



Preparing for ENERGY STAR Manufactured Homes Version 3

Presented on January 10, 2023

Agenda

- What is ENERGY STAR?
- Participating in the ENERGY STAR manufactured homes program
- Preparing for Version 3
- Version 3 implementation timeline
- 45L tax credits
- Q&A

The image shows a large industrial facility, likely a manufacturing plant or warehouse. The top half of the image shows a high-ceilinged area with yellow overhead cranes and blue support structures. A worker in a green shirt and yellow hard hat is pushing a blue cart in the lower half of the image. The floor is concrete, and there are various pieces of equipment, including a red cart and a yellow step ladder. A blue banner with white text is overlaid in the center of the image.

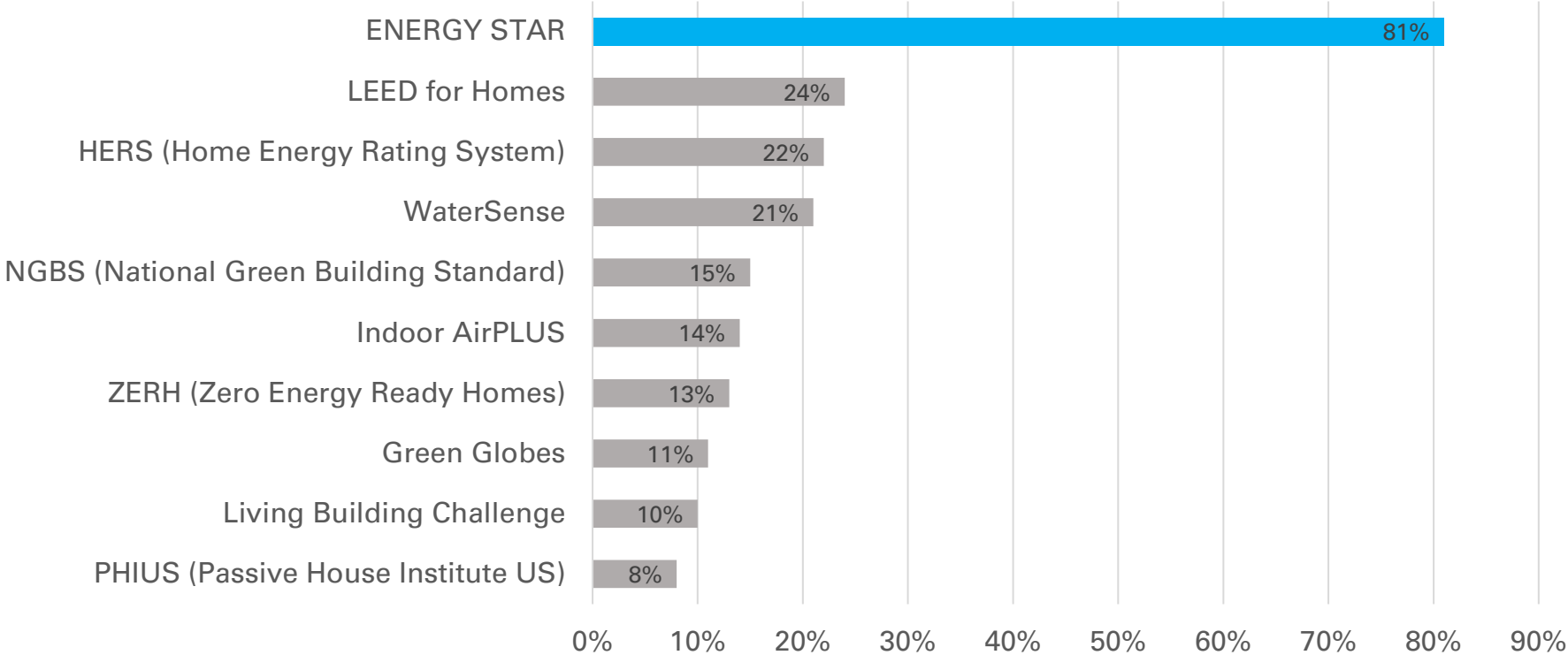
What is ENERGY STAR?



ENERGY STAR[®] is a nationally recognized, voluntary program designed to identify and promote energy-efficient products, new homes, and buildings to consumers and businesses across the United States.

ENERGY STAR is more relevant than ever

Buyers Who Are Aware of Green Certification Programs for Homes
(% of Respondents)



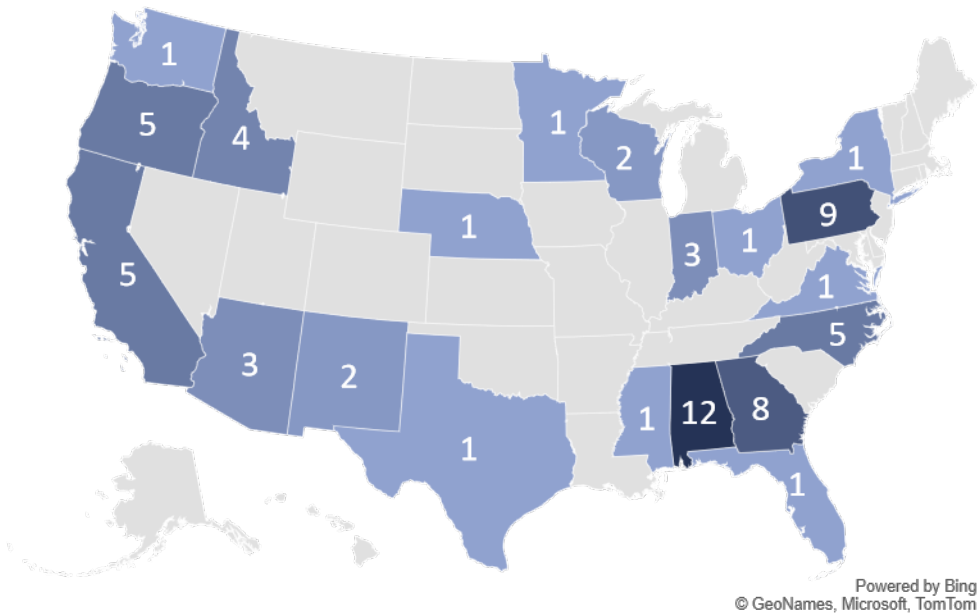
Source: What Home Buyers Really Want, 2019 Edition

Top brand awareness



ENERGY STAR in the Manufactured Housing Sector

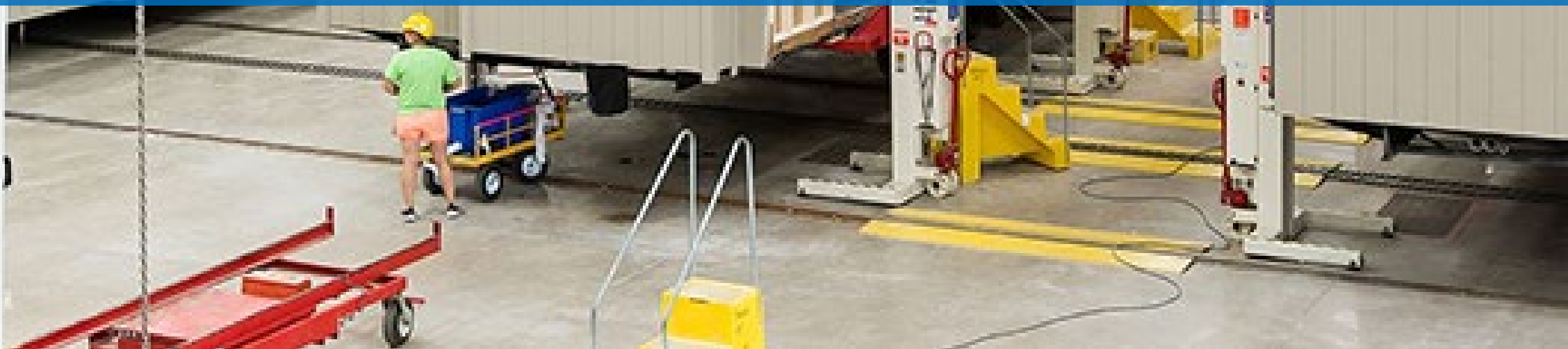
Plants Certified to Produce ENERGY STAR Manufactured Homes



- ENERGY STAR Manufactured Homes have been available since 1998.
- More than 145,000 ENERGY STAR certified manufactured homes have been built to date.
- Historically, one-in-ten manufactured homes built over the last decade were ENERGY STAR certified.
- Over 75 manufactured home plants throughout the U.S. are certified to produce ENERGY STAR homes.
- ENERGY STAR manufactured homes are at least 10% more efficient than a model built to minimum code.

A wide-angle photograph of a large, modern manufacturing facility for manufactured homes. The space is filled with various pieces of machinery, including overhead cranes with yellow beams and blue support structures. In the foreground, there are concrete structures and a metal railing. The background shows more of the factory floor with various equipment and materials.

Participating in the ENERGY STAR Manufactured New Homes Program



Eligibility

- Homes built in a factory that are subject to the federal Manufactured Home Construction and Safety Standards (commonly referred to as the HUD Code) contained in 24 CFR 3280.
- Other ENERGY STAR programs are available for site-built and modular single-family homes and multifamily buildings.

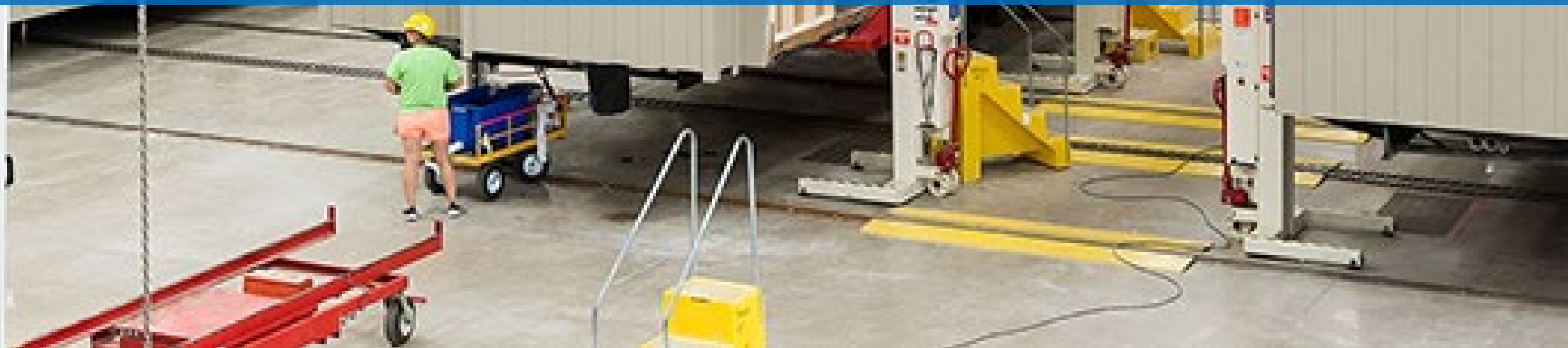
Getting Started with ENERGY STAR

1. Become an ENERGY STAR Partner by signing a free [partnership agreement](#).
2. Certify the plant via an EPA-recognized Quality Assurance Provider (QAP).
3. Build ENERGY STAR Manufactured Homes by successfully meeting the technical and quality control ENERGY STAR program requirements.

Learn more and find a list of QAPs at www.energystar.gov/manufacturedhomes.

A wide-angle photograph of a large industrial facility, likely a factory for manufactured homes. The space is filled with various pieces of machinery, including overhead cranes with yellow beams and blue support structures. In the foreground, there are concrete structures that appear to be part of the home's frame, possibly a roof or a wall section. The lighting is bright, and the overall atmosphere is one of a busy, organized manufacturing environment.

Preparing for **ENERGY STAR** Manufactured Homes Version 3



Key Differences between Version 2 and Version 3

Version 2

- Designed to be 10% more efficient than prior HUD Code.
- Same requirements for single-section and multi-section homes.
- Mandatory measures + 3 predefined package options.

Version 3

- Designed to be 10% more efficient than new Energy Conservation Standards for Manufactured Housing.
- Additional requirements for multi-section homes.
- Mandatory measures + flexible points table.

Version 3 Summary

All homes meet the same requirements in **Exhibit 1**:

- Thermal envelope (insulation, windows, doors)
- Thermostat & ductwork
- Mandatory setup requirements

Multi-section homes also select additional measures from **Exhibit 2**:

- Select measure(s) worth at least 10 points from a flexible points table.

Detailed program requirements available at: energystar.gov/manufacturedhomes.



ENERGY STAR Manufactured New Homes National Program Requirements, Version 3

Eligibility Requirements

Only manufactured homes¹ are eligible to be certified through the ENERGY STAR Manufactured New Homes program. Site-built and modular single-family homes and multifamily buildings may not earn the ENERGY STAR through the Manufactured Homes program but may be eligible for certification through other ENERGY STAR New Construction programs. For more information, visit: www.energystar.gov/newhomesrequirements.

Implementation Timeline

The ENERGY STAR Manufactured New Homes Version 3 program requirements are effective on January 1, 2023, with a transition period of 150 days. Manufactured homes produced on or after January 1, 2023 are permitted to be certified using either Version 2 or Version 3 of the program requirements. Manufactured homes produced on or after May 31, 2023 must be certified using Version 3 of the program requirements.

Partnership and Plant Certification Requirements

Manufactured housing plants must meet the following requirements prior to certifying homes as ENERGY STAR:

- Sign an ENERGY STAR Partnership Agreement, available at www.energystar.gov/homesPA.
- Complete a plant certification process through an EPA-recognized Quality Assurance Provider (QAP).² A list of recognized QAPs can be found at www.energystar.gov/manufacturedhomes.

If a plant is de-certified by its QAP for any reason, it may no longer produce ENERGY STAR certified manufactured homes and must immediately cease all use of the ENERGY STAR name and logo.

ENERGY STAR Certification Process³

1. As noted above, plants must be certified by an EPA-recognized QAP to be eligible to produce homes that earn the ENERGY STAR. The QAP ensures that the plant's home design packages intended for certification meet the requirements in Exhibit 1 and, for multi-section homes, also satisfy the requirements in Exhibit 2.
2. Plants then incorporate the ENERGY STAR program requirements into the Design Approval Primary Inspection Agency's (DAPIA)-approved packages, the plant Quality Control Manual, and the Manufacturer's Installation Manual.
3. Once certified, plants may produce and install ENERGY STAR certified homes in accordance with the designs and installation procedures developed during the plant certification process. The plant's third-party Production Inspection Primary Inspection Agency (PIA) shall inspect the homes for consistency with the DAPIA-approved packages and the plant's quality control (QC) personnel shall verify that the ENERGY STAR features are installed in accordance with the plant's Quality Control Manual.
4. Some ENERGY STAR certified manufactured homes are subject to verification requirements for features that are installed after the home leaves the plant. For multi-section homes, tightly sealed crossover duct installation in accordance with the Mandatory Setup Requirements in Exhibit 1 must be verified at the site. Additionally, for homes designed to meet the Electric Heat Pump Package, installation of the heat pump equipment must be verified. Refer to each QAP for details on approved verification protocols.⁴
5. Plants must report all homes that are certified as ENERGY STAR to their QAP and ensure that an ENERGY STAR label is affixed either adjacent to the HUD Data Plate or inside the electric panel cover of the home. Refer to each QAP for additional details on labeling requirements.
6. The QAP will coordinate with the plant on an ongoing basis to conduct periodic field evaluations and documentation audits. Field evaluations shall be conducted on no less than two percent (2%) of a plant's multi-section ENERGY STAR certified manufactured homes sold and installed on a homeowner's site, or a minimum of one multi-section home each calendar year, whichever is greater. QAPs shall audit documentation of the heat pump equipment installation for no less than ten percent (10%) of certified homes that use the Electric Heat Pump Package.

Revised 12/13/2022

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Page 1: Certification Process



ENERGY STAR Manufactured New Homes National Program Requirements, Version 3

Exhibit 1: Requirements for All Certified Manufactured Homes

Mandatory Energy Efficiency Measures			
Envelope, Windows, & Doors			
• Insulation and glazing U-factor levels shall comply with one of the following options:			
• Meet or exceed the following performance levels:			
Climate Zone: ⁵	CZ 1	CZ 2	CZ 3
Wall Insulation:	R-13	R-21	R-21
Floor Insulation:	R-22	R-22	R-33
Ceiling Insulation:	R-33	R-33	R-38
Door U-factor:	0.40	0.40	0.30
Window U-factor:	0.30	0.30	0.30
• OR achieve an overall coefficient of heat transmission ⁶ (Uo) that does not exceed:			
Single-section Uo:	0.076	0.065	0.057
Multi-section Uo:	0.070	0.063	0.054
• The solar heat gain coefficient of fenestration shall not exceed: ⁷			
SHGC:	0.25	0.25	N/A
Thermostat & Ductwork			
• Programmable thermostat shall be installed.			
• Ducts in floor cavities shall be enclosed by floor insulation.			
• Crossover ducts, ducts in unconditioned attics, and other ducts in unconditioned space shall have at least R-8 duct insulation. ⁸			
Mandatory Setup Requirements			
• Marriage line seal: For multi-section homes only, the marriage line areas must be filled with a continuous, non-porous insulating gasket creating a permanent air barrier in the ceiling, walls, and floor. Acceptable gaskets can be one- or two-part systems, including proprietary gaskets, foams, insulation wrapped in poly and insulation covered by butyl or other long-life tape on one side. There should be no visible gaps or tears. The marriage line seal shall be installed at the plant and be protected against damage during shipping.			
• Duct installation: For multi-section homes only, the crossover ducts must be installed such that all seams and joints are tightly sealed against leakage and the ducts do not rest on the ground.			

Revised 12/13/2022

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Page 2: Exhibit 1 (All Homes)



ENERGY STAR Manufactured New Homes National Program Requirements, Version 3

Exhibit 2: Additional Requirements for Multi-Section Certified Manufactured Homes

For multi-section homes, in addition to meeting the mandatory requirements in Exhibit 1, select one or more additional energy efficiency measures from the table below to achieve a total of at least 10 (ten) points. The first measure in the table represents the mandatory requirement in Exhibit 1, which may be counted towards the required points total.

Energy Efficiency Measure	Point Value		
	CZ 1	CZ 2	CZ 3
Mandatory Requirements			
All requirements in Exhibit 1.	7.5	2.5	2.0
Optional Envelope Improvements			
Coefficient of heat transmission (Uo) ≤ 0.049. ⁶	12.0	9.5	4.5
Optional Heating and Cooling Equipment			
Heat pump ≥ 7.5 HSPF2 / 14.3 SEER2. ⁹	9.0	13.5	17.0
Gas / propane Furnace ≥ 90 AFUE.	2.0	2.5	5.5
Gas / propane Furnace ≥ 95 AFUE.	2.5	3.5	7.5
Gas / Propane Furnace ≥ 96 AFUE.	3.0	4.0	8.5
Optional Water Heater Equipment			
Gas / Propane Water Heater ≥ 0.93 UEF.	4.5	3.5	0.5
Heat pump water heater ≥ 2.20 UEF.	With electric furnace, electric strip, or electric baseboard primary space heating.	6.0	5.5
Heat pump water heater ≥ 3.30 UEF.		7.5	7.0
Heat pump water heater ≥ 2.20 UEF.	With all other primary space heating systems.	9.0	10.0
Heat pump water heater ≥ 3.30 UEF.		11.5	13.0
Optional Lighting, Appliances, & Water Fixtures			
LED lighting installed in all permanently installed fixtures. ¹⁰	0.5	0.5	0.5
Bathroom faucets ≤ 1.5 gallons per minute (gpm) and showerheads ≤ 2.0 gpm.	0.5	0.5	0.5
ENERGY STAR certified refrigerator and dishwasher. ¹¹	0.5	0.5	0.5
ENERGY STAR certified clothes washer. ¹¹	0.5	0.5	0.5

Revised 12/13/2022

Page 3 of 4

Page 3: Exhibit 2 (Multi-Section Homes)



Exhibit 1: Requirements for All Homes

Envelope, Windows, & Doors

- Insulation and glazing U-factors meet either:
 - Prescriptive table, or
 - An overall coefficient of heat transmission (U_o)
- Solar heat gain coefficient (SHGC) of fenestration meets prescriptive table. An area-weighted average may be used.

Exhibit 1: Envelope Requirements

	ENERGY STAR v3		
	Climate Zone 1	Climate Zone 2	Climate Zone 3
Wall	R-13	R-21	R-21
Floor	R-22	R-22	R-33
Ceiling	R-33	R-33	R-38
Door U-factor	0.40	0.40	0.30
Window U-factor	0.30	0.30	0.30
Window SHGC	0.25	0.25	N/A
U_o - Single Section	0.076	0.065	0.057
U_o - Multi-Section	0.070	0.063	0.054

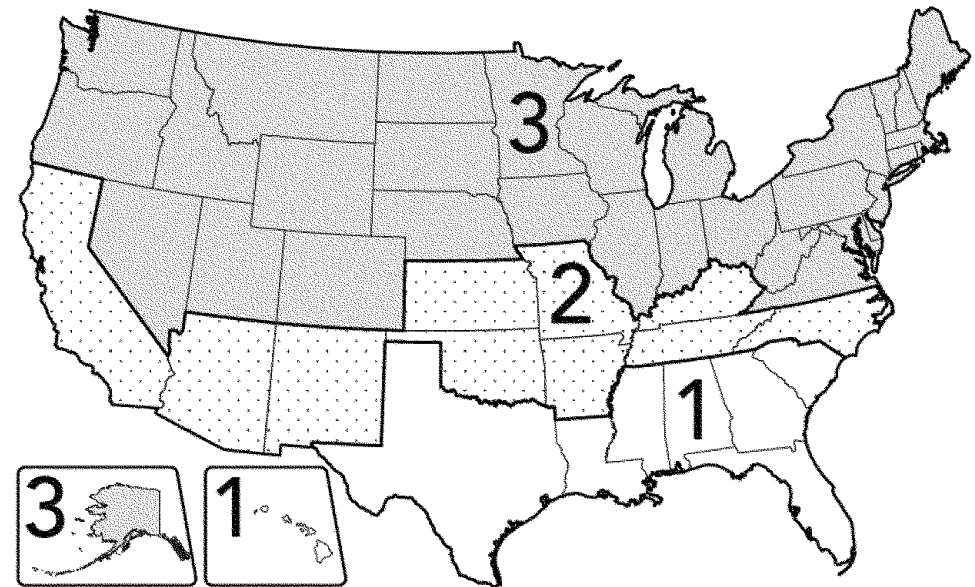


Figure III.1 U_o Zones in the HUD Code

Exhibit 1: Overall Heat Coefficient (U_o) Alternative Examples

Home type: Multi-section home in Climate Zone 1

Target U_o : 0.070

Goal: Keep ceiling insulation at R-30 (code level)


Climate Zone 1		
ENERGY STAR v3		
	Prescriptive	U_o Alternative
Wall	R-13	R-13
Floor	R-22	R-22
Ceiling	R-33	R-30
Door U-factor	0.40	0.30
Window U-factor	0.30	0.30
U_o – Multi-Section	0.070	0.070 

Exhibit 1: Overall Heat Coefficient (U_o) Alternative Examples

Home type: Multi-section home in Climate Zone 2

Target U_o : 0.063

Goal: Use 2x4 wall construction


Climate Zone 2		
ENERGY STAR v3		
	Prescriptive	U_o Alternative
Wall	R-21	R-13
Ceiling	R-22	R-33
Floor	R-33	R-33
Door U-factor	0.40	0.40
Window U-factor	0.30	0.30
U_o - Single Section	0.063	0.063 

Exhibit 1: Requirements for All Homes

Thermostat & Ductwork

- Programmable thermostat shall be installed.
- Ducts in floor cavities shall be enclosed by floor insulation.
- Crossover ducts, ducts in unconditioned attics, and other ducts in unconditioned space shall have at least R-8 duct insulation.

Exhibit 1: Requirements for All Homes

Mandatory Setup Requirements

For multi-section homes only:

- **Marriage line seal:** The marriage line areas must be filled with a continuous insulating gasket creating a permanent air barrier in the ceiling, walls, and floor.
- **Duct Installation:** The crossover ducts must be installed such that all seams and joints are tightly sealed against leakage and the ducts do not rest on the ground.

Quiz 1

Which of the following measures must be installed in single-section ENERGY STAR manufactured homes? (*Select all that apply*)

- ✓ A. Better-than-code envelope
- ✓ B. Programmable thermostat
- ✗ C. ENERGY STAR certified appliances
- ✗ D. High efficiency water heater

Quiz 2

Which of these are valid options for meeting the envelope, window and door requirements? (*Select all that apply*)

- ✓ A. Meeting the prescriptive R-values and U-factors for each individual component.
- ✓ B. Demonstrating an equivalent coefficient of heat transmission (U_o) for the overall home.
- ✗ C. Installing high-efficiency heating and cooling equipment instead of the envelope measures.

Exhibit 2: Additional Requirements for Multi-Section Homes

Multi-section homes select one or more additional measures from Exhibit 2, which could include:

- Additional envelope improvements
- Heating and cooling equipment (e.g., heat pump or high efficiency furnace)
- High efficiency water heater (e.g., heat pump water heater or tankless gas WH)
- LED Lighting
- Low-flow water fixtures
- ENERGY STAR certified appliances

Exhibit 2: Additional Requirements for Multi-Section Homes

How to use Exhibit 2:

1. Start with “free” points on first line. These reflect the mandatory measures from Exhibit 1.
2. Select additional measures until a total of ≥ 10 points is achieved.

Exhibit 2: Additional Requirements for Multi-Section Certified Manufactured Homes

For multi-section homes, in addition to meeting the mandatory requirements in Exhibit 1, select one or more additional energy efficiency measures from the table below to achieve a total of at least 10 (ten) points. The first measure in the table represents the mandatory requirement in Exhibit 1, which may be counted towards the required points total.

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Gas / propane Furnace ≥ 90 AFUE.	2.0	2.5	5.5
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Optional Water Heater Equipment			
Gas / Propane Water Heater ≥ 0.93 UEF.	4.5	3.5	0.5
Heat pump water heater ≥ 2.20 UEF.	6.0	5.5	1.5
Heat pump water heater ≥ 3.30 UEF.			
Heat pump water heater ≥ 2.20 UEF.	9.0	10.0	7.5
Heat pump water heater ≥ 3.30 UEF.			
Optional Lighting, Appliances, & Water Fixtures			
LED lighting installed in all permanently installed fixtures. ¹⁰	0.5	0.5	0.5
Bathroom faucets ≤ 1.5 gallons per minute (gpm) and showerheads ≤ 2.0 gpm.	0.5	0.5	0.5
ENERGY STAR certified refrigerator and dishwasher. ¹¹	0.5	0.5	0.5
ENERGY STAR certified clothes washer. ¹¹	0.5	0.5	0.5

Energy Efficiency Measure	Point Value		
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Heat pump water heater ≥ 3.30 UEF.			
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Bathroom faucets ≤ 1.5 gallons per minute (gpm) and showerheads ≤ 2.0 gpm.	0.5	0.5	0.5
ENERGY STAR certified refrigerator and dishwasher. ¹¹	0.5	0.5	0.5
ENERGY STAR certified clothes washer. ¹¹	0.5	0.5	0.5

$$\begin{array}{r}
 7.5 \\
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 = 16.5 \quad \checkmark
 \end{array}$$

Energy Efficiency Measure	Point Value		
	CZ 1	CZ 2	CZ 3
Mandatory Requirements			
All requirements in Exhibit 1.	7.5	2.5	2.0
Optional Envelope Improvements			
Coefficient of heat transmission (Uo) ≤ 0.049. ⁶	12.0	9.5	4.5
Optional Heating and Cooling Equipment			
Heat pump ≥ 7.5 HSPF2 / 14.3 SEER2. ⁹	9.0	13.5	17.0
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Heat pump water heater ≥ 2.20 UEF.	6.0	5.5	1.5
Heat pump water heater ≥ 3.30 UEF.			
Heat pump water heater ≥ 2.20 UEF.	9.0	10.0	7.5
Heat pump water heater ≥ 3.30 UEF.			
	With electric furnace, electric strip, or electric baseboard primary space heating.		
	With all other primary space heating systems.		
	11.5	13.0	9.0
Optional Lighting, Appliances, & Water Fixtures			
LED lighting installed in all permanently installed fixtures. ¹⁰	0.5	0.5	0.5
Bathroom faucets ≤ 1.5 gallons per minute (gpm) and showerheads ≤ 2.0 gpm.	0.5	0.5	0.5
ENERGY STAR certified refrigerator and dishwasher. ¹¹	0.5	0.5	0.5
ENERGY STAR certified clothes washer. ¹¹	0.5	0.5	0.5

$$\begin{array}{r}
 2.5 \\
 + \\
 3.5 \\
 + \\
 3.5 \\
 + \\
 0.5 \\
 \hline
 = 10 \quad \checkmark
 \end{array}$$

Exhibit 2 – Heat Pump Water Heater Measures

Heat Pump Water Heater points depend on the primary space heating type

- Heat pump water heaters draw heat from the home, which (in the winter) needs to be replaced by the primary heating system.
- Fewer points are available for HPWH’s when paired with an electric furnace, electric strip, or electric baseboard primary space heating, especially in Climate Zone 3.
- More points are available with other primary heating systems like heat pumps or gas/propane furnaces.

Energy Efficiency Measure		Point Value		
		CZ 1	CZ 2	CZ 3
Optional Water Heater Equipment				
Heat pump water heater \geq 2.20 UEF.	With electric furnace, electric strip, or electric baseboard primary space heating.	6	5.5	1.5
Heat pump water heater \geq 3.30 UEF.		7.5	7	1.5
Heat pump water heater \geq 2.20 UEF.	With all other primary space heating systems.	9	10	7.5
Heat pump water heater \geq 3.30 UEF.		11.5	13	9

Exhibit 2 - Example Compliance Options

Example: “Heat Pump”

- **All Climate Zones (CZs):** Federal minimum efficiency (7.5 HSPF2 / 14.3 SEER2) heat pump for space heating and cooling.

Total = 16 – 19 points 

Example: “High Efficiency Gas Equipment”

- **CZ1:** 90 AFUE furnace + LED lighting (or appliance/water fixture)
- **CZ2:** 96 AFUE furnace + 0.93 UEF gas water heater
- **CZ3:** 96 AFUE furnace + 0.93 UEF gas water heater

Total = 10 – 11 points 

Exhibit 2 - Example Compliance Options

Example: “Heat Pump Water Heater”

- **CZ1:** 2.20 UEF Heat Pump Water Heater
- **CZ2:** 3.30 UEF Heat Pump Water Heater + LED lighting
- **CZ3:** Generally more limited, but for example if primary heating is gas/propane or heat pump: 3.30 UEF HPWH

Total = 10 – 13.5 points 

These are just some of the possible compliance options.

Quiz 3

How many total points do multi-section homes need to achieve in Exhibit 2?
(*Select one*)

- A. None
- B. 5 points
- C. 10 points
- D. It depends

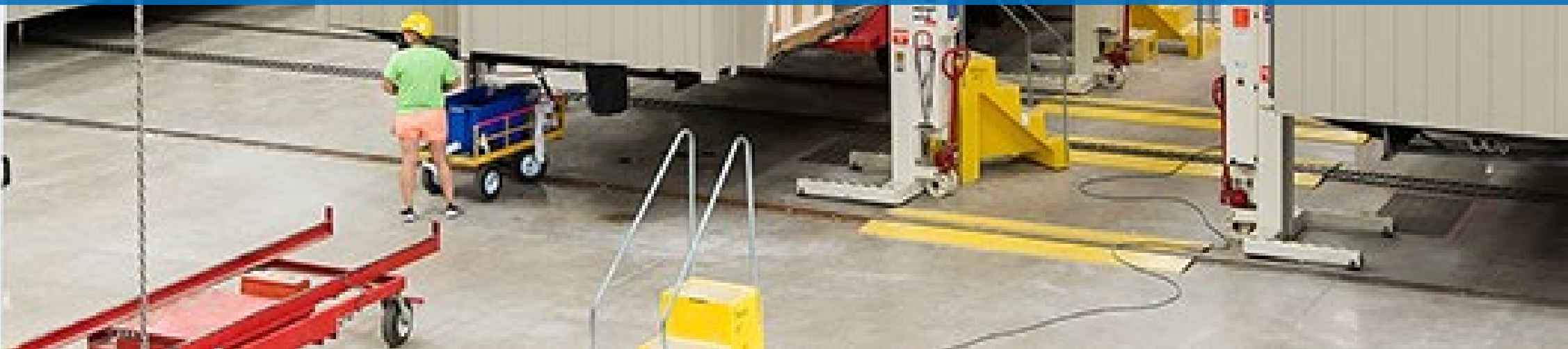
Quiz 4

True or False: Single-section homes only need to meet Exhibit 1, and multi-section homes only need to meet Exhibit 2.

- True
- False



Version 3 Implementation Timeline



Version 3 Implementation Timeline

- Version 3 was released on December 13, 2022.
- Homes produced on or after May 31, 2023 must be certified using Version 3.
- Manufactured homes produced before May 31, 2023 are permitted to be certified using either Version 2 or Version 3 of the program requirements.



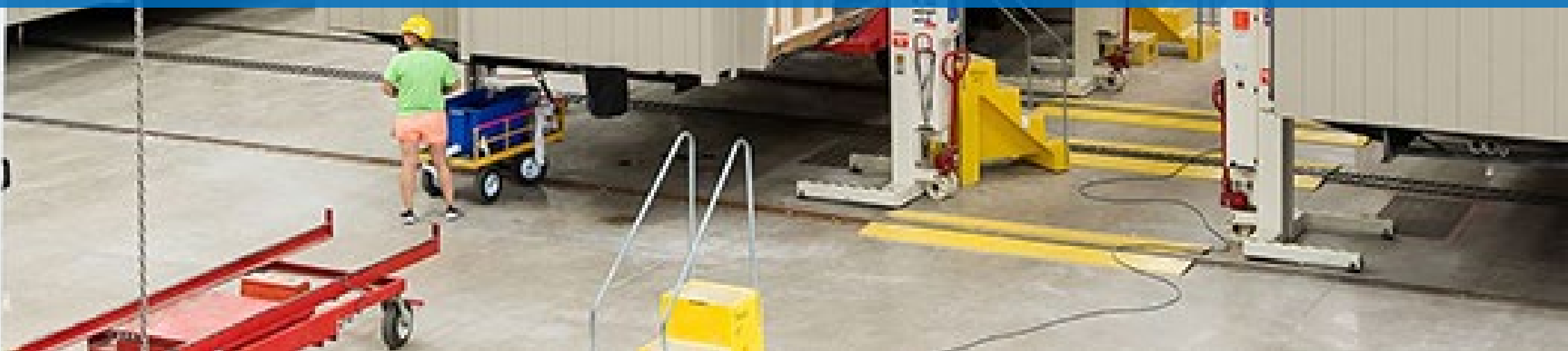
45L Tax Credit

45L Tax Credit

- \$2,500 federal tax credit available per ENERGY STAR certified manufactured home, beginning January 1, 2023.
- IRS guidance is not yet available on program version eligibility.
- EPA is actively engaged with the Treasury and IRS to provide guidance to our partners and will share any information that we receive as soon as possible.
- We recognize the frustration that delayed guidance is causing partners, but are committed to ensuring that any guidance we provide does not turn out to be wrong.



Q&A



ENERGY STAR Residential New Construction

Web & Email:

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