ENERGY STAR Single-Family New Homes

ENERGY STAR National Version 3.1
In New Mexico, Georgia, and Utah

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EPA United States Environmental Protection Agency

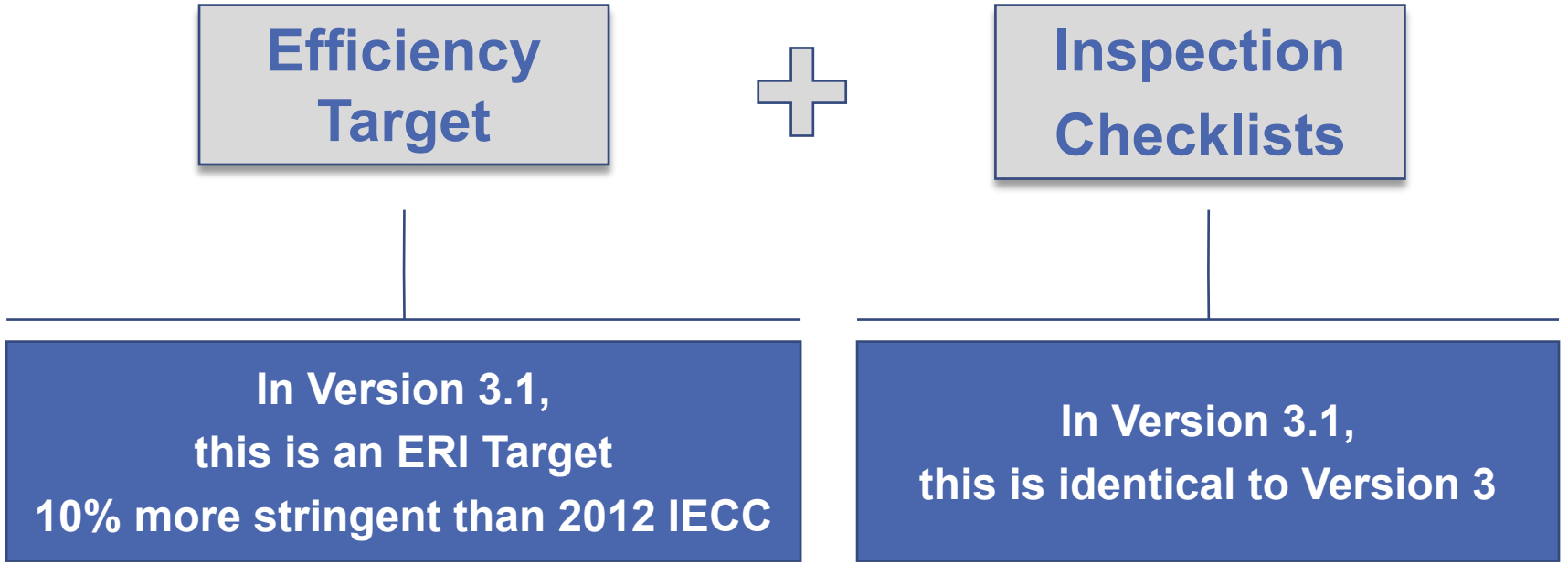
Agenda

- The key differences between Version 3 and 3.1
- How to benchmark homes against v3.1 in rating software
- Example compliance paths for NM, GA and UT
- 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 2020 (not just ENERGY STAR) was:
  - In New Mexico: 56
  - In Georgia: 63
  - In Utah: 55
- 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

UT (3, 5, and 6)

GA (2, 3, and 4)

NM (3, 4, and 5)

Climate Description	Hot		Mixed & Cold		
Climate Zone	2	3	4	5	6
Air Conditioner (SEER)	15	15	13	13	13
Gas Furnace (AFUE)	80	80	95	95	95
Heat Pump (HSPF/SEER)	8.2/15	8.2/15	8.5/15	9.25/15	9.5/15
Duct Location	In Conditioned Space				
Radiant Barrier?	No	No	No	No	No
Infiltration Rate (ACH50)	4	3	3	3	3
Insulation Levels	2012 IECC				
Windows (U-Value)	0.40	0.30	0.30	0.27	0.27
Windows (SHGC)	0.25	0.25	0.40	Any	Any
Door (R-value)	5.9	5.9	5.9	5.9	5.9
Water Heater (EF)	Gas: 0.61 EF for 40 gal; Elec: 0.93 for 40 gal.				
Thermostat Type	Programmable				
Refrigerator	ENERGY STAR Certified				
Dishwasher	ENERGY STAR Certified				
Lighting	90% ENERGY STAR Certified				

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 16.1.0

Selected Reports:

ENERGY STAR V3.1 Home (1)

ENERGY STAR v3.1 Home Report

Property	Organization	HERS
, 77001		Rater ID:
	Builder	

Weather:Savannah, GA
v3_1 ES gas_CZ2_GA
v3_1 ES_gas_CZ2_GA.blg

Projected Rating: Based on Plans - Field Confirmation Required.

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

	ENERGY STAR	As Designed
Heating	12.4	12.4
Cooling	19.0	18.8
Water Heating	6.7	6.3
Lights and Appliances	23.1	22.9
Total	61.2	60.4
ENERGY STAR HERS Index Target	64	63 HERS Index w/o PV
		63 HERS Index

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

Demonstrating compliance with Version 3.1

Ekotrope v4

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
, NM 63101

v3_1 ES_gas_CZ4_NM

Organization
U.S. EPA
Dean Gamble

Builder

Inspection Status
Results are projected

Mandatory Requirements

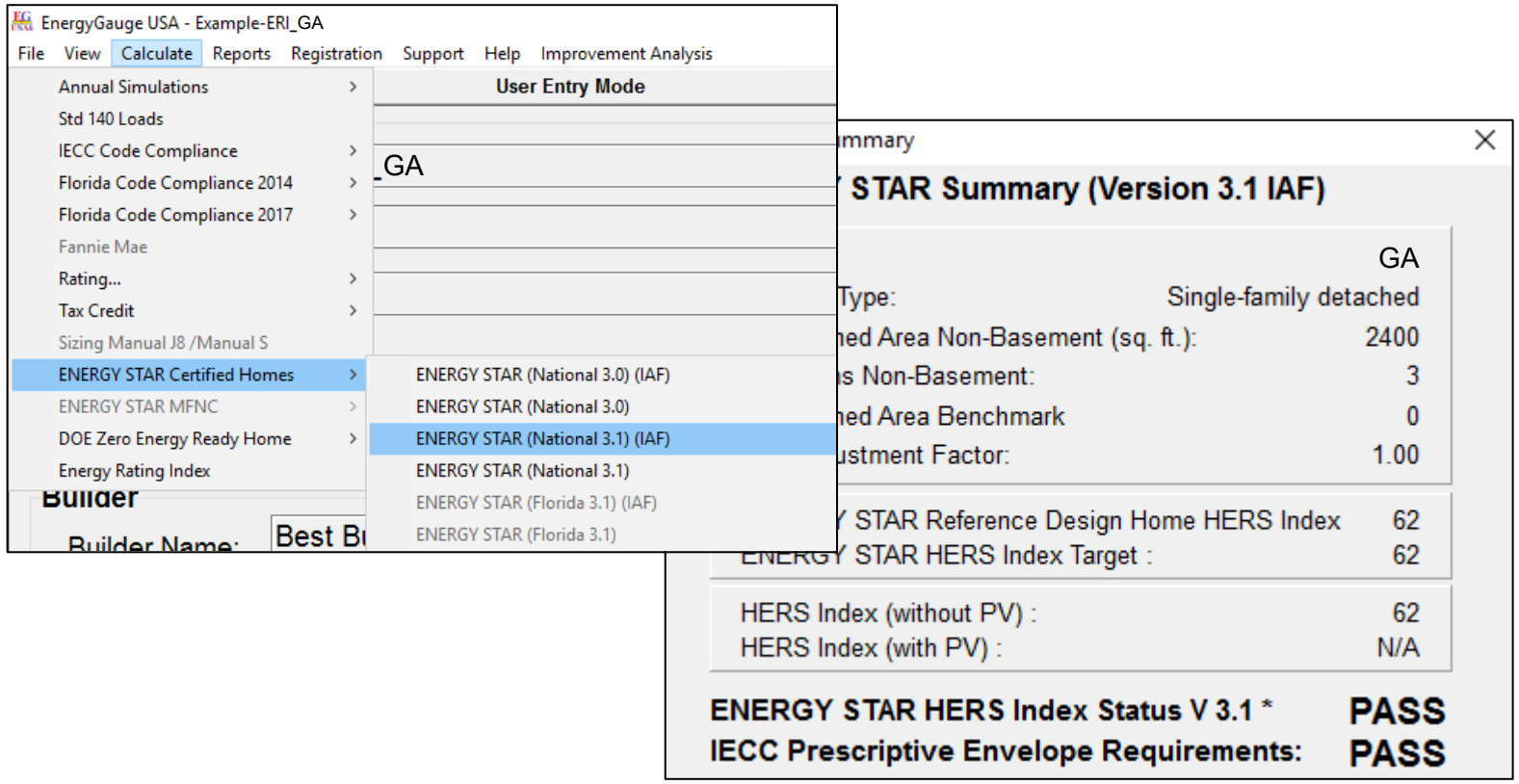
- ✓ Duct leakage at post construction better than or equal to ENERGY STAR v3/3.1 requirements.
- ✓ Envelope insulation levels meet or exceed ENERGY STAR v3/3.1 requirements.
- ✓ Slab on Grade Insulation must be > R-5, and at IECC 2009 Depth for Climate Zones 4 and above.
- ✓ Envelope insulation achieves 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		61
SAF (Size Adjustment Factor)	✕	1.00
SAF Adjusted HERS Target		61
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 NM, GA and UT

- Main architectural features:

Feature	Description
Foundation Type	Slab (GA, NM) Unconditioned Basement (UT)
Number of Stories	2
House size	2,400 sq. ft. CFA
WFA	15%
HVAC System	Gas Furnace with Central AC Or Air Source Heat Pump

Version 3.1 Example – Georgia CZ 3

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

Measure	v3 Efficiency Measures	v3.1 Efficiency Measures	Alternative Path
Walls (R-value)	R-13	R-20 (2)	R-15 (~0.5)
Ceiling (R-value)	R-30	R-38 (1)	R-49 (~1.5)
Windows (U/SHGC)	0.35 / 0.30	0.30 / 0.25 (2)	0.30 / 0.22 (~2.5)
Infiltration (ACH50)	5	3 (1)	3 (1)
Duct Location	Uncond. Space	Cond. Space (4)	Uncond. Space (-)
DHW (elec, EF)	0.95	0.95 (-)	2.06 HPWH (4)
HP (HSPF/SERR)	8.2 / 14.5	8.2 / 15 (1)	8.2 / 16 (~1.5)
Lighting (% CFL)	80%	90% (1)	90% (1)

Version 3.1 Example – New Mexico CZ 4

- ENERGY STAR v3 Target: 75; v3.1 Target: 61
- 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 (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 (~1.5)	95 (~1.5)
Lighting (% CFL)	80%	90% (1)	90% (1)

Version 3.1 Example – Utah CZ 5

- ENERGY STAR v3 Target: 73; ENERGY STAR v3.1 Target: 63
- 10 points needed

Measure	v3 Efficiency Measures	v3.1 Efficiency Measures	Alternative Path
Walls (R-value)	R-20	R-20 (-)	R-20 (-)
Ceiling (R-value)	R-38	R-49 (~0.5)	R-49 (~0.5)
Windows (U-factor)	0.30	0.27 (1)	0.27 (1)
Infiltration (ACH50)	4	3 (1)	3 (1)
Duct Location	Uncond. Space	Cond. Space (~5.5)	Uncond. Space (-)
DHW (gas, EF)	0.61	0.61 (-)	0.94 (~5.5)
Furnace (AFUE)	90	95 (1)	95 (1)
Lighting (% CFL)	80%	90% (1)	90% (1)

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.

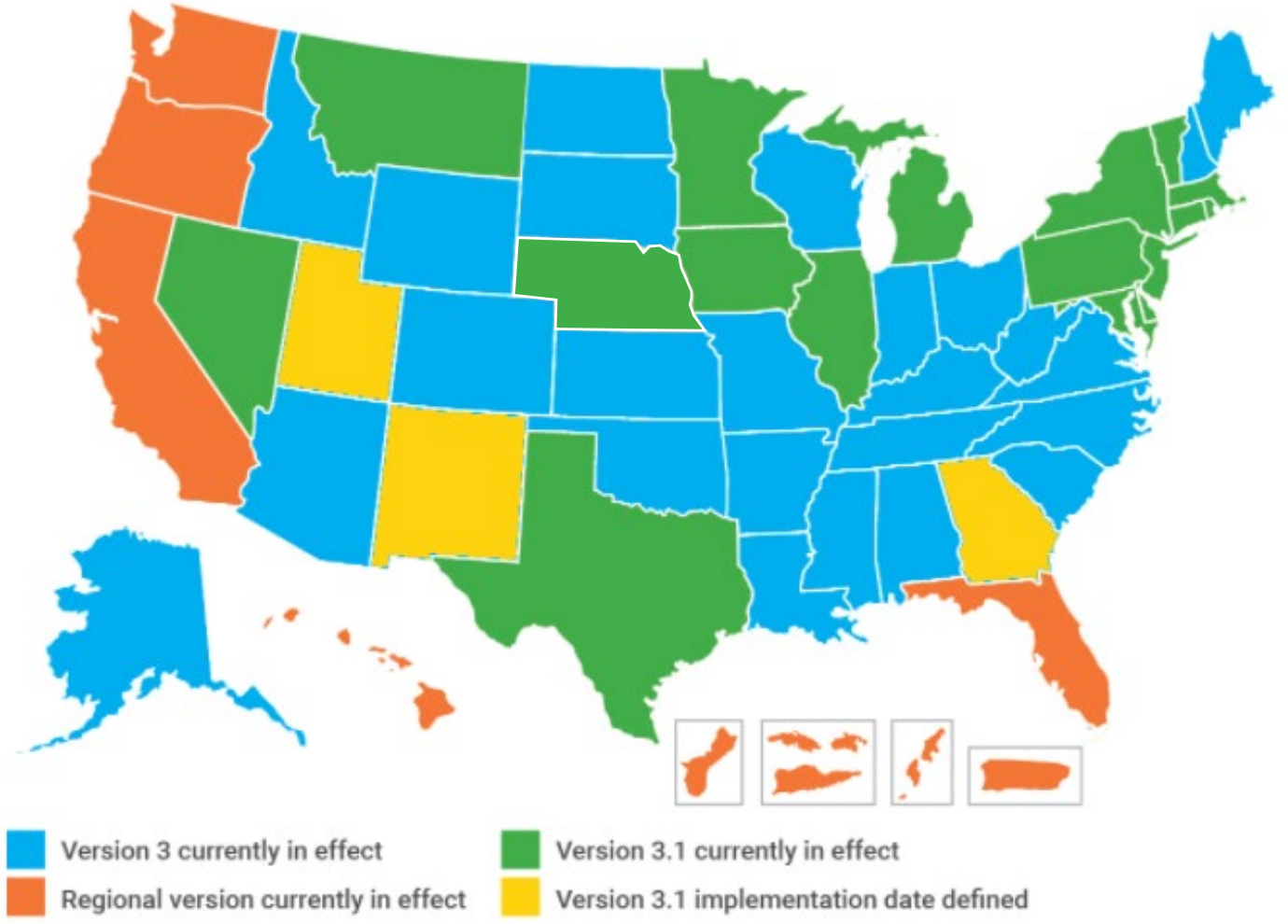
Version 3.1 Implementation Timeline

Version 3.1 Implementation Timeline

- For New Mexico, Georgia, and Utah, all homes *permitted* on or after 07/01/2022 must be certified using Version 3.1.

Current Implementation of Program Requirements

25	National Version 3 in effect
17	National Version 3.1 in effect
3	National Version 3.1 date defined
5	Regional Version in effect



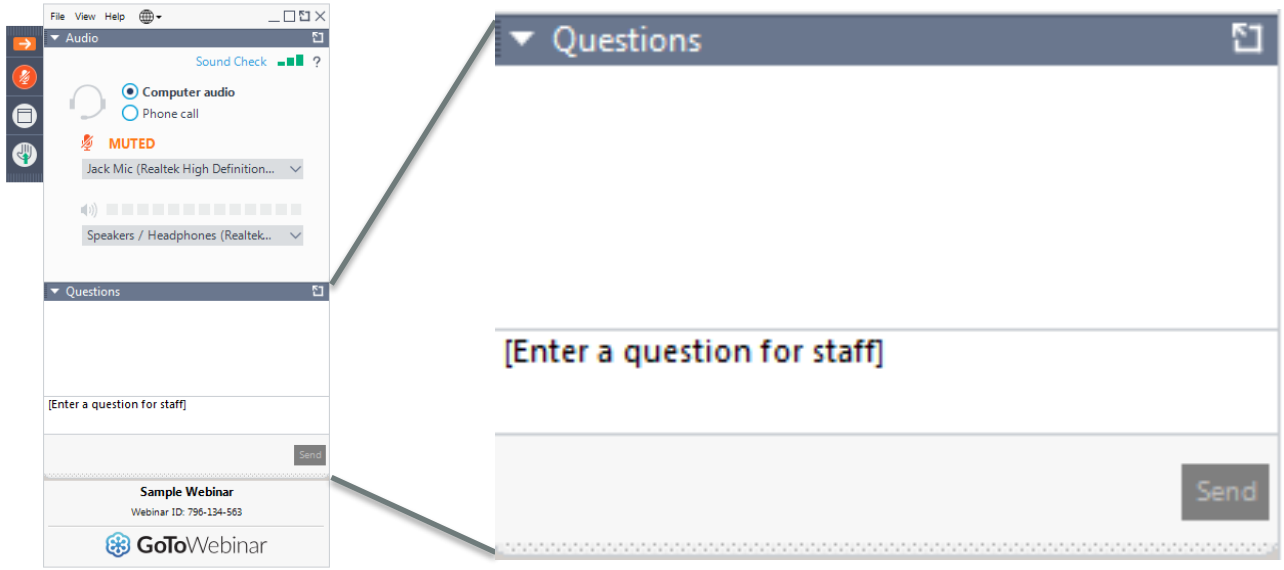
Quiz #3

- When will v3.1 be implemented in New Mexico, Georgia, and Utah?
  - Homes certified on or after 04/01/2022.
  - Homes permitted on or after 07/01/2022.
  - 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 New Mexico, Georgia, and Utah, all homes permitted on or after 07/01/2022 must be certified using v3.1.

Any questions?



ENERGY STAR Single-Family New Homes

Web:

Home: www.energystar.gov/newhomespartners

Technical: www.energystar.gov/newhomesrequirements

MESA: www.energystar.gov/mesa

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