ENERGY STAR Certified Homes

ENERGY STAR National Version 3.1
In Pennsylvania and Nebraska

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Speaking

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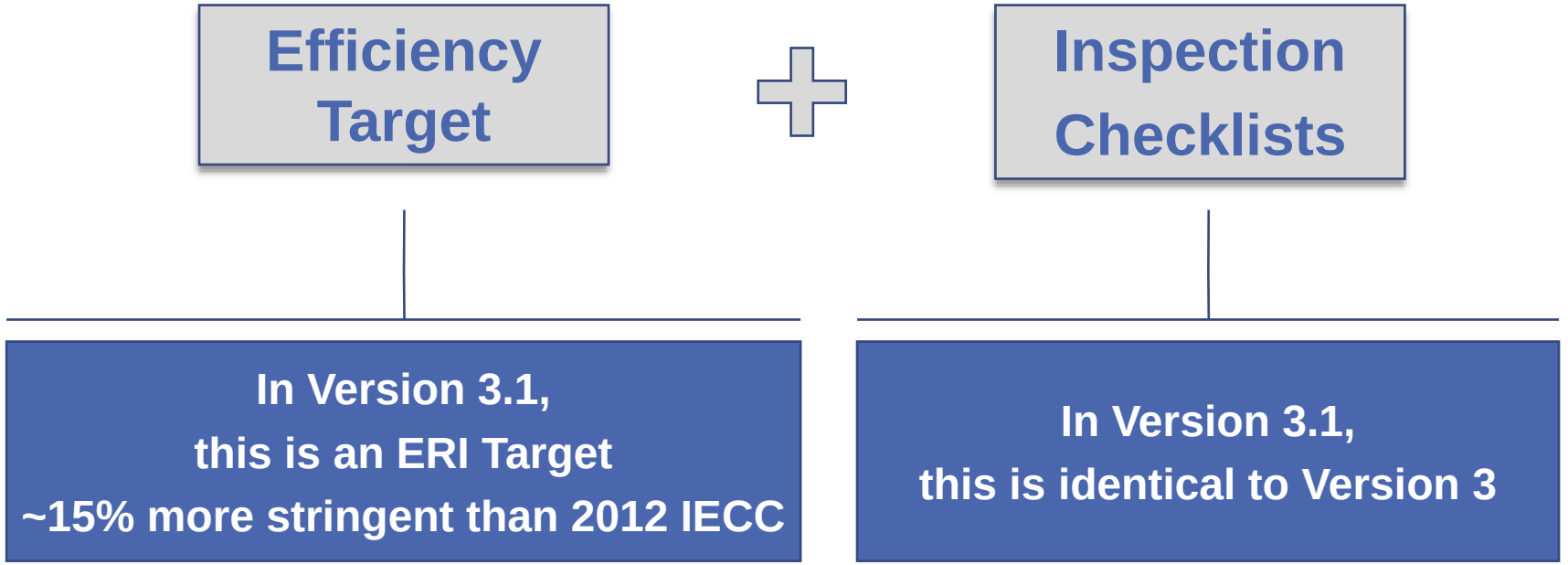
Agenda

- The key differences between Version 3 and 3.1
- How to benchmark homes against v3.1 in rating software
- Example compliance paths for PA and NE
- The implementation timeline for Version 3.1
- Q&A

Key Differences Between Version 3 and Version 3.1

Key differences between Version 3 & Version 3.1

- Two key components to program requirements:



Key differences between Version 3 & Version 3.1

- The more stringent v3.1 ERI target is in the range of ~55-65.
- The average HERS score of all rated homes in 2019 (not just ENERGY STAR) was:
  - In Nebraska: 53
  - In Pennsylvania: 59
- You can hit the more stringent target using 'off-the-shelf' technologies:
  - Lower infiltration rates; and,
  - Better windows & doors; and,
  - More efficient HVAC equipment; and,
  - Ducts in conditioned space; and,
  - More efficient lighting.
- No new mandatory requirements, mix-and-match any measures to hit the target.

Key differences between Version 3 & Version 3.1

Climate Description	Mixed & Cold		
Climate Zone	4	5	6
Air Conditioner (SEER)	13	13	13
Gas Furnace (AFUE)	95	95	95
Heat Pump (HSPF/SEER)	8.5/15	9.25/15	9.5/15
Duct Location	In Conditioned Space		
Radiant Barrier?	No	No	No
Infiltration Rate (ACH50)	3	3	3
Insulation Levels	2012 IECC	2012 IECC	2012 IECC
Windows (U-Value)	0.3	0.27	0.27
Windows (SHGC)	0.4	Any	Any
Door (R-value)	5.9	5.9	5.9
Water Heater (EF)	Gas: 0.61 EF for 40 gal; Elec: 0.39 for 40 gal.		
Thermostat Type	Programmable		
Refrigerator	ENERGY STAR Certified		
Dishwasher	ENERGY STAR Certified		
Lighting	90% ENERGY STAR Certified		

PA (4, 5, and 6) NE (5)

Summary of key differences

- More stringent ENERGY STAR ERI target.
- No new mandatory measures required.
- No changes at all to the:
  - Rater Design Review Checklist
  - Rater Field Checklist
  - HVAC Commissioning Checklist
  - Water Management System Builder Requirements

Quiz #1

- Are ducts in conditioned space mandatory for Version 3.1?
  - Yes
  - No
  - Who knows?

Quiz #2

- What is a typical range for ERI values in v3.1?
  - About 65 to 75
  - About 55 to 65
  - 0 to Hero

How to Demonstrate Compliance with Version 3.1

Demonstrating compliance with Version 3.1

- REM/Rate, EnergyGauge, and Ekotrope all have the ENERGY STAR Version 3.1 Reference Design programmed in.
- This means that you can run the ENERGY STAR Version 3.1 compliance report for any home in the country, even if Version 3.1 has not yet been implemented in your state!
- And, because this is the only key difference between v3 and v3.1, you can easily demonstrate compliance with v3.1.

Demonstrating compliance with Version 3.1

REM/Rate 16.0

Selected Reports:

ENERGY STAR V3.1 Home (1)

ENERGY STAR v3.1 Home Report

Property
, 64030

Weather:Philadelphia, PA
2011 ES_gas_CZ4
v3 CZ4 PA.blg

Organization

Builder

HERS
Rater ID:

Projected Rating: Based on Plans - Field Confirmation Required.

Normalized, Modified End-Use Loads (MMBtu/yr)

	ENERGY STAR	As Designed	
Heating	17.9	27.0	
Cooling	14.2	12.5	
Water Heating	9.7	2.9	
Lights and Appliances	23.1	22.3	
Total	64.9	64.6	
ENERGY STAR HERS Index Target	61	61	HERS Index w/o PV
		61	HERS Index

HERS Index w/o PV <= ES HERS Index Target to comply.

Demonstrating compliance with Version 3.1

Ekotrope v3.2

Select report(s):

- [ ] HERS Certificate
- [ ] ENERGY STAR V3 Home Report
- [x] ENERGY STAR V3.1 Home Report
- [ ] IECC 2015 ERI

ENERGY STAR V3.1 Home Report

Property
, AK 64030

v3 CZ4 PA

Organization
U.S. EPA
Dean Gamble

Builder

Inspection Status
Results are projected

Mandatory Requirements

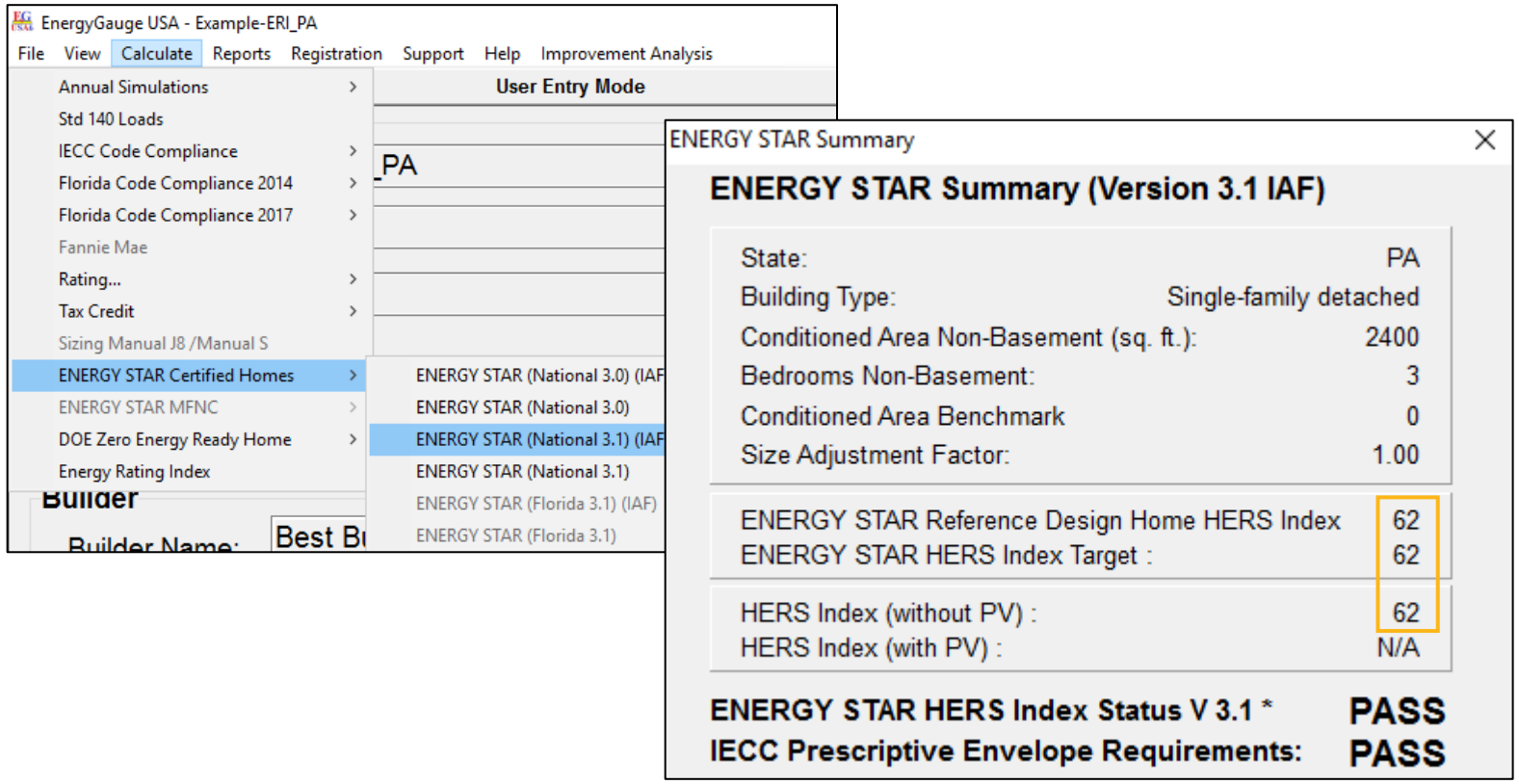
- ✓ Duct leakage at post construction better than or equal to ENERGY STAR v3/3.1 requirements.
- ✓ Envelope insulation levels meet or exceed ENERGY STAR v3/3.1 requirements.
- ✓ Slab on Grade Insulation must be > R-5, and at IECC 2009 Depth for Climate Zones 4 and above.
- ✓ Envelope insulation achieves RESNET Grade I installation, or Grade II with insulated sheathing.
- ✓ Windows meet the 2009 IECC Requirements - Table 402.1.1.
- ✓ Duct insulation meets the EPA minimum requirements of R-6.
- ✓ Mechanical ventilation system is installed in the home.
- ✓ ENERGY STAR Checklists fully verified and complete.

HERS Index Target

Reference Home HERS		59
SAF (Size Adjustment Factor)	✕	1.00
SAF Adjusted HERS Target		59
As Designed Home HERS		59
As Designed Home HERS w/o PV		59

Demonstrating compliance with Version 3.1

EnergyGauge v6.1



Version 3.1 Example Homes

Version 3.1 Example – Typical Home in NE and PA

- Main architectural features:

Feature	Description
Foundation Type	Unconditioned Basement
Number of Stories	2
House size	2,400 sq. ft. CFA
WFA	15%
HVAC System	Gas Furnace with Central AC

Version 3.1 Example – Pennsylvania CZ 4

- ENERGY STAR v3 Target: 74; v3.1 Target: 60
- 14 points needed

Measure	v3 Efficiency Measures	v3.1 Efficiency Measures	Alternative Path
Walls (R-value)	R-13	R-20 (3)	R-15 (1)
Ceiling (R-value)	R-38	R-49 (~0.5)	R-49 (~0.5)
Windows (U/SHGC)	0.32 / 0.40	0.30 / 0.40 (1)	0.30 / 0.22 (3)
Infiltration (ACH50)	5	3 (2)	3 (2)
Duct Location	Uncond. Space	Cond. Space (5)	Uncond. Space (-)
DHW (gas, EF)	0.61	0.61 (-)	0.94 (5)
Furnace (AFUE)	90	95 (2)	95 (3)
Lighting (% CFL)	80%	90% (~0.5)	90% (~0.5)

Version 3.1 Example – Nebraska CZ 5

- ENERGY STAR v3 Target: 71; v3.1 Target: 62
- 9 points needed

Measure	v3 Efficiency Measures	v3.1 Efficiency Measures	Alternative Path
Walls (R-value)	R-20	R-20 (-)	R-15 (-3)
Ceiling (R-value)	R-38	R-49 (~0.5)	R-49 (~0.5)
Windows (U/SHGC)	0.30 / 0.40	0.27 / 0.40 (1)	0.27 / 0.30 (2)
Infiltration (ACH50)	4	3 (1)	3 (1)
Duct Location	Uncond. Space	Cond. Space (6)	Uncond. Space (-)
DHW (gas, EF)	0.61	0.61 (-)	0.94 (6)
Furnace (AFUE)	90	95 (2)	96 (2)
Lighting (% CFL)	80%	90% (~0.5)	95% (1)

Version 3.1 Example – Pennsylvania CZ 6

- ENERGY STAR v3 Target: 70; ENERGY STAR v3.1 Target: 58
- 12 points needed

Measure	v3 Efficiency Measures	v3.1 Efficiency Measures	Alternative Path
Walls (R-value)	R-20	R-20 + 5ci(1)	R-20 (~0.5)
Windows (U-factor)	0.3	0.27 (1)	0.27 (1)
Doors (R-value)	R-4.8	R-5.9 (~0.5)	R-5.9 (~0.5)
Infiltration (ACH50)	4	3 (1)	3 (1)
Duct Location	Uncond. Space	Cond. Space (6)	Uncond. Space (-)
DHW (gas, EF)	0.61	0.61 (-)	0.94 (7)
Furnace (AFUE)	90	95 (2)	95 (2)
Lighting (% CFL)	80%	90% (~0.5)	90% (~0.5)

Version 3.1 Examples – Summary

- None of the upgrade options are mandatory. The only requirement is to hit the v3.1 ERI target.
- Most partners have pursued high-efficiency water heaters or ducts in conditioned space to get the bulk of their points.

Version 3.1 Implementation Timeline

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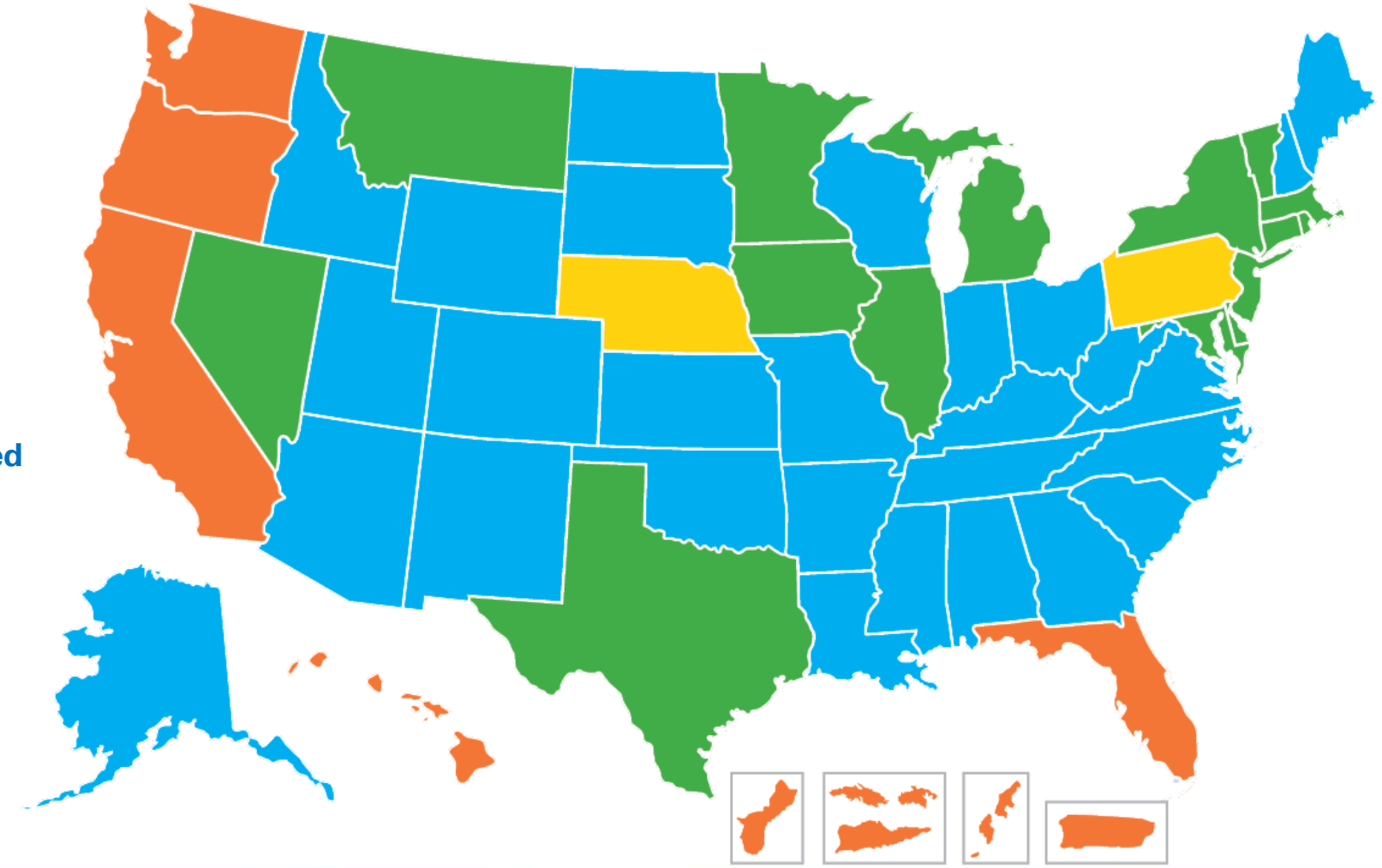
- For Pennsylvania, all homes *permitted* on or after 04/01/2021 must be certified using Version 3.1.
- For Nebraska, all homes *permitted* on or after 07/01/2021 must be certified using Version 3.1.

Current Implementation of Program Requirements

28	National Version 3 in effect
15	National Version 3.1 in effect
2	National Version 3.1 date defined
5	Regional Version in effect



Quiz #3

- For Nebraska, when will v3.1 be implemented?
  - Homes certified on or after 04/01/2021.
  - Homes permitted on or after 07/01/2021.
  - It has already been implemented.

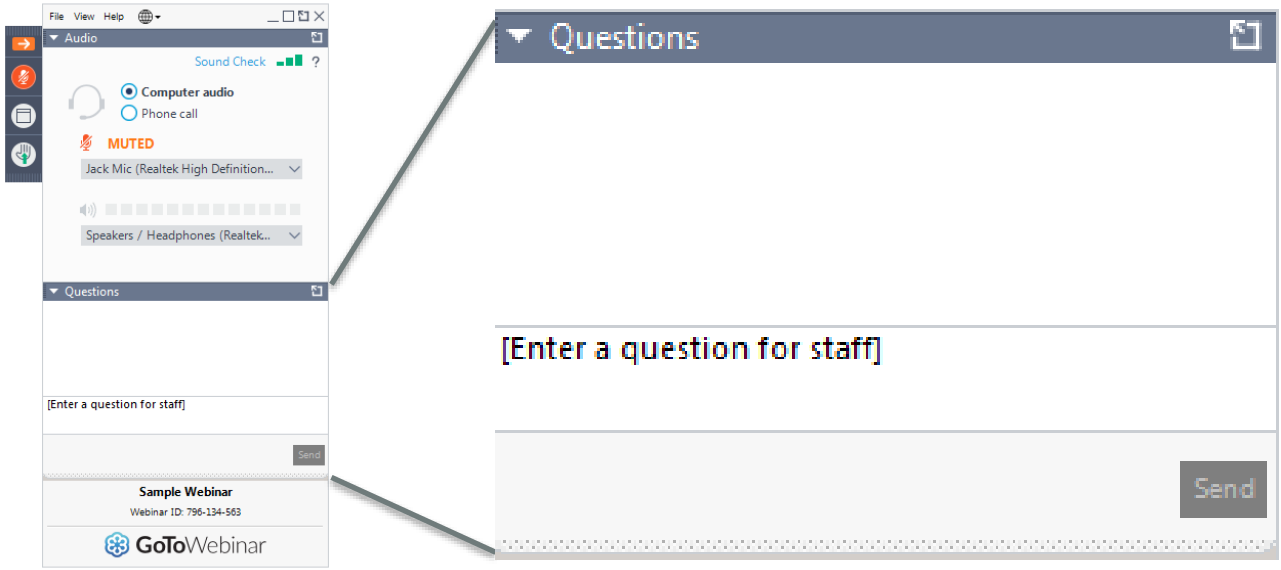
Quiz #4

- For Pennsylvania, when will v3.1 be implemented?
  - Home permitted on or after 04/01/2021.
  - Homes permitted on or after 07/01/2021.
  - It has already been implemented.

Summary

- Inspection checklists do not change, but performance target is ~10 ERI points more stringent; 55-65 for most homes.
- It is not mandatory for ducts to be in conditioned space.
- For Pennsylvania, all homes permitted on or after 04/01/2021 must be certified using v3.1.
- For Nebraska, all homes permitted on or after 07/01/2021 must be certified using v3.1.

Any questions?



ENERGY STAR Certified Homes

Web:

Home: www.energystar.gov/newhomespartners

Technical: www.energystar.gov/newhomesrequirements

MESA: www.energystar.gov/mesa

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