHB requests that EPA shares the detailed calculations used to developed cost estimates in Exhibit 16 on Page 31 in the Roadmap. Based on our extensive experience with cost evaluations, the reported estimates appear to underestimate the total impact on the construction costs that will be passed on to the homebuyer. It's critical that ENERGY STAR offers a program that is cost-effective to the consumer. One of the distinguishing attributes of the ENERGY STAR program has been the emphasis on improving compliance in addition to efficiency via the use of checklists and reliance on raters. With efficiency gains reaching diminishing returns, ENERGY STAR's value will be shifting towards gains in compliance.

[Is the proposed more stringent thermal backstop for SFNH Version 3.2 and MFNC Version 1.2, aligned with the 2021 IECC, appropriate and achievable?](#)

The 2021 IECC envelope backstop is not appropriate for the following reasons:

- The increases in insulation levels in the 2021 IECC result in marginal and in many cases negligible energy savings. The Home Innovation Research Labs analysis of the 2021 IECC shows that for a 2,600 square foot single-family house the increase in attic insulation levels to R49 results in average monthly savings of \$0.67 in Houston (CZ 2) and \$0.92 in Memphis (northern boundary of CZ 3). The simple payback for the increased attic insulation and wall insulation ranges between 78 years and 177 years. It's noted that these changes were incorporated into the 2021 IECC without adequate technical review and justification – these measures were added at the last minute during the online vote after first getting disapproved by the technical committee and then disapproved again by the assembly of code officials. To address these issues with the procedures, ICC has completely revamped its development process for the 2024 IECC where these prescriptive requirements will be a subject of review and reconsideration.
- It is not reasonable to ask designers and builders to trade-off these unjustified insulation levels for other envelope measures. Other measures such as windows and building tightness should stand on their own merit and not be used as a way to offset the 2021 IECC insulation levels.
- The proposed 2021 IECC backstop leapfrogs over the 2018 IECC code. The performance baseline between versions 3.1 and 3.2 effectively moves one energy code version (2018 IECC to 2021 IECC). However, the envelope backstop effectively moves two code versions (2009/2012/2015 IECC to 2021 IECC). The adjustment that the market would have to make would be dramatic and unsupported by the associated savings, mostly likely leading to reduced participation from builders and a loss of market share by ENERGY STAR.
- Jurisdictions that will be adopting the 2021 IECC will consider providing relief from these prescriptive insulation requirements by allowing flexibility in compliance. If the EPA envelope backstops will be set at a levels different from those that jurisdictions will have just adopted, it will create a significant barrier to entry and will likely lead to a diminishing market share for the ENERGY STAR programs.
- NAHB agrees that the envelope backstop should be updated. In line with the ENERGY STAR history that used a 2009 IECC backstop for version 3.1 which was based on the 2012 IECC, EPA should set the backstop at the 2018 IECC envelope level. In fact, a 2018 IECC envelope backstop will be consistent with the only full performance method within the 2021 IECC – the ERI Method – which allows a 15% increase relative to the prescriptive UA (Section R406.3.1 of 2021 IECC). It's further noted that the 2021 IECC Total Building Performance method (R405) allows building tightness



# ENERGY STAR Residential New Construction Roadmap Comments

trade-off (new to 2021 IECC – see Section R402.4.1.2) and sets the individual building envelope efficiency levels at 2009 IECC (Section R405.2(2)).

- EPA notes in the Roadmap that it expects version 3.2 to be in existence for a long time and further suggests that this is the reason for the stringent backstop. It's recommended that the backstop be set at the 2018 IECC level with the disclosure that EPA will review this position in the future and evaluate whether the envelope backstop should be revised within the overall framework of version 3.2.

It's also noted that EPA's UA analysis (Exhibits 6-10) does not include homes with a window ratio of higher than 15%. Therefore, the analysis does not show the options designers and builders will have for homes where windows exceed the 15% threshold (e.g., smaller homes).

For SFNH Version 3.2, is the proposed more stringent alternative backstop for homes with low infiltration, defined as  $\leq 115\%$  of the total UA resulting from the U-factors in the 2021 IECC, appropriate and achievable? Should this alternative backstop be restructured to better target the types of homes most likely to use it (e.g., homes with ducts in an unvented attic)?

See the previous comment regarding envelope backstop. The alternative backstop should be tied to the 2018 IECC.

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

Regarding the following comments on pages 13-14 of the Roadmap:

“The Residential Energy Services Network (RESNET) has reported that approximately a third of all homes that received an energy rating and were registered in 2020 already used such technology.”

These market share numbers most likely are skewed towards high efficiency gas water heaters and should not be used as justification for electric heat pump water heaters.

Exhibit 4 provides a helpful and informative summary of the types of features expected in Version 3.2. EPA is encouraged to expand this analysis by evaluating other types of house configurations in terms of square footage, number of stories, foundation types in a given climate zone, attached vs detached units, etc. The expanded analysis will more accurately capture impact on a wider range of home configurations and construction practices across the country. The DOE reference building is primarily intended for evaluating an “average box” house in terms of national average energy savings. Relying solely on the DOE reference building with a limited number of configuration variables will result in “blind spots” in the analysis and may have unintended consequences for large segments of the market. This is particularly important for version 3.2 because of the reduced flexibility for trade-offs at higher levels of efficiency.

Heat pump water heater market share remains low in the residential sector and even more so in the multifamily buildings due to issues with space, noise, comfort, cost, hot water supply, etc. Setting ENERGY STAR provisions at a level where it's challenging for an electric house to comply without a HPWH (see Exhibit 4) will continue to limit the market acceptance for some segments of the single-family market. Furthermore, forcing installation of HPWHs in smaller units (e.g., townhome on slab) will lead to customer dissatisfaction with the technology that will have broader ramifications with creating an unpopular public image for HPWHs in general.



# ENERGY STAR Residential New Construction Roadmap Comments

## Introduction of New Certification Label to Accelerate Construction of Next Generation of Homes & Apts.

### General

Do you have general feedback on this topic?

ENERGY STAR is a consumer-facing energy efficiency label. It has a long history of conveying the message of a lowered energy bill for those consumers who chose an ENERGY STAR product or house. Electrification of buildings that otherwise would have been supplied with natural gas is a significant deviation from this traditional tenant of energy efficiency. In colder climates, the use of electric heating will result in significantly higher utility bills for consumers. A Home Innovation Research Labs' study quoted in the EPA Roadmap on page 42 showed \$650 increase in electric bill per year in Minneapolis when compared to natural gas. It's important that the messaging and branding around the new program does not create a misconception in the consumers' eyes regarding the expected energy use.

### ENERGY STAR Certified Connected Heat Pumps

EPA is proposing that all installed heat pumps must use the HVAC Grading Track and achieve Grade I for all elements. Is mandatory HVAC grading and achieving Grade I in homes an appropriate requirement for the new certification?

We recommend first identifying how many HVAC systems within the program are falling short of Grade I, and how many projects currently opt out of using the HVAC Grading Track.

EPA is proposing that all installed heat pumps must meet EPA's 'connected' criteria or use an ENERGY STAR smart thermostat. Are these connected options appropriate requirements?

Consider allowing exceptions for areas with poor cellular and/or internet services, as energy reporting and remote consumer access is often disrupted in areas with connectivity issues. Also consider exception for areas where the utility does not offer an active program for connected appliances.

### ENERGY STAR Certified Heat Pump Water Heaters

EPA is proposing that heat pumps installed in occupiable space have a sound rating of  $\leq 55$  dBA. Is this an appropriate threshold?

It's important that EPA captures and reports the added costs associated with achieving compliance with this metric as well as any other associated limitations (e.g., is this going to limit the compressor size and therefore the availability of hot water supply for the occupants?)

EPA is proposing that heat pump water heaters will be mandatory to earn the new certification for all types of new construction, including multifamily. Should EPA consider allowing conventional electric water heaters while the market develops new heat pump water heater solutions?

Conventional units should remain an option, at least in the first iteration of the new program. See previous comments regarding heat pump water heaters.

### Induction/Electric Cooking

EPA is proposing an exemption from the certification requirement for induction cooktops and ranges in government-subsidized affordable housing projects, where conventional electric cooktops will be allowed as an alternative. Is this allowance appropriate and advisable for affordable housing?





# ENERGY STAR Residential New Construction Roadmap Comments

Until induction cooktops and cookware achieve price parity with conventional electric cooktops, NAHB supports the allowance for conventional electric cooktops for affordable housing.

## **Electric Vehicle Charging Capability**

Are EPA's proposed requirements for private EV-Ready spaces and/or installed EV chargers and EV-Capable parking spaces appropriate?

If EPA decides to incorporate EV provisions, it's recommended that the primary focus is on installation of conduit with the goal of avoiding future retrofits that require demolition and repair of building elements. It's also important that clear guidance is provided regarding expectations for sizing of transformers in developments with EV-ready or EV-capable buildings. The question of transformer sizing will have major implications for the development of utility infrastructure and if not addressed may lead to deployment of unutilized assets.



# ENERGY STAR Residential New Construction Roadmap Comments

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

**Respondent Last Name:** Terry

**Respondent First Name:** David

**Comments:**

*Comments submitted in letter. See next page.*



National Association of  
State Energy Officials

November 15, 2021

Mr. Jon Passe  
U.S. Environmental Protection Agency  
1200 Pennsylvania Avenue NW  
Washington, DC 20004

Via email to [energystarhomes@energystar.gov](mailto:energystarhomes@energystar.gov)

Dear Mr. Passe,

The National Association of State Energy Officials (NASEO) respectfully submits these comments regarding the proposed ENERGY STAR Residential New Construction Program Roadmap Framework Document for Stakeholder Feedback. NASEO is the only national non-profit organization representing the 56-governor designated State, Territory, and District of Columbia Energy Directors and their offices. NASEO collaborates with State Energy Offices on topics that span energy programs and policies, including the development of energy codes and building labels and certifications.

NASEO supports EPA’s proposed roadmap and its focus on accelerating the voluntary deployment of new energy efficient and low-emissions technologies into new construction single-family homes and multifamily buildings. NASEO generally supports the proposed changes, including: Transitioning Version 3.0 ENERGY STAR Single-Family New Homes (SFNH) to Version 3.1; transitioning Multifamily New Construction (MFNC) Version 1.0 to Version 1.1; introducing new versions of Single-Family New Homes and Multifamily New Construction program requirements; and introducing a new ENERGY STAR certification label that incorporates technologies such as heat pumps, heat pump water heaters, induction cooking and electric vehicle charging capabilities. Specific comments for each proposal follow.

*Re: Transitioning Version 3.0 ENERGY STAR SFNH to Version 3.1 and transitioning MFNC Version 1.0 to Version 1.1*

NASEO supports transitioning all states using SFNH Version 3.0 and MFNC Version 1.0 to Version 3.1 and Version 1.1, respectively. NASEO is not aware of any data or analysis that would indicate a transition is not warranted or any data or analysis that would not support the transition timeline.

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*Re: Introducing new versions of Single-Family New Homes and Multifamily New Construction program requirements*

NASEO supports the development of a SFNH 3.2 and MFNC Version 1.2 thermal backstop using the 2021 International Energy Conservation Code (IECC) as the baseline energy code requirement. Many of the State Energy Offices were deeply involved in the development of the 2021 IECC and support its use as the baseline for voluntary ENERGY STAR above-code programs. Advancing the thermal baseline of the ENERGY STAR program from the 2009 IECC to the 2021 IECC is appropriate, as the code has now been updated four times since the 2009 was published and because the ENERGY STAR residential program certifies “homes and apartments [that] are at least 10% more efficient than those built to code”<sup>1</sup>. As noted in the framework document, U.S. DOE has determined that the “2021 IECC will improve energy cost savings by approximately 9% relative to the prior edition”. Previous code determinations published by U.S. DOE indicate that cumulative savings from the 2012, 2015 and 2018 codes contribute additional energy savings of more than 10% from the 2009 IECC baseline. Continuing to use the 2009 IECC as the thermal baseline is no longer appropriate considering the continued improvement of subsequent code editions which make a minimally code compliant structure built to more recent codes nearly equivalent to the thermal baseline of a 2009 compliant structure.

*Re: Introducing a new ENERGY STAR certification label that incorporates technologies such as heat pumps, heat pump water heaters, induction cooking and electric vehicle charging capabilities*

NASEO supports the development of a new voluntary ENERGY STAR certification that recognizes homes with next generation features and the proposed methodology which requires energy efficiency levels proposed in SFNH 3.2 and MFNC combined with the proposed requirements for space-conditioning heat pumps, heat pump water heaters, electric cooking, and EV charging capacity.

There are two proposed prescriptive requirements of which NASEO is generally supportive, but which we encourage EPA to further evaluate prior to issuance of the final rule. NASEO recommends evaluation of the benefit of “connected” requirement for heat pumps, heat pump water heaters, and the proposed exemption of induction cooking equipment for buildings financed with government subsidies.

Regarding the “connected” requirements for heat pumps and heat pump water heaters, these technologies can provide significant energy savings with or without ‘connected’ requirements, but the additional functionality enabled by ‘connected’ equipment brings value by enabling demand response and demand flexibility functions which can reduce energy expenses and reduce pollution. However, we encourage EPA to consider how availability of access to the internet in disadvantaged communities and/or rural areas may hinder the use of these technologies and determine if a ‘connected ready’ requirement which allows the use of equipment that does not have active communications equipment, but does possess data ports to enable later addition of such technology would be more appropriate for those communities lacking internet access.

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<sup>1</sup> U.S. EPA. What is ENERGY STAR. <https://www.energystar.gov/about>. Accessed November 12, 2021.



EPA proposes that homes constructed with a government subsidy (affordable housing) can meet certification requirements with conventional electric cooktops instead of the induction cooktops that will be required of all other buildings. NASEO recognizes that induction ranges carry a price premium and may require cookware replacement at additional expense to the resident. However, NASEO suggests that EPA consider an approach where technology requirements avoid creating different standards for ENERGY STAR certified market rate and subsidized affordable housing. Regarding the specific question posed by EPA considering the allowance of conventional electric cooktops in market-rate housing, NASEO supports this alternative, but emphasizes that there should not be different standards for market rate and affordable housing.

NASEO supports the inclusion of EV charging capacity as a requirement for certification. Electric vehicle charging equipment costs significantly less to install at the time of construction than installing similar equipment as a retrofit. NASEO again emphasizes that EPA should maintain a consistent standard for market rate and subsidized affordable housing which will provide residents of both types of housing built to achieve this voluntary above-code program with the same benefits.

Thank you for this opportunity to comment.

A handwritten signature in black ink, appearing to read "DTerry".

David Terry  
Executive Director, National Association of State Energy Officials



# ENERGY STAR Residential New Construction Roadmap Comments

**Organization Name:** Natural Resources Defense Council

**Respondent Last Name:** Goldstein

**Respondent First Name:** David B.

**Comments:**

## General

On behalf of its more than three million members and online activists, the Natural Resources Defense Council (NRDC) respectfully submits its comments in response to the request for stakeholder input concerning the ENERGY STAR Residential New Construction Program. NRDC has been a strong supporter of ENERGY STAR since its inception, both directly and through the Consortium for Energy Efficiency.

We have found that this program works very well to encourage new technologies and designs and to expand the use of the better existing options, especially when it is integrated into a suite of policies that include codes, ratings, and financial incentives. (See "A Suite of Policies for Energy Efficiency in Buildings: Maximizing Synergies." David Goldstein, [Proceedings of the 2016 ACEEE Summer Study on Energy Efficiency in Buildings](#). Washington D.C.: American Council for an Energy-Efficient Economy, 2016 [http://aceee.org/files/proceedings/2016/data/papers/9\\_418.pdf](http://aceee.org/files/proceedings/2016/data/papers/9_418.pdf).)

The changes proposed are a step in the right direction: each of them is defensible as the codes and programs evolve. But the world is facing a climate crisis now, and the improvements proposed are too incremental. The Administration's Build Back Better agenda calls for a 50%+ reduction in GHG emissions by 2030, and the buildings sector is one of the easiest to decarbonize. We need, as a nation, to do even better than this proposal.

Ten percent better than code simply is not good enough. And the failure to harmonize the ENERGYSTAR ERI with the ASHRAE 90.2 ERI or the nearly identical HERS Index (which is used in some state and local codes) is also not good enough. The absence of credit for renewable energy on site is not good enough, and neither is allowing continued fossil fuel-fired appliances.

This problem is easy to fix, as the inspections and software are the same.

This observation is all the more important as we see the potential for Congress to enact tax credits for energy efficient and low-emissions homes, and for the legislation to set ENERGY STAR as the qualification level. It is one thing to ask for 10% savings when the program is entirely voluntary, but quite another to ask for it when thousands of dollars of incentives may be in the mix.

Programs such as this work best when they are integrated with other policies, as noted above. A key criterion for successful integration is to use the same key performance indicators. If we want the markets to understand the ENERGYSTAR value proposition in terms of energy consumption and its cost, we need to make it easy to understand, and to compare with code. We need to harmonize across high rise and low rise; this allows consistent marketing of EE and RE.

Another area for integration is EPA's own Clean Air Plus program. Achieving the higher energy efficiency we recommend here is likely to entail deep cuts in air leakage coupled with mechanical ventilation and energy recovery. These measures make balanced ventilation with removable filtering easier to accomplish. Removable filtration (filters removable when outdoor



# ENERGY STAR Residential New Construction Roadmap Comments

air quality is good—that is, most of the time) is a response to the recent episodes of poor outdoor air quality resulting from wildfires, which has produced PM2.5 readings of 350 or worse throughout large regions of the country. This problem is predicted to get worse even if we stabilize climate change at 1.5C. Reliance on the building envelope to function as a MERV filter (In other words, assuming that, if the windows are shut, indoor air will be significantly cleaner than outdoor air) is not good health policy.

Decarbonization can be achieved both by greater efficiency, greater use of solar, and clean fuels. Thus, we support enthusiastically the EPA suggestion to provide a version of the program that specifies electrification of the end uses suggested in the EPA draft and encourage EPA to go further and require all-electric construction in the program. New construction is the low-hanging fruit of building decarbonization: it is cost-effective, saving both on upfront construction costs and operating cost when using high-efficiency heat pumps. New construction is also the biggest lever we have to jumpstart the market for clean heating and hot water technologies, bringing down their cost, and setting the stage for its broader adoption in existing homes.

We also suggest that the program encourage solar power installation on homes. The approach used in ASHRAE 90.2 of setting an ERI threshold, including solar coupled with backstops on envelope efficiency and the requirement that the RECs from the solar be retired, provides a good starting point.

In a short time, there is likely to be an ANSI/RESNET standard on CO<sub>2</sub> emissions that can be the basis for ENERGYSTAR compliance. RESNET is developing procedures for crediting cleaner energy on a house-by-house basis, as well as for crediting controls that *allow flexibility in the times of energy demand*. We recommend that EPA follow that process and consider using the CO<sub>2</sub> Index in addition to or instead of the ERI in the next version of ENERGYSTAR.

Another major opportunity on the horizon is dealing with emissions associated with constructing residential buildings. Analysis presented at the October 2021 Net Zero Forum in New York showed that emissions from constructing buildings from now to 2030 exceed the cumulative operational emissions by that date. 2030 is the critical date for when emissions reductions count most, according to IEA and IPCC analysis, as well as our own.

One of the barriers to addressing construction emissions is the lack of a credible data base that allows comparisons between product types as well as products. Yes, there are data sources, but the difference between different options is not perceived by the affected industries as reliably calculated.

NRDC suggests that EPA develop the necessary standards and curated data, building on existing efforts, that can make this data acceptable to the markets. This is the first step toward establishing an ENERGYSTAR specification for Scope 3 emissions, the reduction of which is a major low-to-no-cost method for meeting climate goals. It is obviously beyond the portfolio of ENERGYSTAR staff, but the Agency has expertise and long term experience in this effort.



# ENERGY STAR Residential New Construction Roadmap Comments

**Organization Name:** North American Gas Heat Pump Collaborative

**Respondent Last Name:** Jerozal Jr.

**Respondent First Name:** James

**Comments:**

*Comments submitted in letter. See next page.*





U.S. Environmental Protection Agency  
1200 Pennsylvania Ave., NW  
Washington, DC 20460

November 15, 2021

RE: ENERGY STAR® Residential New Construction Program Roadmap and Framework Document

Thank you for allowing the North American Gas Heat Pump Collaborative (“Collaborative”) the opportunity to comment on the Residential New Construction Program Roadmap and Framework Document released October 18, 2021.

In late 2019, fourteen natural gas utilities and program administrators formed the Collaborative. These organizations are listed at the end of this letter and represent one-third of US and Canadian households that have gas service. Collaborative members have supported activities to develop gas heat pump (GHP) technology, and now see the opportunity to start conditioning the market and designing incentive programs that will accelerate market adoption when the products become widely available.

**The mission of the Collaborative is to accelerate the adoption of innovative gas technologies that facilitate the decarbonization of North America’s gas network through market transformation initiatives.** The Collaborative is committed to making highly efficient gas technologies with efficiencies over 100% standard practice. In general, we plan to do this by developing utility programs, supporting manufacturers and trade ally networks, advancing codes & standards, and creating common messages and specifications.

**The energy savings potential and greenhouse gas (GHG) reduction effects of GHP technology is of significant importance and interest to the Collaborative utilities.** Gas heat pumps have efficiencies greater than 100%, result in less cost to society than reducing GHG with other technologies and offer resilient functionality. In addition, fuel diversity is important for a stable, low-cost energy future. The areas of focus for the Collaborative are priming the market for GHP water heaters and residential combination (space and water heating) units. The Collaborative has supported the Consortium for Energy Efficiency as they have begun integrating performance tiers reflective of GHP technologies in their Residential HVAC and Water Heating specifications.

The Collaborative supports the following residential building code advancements proposed by EPA in its October 18, 2021 Residential New Construction Program Roadmap and Framework Document:

- Transitioning states currently using ENERGY STAR® Single-Family New Homes version 3.0 to version 3.1.
- Transitioning states currently using ENERGY STAR® Multifamily New Construction Version 1.0 to Version 1.1 and using ASHRAE 90.1-2010 as the baseline code in multifamily buildings.
- Introducing new versions of Single-Family New Homes and Multifamily New Construction program requirements that achieve 10 percent savings beyond the 2021 IECC requirements. The Collaborative is pleased to see EPA’s inclusion of high-efficiency gas furnaces, boilers, and domestic hot water appliances in both sets of requirements.



The Collaborative also supports the introduction of a new advanced certification program that recognizes the next generation of energy-efficient homes and apartments. Rather than limiting this certification program to efficient electric technologies as EPA proposes, we encourage EPA to include highly efficient gas heat pump space heating, water heating, and combination technologies as well. Certifications that cover highly efficient electric *and gas* technologies are crucial to supporting consumers, utilities, the market, and the ENERGY STAR® brand as the country transitions to a cleaner-energy future.

The Collaborative looks forward to continuing to partner with ENERGY STAR®, builders, and other stakeholders on fostering a clean energy economy and further reducing GHG emissions.

Thank you again for the opportunity to submit comments on this draft roadmap and framework document. Please contact Molly Garcia ([mgarcia@resource-innovations.com](mailto:mgarcia@resource-innovations.com)) at Resource Innovations with questions about our comments.

Sincerely,

James J. Jerozal Jr., Director of Energy Efficiency Strategy, Nicor Gas  
Chair, North American Gas Heat Pump Collaborative

#### Members of the Collaborative

- ATCO
- Enbridge Gas Inc.
- FortisBC
- Intermountain Gas Company
- APGA Research Foundation
  - 155 Municipal Natural Gas Utilities
- National Fuel
- New Jersey Natural Gas
- Northwest Energy Efficiency Alliance
  - Northwest Natural Gas
  - Avista
  - Cascade Natural Gas
  - Puget Sound Energy
  - Energy Trust of Oregon
- ONE Gas
- Peoples Gas & North Shore Gas
- Southern California Gas Company
- Southern Company Gas
- Atlanta Gas Light
- Chattanooga Gas
- Nicor Gas
- Virginia Natural Gas
- South Jersey Industries
  - Elizabethtown Gas
  - South Jersey Gas
- Spire Energy



# ENERGY STAR Residential New Construction Roadmap Comments

**Organization Name:** NEHERS

**Respondent Last Name:** DeVico

**Respondent First Name:** Sara

**Comments:**

## General

These comments are submitted on behalf of the Northeast Home Energy Rating Services Alliance, which represents more than 175 Raters and 9 Providers from New Jersey to Maine.

### National Transition to SFNH v3.1/MFNC v1.1

Will the proposed date of January 1, 2023 (based on permit date) provide partners with sufficient time to prepare for the transition to SFNH Version 3.1 and MFNC Version 1.1?

Yes, the proposed timeline is sufficient

Do you have additional general feedback on this topic?

Given the available data presented by EPA regarding current scores, we support this transition, which will both simplify the programmatic offerings and encourage increased energy efficiency in states that have not adopted newer versions of the IECC.

### Introduction of National SFNH Version 3.2 and MFNC Version 1.2 Program Requirements

Is the proposed more stringent thermal backstop for SFNH Version 3.2 and MFNC Version 1.2, aligned with the 2021 IECC, appropriate and achievable?

IECC 2021 as the backstop is aggressive. While some states are set to adopt the 2021 standard in the near future, it we don't yet know what may be amended out. Where there are concerns regarding cost effectiveness related to measures such as the R-5 continuous insulation, adoption of the 2021 IECC as the backstop may limit participation in the ENERGY STAR program. We suggest that instead using the 2018 IECC as a backstop.

For SFNH Version 3.2, is the proposed more stringent alternative backstop for homes with low infiltration, defined as  $\leq 115\%$  of the total UA resulting from the U-factors in the 2021 IECC, appropriate and achievable? Should this alternative backstop be restructured to better target the types of homes most likely to use it (e.g., homes with ducts in an unvented attic)?

We support this UA alternative.

Should EPA maintain its previous policy of requiring that the new version of the program be used to certify homes and apartments permitted one year after the date of implementation of the state's new code for the proposed SFNH Version 3.2 and MFNC Version 1.2 program requirements?

Yes, maintain consistency in the implementation timeline.

In the new MFNC Reference Design, EPA is proposing to include a 1.2 EF water heater. This efficiency level falls between what is available for electric tank products and heat pump products and was selected to require apartments



# ENERGY STAR Residential New Construction Roadmap Comments

with electric water heating to install heat pump water heaters when using the Prescriptive Path, while not making it prohibitively difficult to achieve the ERI target for those using the ERI Path. Is this an appropriate level of water heater efficiency for EPA to include in the proposed new MFNC Reference Design?

There should be an alternative noted for central/commercial water heating that does not utilize the same rating standard

Do you have additional general feedback on this topic?

We support HVAC grading as an option, as it currently is in v3.1, but do not agree with making HVAC grading mandatory at this time. It is currently a voluntary option that appears to have little uptake, which means there is limited data to support its impact.

## **Introduction of New Certification Label to Accelerate Construction of Next Generation of Homes & Apts. ENERGY STAR Certified Connected Heat Pumps**

EPA is proposing that all installed heat pumps must use the HVAC Grading Track and achieve Grade I for all elements. Is mandatory HVAC grading and achieving Grade I in homes an appropriate requirement for the new certification?

We support it as an option, as it currently is in v3.1, but do not agree with making HVAC grading mandatory at this time. It is currently a voluntary option that appears to have little uptake, which means there is limited data to support its impact.

EPA is proposing that all installed heat pumps must meet EPA's 'connected' criteria or use an ENERGY STAR smart thermostat. Are these connected options appropriate requirements?

Yes, this is appropriate. However, we suggest that you clarify the connected criteria and type of controls permitted to meet the requirement.

EPA is not proposing to include space conditioning or connected requirements for non-dwelling unit spaces in multifamily buildings. Is this an appropriate and advisable exemption?

We support this exemption.

EPA is proposing that cold climate heat pumps be required in Climate Zones 5-8. Are these the most appropriate areas for requiring these systems? Should any Climate Zones be added or any eliminated?

This is appropriate, and already standard practice in many areas.

## **ENERGY STAR Certified Heat Pump Water Heaters**

EPA is proposing minimum tank size requirements to help ensure that the heat pump is used as the primary water heating source, rather than the electric resistance backup coil. Is this advisable, and are the proposed tank sizes appropriate?

These tank sizes do not align with what is commonly seen in various unit sizes. For example, it is far more common to see a 75 gallon tank in a 3 Br unit than an 80 gallon.

EPA is proposing that heat pumps installed in occupiable space have a sound rating of  $\leq 55$  dBA. Is this an appropriate



threshold?

We completely support this requirement, as noise concerns are a primary deterrent from the use of heat pumps.

EPA is proposing that heat pump water heaters will be mandatory to earn the new certification for all types of new construction, including multifamily. Should EPA consider allowing conventional electric water heaters while the market develops new heat pump water heater solutions?

For the purpose of this new certification, we feel it is appropriate to require heat pump water heaters.

## Induction/Electric Cooking

EPA is proposing an exemption from the certification requirement for induction cooktops and ranges in government-subsidized affordable housing projects, where conventional electric cooktops will be allowed as an alternative. Is this allowance appropriate and advisable for affordable housing?

Yes, there should be an exemption for affordable housing in consideration of the increased expense of the cookware required for induction cooking.

Should EPA also consider allowing conventional electric cooktops in market-rate housing as an alternative to induction?

If the goal is to drive the market towards electrification, and towards the use of induction cooking, then no, there should not be an allowance for conventional electric cooktops for market rate housing.

## Electric Vehicle Charging Capability

Are EPA's proposed requirements for private EV-Ready spaces and/or installed EV chargers and EV-Capable parking spaces appropriate?

We propose that instead of requiring level 2 chargers across the board, there should be an alternative that allows for the installation of level 1 chargers at a higher rate. For example, if a project would have required 5 level 2 chargers, they may instead be required to install 10 level 1 chargers, which would increase the capacity for a multifamily building or development.

EPA is proposing to cap the number of required EV-chargers for a development at five (5). Is this an advisable limit?

No, there should not be a cap on the number of EV chargers. It should instead simply be based on the percentage of units if the goal is to increase the availability of chargers and the adoption of EV.

EPA is not proposing to relax the EV-Ready or EV-Charging requirements for government-subsidized affordable housing. Should EPA consider setting alternative EV charging infrastructure requirements (or have no EV requirements) for affordable housing?

No, affordable housing should have the same requirements, allowing the same access to charging resources that market rate housing has as the market moves towards EV.



# ENERGY STAR Residential New Construction Roadmap Comments

**Organization Name:** Phius

**Respondent Last Name:** Lisanti

**Respondent First Name:** Anthony

**Comments:**

## General

An overall comment would be the continued reliance on HQUITO Accredited HVAC contractors. It is my opinion that this requirement, since it's inception, has not adequately produced the quantity and quality of contractors. Phius is looking ways for mass adoption of our standards, which rely on Energy Star SFNH & MFNC Certification. We feel that HVAC Contractor Credentialing is an impediment to this goal. Having the ability to Grade installation via Path A of the respective HVAC Checklists provides an alternative and incentive for better HVAC installation practices. Mandating a credential which DOES NOT GUARANTEE a better quality installation remains troublesome. It does guarantee that a number of contractors get credentialed and complete 1-2 projects and never improve their installation practices. Being more inclusive of experienced HVAC Contractors that can adequately complete the Commissioning Requirements without a credential will move us toward more mass adoption of high performance/low-energy homes & buildings.

## National Transition to SFNH v3.1/MFNC v1.1

Are there any available data or analyses to indicate that a national transition to SFNH Version 3.1 and MFNC Version 1.1 is not warranted at this time?

Phius has no comment or issue with transitioning to either SFNH v3.1 or MFNC 1.1 at this time. So long as Energy/ Building Codes in certain locales are not in conflict with the either Program's standards

Will the proposed date of January 1, 2023 (based on permit date) provide partners with sufficient time to prepare for the transition to SFNH Version 3.1 and MFNC Version 1.1?

Yes

Do you have additional general feedback on this topic?

No

## Introduction of National SFNH Version 3.2 and MFNC Version 1.2 Program Requirements

Are there any available data or analyses to indicate that EPA's proposed SFNH Version 3.2 and MFNC Version 1.2 program requirements are not warranted or that the proposed efficiency levels are not achievable or cost-effective?

For the infiltration limits- we like to see compartmentalization numbers for duplexes and townhouses that compliment the air infiltration limits. Noting- Phius air tightness limits are far below these proposed limits in V3.2.

Is the proposed more stringent thermal backstop for SFNH Version 3.2 and MFNC Version 1.2, aligned with the 2021 IECC, appropriate and achievable?

Reasonably so, yes



# ENERGY STAR Residential New Construction Roadmap Comments

For SFNH Version 3.2, is the proposed more stringent alternative backstop for homes with low infiltration, defined as  $\leq 115\%$  of the total UA resulting from the U-factors in the 2021 IECC, appropriate and achievable? Should this alternative backstop be restructured to better target the types of homes most likely to use it (e.g., homes with ducts in an unvented attic)?

Yes- not all home builders are willing to locate equipment in conditioned spaces. Although for PHIUS it is a requirement via reliance on the EPA Indoor airPLUS and DOE ZERH Program requirements

Should EPA maintain its previous policy of requiring that the new version of the program be used to certify homes and apartments permitted one year after the date of implementation of the state's new code for the proposed SFNH Version 3.2 and MFNC Version 1.2 program requirements?

Yes this is reasonable- perhaps including an exception that would recognize Pre-Certification dates for Phius projects due to the longer development time many projects experience would be a welcome alternative.

In the new MFNC Reference Design, EPA is proposing to include a 1.2 EF water heater. This efficiency level falls between what is available for electric tank products and heat pump products and was selected to require apartments with electric water heating to install heat pump water heaters when using the Prescriptive Path, while not making it prohibitively difficult to achieve the ERI target for those using the ERI Path. Is this an appropriate level of water heater efficiency for EPA to include in the proposed new MFNC Reference Design?

No- Phius recommends leaving the reference design as is for Water Heaters

Do you have additional general feedback on this topic?

Individual Heat Pump Water heaters used in apartments may have some unintended consequences. Noise, vibration, and the effect of cooling and dehumidification needs to be looked at over time. More experiential data showing the cumulative effects of numerous ASHP Water heaters in MF buildings should be examined before making this change.

## Introduction of New Certification Label to Accelerate Construction of Next Generation of Homes & Apts.

### General

Do you have general feedback on this topic?

No

### Energy Efficiency Prerequisite

Are EPA's proposed energy efficiency requirements at an appropriate level for the new certification?

Yes

### ENERGY STAR Certified Connected Heat Pumps

EPA is proposing that all installed heat pumps must use the HVAC Grading Track and achieve Grade I for all elements. Is mandatory HVAC grading and achieving Grade I in homes an appropriate requirement for the new certification?

It is reasonable

EPA is proposing that all installed heat pumps must meet EPA's 'connected' criteria or use an ENERGY STAR smart thermostat. Are these connected options appropriate requirements?



# ENERGY STAR Residential New Construction Roadmap Comments

Yes Phius is in favor of this requirement. However, in Phius Certified homes, Utility control of the primary heating/cooling system features such as set back may lead to some unintended consequences. Generally, Phius certified homes do not need or require set back features since the H/C system are supplemental. In certain climates the ability to recover temperature in cooling mode may provide some challenges since the systems may not have the capacity to cool or dehumidify the home as quickly as a “conventional” home. Therefore occupants in Phius Certified homes may report experience comfort issues with the HVAC system if they are unaware of outside intervention with the settings of their HVAC controls.

EPA is not proposing to include space conditioning or connected requirements for non-dwelling unit spaces in multifamily buildings. Is this an appropriate and advisable exemption?

yes

EPA is proposing that cold climate heat pumps be required in Climate Zones 5-8. Are these the most appropriate areas for requiring these systems? Should any Climate Zones be added or any eliminated?

Consider adding Climate zone 4

## **ENERGY STAR Certified Heat Pump Water Heaters**

EPA is proposing minimum tank size requirements to help ensure that the heat pump is used as the primary water heating source, rather than the electric resistance backup coil. Is this advisable, and are the proposed tank sizes appropriate?

Yes

EPA is proposing that heat pumps installed in occupiable space have a sound rating of  $\leq 55$  dBA. Is this an appropriate threshold?

Yes- any opportunity the EPA may have to drive down the sound ratings is also welcome

EPA is proposing that heat pump water heaters will be mandatory to earn the new certification for all types of new construction, including multifamily. Should EPA consider allowing conventional electric water heaters while the market develops new heat pump water heater solutions?

Yes- EPA Should also consider an alternative for MF Buildings with Central Water Heating

## **Induction/Electric Cooking**

EPA is proposing an exemption from the certification requirement for induction cooktops and ranges in government-subsidized affordable housing projects, where conventional electric cooktops will be allowed as an alternative. Is this allowance appropriate and advisable for affordable housing?

No- Phius recommends Induction Cooktops

Should EPA also consider allowing conventional electric cooktops in market-rate housing as an alternative to induction?

No

## **Electric Vehicle Charging Capability**





# ENERGY STAR Residential New Construction Roadmap Comments

Are EPA's proposed requirements for private EV-Ready spaces and/or installed EV chargers and EV-Capable parking spaces appropriate?

Yes

EPA is proposing to cap the number of required EV-chargers for a development at five (5). Is this an advisable limit?

Yes- but alternatives for MF projects in urban areas where parking is limited should be considered



# ENERGY STAR Residential New Construction Roadmap Comments

**Organization Name:** Stone Mountain Technologies

**Respondent Last Name:** Michael

**Respondent First Name:** Garrabrant

**Comments:**

*Comments submitted in letter. See next page.*



## **Stone Mountain Technologies, Inc.** *Thermally Driven Heat Pumps*

November 12, 2021

Jon Passe  
Chief, Energy Star Residential Branch  
US Environmental Protection Agency  
1200 Pennsylvania Ave, NW  
Washington, DC 20460

RE: Response to Energy Star Residential Home Construction Program Roadmap of October 18, 2021

Dear Jon,

Stone Mountain Technologies, Inc. (SMTI) is a developer and manufacturer of advanced thermally-driven heat pumps (TDHPs) for residential and light commercial space and water heating applications. The performance of our air-to-water gas-fired heat pumps, AFUE of 140%, COP of 1.45 and UEF > 1.0 has been 3rd party tested and field verified. The development of our family of TDHPs was supported with support from the Department of Energy (DOE), California Energy Commission (CEC) and several others. SMTI's TDHP models will be commercially available by the end of 2022.

SMTI appreciates the opportunity to submit these comments to the U.S. Environmental Protection Agency (EPA) regarding its request for comment on the ENERGY STAR Residential New Construction Program Roadmap, Framework Document for Stakeholder Feedback, dated October 18, 2021.

SMTI understands that the new label to be applied to next generation homes and apartments will focus heavily on inclusion of Energy Star qualified home comfort (space heating and water heating) components including connected space-conditioning heat pumps, and connected heat pump water heaters, among other items. We understand, from the EPA call of 11/4/21, that these home comfort solutions will exclude all options employing natural gas fuel for anything other than backup space heating. SMTI supports the idea of an advanced Energy Star label going above and beyond the existing system to provide the market with signals about where technology innovation is headed in the coming 5- or 10-year period. We believe it is important to maintain the traditionally fuel-neutral policy of Energy Star, while focusing on the intended goal of supporting pathways to maximal decarbonization of building heating and cooling.

In addition to the electric heat pump (EHP) options discussed, SMTI requests that EPA also include thermally driven heat pumps (TDHPs), for both space heating and domestic hot water as part of the group of home comfort products which qualify for inclusion in the proposed new certification level for next generation homes and apartments. While a few TDHP products are in the market and they are not (yet) widely familiar to the HVAC market, this category of products can serve as primary heat for both space and domestic hot water in single-family homes. TDHPs will offer builders and homeowners an additional and economically attractive choice to promote low- and zero-carbon environmental footprint. TDHPs require no back-up appliance in cool/cold weather, operating with outdoor temperatures as low as minus 40 degrees, while providing ample warmth and comfort to the homeowner. It will also immediately lower

609 Wesinpar Rd. Johnson City, TN 37604

423-735-7400



homeowner heating bills by 30-50% compared to conventional gas heating appliances – in contrast to EHPs which may significantly increase such costs, especially in cool-cold climates.

Finally, TDHPs will also immediately reduce homeowner carbon footprints by 30-50% compared to conventional appliances when using natural gas. In the future, as the gas pipeline system transitions towards delivering low and zero-carbon fuels, the TDHP carbon footprint will move rapidly towards “zero”. In fact, TDHPs will significantly help accelerate the path towards low/zero carbon fuels because of its high COP and strong operating performance in cold climates. If a natural gas stream were to contain 20% zero-carbon energy, then using it in TDHP products would yield the functional equivalent of 47% carbon-neutral content if the gas had been used in conventional technology. The gas industry in both North America and Europe is in the early stages of rapidly transitioning towards “clean molecules” – all of which can be easily utilized in TDHP technology with little or no modification. Since no one can confidently predict the relative pace of decarbonization for the electric and gas grids – it makes sense to categorically enable both options to compete for the future of decarbonized building heat.

SMTI requests that Energy Star refrain from “picking winners” or pre-supposing that any given technology or energy stream can or cannot accomplish the larger objective of decarbonization. Specifically, in the section “Cold Climate Heat Pumps” (page 37), SMTI requests that TDHPs be added to the proposed specification. By allowing gas heat pumps to be an option in the proposed new construction specification, the market will be allowed to innovate and achieve goals in the most rapid means possible. SMTI would be pleased to share additional information with EPA regarding our technology as well as the new space- and water-heating offering we are bringing to market.

Sincerely,

A handwritten signature in black ink, appearing to read "Michael Garrabrant".

Michael Garrabrant, President



# ENERGY STAR Residential New Construction Roadmap Comments

**Organization Name:** Xcel Energy

**Respondent Last Name:** Mark

**Respondent First Name:** Nick

**Comments:**

## General

Xcel Energy is generally supportive of the proposed New Certification Label to Accelerate Construction of Next Generation of Homes & Apartments. Xcel Energy is a leader in decarbonizing the electricity and natural gas that customers rely on every day. Our efforts to reduce the carbon intensity of homes and businesses require a broad suite of tools that do not limit backup options for customers. Critical among these are programs such as this ENERGY STAR proposal for residential new construction. In some states served by Xcel Energy we are already delivering voluntary programs for all-electric new construction and replacement equipment that overlap with many of the end-uses noted in the proposal. This approach sends a clear signal to the market that electric new construction is an option to consider in the right conditions, backed by a combination of utility program resources and the strength of the ENERGY STAR brand.

Xcel Energy is a member of the Consortium for Energy Efficiency (CEE), an organization representing energy program administrators in Canada and the United States. In addition to the comments contained here, Xcel Energy has also contributed to more detailed comments on the proposal submitted on behalf of CEE's larger group of energy efficiency program stakeholders. One area that we would like to emphasize and support is inclusion of connected equipment in this new certification label. This requirement aligns with the emerging desire for both electric and natural gas program administrators to leverage controls to match consumer energy demand to grid conditions.



# ENERGY STAR Residential New Construction Roadmap Comments

**Organization Name:** Alliance to Save Energy, American Council for an Energy-Efficient Economy, Energy Efficient Code Coalition, Institute for Market Transformation, Insulation Contractors Association of America, National Association of State Energy Officials, Natural Resources Defense Council, New Building Institute, North American Insulation Manufacturers Association, Polyisocyanurate Insulation Manufacturers Association, Responsible Energy Code Alliance, U.S. Green Building Council

**Respondent Last Name:** [Add last name]

**Respondent First Name:** [Add first name]

**Comments:**

*Comments received after close of comment period.*

*Comments submitted in letter. See next page.*



## VIA E-MAIL

February 11, 2022

The Honorable Michael Regan, Administrator  
U.S. Environmental Protection Agency  
1200 Pennsylvania Avenue, N.W.  
Washington, D.C. 20460

Dear Administrator Regan:

The U.S. Environmental Protection Agency's ("EPA") ENERGY STAR program is one of the most publicly recognizable and impactful voluntary programs available to both save homeowners money on their energy bills and help this Administration to meet its ambitious climate decarbonization goals. Its "Certified Homes" program, if properly configured, can drive immediate and substantial carbon reductions from the residential building sector. Unfortunately, the EPA appears to be considering a Version 3.2 ENERGY STAR Certified Homes update ("Version 3.2") that falls far short of meeting the climate challenge.

Version 3.2 is intended to be at least ten percent more stringent than the 2021 International Energy Conservation Code ("2021 IECC"). However, some industry stakeholders advocate that EPA weaken the mandatory building envelope requirements included in the October 2021 proposal. If those requirements are dropped, Version 3.2 may not ensure the substantial lifetime building envelope efficiency improvements that are the hallmark of the 2021 IECC as compared to previous code editions. Instead, Version 3.2 may permit minimum insulation standards at the significantly lower level established in the 2012 IECC and maintained in the 2015 and 2018 IECC.

To maximize energy bill savings over the longer term and to be fully aligned with the Administration's climate goals, the Version 3.2 update must set the prescriptive building envelope levels of the 2021 IECC as a minimum requirement for this voluntary program. A highly efficient building envelope delivers many important benefits. It reduces home energy consumption and carbon emissions for decades with measures such as wall insulation that are very hard to retrofit after construction. In addition, it moderates a home's energy usage during intensive heating and cooling periods, promoting resiliency and reducing peak electricity demand, including winter peaks in electric heating, which are hard to meet with renewable power.

Aligning ENERGY STAR Version 3.2 with the mandatory requirements of the 2021 IECC is also cost effective. The Department of Energy analyzed the 2021 IECC, stating: "the prescriptive and mandatory provisions of the 2021 IECC are shown to generate an average life-cycle cost savings of \$2,320, an average payback of 10.5 years, and the years to cumulative positive cashflow averaging 4 years for all climate zones." (*National Cost Effectiveness of the Residential Provisions of the 2021 IECC, Pacific Northwest National Labs – June 2021*)



# ENERGY STAR Residential New Construction Roadmap Comments

The Honorable Michael Regan, Administrator  
February 11, 2022  
Page 2

Finally, weakening the backstop for a voluntary program would send the wrong signal at a time when states and local jurisdictions are considering whether to adopt the 2021 IECC to achieve its large energy and carbon savings.

In closing, we ask that EPA fully meet the challenge demanded by the climate crisis and issue an ENERGY STAR Version 3.2 standard that sets minimum mandatory envelope standards consistent with the 2021 IECC.

Sincerely,

Alliance to Save Energy  
American Council for an Energy-Efficient Economy  
Energy Efficient Code Coalition  
Institute for Market Transformation  
Insulation Contractors Association of America  
National Association of State Energy Officials  
Natural Resources Defense Council  
New Building Institute  
North American Insulation Manufacturers Association  
Polyisocyanurate Insulation Manufacturers Association  
Responsible Energy Code Alliance  
U.S. Green Building Council

cc: Victoria Arroyo, Associate Administrator, Office of Policy  
Joseph Goffman, Principal Deputy Assistant Administrator, Office of Air and Radiation  
Chris Grundler, Director, Office of Atmospheric Programs  
Elizabeth Shaw, Deputy Assistant Administrator, Office of Air and Radiation





# ENERGY STAR Residential New Construction Roadmap Comments

**Organization Name:** American Chemistry Council

**Respondent Last Name:** Baca

**Respondent First Name:** Joshua

**Comments:**

*Comments received after close of comment period.*

*Comments submitted in letter. See next page.*



January 13, 2021

The Honorable Michael Regan  
Administrator  
U.S. Environmental Protection Agency  
1200 Pennsylvania Avenue N.W.  
Washington, DC 20004

**RE: DRAFT ENERGY STAR Single-Family New Homes National Program Requirements, Version 3.2**

Dear Administrator Regan,

The American Chemistry Council supports the U.S. Environmental Protection Agency's (EPA) efforts to update the ENERGY STAR for Homes Program to keep pace with the increased efficiency in the International Energy Conservation Code (IECC). The Agency has the opportunity to make a meaningful reduction in greenhouse gas (GHG) emissions by implementing an updated version of the ENERGY STAR for Homes Program that not only meets but truly exceeds the IECC. According to the Department of Energy (DOE), residential buildings consume 21% of the total U.S. Energy Consumption.<sup>1</sup> New homes must be constructed with highly efficient building envelopes to maximize the GHG reduction and energy savings across the lifespan of the home. DOE estimates that 56% of the energy used in a home goes to heating and cooling.<sup>2</sup> Through innovative chemistry, the industry has developed products to build well-insulated and airtight building envelopes. These products present a significant opportunity to reduce the energy required to condition air in the nation's building stock.

ACC is concerned that ENERGY STAR Version 3.2 will require the use of older building energy efficiency requirements outlined in the 2012, 2015, and 2018 IECC as opposed to using the building energy efficiency requirements in the 2021 IECC. The 2012, 2015, and 2018 IECC share the same energy efficiency requirements for the building envelope. Implementing Version 3.2 based upon anything less than the 2021 IECC allows homes to be built to efficiency standards that are essentially a decade old. Implementing outdated building envelope requirements harms our shared goal of fighting climate change by reducing energy and carbon consumption.

Residential buildings must be properly insulated and air-sealed upon initial construction in order to maximize energy efficiencies. Building envelopes are rarely renovated due to the intensive nature and cost of such projects. Therefore, envelopes must be constructed as efficiently as possible from the very beginning or homes will likely be under-insulated and less airtight for generations. Accordingly, ACC suggests EPA maximize GHG reductions by implementing the

<sup>1</sup> [Energy Data Fact – Office of Energy Efficiency and Renewable Energy](#)

<sup>2</sup> <https://www.energy.gov/energysaver/heating-and-cooling>





most efficient version of ENERGY STAR by adopting requirements for the building envelope in the 2021 IECC as opposed to the less stringent requirements in the 2012, 2015, and 2018 IECC.

EPA has suggested that ENERGY STAR Version 3.2 will be 10% more efficient than the 2021 International Energy Conservation Code (IECC).<sup>3</sup> However, virtually all the proposed efficiency improvements that exceed the 2021 IECC requirements currently come from equipment (i.e., HVAC, water heaters, appliances) with a life span of 10-20 years. ACC supports the use of more energy-efficient appliances but not at the expense of building a less efficient building envelope.

The Administration has set ambitious goals for reducing carbon emissions and the ENERGY STAR program is a significant government tool to reduce GHG emissions from homes. ACC encourages EPA to use the ENERGY STAR program to reduce GHG emissions from the nation's building stock. To accomplish this goal, EPA must ensure ENERGY STAR Version 3.2 uses the building envelope levels of the 2021 IECC as a minimum mandatory requirement.

Sincerely,

Joshua Baca  
Vice President  
American Chemistry Council, Plastics Division

CC: Gina McCarthy, White House National Climate Advisor  
Mark Chambers, White House Climate Team

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<sup>3</sup> [Raising the Bar: Advancing the Versions of the ENERGY STAR Residential New Construction Programs](#) (Page 18)



# ENERGY STAR Residential New Construction Roadmap Comments

**Organization Name:** GTI

**Respondent Last Name:** LaFleur

**Respondent First Name:** Jason

**Comments:**

*Comments received after close of comment period.*

## Introduction of New Certification Label to Accelerate Construction of Next Generation of Homes & Apts.

### General

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

The to-be-named “New Certification Program” will provide an optional pathway through ENERGY STAR certification and presumably an extra branding label for those builders choosing to pursue it. Given that the new program does not have any prerequisites or criteria related to on-site renewable generation, it will be very important for the labeling of this program to be transparent and not misrepresent its contents. For example, a name involving phrases such as “decarbonized” “zero emission” or “clean electricity” could all inaccurately portray what the proposed program actually provides. While many States and utilities in the electrical power generation space are increasingly setting goals and targets for carbon-free electricity by a certain date in the future, the reality of what will occur in the near future or even mid-term is less clear. Depending on the local grid generation mix where a proposed building might be located, the greenhouse gas emissions could actually be higher for a home under the New Certification Program than a mixed fuel home under the base ENERGY STAR New Construction program, particularly if onsite renewable energy is not included in the project. These are some challenging considerations when branding the New Certification Program.

### Energy Efficiency Prerequisite

[Are EPA’s proposed energy efficiency requirements at an appropriate level for the new certification?](#)

Alignment with proposed revised ENERGY STAR New Construction programs is appropriate for the new certification

### ENERGY STAR Certified Connected Heat Pumps

[EPA is proposing that all installed heat pumps must use the HVAC Grading Track and achieve Grade I for all elements. Is mandatory HVAC grading and achieving Grade I in homes an appropriate requirement for the new certification?](#)

Mandatory HVAC achieving Grade 1 is very appropriate. In particular, the Grade 1 requirement to confirm refrigerant is heavily warranted as a mandatory requirement given that common residential refrigerants such as R410 are over 4,000 times more damaging on a CO<sub>2</sub>-equivalent green house gas basis. If electric heat pumps are to be required, Grade 2 and Grade 3 HVAC grades should not be permissible as a mandatory program requirement.

[EPA is proposing that cold climate heat pumps be required in Climate Zones 5-8. Are these the most appropriate areas for requiring these systems? Should any Climate Zones be added or any eliminated?](#)

Electrically driven cold-climate heat pumps should be one option, but increasing manufacturers are integrating electric heat pumps with fuel-fired backup systems for low ambient temperatures. These hybrid systems should be permissible when on a source energy and CO<sub>2</sub> emissions basis, a fuel-fired backup at cold temperatures would in fact deliver greater energy efficiency and lower CO<sub>2</sub> emissions than a cold climate heat pump which may have backup electric resistance heating and ancillary electrical loads such as defrost and oil circulation to the compressor which significantly derates real world



# ENERGY STAR Residential New Construction Roadmap Comments

performance versus steady state rating conditions. EPA should adopt the cold climate requirements in the proposed ENERGY STAR Version 6 Product Specification, with modification to allow fuel-fired backup heat options at temperatures below 30 degF.

Additionally, there are multiple manufacturers bringing cold-climate heat pumps fueled by natural gas to market in the next year. The ENERGY STAR New Certification Label should permit fuel-fired equipment in cold climates that both meets CEE Advanced Tier performance of > 120% AFUE and is located such that all combustion occurs outside the thermal and air barrier. These technologies will deliver advanced decarbonization regardless of phased reductions in local electrical grid generation, and will reduce operating costs for consumers, thus providing a compelling choice for design and construction teams.

## **ENERGY STAR Certified Heat Pump Water Heaters**

EPA is proposing minimum tank size requirements to help ensure that the heat pump is used as the primary water heating source, rather than the electric resistance backup coil. Is this advisable, and are the proposed tank sizes appropriate?

Given recovery rate times, the minimum tank size requirements proposed are acceptable.

EPA is proposing that heat pumps installed in occupiable space have a sone rating of  $\leq 55$  dBA. Is this an appropriate threshold?

The sone rating should require a rating of 65 dBA or lower, when measured in accordance with a procedure such as NEEA's methodology which requires multiple measurements taken at 8 different locations around the equipment and averaged.

EPA is proposing that heat pump water heaters will be mandatory to earn the new certification for all types of new construction, including multifamily. Should EPA consider allowing conventional electric water heaters while the market develops new heat pump water heater solutions?

Conventional electric resistance water heaters are a step backward in efficiency goals and should not be permitted while the market is developing solutions. If an interim product technology solution is needed while the market develops more heat pump water heaters solutions, alternatives such as micro combined heat and power should be explored, particularly for inclusion in multifamily applications.

## **Induction/Electric Cooking**

EPA is proposing an exemption from the certification requirement for induction cooktops and ranges in government-subsidized affordable housing projects, where conventional electric cooktops will be allowed as an alternative. Is this allowance appropriate and advisable for affordable housing?

Conventional electric cooktops should not be permitted. Natural gas ranges only if paired with a smart direct exhaust hood triggered by thermal plumes, indoor air quality, or activation of the range should be permitted. This will ensure appropriate operation and management of source contaminants of concern.

Should EPA also consider allowing conventional electric cooktops in market-rate housing as an alternative to induction?



# ENERGY STAR Residential New Construction Roadmap Comments

Conventional electric cooktops should not be permitted. Natural gas ranges only if paired with a smart direct exhaust hood triggered by thermal plumes, indoor air quality, or activation of the range should be permitted. This will ensure appropriate operation and management of source contaminants of concern.

## **Electric Vehicle Charging Capability**

EPA is proposing to cap the number of required EV-chargers for a development at five (5). Is this an advisable limit?

The cap for required EV-chargers should not be capped at a fixed number such as five chargers, unless overall parking space / unit density in a very urban area for example would impose practical limits on the development.

Some concern has been expressed that the addition of an EV charging circuit would require a costly upgrade to 400-amp service. EPA believes this will be a relatively rare occurrence (and may become even rarer with emerging tech solutions that could eliminate the need for upgrades). Is EPA underestimating the frequency with which this might occur, and if so, should the requirement be changed?

Even with emerging technology solutions that could assist load balancing, professional electrical engineers may take a conservative approach and plan on 400 amp service to accommodate certain chargers. If that is the decision of the design and construction team, that should be permitted by the ENERGY STAR program.



# ENERGY STAR Residential New Construction Roadmap Comments

**Organization Name:** Karpman Consulting

**Respondent Last Name:** Karpman

**Respondent First Name:** Maria

**Comments:**

*Comments received after close of comment period.*

## 1. Minimum baseline 90.1 2010 regardless of state code

31 states have codes that are set at 90.1 2013 or later and 8 states have Home Rule (per the second column in the table shown below) from <https://www.energycodes.gov/status/commercial>. In some municipalities in the Home Rule states local codes are set at levels more stringent than 90.1-2010. Perhaps it is justifiable to go even further and set the minimum baseline at 90.1 2013. Over the past ten years energy performance goals across states have increased dramatically with the effects of climate change becoming more and more evident.

Table 1. Status of State Energy Code Adoption Map Summary - Commercial

State	Current Code (as of 9/30/21)	State Map Legend (as of 9/30/21)
Alabama	90.1-2013	90.1-2013
Alaska	None statewide	No statewide code
Arizona*	Home rule	< 90.1-2007
Arkansas	2009 IECC and 90.1-2007	90.1-2007
California	2016 Building Energy Efficiency Standards	90.1-2016
Colorado	Home Rule	No statewide code

### EPA Questions

Are there any available data or analyses to indicate that a national transition to SFNH Version 3.1 and MFNC Version 1.1 is not warranted at this time?

No.

Will the proposed date of January 1, 2023 (based on permit date) provide partners with sufficient time to prepare for the transition to SFNH Version 3.1 and MFNC Version 1.1?

No evidence that there is insufficient time to prepare.

## 2. 10 percent savings relative to 2021 IECC, I think this is the same as previous versions, 15% is for the ASHRAE Path because the EPA says that 90.1 is 5% less stringent than IECC

We request that a v1.1vs 1.2 changes document to be posted (like the document they made for differences between the MFHR and MFNC document).

### EPA Questions

Are there any available data or analyses to indicate that EPA's proposed SFNH Version 3.2 and MFNC Version 1.2 program requirements are not warranted or that the proposed efficiency levels are not achievable or cost-effective?

Not that we are aware of.



Is the proposed more stringent thermal backstop for SFNH Version 3.2 and MFNC Version 1.2, aligned with the 2021 IECC, appropriate and achievable?

This appears to be quite a stringent backstop. We are all for improving efficiency in buildings but part of the reason for going with the whole building performance path is that you have trade off options. If the backstop is for Version 1.2 which is a baseline of ASHRAE 90.1-2019 then it appears that there will be no trade off opportunities for building envelope. Perhaps a backstop of 2018 would be a better option.

In the new MFNC Reference Design, EPA is proposing to include a 1.2 EF water heater. This efficiency level falls between what is available for electric tank products and heat pump products and was selected to require apartments with electric water heating to install heat pump water heaters when using the Prescriptive Path, while not making it prohibitively difficult to achieve the ERI target for those using the ERI Path. Is this an appropriate level of water heater efficiency for EPA to include in the proposed new MFNC Reference Design?

I (Christina) have heard that in some instances MF projects struggle with some technical difficulties associated with heat pump water heaters. Specifically, not having enough of a heat source in the winter in basements and not enough air flow to replenish the heat sink with outdoor air. We have not seen very many as of yet. However, I think the technology will improve quickly and there will be more readily available options like split heat pump water heaters so perhaps this is a reasonable assumption.

### 3. New net zero ready certification

We can see that this additional level of certification could be beneficial, even with the existence of DOE's Zero Energy Ready Homes (ZERH), in that if a project already must obtain ENERGY STAR certification for financing or for some other reason than it would be a more efficient process for them to also work to achieve a net zero certification through ENERGY STAR as well. It would prevent a project from having to apply to both the EPA and the DOE for certifications. In general, we like this concept.

#### EPA Questions

Are EPA's proposed energy efficiency requirements at an appropriate level for the new certification?

Perhaps also have a site EUJ target by climate zone would also make sense since low EUJs are typically needed to achieve net zero. This would also be another step in pushing the performance of building with the certification even further beyond base level ENERGY STAR certification.

EPA is not proposing to include space conditioning or connected requirements for non-dwelling unit spaces in multifamily buildings. Is this an appropriate and advisable exemption?

In order for the building to have the best chance of achieving net zero perhaps it's best not to include these exemptions unless it is for building areas that are not residential support areas like future retail.

EPA is proposing minimum tank size requirements to help ensure that the heat pump is used as the primary water heating source, rather than the electric resistance backup coil. Is this advisable, and are the proposed tank sizes appropriate?

Agree advisable. No comment on tank size.





# ENERGY STAR Residential New Construction Roadmap Comments

EPA is proposing that heat pump water heaters will be mandatory to earn the new certification for all types of new construction, including multifamily. Should EPA consider allowing conventional electric water heaters while the market develops new heat pump water heater solutions?

Yes, one idea is to have a points system where there are a handful of items that the project can optionally include in order to achieve the required numbers of points (the list could include even higher performance options and items that are still maturing in the marketplace). Projects could pick and choose which items to include in order to achieve the required number of points. Heat pump water heaters, induction appliances, higher than minimum performance, all spaces even retail meeting requirements, installation of renewables, etc. could all be potential items that buildings could choose to implement. This way there is some flexibility as the market and technologies matures.

Another option for projects that are unable to meet some of the requirements that are a stretch for whatever reason is to have a tiered approach. Net zero emerald and net zero diamond.

EPA is proposing an exemption from the certification requirement for induction cooktops and ranges in government-subsidized affordable housing projects, where conventional electric cooktops will be allowed as an alternative. Is this allowance appropriate and advisable for affordable housing?

Yes. See comment above.

Should EPA also consider allowing conventional electric cooktops in market-rate housing as an alternative to induction?

Yes, since tenant cookware would have to be compatible with induction and this may be overly burdensome. See comment above regarding points.

Some concern has been expressed that the addition of an EV charging circuit would require a costly upgrade to 400-amp service. EPA believes this will be a relatively rare occurrence (and may become even rarer with emerging tech solutions that could eliminate the need for upgrades). Is EPA underestimating the frequency with which this might occur, and if so, should the requirement be changed?

See comment above regarding points.

#### **4. New future version of the EPA MFNC program**

The ASHRAE ECB committee is developing a simplified modeling approach for simple buildings. Perhaps this would be worth exploring for a future version of the program. NYStretch is considering adopting this method.