

# Speaking

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# **ENERGY STAR Single-Family New Homes**

## **National Version 3.1**

### **In Maine**

Dean Gamble  
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# Agenda

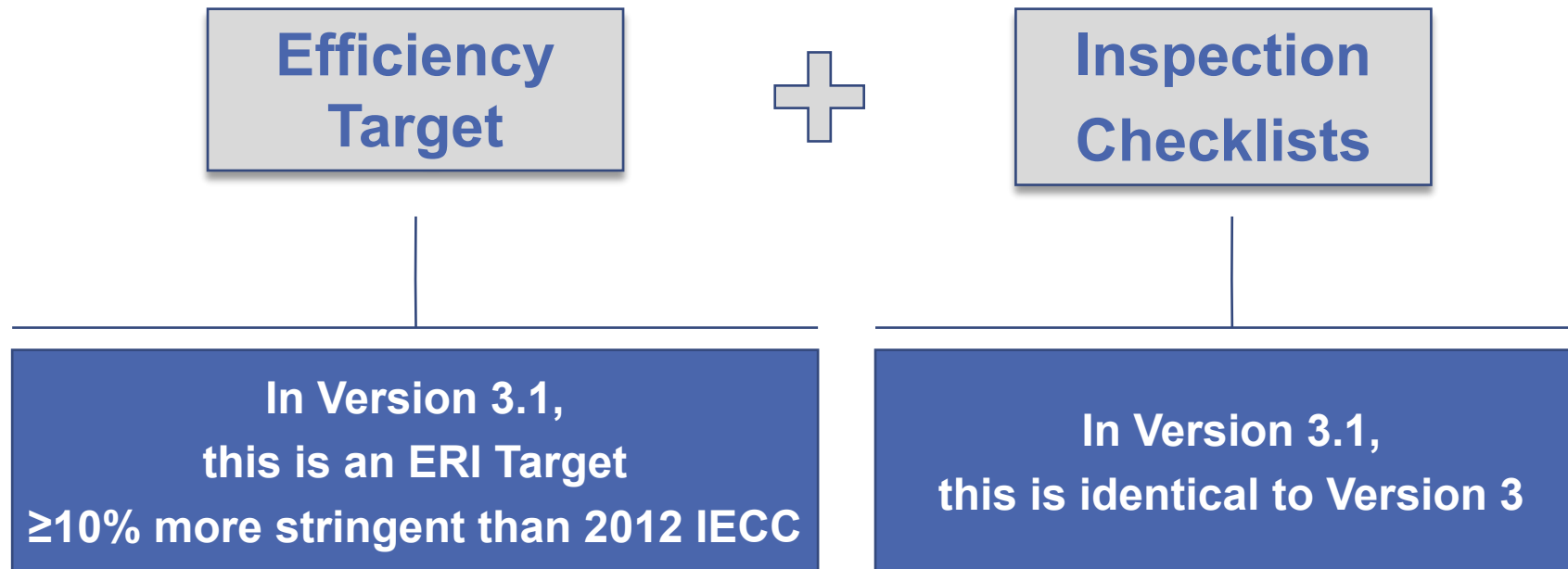
- The key differences between Version 3 and 3.1
- How to benchmark homes against v3.1 in rating software
- Example compliance paths for homes in Maine
- The implementation timeline for Version 3.1
- Q&A



# Key Differences Between Version 3 and Version 3.1

# Key differences between Version 3.0 & 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.
- Avg. HERS Index of all rated homes in 2020, not just ENERGY STAR, was 58.
- 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, use any combo of measures to hit target.

# Key differences between Version 3 & Version 3.1

Climate Description	Mixed & Cold	
Climate Zone	6	7
Air Conditioner (SEER)	13	13
Gas Furnace (AFUE)	95	95
Heat Pump (HSPF/SEER)	9.5/15	3.6 COP / 17.1 EER GSHP
Duct Location	In Conditioned Space	
Radiant Barrier?	No	No
Infiltration Rate (ACH50)	3	3
Insulation Levels	2012 IECC	2012 IECC
Windows (U-Value)	0.27	0.27
Windows (SHGC)	Any	Any
Door (R-value)	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	

# 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 the typical range of ENERGY STAR ERI targets for 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 16.3.1

Report Selection: ENERGY STAR V3.1 Reports

Group of Reports to Consider: Certification Programs

Building Selection: ENERGY STAR V3.1 Reports

Unselected Reports To Consider:

- DOE Zero Energy Ready Home Certificate (1)
- DOE Zero Energy Ready Home Verification S
- ENERGY STAR Inspection Checklist (1)
- ENERGY STAR V3 Home (1)
- ENERGY STAR V3 Summary (1)
- ENERGY STAR V3 Certificate (1)
- ENERGY STAR V3 Label (1)
- ENERGY STAR V3 Pacific Home (1)
- ENERGY STAR V3 Pacific Summary (1)
- ENERGY STAR V3 Pacific Certificate (1)
- ENERGY STAR V3 Pacific Label (1)
- ENERGY STAR V3.1 Summary (1)

Selected Reports:

- ENERGY STAR V3.1 Home (1)

Buttons: Add >>, Add All >>, << Remove

### ENERGY STAR v3.1 Home Report

Property: , 05401  
 Organization: Builder  
 HERS Rater ID:  
 Weather: Portland, ME  
 v3\_1 ES\_gas\_CZ6\_ME.blg

**Projected Rating: Based on Plans - Field Confirmation Required.**  
 Normalized, Modified End-Use Loads (MMBtu/yr)

	ENERGY STAR	As Designed	
Heating	22.0	22.2	
Cooling	3.2	3.3	
Water Heating	10.6	10.6	
Lights and Appliances	21.9	22.3	
<b>Total</b>	<b>57.8</b>	<b>58.3</b>	
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 v4.0.1

Select report(s):

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

### ENERGY STAR V3.1 Home Report

<b>Property</b> AK 64030 <hr/> v3.1 CZ6 ME	<b>Organization</b> U.S. EPA Dean Gamble	<b>Inspection Status</b> Results are projected
<b>Builder</b>		

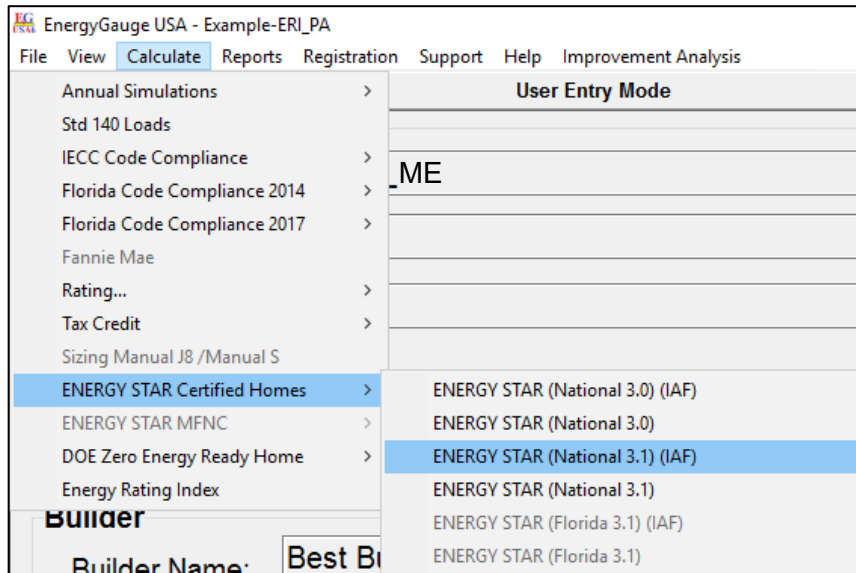
  

Mandatory Requirements	HERS Index Target
✓ Duct leakage at post construction better than or equal to ENERGY STAR v3/3.1 requirements.	Reference Home HERS 59
✓ Envelope insulation levels meet or exceed ENERGY STAR v3/3.1 requirements.	SAF (Size Adjustment Factor) <b>x</b> 1.00
✓ Slab on Grade Insulation must be > R-5, and at IECC 2009 Depth for Climate Zones 4 and above.	SAF Adjusted HERS Target <b>59</b>
✓ Envelope insulation achieves RESNET Grade I installation, or Grade II with insulated sheathing.	As Designed Home HERS 59
✓ Windows meet the 2009 IECC Requirements - Table 402.1.1.	As Designed Home HERS w/o PV 59
✓ 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.	



# Demonstrating compliance with Version 3.1

## EnergyGauge v7.0.03



ENERGY STAR Summary

### ENERGY STAR Summary (Version 3.1 IAF)

State:	ME	PA
Building Type:	Single-family detached	
Conditioned Area Non-Basement (sq. ft.):	2400	
Bedrooms Non-Basement:	3	
Conditioned Area Benchmark	0	
Size Adjustment Factor:	1.00	
ENERGY STAR Reference Design Home HERS Index	62	
ENERGY STAR HERS Index Target :	62	
HERS Index (without PV) :	62	
HERS Index (with PV) :	N/A	

**ENERGY STAR HERS Index Status V 3.1 \*      PASS**  
**IECC Prescriptive Envelope Requirements:      PASS**



# Version 3.1 Example Homes

## Version 3.1 Example – Typical Home in ME

- 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 – Maine CZ 6

- ENERGY STAR v3 Target: **73**; ENERGY STAR v3.1 Target: **62**
- 11** points needed

Measure	v3 Efficiency Measures	v3.1 Efficiency Measures	Alternative Path
Walls (R-value)	R-20	R-20 + 5ci ( <b>1</b> )	R-21 ( <b>0</b> )
Windows (U-factor)	0.30	0.27 ( <b>1</b> )	0.27 ( <b>1</b> )
Doors (R-value)	R-4.8	R-5.9 ( <b>~1</b> )	R-5.9 ( <b>~1</b> )
Infiltration (ACH50)	4	3 ( <b>1</b> )	3 ( <b>1</b> )
Duct Location	Uncond. Space	Cond. Space ( <b>4</b> )	Uncond. Space (-)
DHW (gas, EF)	0.61	0.61 (-)	0.85 ( <b>5</b> )
Furnace (AFUE)	90	95 ( <b>2</b> )	95 ( <b>2</b> )
Lighting (% CFL)	80%	90% ( <b>~1</b> )	90% ( <b>~1</b> )

# Version 3.1 Example – Maine CZ 7

- ENERGY STAR v3 Target: **71**; v3.1 Target: **58**
- **13** points needed

Measure	v3 Efficiency Measures	v3.1 Efficiency Measures	Alternative Path
Walls (R-value)	R-20	R-20 + 5ci ( <b>1</b> )	R-23 ( <b>~0.5</b> )
Windows (U-factor)	0.30	0.27 ( <b>1</b> )	0.27 ( <b>1</b> )
Doors (R-value)	R-4.8	R-5.9 ( <b>~0.5</b> )	R-5.9 ( <b>~0.5</b> )
Infiltration (ACH50)	4	3 ( <b>1</b> )	3 ( <b>1</b> )
Duct Location	Uncond. Space	Cond. Space ( <b>~5.5</b> )	Uncond. Space (-)
DHW (gas, EF)	0.61	0.61 (-)	0.92 ( <b>6</b> )
Furnace (AFUE)	90	95 ( <b>~2.5</b> )	96 ( <b>~2.5</b> )
Lighting	80% CFL	90% CFL ( <b>~0.5</b> )	100% LED ( <b>~1.5</b> )

# 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.





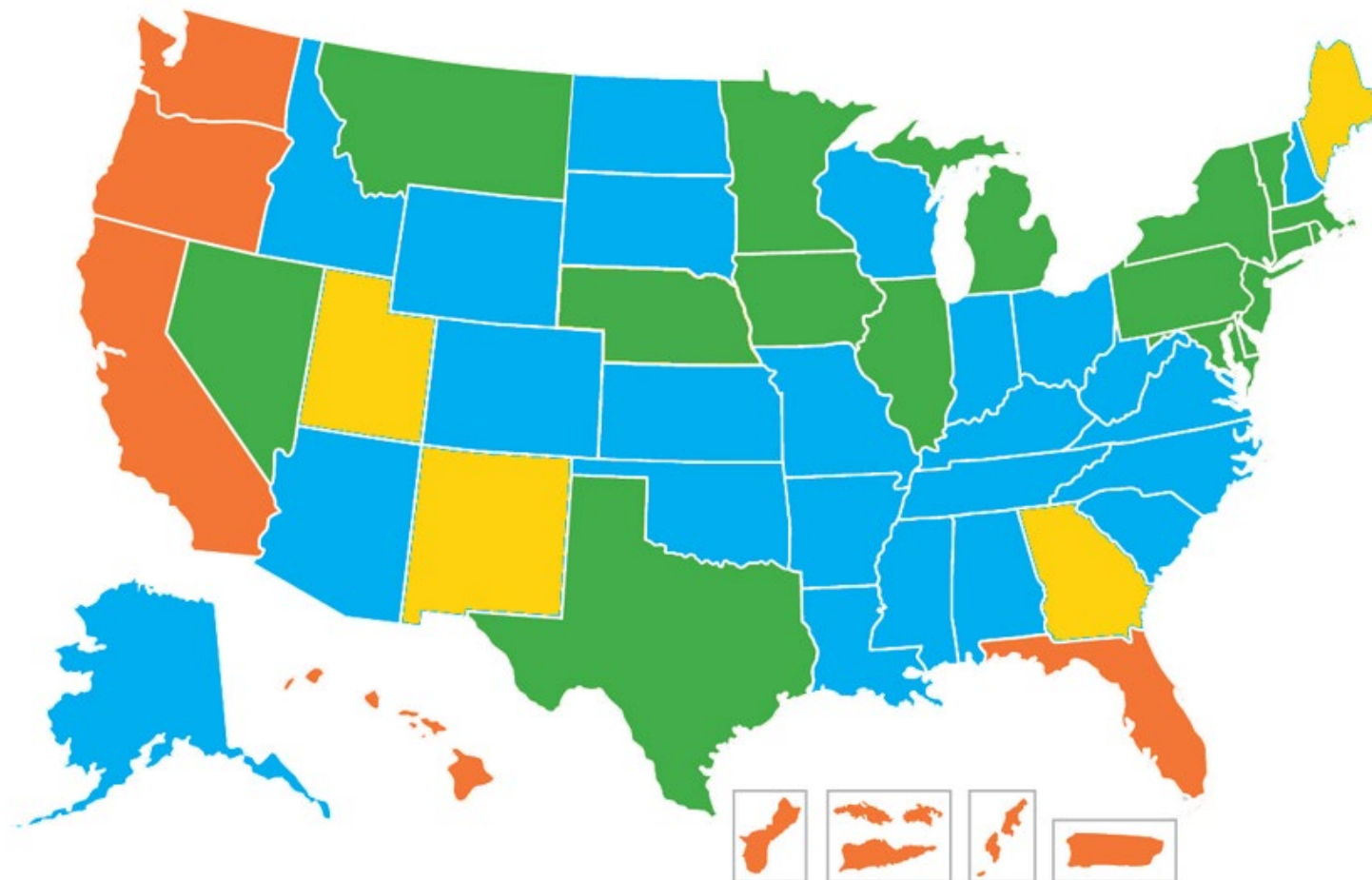
# Version 3.1 Implementation Timeline

# Version 3.1 Implementation Timeline

- For Maine, all homes *permitted* on or after **10/01/2022** must be certified using Version 3.1.

# Current Implementation of Program Requirements

- 24 National Version 3 in effect
- 18 National Version 3.1 in effect
- 4 National Version 3.1 date defined
- 5 Regional Version in effect



## Quiz #3

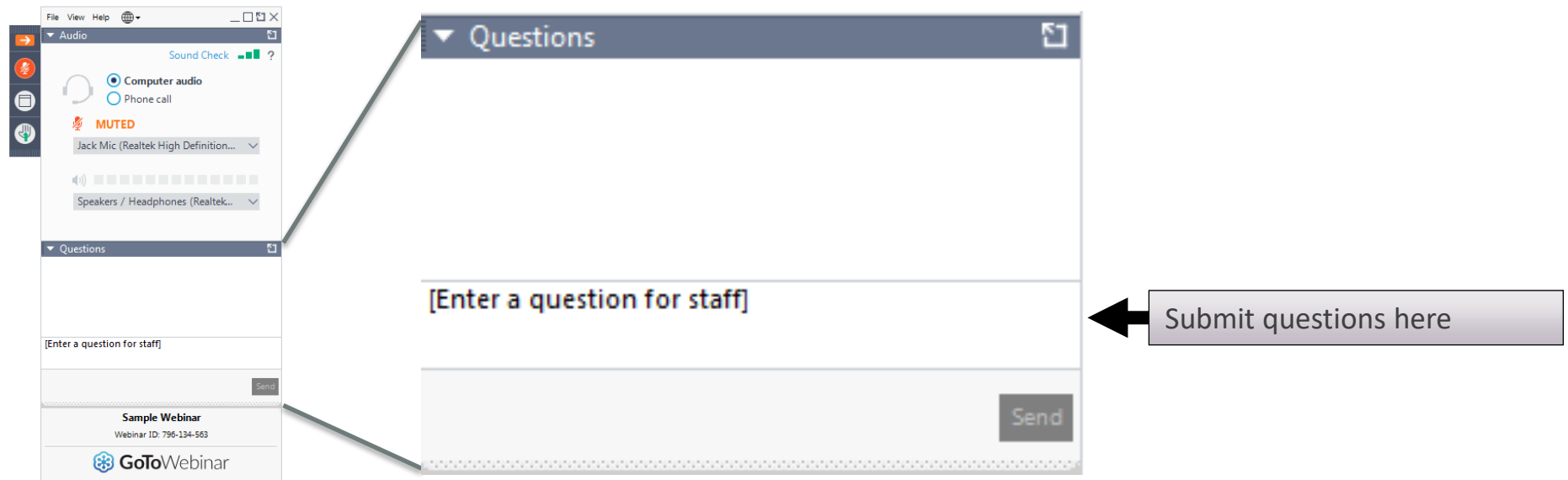
- For Maine, when will v3.1 be implemented?
  - Homes certified on or after 11/01/2021.
  - Homes permitted on or after 10/01/2022.
  - It has already been implemented.



# 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 Maine, all homes permitted on or after 10/01/2022 must be certified using v3.1.

# Any questions?



The image shows a screenshot of a webinar interface. On the left, there is a sidebar with several panels. The top panel is titled 'Audio' and includes a 'Sound Check' indicator, radio buttons for 'Computer audio' (selected) and 'Phone call', a 'MUTED' status, and dropdown menus for 'Jack Mic (Realtek High Definition...)' and 'Speakers / Headphones (Realtek...'. Below this is a 'Questions' panel with a text input field containing '[Enter a question for staff]' and a 'Send' button. The main content area on the right is a larger 'Questions' panel with a similar text input field and 'Send' button. A grey callout box with the text 'Submit questions here' and a black arrow points to the input field in the main panel.



# ENERGY STAR Single-Family New Homes

## Web:

Home: [www.energystar.gov/newhomespartners](http://www.energystar.gov/newhomespartners)

Technical: [www.energystar.gov/newhomesrequirements](http://www.energystar.gov/newhomesrequirements)

MESA: [www.energystar.gov/mesa](http://www.energystar.gov/mesa)

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