Marshall Fire Incentives

ENERGY STAR v3.2

ENERGY STAR New Certification Program

Agenda

- Introductions
- Program Participation Process
- ENERGY STAR v3.2
- ENERGY STAR New Certification Program
- Q&A
- Survey

Xcel Energy℠

RESIDENTIAL science resources

Introductions

- Rob Buchanan
- Michael Resech
- Erik Straite
- Dean Gamble
- Asa Foss

Builder Incentives

- Baselined to 2018 IECC

COMBO HOMES – 2012 IECC OR HIGHER AND PERCENT BTC	
Percent BTC	**Rebate**
10% – 14.999%	**$250**
15% – 19.999%	**$400**
20% – 24.999%	**$600**
25% – 29.999%	**$900**
30% – 34.999%	**$1,300**
35% – 39.999%	**$2,000**
40% and higher	**$2,550**

ELECTRIC ONLY HOMES – REBATE LEVELS – 2012 IECC OR HIGHER AND PERCENT BTC	
Percent BTC	**Rebate**
10% – 14.999%	**$500**
15% – 19.999%	**$800**
20% – 24.999%	**$1,200**
25% – 29.999%	**$2,800**
30% – 34.999%	**$3,900**
35% – 39.999%	**$5,200**
40% and higher	**$6,700**

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Homeowner Incentives*

Certification	Homeowner Incentive
2021 IECC**	$7,500
ENERGY STAR v3.2†	$10,000
Zero Energy Ready Homes v2†	$12,500
ENERGY STAR New Certification†	$17,500
Passive House (PHI/PHIUS) †	$37,500

* Only rebuilding residents are eligible
** Only homes built on a plot where IECC 2021 is enforced are eligible
† Applies across all code enforcement jurisdictions

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Marshall Fire New Resident Incentives

Certification	Homeowner Incentive
2021 IECC	-0-
ENERGY STAR v3.2	$1,250
Zero Energy Ready Homes v2	$2,500
ENERGY STAR New Certification	$5,000
Passive House (PHI/PHIUS)	$15,000

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Prequalification*

ENERGY STAR v3.2, New Certification Program, DOE ZER v2, Passive House

- Submit prequalification form
- Submit ENERGY STAR v3.2 National Rater Design Review Checklist (draft version prior finalization)

*Optional, but strongly encouraged
*Requirements subject to change

Submission*

2021 IECC, ENERGY STAR v3.2, New Certification Program, DOE ZER v2, Passive House

- Submit claim form
- Submit ENERGY STAR v3.2 National Rater Field Checklist (draft version prior finalization)
- Submit blower door test file*
- Submit energy modeling file*

*Also part of builder rebate submission requirements

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RESIDENTIAL science resources

Marshall Fire New Construction Certification
Xcel Energy Rebates- Part I

ENERGY STAR Version 3.2
ENERGY STAR New Certification Label

Presented on April 27, 2022

Dean Gamble

Technical Manager

ENERGY STAR Single-Family New Homes

Asa Foss

Program Development Manager

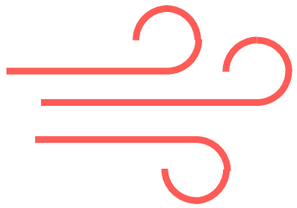
ENERGY STAR Res. New Construction

Agenda

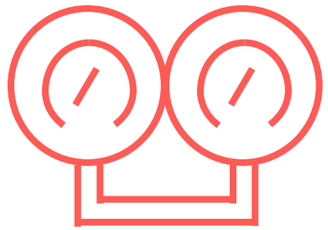
- HVAC grading overview
- Purpose of Version 3.2 and implementation timeline
- The key differences between Version 3.1 and 3.2
- Sample packages
- How you'll be able to demonstrate compliance with v3.2 in rating software..
- ..And what to do in the interim

HVAC grading overview

HVAC systems are routinely installed incorrectly

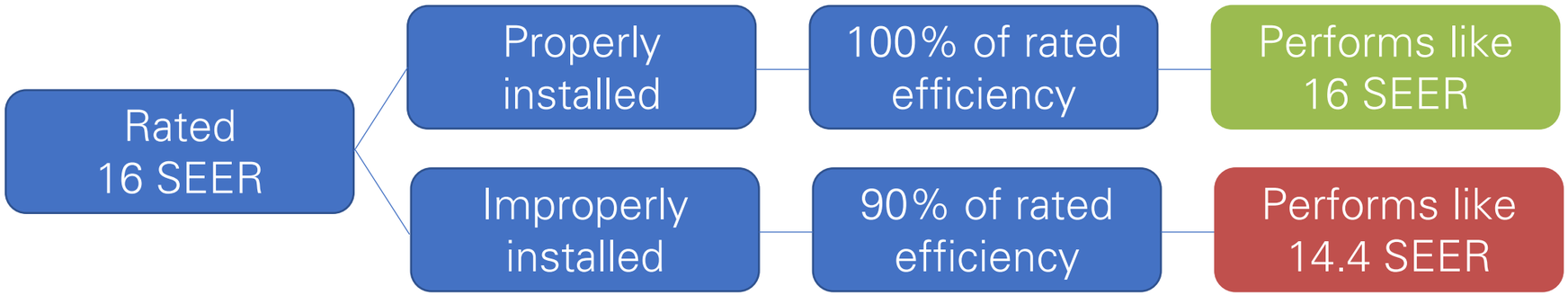


Improper airflow in nearly 50% of systems

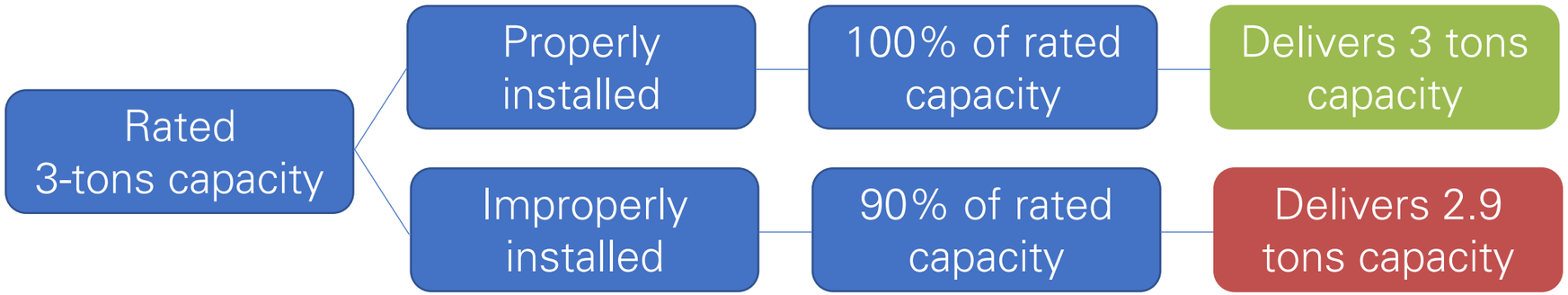


Incorrect charge in 60-80% of systems

HVAC installation quality impacts efficiency



HVAC installation quality impacts capacity



HVAC Grading Standard: ANSI / RESNET / ACCA / ICC 310

The Five Key Sequential Tasks in Standard 310

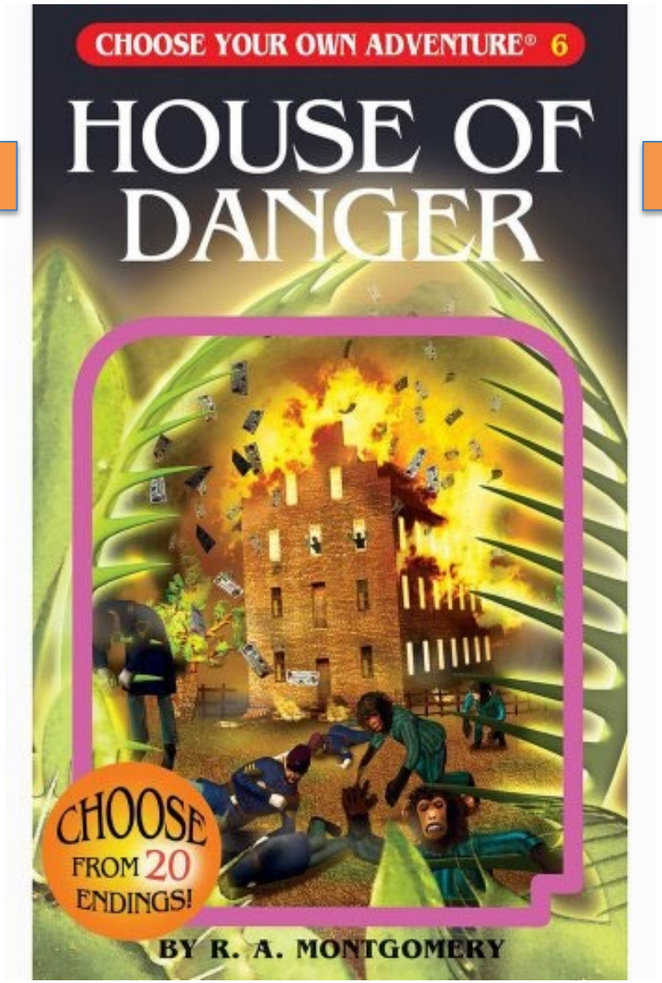
Task 1	Task 2	Task 3	Task 4	Task 5
Design Review	Total Duct Leakage	Blower Fan Airflow	Blower Fan Watt Draw	Refrigerant Charge

HVAC grading makes it easier to certify ENERGY STAR homes and apartments:

- Integrates most ENERGY STAR HVAC requirements into an ERI rating
- For eligible systems, does not require a credentialed HVAC contractor / FT agent
- For eligible systems, eliminates or greatly streamlines the HVAC Commissioning Checklist
- Rewards proper installation with ERI points and may help meet the 45L tax credit

Two HVAC pathways to ENERGY STAR certification

Track A: HVAC Grading



Track B: HVAC Credential

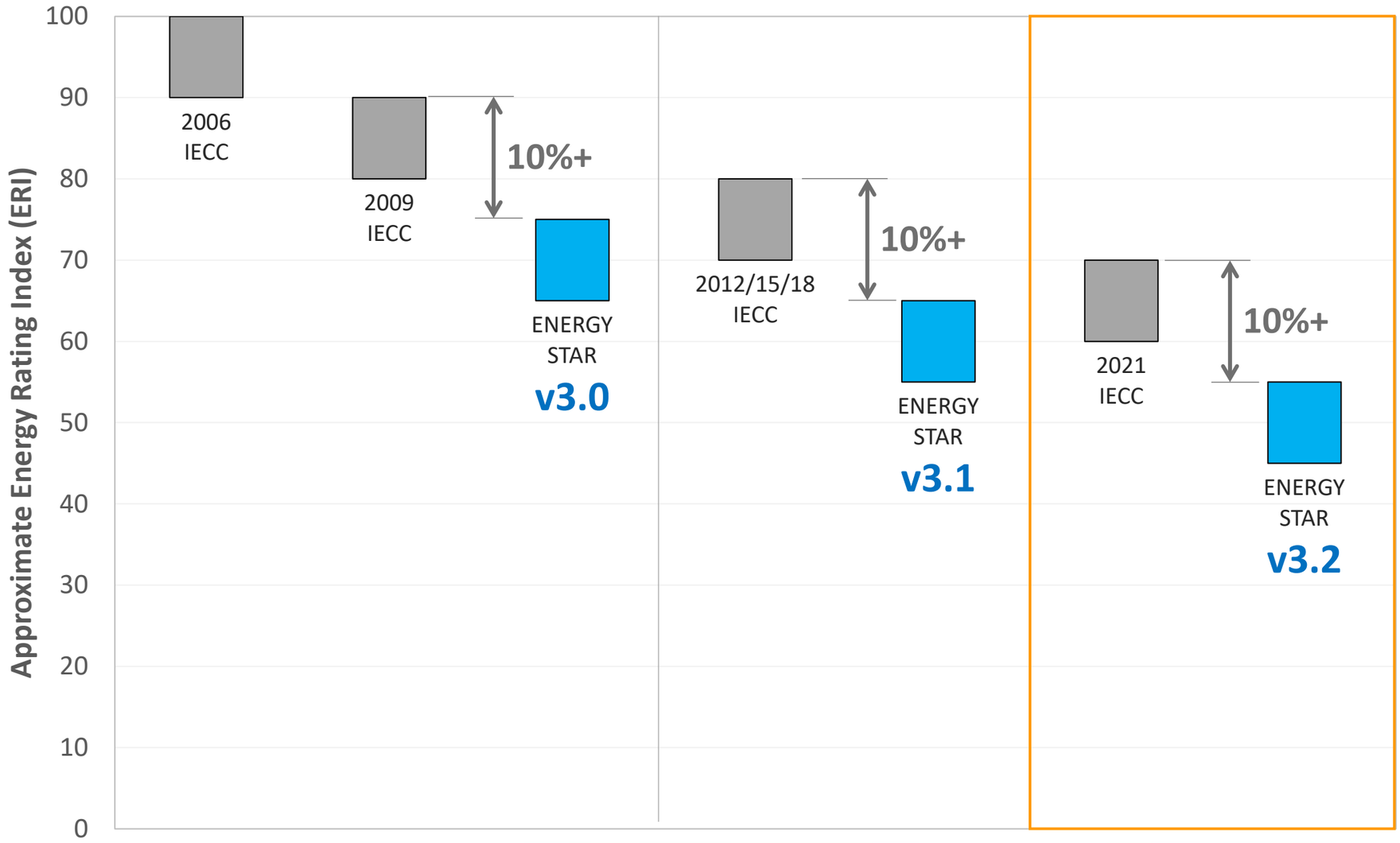
Two HVAC pathways to ENERGY STAR certification

	Track A: HVAC Grading	Track B: HVAC Credential
HVAC designer completes..	..Std. 310 Design Report + ENERGY STAR Supplement	..ENERGY STAR Design Report
Rater reviews design report per..	..Std. 310 Review Checklist + ENERGY STAR RDRC	..ENERGY STAR Review Checklist
Rater verifies..	[n/a]	..HVAC contractor is credentialed
HVAC contractor installs..	..equipment	..equipment and completes ES HVAC Commissioning Checklist
Rater verifies..	..Grade I total duct leakage, Grade I / II blower fan airflow, Grade I / II blower fan watt draw, Grade I refrigerant charge*	..total duct leakage limits, static pressure, permitted to collect ES HVAC Commissioning Checklist

* Exception: Grade III refrigerant charge is allowed when it's too hot or cold outside, or is a mini- / multi-split system

Purpose of Version 3.2

Purpose of Version 3.2



Implementation of Version 3.2

- EPA expects to finalize Version 3.2 in May and then work with rating software to incorporate over the next ~6 months.
- Version 3.2 will be implemented in states that adopt the 2021 IECC or equivalent; implementation date one year after enforcement of new state code.
- Version 3.2 will also be required as a prerequisite for new, optional, ENERGY STAR certification label.
- Utilities can optionally incentivize this level of performance, ahead of schedule.

Key Differences Between Version 3.1 and 3.2

Key differences between Version 3.1 & Version 3.2

- Two key components to program requirements:

Version 3.1: ~55 - 65
Version 3.2: ~50 - 55

Version 3.1: Thermal backstop is 2009 IECC
Version 3.2: Thermal backstop is 2021 IECC, with phase-in period

Key differences between Version 3.1 & Version 3.2: Performance target

- The more stringent efficiency target is achievable using ‘off-the-shelf’ technologies.
- Key changes in CZ 5 include:
  - More attic, wall, and slab insulation
  - More efficient AC and HP equipment
  - Grade II HVAC airflow and watt draw
  - Instant gas water heater or heat pump water heater
  - More efficient lighting
- You don’t have to include these features, as long as you can achieve the overall ENERGY STAR ERI Target.

Key differences between Version 3.1 & Version 3.2: Performance target

Key ENERGY STAR Reference Design Features

Climate Zone 5	Version 3.1	Version 3.2
Thermal Enclosure		
Ceiling Insulation	R-49	R-60
Ceiling Insulation Grade	I	I
Wall Insulation: Cavity	R-20	R-20 + R-5
Wall Insulation Grade	I	I
Door U-factor	0.17	0.17
Frame Floor Insulation	R-30	R-30
Floor Insulation Grade	I	I
Slab On Grade Insulation & Depth	R-10 2 ft	R-10 4 ft
Window U-factor	0.27	0.27
Window SHGC	0.40	0.40
Infiltration and Mechnical Ventilation		
Infiltration (ACH50)	3	3
Mech. Vent. Type & Efficiency (CFM / W)	Exhuast Fan / 2.8	Exhuast Fan / 2.8
HVAC Equipment & Controls		
Furnace & AC Efficiency (AFUE / SEER)	95 / 13	95 / 14
Heat Pump Efficiency (HSPF / SEER)	9.25 / 15	9.2 / 16
Thermostat Type	Programmable	Programmable
HVAC Grading		
Airflow Devitation	n/a	II
Watt Draw Efficiency (W / CFM)	n/a	II
Refrigerant Grade	n/a	III
Ducts		
Leakge to Outside (CFA) & Insulation	0 CFA / Not Present	0 CFA / Not Present
Location	100% Conditioned Space	100% Conditioned Space
DHW		
Gas - Efficiency & Capacity (EF / Gal.)	0.57 / 60 gallon	0.90 / 0 gallon (Instantaneous)
Electric - Efficiency & Capacity (EF / Gal.)	0.91 / 60 gallon	2.06 / 60 gallon
Lighting & Appliances		
Lighting	90% Tier 1 (CFL)	100% Tier 2 (LED)
Refrigerator (kWh/yr)	423	450
Dishwasher	ENERGY STAR	ENERGY STAR

Key differences between Version 3.1 & Version 3.2: Mandatory features

- The thermal backstop defines the minimum amount of insulation and window performance allowed, regardless of ERI.
- The only change to the mandatory features is a more stringent thermal backstop:
  - Version 3.1: 2009 IECC
  - Version 3.2:
    - For homes permitted on or before 1/1/2025: 105% x 2021 IECC UA
    - For homes permitted after 1/1/2025: 100% x 2021 IECC UA
- Note that the thermal backstop is defined in terms of a 'UA' target.
  - This is a single number that quantifies the overall thermal resistance of the enclosure.
  - It allows a home to trade off between:
    - Ceiling insulation
    - Wall insulation
    - Foundation insulation
    - Windows & doors

Key differences between Version 3.1 & Version 3.2: Mandatory features

- Calculated UA trade-offs for a typical home:
  - 2,400 sq. ft.
  - Two-stories
  - 15% WFA
  - Conditioned basement

Windows			
Area	U-value	UA	Change in UA
360	0.35	**126**	**-**
360	0.30	**108**	**-18**
360	0.25	**90**	**-18**

Walls				
Area	R-value	U-Value	UA	Change in UA
1978	13	0.077	**152**	**-**
1978	15	0.067	**132**	**-20**
1978	19	0.053	**104**	**-28**
1978	21	0.048	**94**	**-10**

Ceilings				
Area	R-value	U-Value	UA	Change in UA
1200	38	0.026	**32**	**-**
1200	49	0.020	**24**	**-7**
1200	60	0.017	**20**	**-4**

Key differences between Version 3.1 & Version 3.2: Mandatory features

- In Climate Zone 5, for a conditioned basement home, scenarios that meet the interim 105% x 2021 IECC UA target:

Climate Zone	5	
IECC Version	**2009**	**2021**
Ceiling Insulation	38	60
Wall Insulation: Cavity + Cont	20	20 + 5
Windows & Doors	0.35	0.30
Frame Floor Insulation	30	30
Basement Wall Insulation	13	19
Crawlspace Wall Insulation	13	19
Slab Insulation	10, 2ft	10, 4ft

Scenario Name	2021 IECC	Alt. 1	Alt. 2
Ceiling Insulation	60	38	49
Wall Insulation: Cavity	20	21	21
Wall Insulation: Continuous	5	None	None
Window U-factor	0.30	0.28	0.29
Door U-factor	0.30	0.17	0.17
Basement Wall Insulation	19	19	15
Slab Insulation & Depth	None	None	None
Total UA for Home	**379.2**	**397.3**	**398.7**
% better than 105% x 2021 IECC Target	5.3%	0.7%	0.4%

Key differences between Version 3.1 & Version 3.2: Mandatory features

- In Climate Zone 5, for a conditioned basement home, scenarios that meet the interim 100% x 2021 IECC UA target:

Climate Zone	5	
IECC Version	**2009**	**2021**
Ceiling Insulation	38	60
Wall Insulation: Cavity + Cont	20	20 + 5
Windows & Doors	0.35	0.30
Frame Floor Insulation	30	30
Basement Wall Insulation	13	19
Crawlspace Wall Insulation	13	19
Slab Insulation	10, 2ft	10, 4ft

Scenario Name	2021 IECC	Alt. 3	Alt. 4	Alt. 5
Ceiling Insulation	60	60	49	49
Wall Insulation: Cavity	20	21	23	21
Wall Insulation: Continuous	5	None	None	None
Window U-factor	0.30	0.27	0.27	0.24
Door U-factor	0.30	0.17	0.17	0.17
Basement Wall Insulation	19	21	19	13
Slab Insulation & Depth	None	None	None	None
Total UA for Home	**379.2**	**378.4**	**378.7**	**373.8**
% better than 100% x2021 IECC Target	0.5%	0.7%	0.7%	1.9%

Sample Packages

Sample packages

- While there's no v3.2 compliance report yet, we can model the ENERGY STAR Ref. Design manually, along with alternative measures, to show packages in the ballpark.

Gas Home Scenarios

Scenario	Prescriptive Path	DHW & HVAC	Inf & HRV	Thermal Enclosure
Thermal Enclosure				
Ceiling Insulation	R-60	R-49	R-49	R-49
Ceiling Insulation Grade	I	I	I	I
AG Wall Insulation: Cavity + Cont.	R-20 + R-5	R-21	R-21	R-23
AG Wall Insulation Grade	I	I	I	I
Door U-factor	0.17	0.17	0.17	0.17
Basement Wall Insulation: Cavity	R-19	R-15	R-15	R-19
Basement Wall Insulation Grade	I	I	I	I
Window U-factor	0.27	0.27	0.27	0.24
Window SHGC	0.40	0.40	0.40	0.40
Infiltration and Mechnical Ventilation				
Infiltration (ACH50)	3	3	2.5	2.5
Mech. Vent. Type	Exhuast Fan	Exhuast Fan	HRV	Exhuast Fan
Mech. Vent. Efficiency (CFM/W & SRE)	2.8	2.8	2.0 & 63%	2.8
HVAC Equipment & Controls				
Furnace & AC Efficiency (AFUE / SEER)	95 / 14	96 / 15	92 / 14	92 / 14
Thermostat Type	Programmable	Programmable	Programmable	Programmable
HVAC Grading				
Airflow Devitation	II	III	III	III
Watt Draw Efficiency (W / CFM)	II	III	III	III
Refrigerant Grade	III	III	III	III
Ducts				
Leakge to Outside (CFA) & Insulation	0 CFA / No Ins.	0 CFA / No Ins.	0 CFA / No Ins.	0 CFA / No Ins.
Location	100% Cond. Space	100% Cond. Space	100% Cond. Space	100% Cond. Space
DHW				
Gas - Efficiency & Capacity (UEF / Gal.)	0.90 / 0 gal (Instant)	0.96 / 0 gal (Instant)	0.86 / 0 gal (Instant)	0.90 / 0 gal (Instant)
Lighting & Appliances				
Lighting	100% Tier 2 (LED)	100% Tier 2 (LED)	100% Tier 2 (LED)	100% Tier 2 (LED)
Refrigerator (kWh/yr)	450	450	450	450
Dishwasher	ENERGY STAR	ENERGY STAR	ENERGY STAR	ENERGY STAR
ERI	**54**	**54**	**54**	**54**
% Better than 100% x 2021 IECC UA	**5.8%**	**-1.8%**	**-1.8%**	**4.7%**

Sample packages

Electric Home Scenarios

Scenario	Prescriptive Path	DHW & HVAC	Inf & HRV	Thermal Enclosure
Thermal Enclosure				
Ceiling Insulation	R-60	R-49	R-49	R-49
Ceiling Insulation Grade	I	I	I	I
AG Wall Insulation: Cavity + Cont.	R-20 + R-5	R-21	R-21	R-23
AG Wall Insulation Grade	I	I	I	I
Door U-factor	0.17	0.17	0.17	0.17
Basement Wall Insulation: Cavity	R-19	R-15	R-15	R-19
Basement Wall Insulation Grade	I	I	I	I
Window U-factor	0.27	0.27	0.27	0.24
Window SHGC	0.40	0.40	0.40	0.40
Infiltration and Mechnical Ventilation				
Infiltration (ACH50)	3	3	2.5	2.5
Mech. Vent. Type	Exhaust Fan	Exhaust Fan	HRV	Exhaust Fan
Mech. Vent. Efficiency (CFM/W & SRE)	2.8	2.8	2.0 & 63%	2.8
HVAC Equipment & Controls				
ASHP Efficiency (HSPF / SEER)	9.2 / 16	9.5 / 17	8.8 / 15	8.8 / 15
Thermostat Type	Programmable	Programmable	Programmable	Programmable
HVAC Grading				
Airflow Devitation	II	III	III	III
Watt Draw Efficiency (W / CFM)	II	III	III	III
Refrigerant Grade	III	III	III	III
Ducts				
Leakge to Outside (CFA) & Insulation	0 CFA / No Ins.	0 CFA / No Ins.	0 CFA / No Ins.	0 CFA / No Ins.
Location	100% Cond. Space	100% Cond. Space	100% Cond. Space	100% Cond. Space
DHW				
Elec - Efficiency & Capacity (UEF / Gal.)	2.20 / 60 gal	3.30 / 60 gal	2.50 / 60 gal	2.85 / 60 gal.
Lighting & Appliances				
Lighting	100% Tier 2 (LED)	100% Tier 2 (LED)	100% Tier 2 (LED)	100% Tier 2 (LED)
Refrigerator (kWh/yr)	450	450	450	450
Dishwasher	ENERGY STAR	ENERGY STAR	ENERGY STAR	ENERGY STAR
ERI	**56**	**56**	**56**	**56**
% Better than 100% x 2021 IECC UA	**5.8%**	**-1.8%**	**-1.8%**	**4.7%**

How you'll be able to demonstrate compliance with v3.2 in rating software

Demonstrating compliance with Version 3.2

- REM/Rate, EnergyGauge, and Ekotrope will all have the ENERGY STAR Version 3.2 Reference Design programmed in.
- And, because the only key differences between v3.1 and v3.2 are the ERI target and the thermal backstop, you'll be able to easily demonstrate compliance with v3.2.

Demonstrating compliance with Version 3.2

Mockup of Possible Compliance Report

Select report(s):

- [ ] HERS Certificate
- [ ] ENERGY STAR V3 Home Report
- [ ] ENERGY STAR V3.1 Home Report
- [x] ENERGY STAR V3.2 Home Report

ENERGY STAR V3.2 Home Report

Property
123 Best Way
Boulder, CO 80301
Model: Starburst
Community: Sunrise Mesa

ES
v3.2_gas_CZ5_CO_G5_2_Stories_)
ES
v3.2_gas_CZ5_CO_G5_2_Stories_(

Organization
U.S. EPA
Dean Gamble

Builder
Best Builder Inc

Inspection Status
Results are projected

Mandatory Requirements

- ✓ Duct leakage at post construction better than or equal to ENERGY STAR v3.2 requirements.
- ✓ Envelope insulation levels meet or exceed ENERGY STAR v3.2 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 2021 IECC Requirements – Table 402.1.2.
- ✓ 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	54
SAF (Size Adjustment Factor)	× 1.00
SAF Adjusted HERS Target	54
As Designed Home HERS	54
As Designed Home HERS w/o PV	54

Normalized, Modified End-Use Loads (MBtu / year)

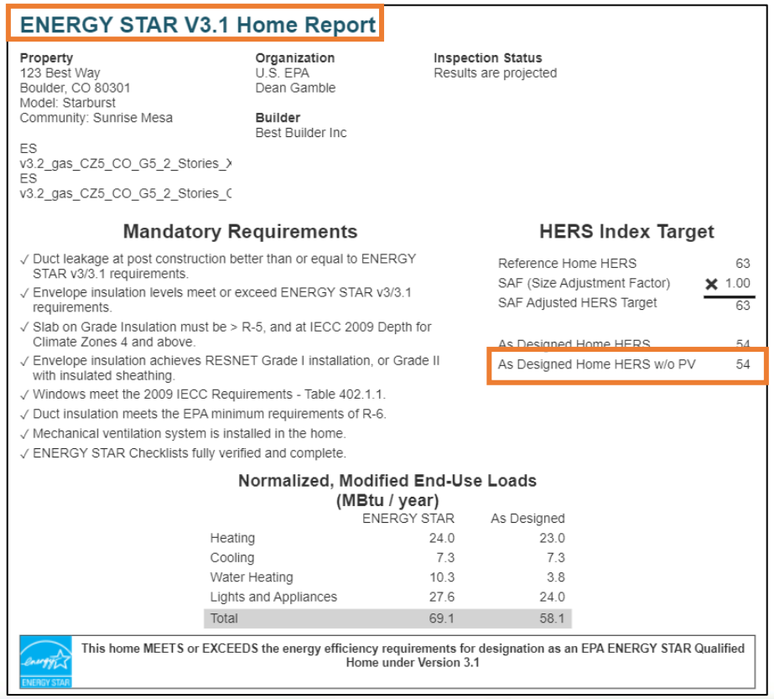
	ENERGY STAR	As Designed
Heating	23.0	23.0
Cooling	7.3	7.3
Water Heating	3.8	3.8
Lights and Appliances	24.0	24.0
Total	58.1	58.1

This home MEETS or EXCEEDS the energy efficiency requirements for designation as an EPA ENERGY STAR Qualified Home under Version 3.2

..And what to do in the interim

Demonstrating compliance with Version 3.2

- Until reports are available within rating software, homes cannot be certified to v3.2.
- However, this will get you in the right ball park:
  - Certify the home to Version 3.1
  - Achieve an ERI ≤ 50
  - Achieve a UA value ≤ 105% x 2021 IECC UA (Run a 2021 IECC UA Compliance report)



ENERGY STAR V3.1 Home Report

Property
123 Best Way
Boulder, CO 80301
Model: Starburst
Community: Sunrise Mesa

ES
v3.2_gas_CZ5_CO_G5_2_Stories_)
ES
v3.2_gas_CZ5_CO_G5_2_Stories_(

Organization
U.S. EPA
Dean Gamble

Builder
Best Builder Inc

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.

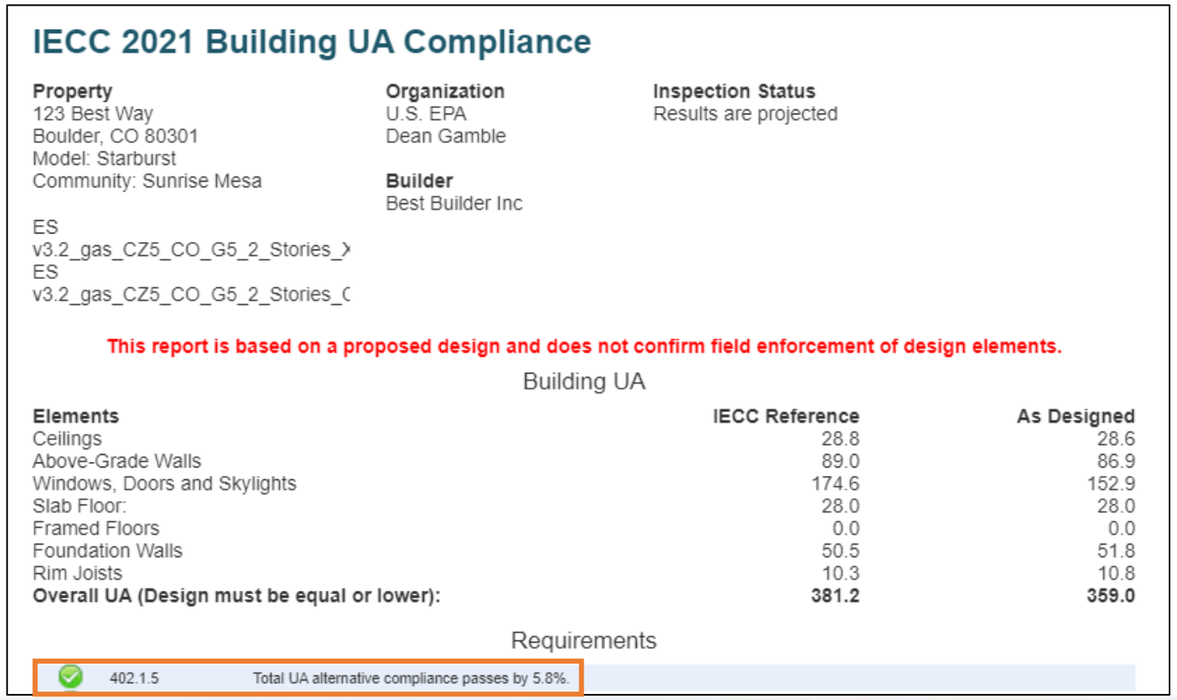
HERS Index Target

Reference Home HERS	63
SAF (Size Adjustment Factor)	× 1.00
SAF Adjusted HERS Target	63
As Designed Home HERS	54
As Designed Home HERS w/o PV	54

Normalized, Modified End-Use Loads (MBtu / year)

	ENERGY STAR	As Designed
Heating	24.0	23.0
Cooling	7.3	7.3
Water Heating	10.3	3.8
Lights and Appliances	27.6	24.0
Total	69.1	58.1

This home MEETS or EXCEEDS the energy efficiency requirements for designation as an EPA ENERGY STAR Qualified Home under Version 3.1



IECC 2021 Building UA Compliance

Property
123 Best Way
Boulder, CO 80301
Model: Starburst
Community: Sunrise Mesa

ES
v3.2_gas_CZ5_CO_G5_2_Stories_)
ES
v3.2_gas_CZ5_CO_G5_2_Stories_(

Organization
U.S. EPA
Dean Gamble

Builder
Best Builder Inc

Inspection Status
Results are projected

This report is based on a proposed design and does not confirm field enforcement of design elements.

Building UA

Elements	IECC Reference	As Designed
Ceilings	28.8	28.6
Above-Grade Walls	89.0	86.9
Windows, Doors and Skylights	174.6	152.9
Slab Floor:	28.0	28.0
Framed Floors	0.0	0.0
Foundation Walls	50.5	51.8
Rim Joists	10.3	10.8
Overall UA (Design must be equal or lower):	**381.2**	**359.0**

Requirements

✓	402.1.5	Total UA alternative compliance passes by 5.8%.

ENERGY STAR Residential New Construction

Web & Email:

Single Family: www.energystar.gov/newhomesrequirements
Multifamily: www.energystar.gov/mfnc
Email: energystarhomes@energystar.gov

Dean Gamble
Technical Manager
ENERGY STAR Single-Family New Homes
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Asa Foss
Program Development Manager
ENERGY STAR Res. New Construction
foss.asa@epa.gov

A New Whole-House Certification Program to Accelerate Decarbonization in the Residential Sector

Presented on

April 27, 2022

EPA United States Environmental Protection Agency

Introduction

- Addressing the challenge of climate change will require commitment and action from every level of government and every sector of the economy.

- In the residential sector, this will require expanding beyond energy efficiency to make greater strides in the adoption of:
  - Strategic electrification
  - Connected equipment to aid in demand response

- While addressing new construction alone will not get us there, it is a critical component to success.
  - Lost opportunity cost
  - By 2050, 20% of homes have not been built

Proposed Requirements for the New Certification Program

1. Highly energy-efficient construction
2. Multi-stage ENERGY STAR certified connected heat pump
3. ENERGY STAR certified connected heat pump water heater
4. Induction cooktop and electric oven
5. Electric vehicle charging capability

Rater Field Checklist

DRAFT ENERGY STAR *New Certification Program*
National Rater Field Checklist

Home/Building Address: _____ City: _____ State: _____ Permit Date: _____

1. ENERGY STAR Certification Baseline	Must Correct	Rater Verified [1]	N/A [2]
1.1 Home or building certified under one of the following ENERGY STAR New Construction programs (check box): Single Family New Homes (SFNH) — Multifamily New Construction (MFNC) ☐ SFNH National Version 3.2 — ☐ MFNC National Version 1.2 *California Projects Only:* ☐ SFNH California Version 3.3 — ☐ MFNC California Version 1.3	☐	☐	-
2. Dwelling Unit Space Heating			
2.1 ENERGY STAR certified two-speed or variable-speed heat pump(s), or ENERGY STAR certified geothermal heat pump(s), installed and sized in accordance with the HVAC Design Report	☐	☐	-
2.1.1 Blower fan volumetric airflow, blower fan watt draw, and refrigerant charge are Grade I per ANSI / RESNET / ACCA Std. 310 [3]	☐	☐	☐
2.1.2 In CZ 5-8, installed air-source heat pumps are ENERGY STAR certified for Cold Climate	☐	☐	☐
2.2 Each air-source heat pump meets EPA's 'connected' criteria or is controlled by an ENERGY STAR certified smart thermostat	☐	☐	-
3. Dwelling Unit Water Heating			
3.1 ENERGY STAR certified heat pump water heater that is 208/240 volts is installed [4]	☐	☐	☐
3.2 Each heat pump water heater has minimum tank capacity as follows: **Bedrooms:** 1 — 2 — 3 — 4+ **Minimum Tank Capacity:** 36 — 45 — 59 — 72	☐	☐	☐
3.3 Each heat pump water heater located within occupiable space has a manufacturer-rated sound level ≤ 55 dBA [5, 6]	☐	☐	☐
3.4 Each heat pump water heater meets EPA's 'connected' criteria			
4. Cooking			
4.1 Cooktops and range elements/burners use induction technology, and ovens are electric [7, 8]	☐	☐	☐
5. Electric Vehicle Charging Infrastructure - For one and two-family dwellings with a private driveway or garage, comply with Item 5.1 For all other dwellings and dwelling units, comply with either Item 5.1 or 5.2			
5.1 EV-Ready: One parking space is provided per dwelling unit that includes all of the items below: [9]	-	-	☐
5.1.1 A powered 208/240 receptacle is installed in garage or within 3 feet of driveway or dedicated parking space [10]	☐	☐	-
5.1.2 The electric service panel includes a 40-amp breaker (or greater) and panel directory identifies the branch circuit as "Electric vehicle charging"	☐	☐	-
5.2 EV Chargers and EV-Capable parking spaces are installed, including all of the items below:	-	-	☐
5.2.1 EV Charger: Install (at a minimum) the following number of ENERGY STAR certified EV Chargers that meet EPA's 'connected' criteria as follows: [11, 12] **Parking Spaces:** 1-10 spaces — 11-20 spaces — 21-30 spaces — 31-40 spaces — 41+ spaces **EV Chargers:** 1 — 2 — 3 — 4 — 5	☐	☐	-
5.2.2 EV-Capable: Conduit is installed that runs continuously from the electrical panel to a junction box that terminates within 3 feet of at least 20% of the development's parking spaces [12, 13, 14]	☐	☐	-

Rater Name: _____ Rater Inspection Date: _____ Rater Initials: _____

1. Energy Efficiency Prerequisite

- Home or building certified to the most rigorous ENERGY STAR New Construction program requirement: National v3.2/Multifamily v1.2
    - This requirement would also apply in states that would not otherwise be subject to these versions of the program requirements due to code adoption

2. ENERGY STAR Certified Connected Heat Pumps

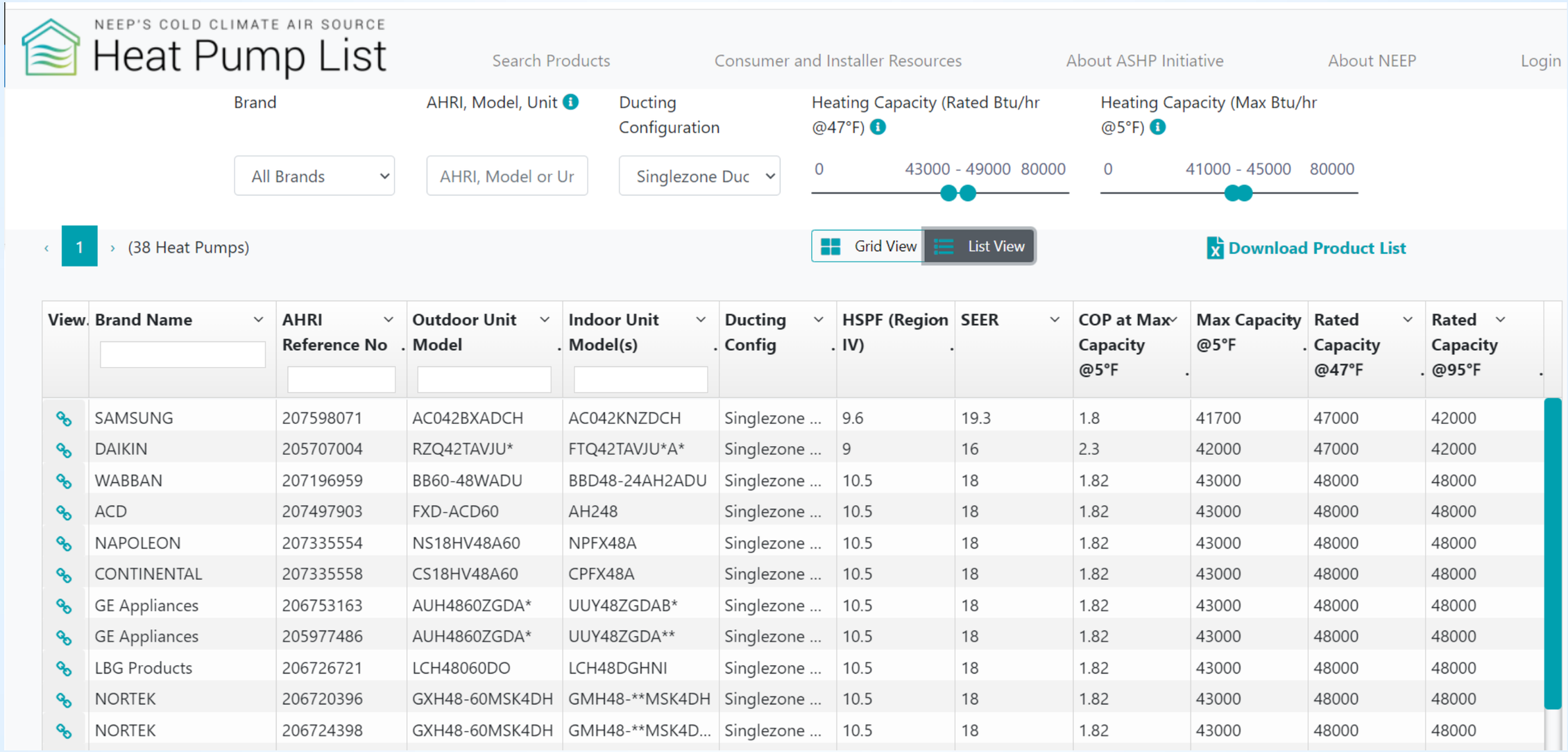
- ENERGY STAR certified two-speed or variable-speed heat pump installed that serves the design load of each heated zone
  - In Climate Zones 5-8, installed heat pumps are ENERGY STAR Cold Climate certified
  - Each heat pump must also meet EPA's 'connected' criteria or be controlled by an ENERGY STAR certified smart thermostat
  - Blower fan volumetric airflow, blower fan watt draw, and refrigerant charge are Grade I per ANSI / RESNET / ACCA Std. 310

2. ENERGY STAR Certified Connected Heat Pumps

- Equipment Selection: ENERGY STAR certified two-speed or variable-speed heat pump installed that serves the design load of each heated zone

- Use NEEP Cold Climate Air Source Heat Pump Product List
  - https://neep.org/heating-electrification/ccashp-specification-product-list
  - Equipment listed as ENERGY STAR Certified
  - Capacity Maintenance (Max 5°F/Rated 47°F) is at least 70%

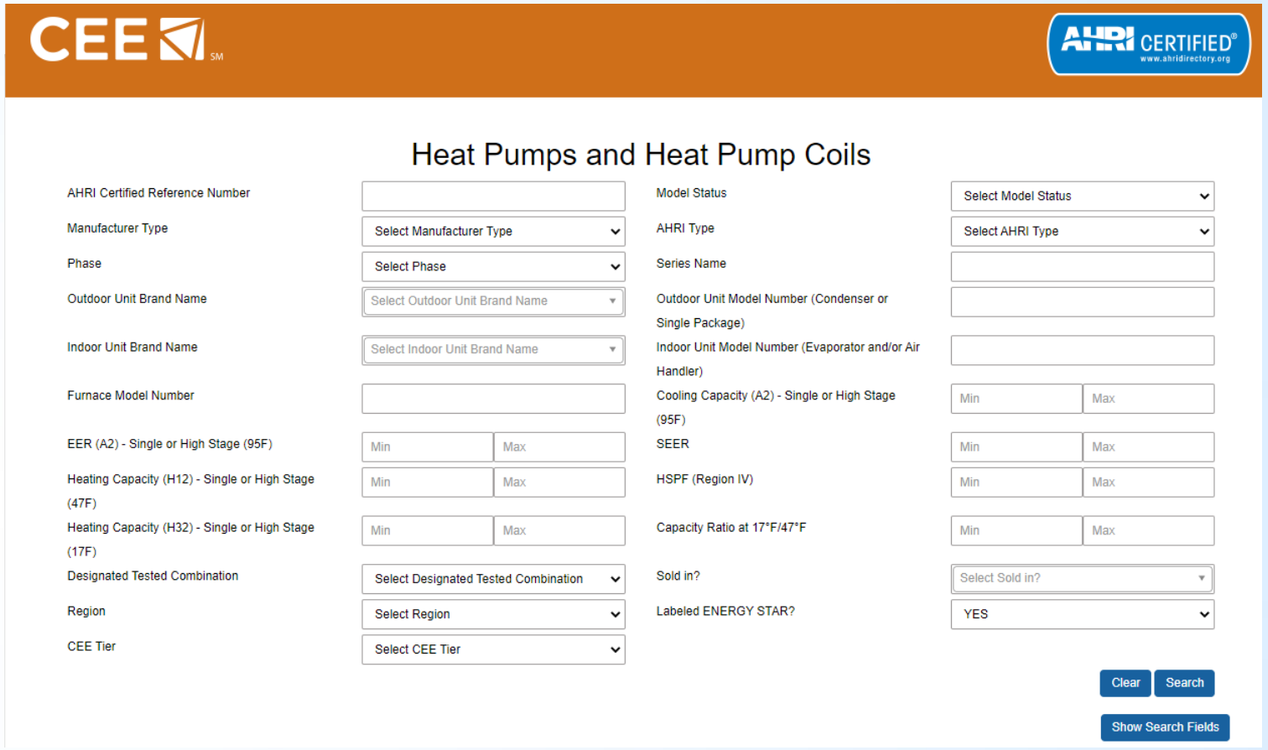
2. ENERGY STAR Certified Connected Heat Pumps



View	Brand Name	AHRI Reference No	Outdoor Unit Model	Indoor Unit Model(s)	Ducting Config	HSPF (Region IV)	SEER	COP at Max Capacity @5°F	Max Capacity @5°F	Rated Capacity @47°F	Rated Capacity @95°F
	SAMSUNG	207598071	AC042BXADCH	AC042KNZDCH	Singlezone ...	9.6	19.3	1.8	41700	47000	42000
	DAIKIN	205707004	RZQ42TAVJU*	FTQ42TAVJU*A*	Singlezone ...	9	16	2.3	42000	47000	42000
	WABBAN	207196959	BB60-48WADU	BBD48-24AH2ADU	Singlezone ...	10.5	18	1.82	43000	48000	48000
	ACD	207497903	FXD-ACD60	AH248	Singlezone ...	10.5	18	1.82	43000	48000	48000
	NAPOLEON	207335554	NS18HV48A60	NPFX48A	Singlezone ...	10.5	18	1.82	43000	48000	48000
	CONTINENTAL	207335558	CS18HV48A60	CPFX48A	Singlezone ...	10.5	18	1.82	43000	48000	48000
	GE Appliances	206753163	AUH4860ZGDA*	UUY48ZGDAB*	Singlezone ...	10.5	18	1.82	43000	48000	48000
	GE Appliances	205977486	AUH4860ZGDA*	UUY48ZGDA**	Singlezone ...	10.5	18	1.82	43000	48000	48000
	LBG Products	206726721	LCH48060DO	LCH48DGHNI	Singlezone ...	10.5	18	1.82	43000	48000	48000
	NORTEK	206720396	GXH48-60MSK4DH	GMH48-**MSK4DH	Singlezone ...	10.5	18	1.82	43000	48000	48000
	NORTEK	206724398	GXH48-60MSK4DH	GMH48-**MSK4D...	Singlezone ...	10.5	18	1.82	43000	48000	48000

2. ENERGY STAR Certified Connected Heat Pumps

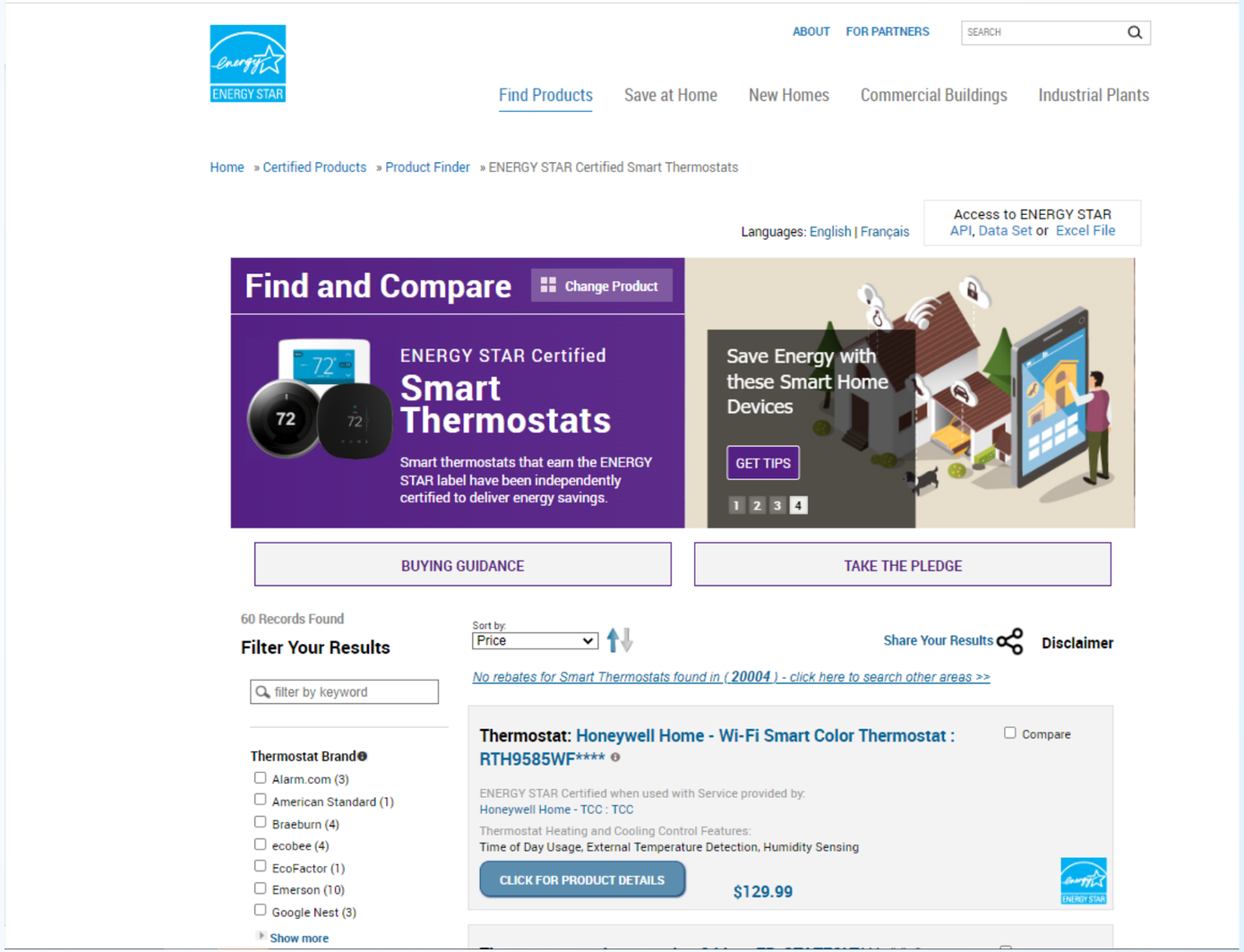
- Each heat pump must also meet EPA's 'connected' criteria or be controlled by an ENERGY STAR certified smart thermostat
    - Equipment's AHRI Certified Reference Number listed on CEE Directory of Efficient Equipment as CEE Tier 1, CEE Tier 2 or CEE Tier 3



- For smart thermostats option, use ENERGY STAR Product Finder

2. ENERGY STAR Certified Connected Heat Pumps

- ENERGY STAR Product Finder: Smart Thermostats



2. ENERGY STAR Certified Connected Heat Pumps

- HVAC Grading
- Mandatory for the Next Generation Certification
- Blower fan volumetric airflow, blower fan watt draw, and refrigerant charge are Grade I per ANSI / RESNET / ACCA Std. 310
- RESNET Training: https://www.resnet.us/articles/ansi-resnet-acca-310-implementation-of-hvac-grading/
- For this new certification program, the home is not permitted to be certified with a default refrigerant charge designation of Grade III. If the non-invasive procedure cannot be performed during the final inspection of a home, the weigh-in method procedure in ANSI / RESNET / ACCA Std. 310 may still be used to pursue a Grade I designation.

3. ENERGY STAR Certified Connected Heat Pump Water Heaters

- ENERGY STAR certified heat pump water heater that meets EPA's 'connected' criteria
  - Or install CTA-2045 EcoPorts

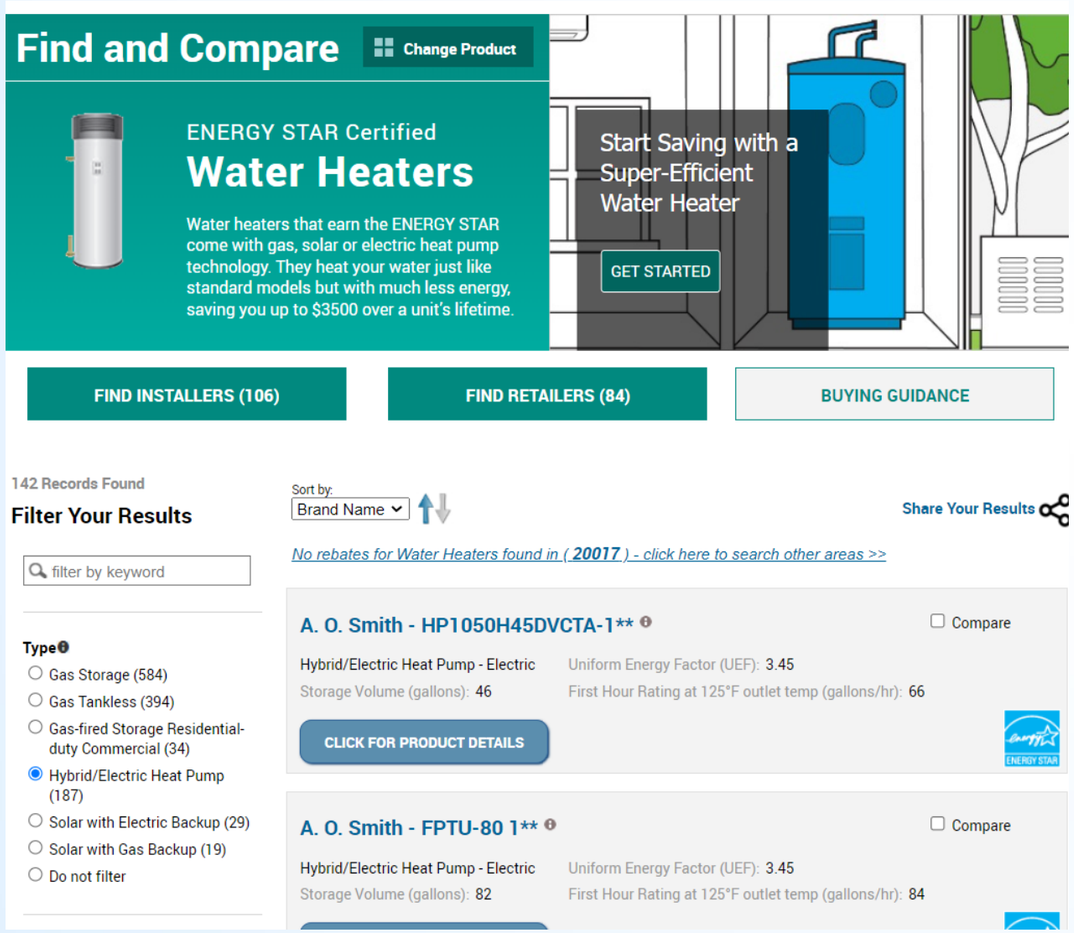
- Each heat pump water heater is 208/240 volts, with minimum tank capacity as follows:

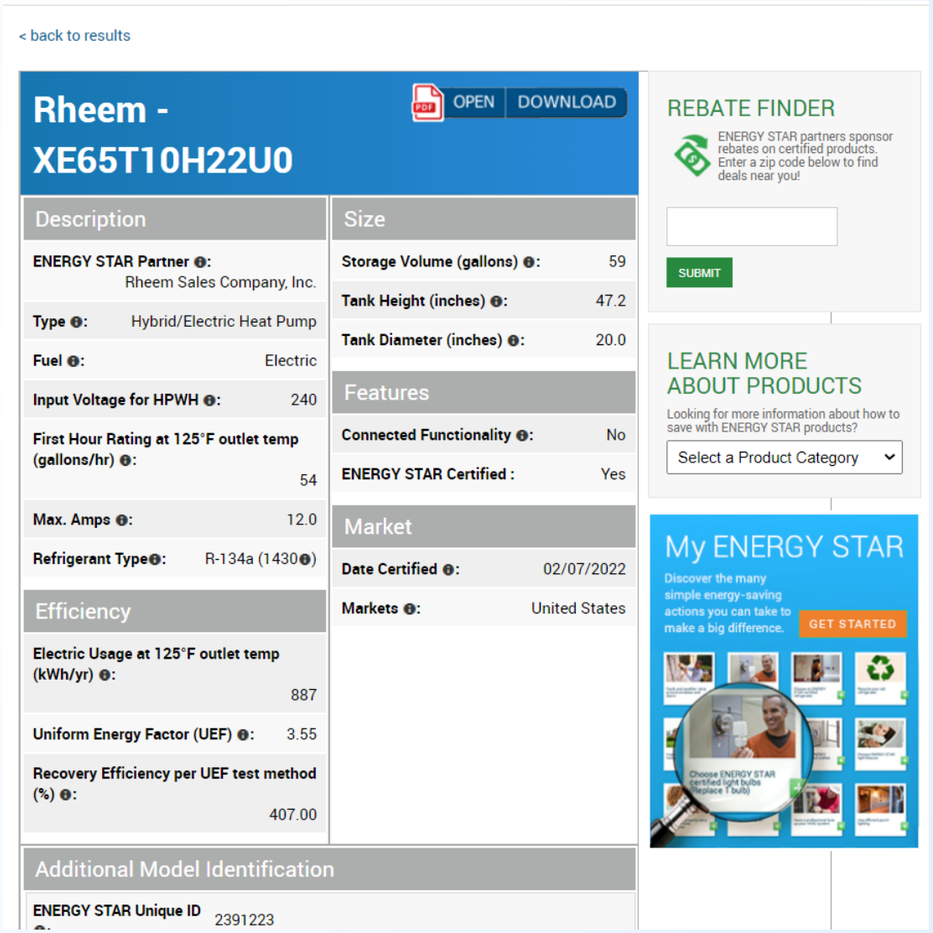
Bedrooms	1	2	3	4+
Tank Capacity	**36**	**45**	**59**	**72**

- Each heat pump water heater located within occupiable space has a sound rating ≤ 55 dBA

3. ENERGY STAR Certified Connected Heat Pump Water Heaters

https://www.energystar.gov/productfinder/product/certified-water-heaters/results





3. ENERGY STAR Certified Connected Heat Pump Water Heaters

Per ASHRAE 62.2-2010, the term “occupiable space” is defined as any enclosed space inside the pressure boundary and intended for human activities, including, but not limited to, all habitable spaces, toilets, closets, halls, storage and utility areas, and laundry areas.

NEEA Advanced Water Heater Specification Qualified Products List

- Integrated HPWH - Tier 3.0 or Tier 4.0
- Split-System - Tier 3.0

*Note that some products that meet a Tier 1.0 or Tier 2.0 may be compliant with dBA ≤ 55 requirement

3. ENERGY STAR Certified Connected Heat Pump Water Heaters

Advanced Water Heater Specification Qualified Products List for Heat Pump Water Heaters

Last Updated: 2/22/22

Integrated Water Heaters

Product Tier	Product Brand	Model	Volume (gallons)	Maximum Recommended Household Size	Cool Climate Efficiency (CCE)†	Uniform Energy Factor (UEF)	CTA-2045 Compliant Communication Port*	Qualified Date
Tier 4								
	Direct Energy	ECEPH40 T2 RH375-15	40	2	3.1	3.45	x	10/23/2020
	Direct Energy	ECEPH50 T2 RH375-15	50	2-3	3.2	3.75	x	10/23/2020
	Direct Energy	ECEPH65 T2 RH375-15	65	2-3	3.2	3.55	x	10/23/2020
	Direct Energy	ECEPH80 T2 RH375-15	80	4	3.2	3.70	x	10/23/2020
	Direct Energy	ECEPH40 T2 RH375-30	40	2	3.1	3.75	x	10/23/2020
	Direct Energy	ECEPH50 T2 RH375-30	50	2-3	3.2	3.75	x	10/23/2020
	Direct Energy	ECEPH65 T2 RH375-30	65	2-3	3.2	3.85	x	10/23/2020
	Direct Energy	ECEPH80 T2 RH375-30	80	4	3.2	4.00	x	10/23/2020
	Direct Energy	ECEPH40 T2 RH375-SO	40	2	3.1	3.75	x	10/23/2020
	Direct Energy	ECEPH50 T2 RH375-SO	50	2-3	3.2	3.75	x	10/23/2020
	Direct Energy	ECEPH65 T2 RH375-SO	65	2-3	3.2	3.85	x	10/23/2020
	Direct Energy	ECEPH80 T2 RH375-SO	80	4	3.2	4.00	x	10/23/2020
	Rheem	HPLD40-1RH	40	2	3.1	3.75	x	10/23/2020
	Rheem	HPLD50-1RH	50	2-3	3.2	3.75	x	10/23/2020
	Rheem	HPLD65-1RH	65	2-3	3.2	3.85	x	10/23/2020
	Rheem	HPLD80-1RH	80	4	3.2	4.00	x	10/23/2020
	Rheem	PROPH40 T2 RH375-15	40	2	3.1	3.45	x	4/23/2020
	Rheem	PROPH50 T2 RH375-15	50	2-3	3.2	3.75	x	4/23/2020
	Rheem	PROPH65 T2 RH375-15	65	2-3	3.2	3.55	x	4/23/2020
	Rheem	PROPH80 T2 RH375-15	80	4	3.2	3.70	x	4/23/2020
	Rheem	PROPH40 T2 RH375-30	40	2	3.1	3.75	x	4/23/2020
	Rheem	PROPH50 T2 RH375-30	50	2-3	3.2	3.75	x	4/23/2020

4. Induction/Electric Cooking

- Cooktops and range burners use induction technology, and ovens are electric

Footnote:

- This requirement does not apply for sleeping units without kitchens but does apply to kitchens in common spaces. This requirement does not apply to cooking appliances located outside the building thermal envelope, (e.g. grills or outdoor kitchens).

5. Electric Vehicle Charging Capability

- For one- and two-family dwellings with dedicated parking:
  - EV-Ready: One parking space is provided per dwelling unit that includes all of the items below.
    - A powered 208/240 receptacle is installed in garage or within 3 feet of driveway or dedicated parking space
    - The electric service panel includes a 40-amp **(or greater)** breaker and panel directory identifies the branch circuit as “Electric vehicle charging”

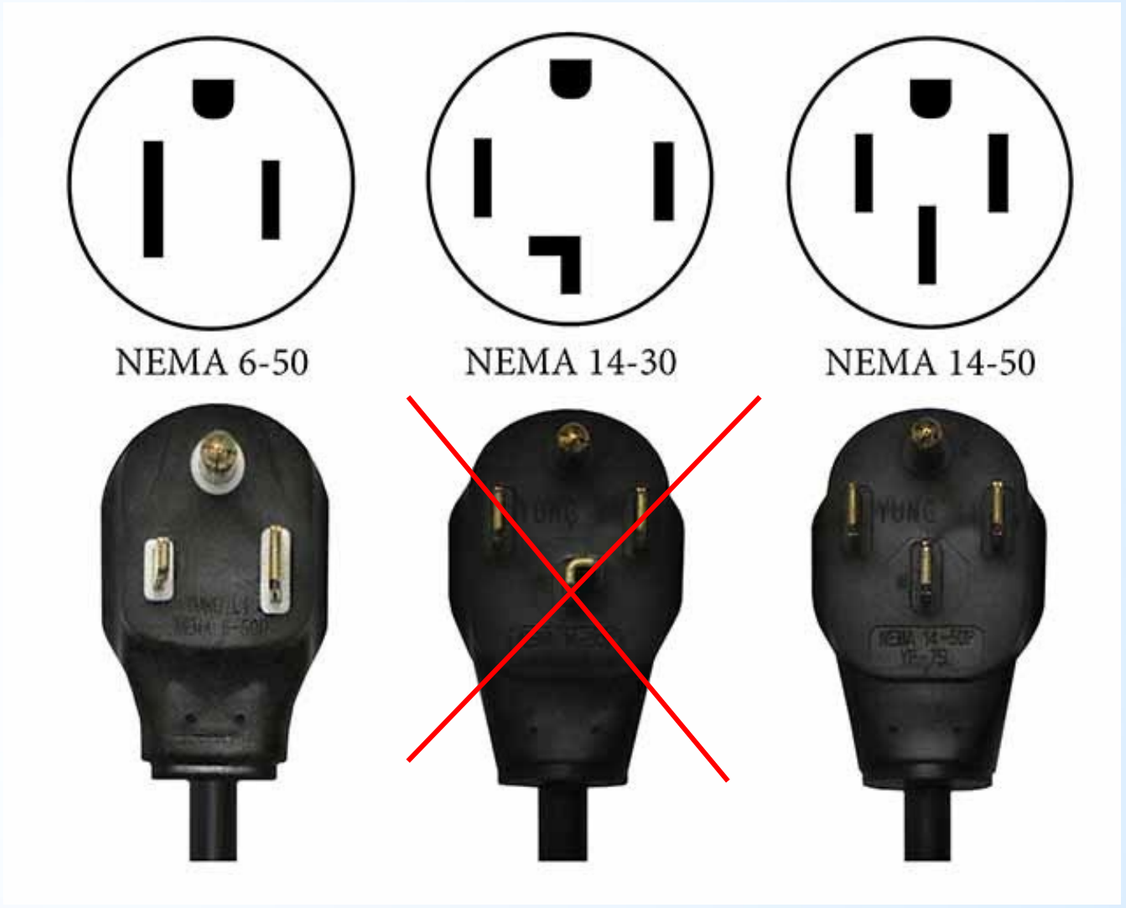
5. Electric Vehicle Charging Capability

Footnotes

- When there are fewer parking spaces than dwelling units, meet EV-Ready for 100% of units with parking spaces.
- If the addition of the 40-amp Electric Vehicle Charging branch circuit increases the electrical service to the next nominal size (i.e., from 200-amp to 400-amp service), connecting the circuit to the electrical panel is not required. The Rater shall retain a copy of the electrical sizing calculations or statement from the electrical designer for their records but need not evaluate the documentation to certify the home.

5. Electric Vehicle Charging Capability

- 50A Receptacle (40A doesn't exist)
  - Most common are "NEMA 14-50" or "NEMA 6-50"
  - Written on the face of the receptacle
  - Installed in garage or next to driveway



5. Electric Vehicle Charging Capability

- For all other dwellings, comply with either EV-Ready or both of the below:
  - EV Charger: Install (at a minimum) the following number of ENERGY STAR certified EV-Chargers that meet EPA's 'connected' criteria as follows:

Parking Spaces:	1-10	11-20	21-30	31-40	41+
EV Chargers:	1	2	3	4	5

  - EV-Capable: Conduit is installed that runs continuously from the electrical panel to a junction box that terminates within 3 feet of at least 20% of the development's parking spaces

5. Electric Vehicle Charging Capability

Footnotes:

- When calculating the number of EV chargers and EV-Capable spaces required, include all parking spaces in the development except for one and two-family dwellings' private driveways or garages that must comply with EV-Ready requirements. For this purpose, the "development" includes the combined areas covered by the project's site permit and zoning permit. The number of required compliant spaces should be rounded up to the nearest whole number.
- EV chargers that contain two charging ports may be counted as two chargers, so long as the connectors can reach and charge EVs in two parking spaces simultaneously.
- An EV-Ready parking space qualifies as EV-Capable. EV chargers also qualify as EV-Capable, except those required to meet the 10% requirement.
- Projects with a common area electrical room may have the conduit terminate anywhere within the electrical room. Parking spots in a covered garages are deemed EV-Capable if the conduit terminates anywhere within the garage on that parking level.

Next Steps and Timeline

Final specification release
(Expected: Q2 2022)

Full deployment
(Expected: January 1, 2023)

- Branding
- Supplemental Materials
- Training

Q&A

Survey