

ENERGY STAR. The simple choice for energy efficiency.



# ENERGY STAR Residential New Construction Programs The Year Ahead

RESNET Building Performance Conference

February 25th, 2019



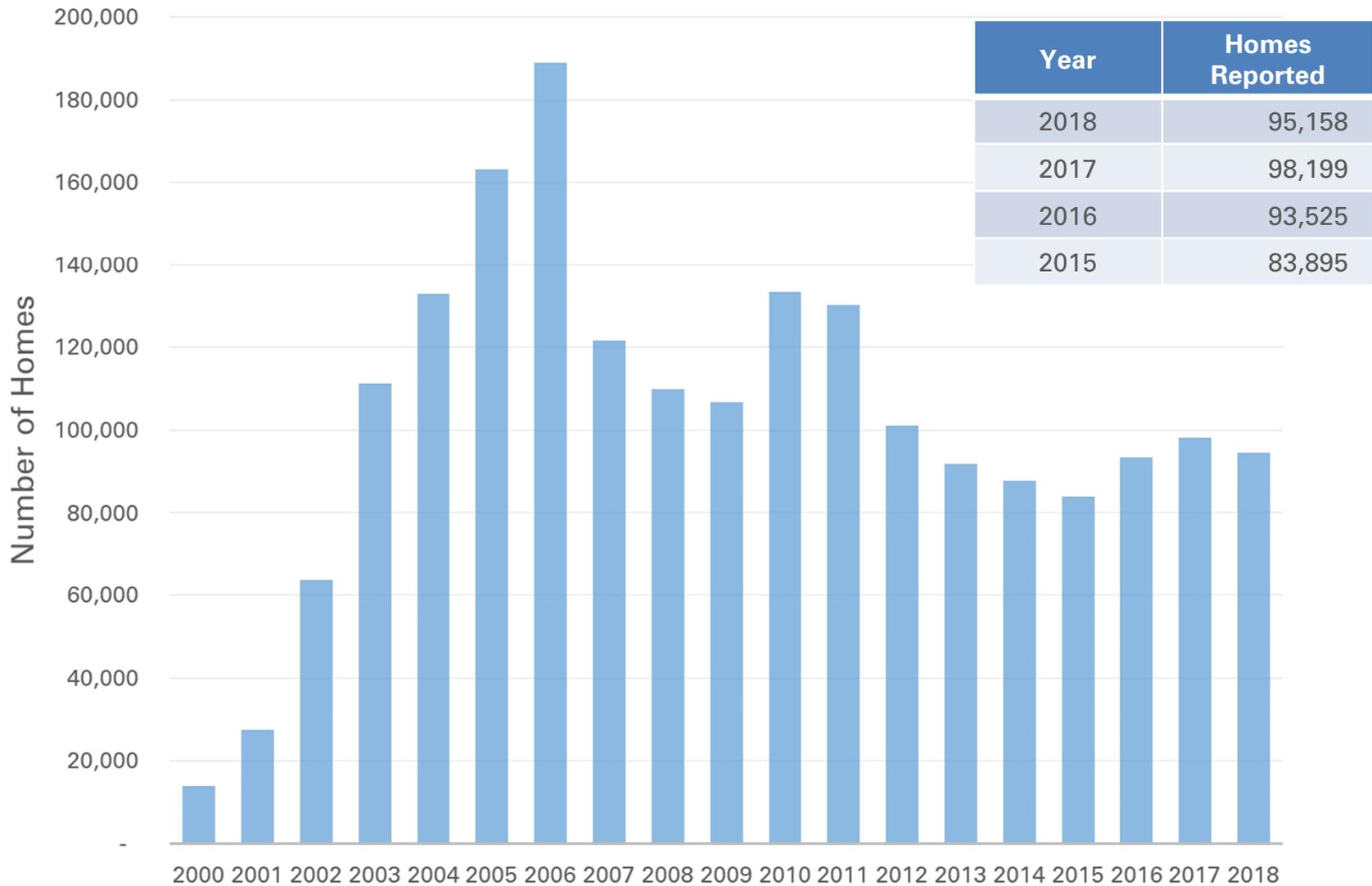


# The Numbers





### Annual ENERGY STAR Certified Homes Built





# Program Requirements



# Overhaul of ENERGY STAR Technical Website

ABOUT ENERGY STAR PARTNER RESOURCES

The simple choice for energy efficiency.

ENERGY EFFICIENT products    ENERGY SAVINGS at home    ENERGY EFFICIENT new homes    ENERGY STRATEGIES FOR buildings & plants

Home > Partner Resources > For New Home Construction Professionals > ENERGY STAR Certified Homes Program Requirements > Version 3 Program Requirements

## ENERGY STAR Certified Homes Version 3 Program Requirements

**Should I use the Version 3 Program Requirements?**

To earn the ENERGY STAR, a home must be certified under Version 3 of the program requirements, unless it is located in California, Connecticut, Delaware, District of Columbia, Florida, Guam, Hawaii, Illinois, Iowa, Maryland, Massachusetts, Michigan, Minnesota, Montana, Nevada, New Jersey, New York Northern Mariana Islands, Oregon, Puerto Rico, Rhode Island, Texas, U.S. Virgin Islands, Vermont, or Washington. A home in these locations must be certified using [Regional Specifications](#).

**How to Certify a Home**

**Select the core energy efficiency measures**

Working with a Home Energy Rater, builders configure the preferred set of energy measures for their home and verify that the resulting HERS Index meets or exceeds the ENERGY STAR HERS Index Target. The National Program Requirements contain more information about how the target is defined and the typical measures used to meet this target. See the [National Program Requirements](#) (182KB).

**Complete Mandatory Measures**

Certification of a home also requires the completion of the following:

- [Rater Design Review Checklist and Rater Field Checklist](#) (632KB)
- [HVAC Design Report](#) (338KB)

**MARKETING TOOLS AND RESOURCES**

**Consumer Video**

Play the full or 90 second version of the consumer video on your website and in model homes. Co-brand the video by adding your logo. [Learn more.](#)

**Partner Resources**

- Product Brand Owners
- Retailers
- New Home Industry**
  - Next Generation
  - Resources
  - Affordable Housing
  - RE Ready Home
- Utilities/EEPS
- Residential & Commercial Products Programs
- Service & Product Providers
- Buildings & Plants
- Small Businesses
- Congregations
- For Contractors
- For Federal Agencies
- [Join ENERGY STAR](#)

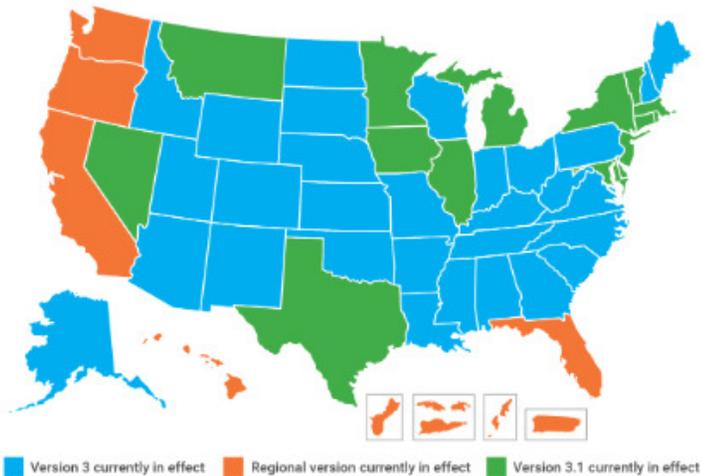




SINGLE FAMILY    MULTIFAMILY    MANUFACTURED    UNDERGOING GUT REHAB

**PROGRAM VERSIONS AT A GLANCE**

Select State or Territory ▼



**ELIGIBILITY**

These requirements apply to site-built single family homes, duplexes and townhomes. For multifamily, modular, manufactured and single family homes undergoing gut rehab, click on the appropriate tab above.

**PROGRAM REQUIREMENTS**

- National Program Requirements**  
 National Program Requirements Version 3 (PDF, 210 KB)  
 National Program Requirements Version 3.1 (PDF, 228 KB)
- Regional Program Requirements**  
 Tropics Program Requirements Version 3 (PDF, 233 KB)  
 California Program Requirements Version 3.1 (PDF, 134 KB)  
 Florida Program Requirements Version 3.1 (PDF, 196 KB)  
 California Program Requirements Version 3.2 (PDF, 134 KB)  
 Oregon and Washington Program Requirements Version 3.2 (PDF, 204 KB)
- Mandatory Measures**  
 National Rater Design Review Checklist (PDF, 634 KB)  
 National Rater Field Checklist (PDF, 508 KB)  
 Tropics Rater Design Review Checklist (PDF, 212 KB)  
 Tropics Rater Field Checklist (PDF, 273 KB)  
 National HVAC Design Report (PDF, 252 KB)  
 National HVAC Commissioning Checklist (PDF, 184 KB)  
 National Water Management System Builder Requirements (PDF, 193 KB)

**IMPLEMENTATION TIMELINE**

This table contains all implementation timelines applicable on or after September 1, 2016. Implementation timelines applicable prior to this date can be obtained by contacting [energystarhomes@energystar.gov](mailto:energystarhomes@energystar.gov).

To determine the program Version and Revision that a home is required to be certified under, identify the location and permit date of the home below. Note that the National Version 3.1 program requirements are being implemented in states that have adopted the 2012, 2015, or 2018 IECC, or an equivalent code. Note, as well, that regional program requirements have been developed for homes in CA, FL, GU, HI, the Northern Mariana Islands, OR, PR, and WA.

State / Territory	Home Permitted On or After This Date Must Meet the Adjacent Version & Revision	Certified Home Program Version	Revision
AL, AK, AZ, AR, CO, GA, IN, ID, KS, KY, LA, ME, MS, MO, NE, NH, NM, NC, ND, OH, OK, PA, SC, SD, TN, UT, VA, WV	07-01-2016	National Version 3	Revision 08
	01-01-2019	National Version 3	Revision 09

**ADDITIONAL RESOURCES**

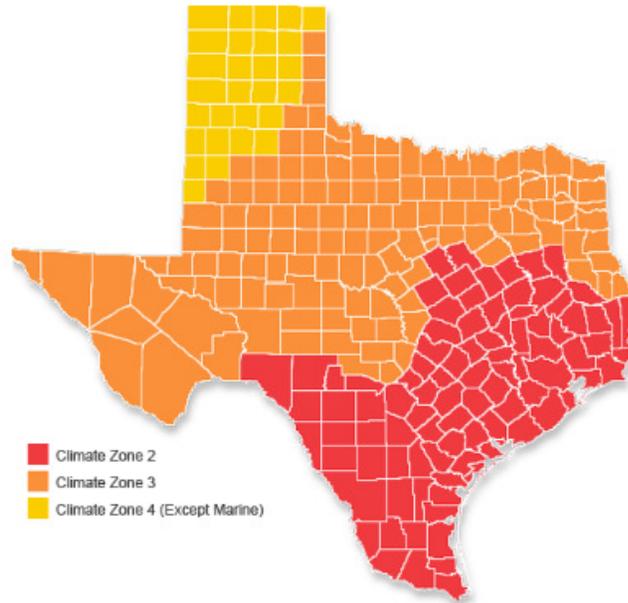


SINGLE FAMILY    MULTIFAMILY    MANUFACTURED    UNDERGOING GUT REHAB

### HARRIS, TX AT A GLANCE

[< Back to National view](#)

Select a County ▼



### COUNTY-LEVEL DESIGN TEMPERATURE LIMITS

Below are the heating and cooling design temperature limits for the selected state and county. These limits generally must not be exceeded in the HVAC design for a home that will be certified in this location. See the Design Temperature Limit Reference Guide for exceptions and details.

1% Cooling Limit 95°F    99% Heating Limit 33°F

### EFFICIENCY FEATURES AT A GLANCE

### ELIGIBILITY

These requirements apply to site-built single family homes, duplexes and townhomes. For multifamily, modular, manufactured and single family homes undergoing gut rehab, click on the appropriate tab above.

### PROGRAM REQUIREMENTS

- [National Program Requirements Version 3.1 \(PDF, 222 KB\)](#)
- [National Rater Design Review Checklist \(PDF, 184 KB\)](#)
- [National Rater Field Checklist \(PDF, 184 KB\)](#)
- [National HVAC Design Report \(PDF, 311 KB\)](#)
- [National HVAC Commissioning Checklist \(PDF, 215 KB\)](#)
- [National Water Management System Builder Requirements \(PDF, 135 KB\)](#)

### ADDITIONAL RESOURCES

- [ENERGY STAR Policy Record](#)
- [ENERGY STAR Training & Education](#)
- [Building America Solutions Center](#)
- [National Version 3.1 Cost & Savings Document \(PDF, 781 KB\)](#)
- [National Version 3.1 ENERGY STAR Reference Design \(PDF, 192 KB\)](#)

### IMPLEMENTATION TIMELINE

Homes in Texas must be certified using the [National Program Requirements Version 3 \(PDF, 210 KB\)](#) if permitted on or after 01/01/2012 but before 07/01/2018.

Homes in Texas must be certified using the [National Program Requirements Version 3.1 \(PDF, 210 KB\)](#) if permitted on or after 07/01/2018.



SINGLE FAMILY

MULTIFAM

EFFICIENCY FEATURES AT A GLANCE

HARRIS, TX AT A GLANCE

< Back to National view

Select a County



- Climate Zone 2
- Climate Zone 3
- Climate Zone 4 (Excluded)

COUNTY-LEVEL DESIGN TEMPERATURES

Below are the heating and cooling design temperature limits generally must not be exceeded at the location. See the Design Temperature table for more details.

1% Cooling Limit 95°F

2009 IECC Climate Zone 4

Below is the set of efficiency features modeled to determine the ENERGY STAR HERS Index Target for homes in Climate Zone 4. While the features are not mandatory, if they are not used then other measures will be needed to achieve the target. See [National Program Requirements Version 3.1](#) (PDF, 195 KB) for complete details.

Envelope, Windows, & Doors	
Radiant Barrier?	n/a
Insulation Install. Quality	Grade I
Ceiling Insulation	R-49
Wall Insulation	R-20 cavity or R-13 cavity + 5 cont.
Mass Wall Insulation	R-8 ext or R-13 int
Floor Insulation	R-19
Basement Wall Insulation	R-10 cont. or R-13 cavity
Crawlspace Wall Insulation	R-10 cont. or R-13 cavity
Slab Insulation	R-10; 2 ft
Infiltration Rate	3 ACH50
Windows	U-factor: 0.30 / SHGC: 0.40
Door: Opaque	U-factor: 0.17 / SHGC: Any
Door: ≤ 1/2 Lite	U-factor: 0.25 / SHGC: 0.25
Door: > 1/2 Lite	U-factor: 0.30 / SHGC: 0.40

Heating and Cooling Equipment	
Gas Furnace	95 AFUE, ENERGY STAR
Oil Furnace	85 AFUE, ENERGY STAR
Gas Boiler	90 AFUE, ENERGY STAR
Oil Boiler	86 AFUE, ENERGY STAR
Heat Pump	8.5 HSPF / 15 SEER / 12 EER
Air Conditioner	13 SEER

Water Heating Equipment	
Efficiency varies by tank size. Common sizes shown below.	
Gas Water Heater	40 gal: 0.61 EF; 60 gal: 0.57 EF
Electric Water Heater	40 gal: 0.93 EF; 60 gal: 0.91 EF
Oil Water Heaters	40 gal: 0.53 EF; 60 gal: 0.49 EF
Solar Water Heater	n/a

Thermostats & Ductwork	
Thermostat Type	Programmable
Location of Ducts and Air Handlers	All within conditioned space
Duct Insulation for Ducts In Unconditioned Space	n/a
Duct Leakage to Outside	n/a

Lighting & Appliances	
Refrigerators	ENERGY STAR
Dishwashers	ENERGY STAR
Ceiling Fans	ENERGY STAR
Lighting	ENERGY STAR light bulbs in 90% of Qualifying Light Fixture Locations

built single homes. For and single ab, click on

EVENTS

ersion 3.1

cklist (PDF,

184 KB)

311 KB)

cklist (PDF,

m Builder

RESOURCES

n

s Document

R Reference

DEADLINE

using the version 3 (PDF, 01/2012 but

using the version 3.1 er



SINGLE FAMILY

**MULTIFAMILY**

MANUFACTURED

UNDERGOING GUT REHAB

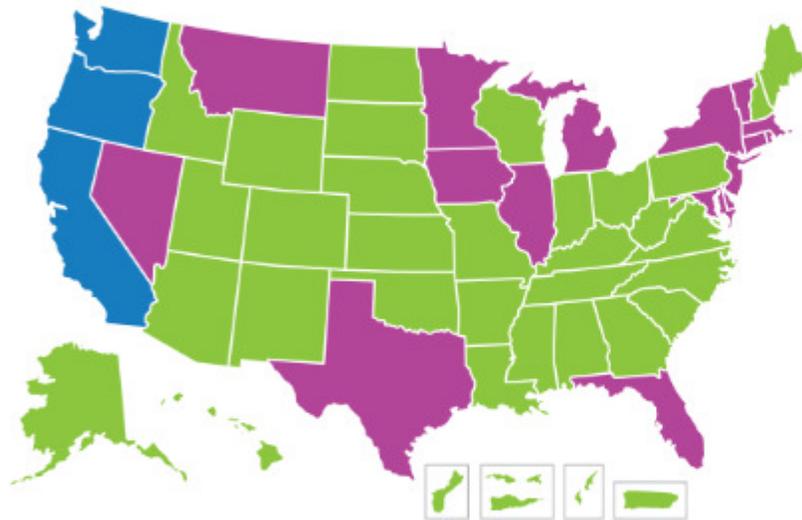
### PROGRAM VERSIONS AT A GLANCE

STEP 1: SELECT A PATH

- ERI and Prescriptive
- ASHRAE / Title 24

STEP 2:

Select State or Territory ▼



### IMPLEMENTATION TIMELINE

To determine the program Version that a multifamily building is required to be certified under, identify the location and permit date of the building below. Note that the National Version 1.1 program requirements are being implemented in states that have adopted the residential 2012, 2015, or 2018 IECC, or an equivalent code. Note, as well, that regional program requirements, and associated implementation timelines, have been developed for buildings in CA, OR, and WA.

### ELIGIBILITY

These requirements apply to most multifamily buildings. See [flow chart](#) (PDF, 85 KB) for the specific multifamily projects that are eligible. Multifamily projects permitted prior to January 1, 2021, may continue to certify through the MFHR or Certified Homes program, based on the eligibility requirements of those programs.

### PROGRAM REQUIREMENTS

#### National Program Requirements

[MFNC National Program Requirements Version 1/1.1/OR-WA 1.2](#) (PDF, 490 KB)

#### Regional Program Requirements

[MFNC California Program Requirements Version 1.2](#) (PDF, 387 KB)

#### Mandatory Measures

[MFNC Rater Design Review Checklist](#) (PDF, 523 KB)

[MFNC Rater Field Checklist](#) (PDF, 736 KB)

[MFNC HVAC Design Report](#) (PDF, 415 KB)

[MFNC HVAC Functional Testing Checklist](#) (PDF, 407 KB)

[MFNC Water Management System Requirements](#) (PDF, 143 KB)

### SUPPORTING DOCUMENTS

Coming Soon!



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



ABOUT ENERGY STAR PARTNER RESOURCES

The simple choice for energy efficiency.

ENERGY EFFICIENT  
products
ENERGY SAVINGS  
at home
ENERGY EFFICIENT  
new homes
ENERGY STRATEGIES FOR  
buildings & plants

Home » Partner Resources » Residential New Construction » Working with ENERGY STAR

## Partner Resources

Join ENERGY STAR
Products
Residential New Construction
Buildings & Plants
Utilities/EEPS
Home Improvement

- Program Requirements ▶
- About the Residential New Construction Program
- Working with ENERGY STAR** ▼
- Builders & Developers ▶
- Energy Rating Companies
- Utilities & Other Program Sponsors ▶
- HVAC Contractors ▶
- Functional Testing Agents
- Other Participants ▶
- Marketing Resources ▶
- Educational Resources ▶
- Certified Homes Partner Locator
- Tools & Resources
- Related Programs ▶
- Home Buyers Information

### Working with ENERGY STAR

ENERGY STAR is the government-backed symbol for energy efficiency recognized by more than 90% of American households. ENERGY STAR certified homes and apartments are designed and constructed to be significantly more energy efficient than those built to code while lowering homeowner utility bills and providing superior comfort, quality, and durability.

ENERGY STAR provides marketing, technical, and programmatic support to both partners and other organizations, including:

- **ENERGY STAR Sales and Marketing Resources:**
  - Consumer Brochure
  - Consumer Video
- **Educational Resources and Technical Support:**
  - Live Webinars, Recorded Presentations, and Training Videos
  - Technical Support
  - Multifamily High Rise Training Resources

There are opportunities for various types of organizations to support the construction of energy-efficient new homes and apartments through the ENERGY STAR Residential New Construction Program. Learn more about participating with ENERGY STAR, including eligibility to partner with the program.

Builders & Developers

HVAC Contractors

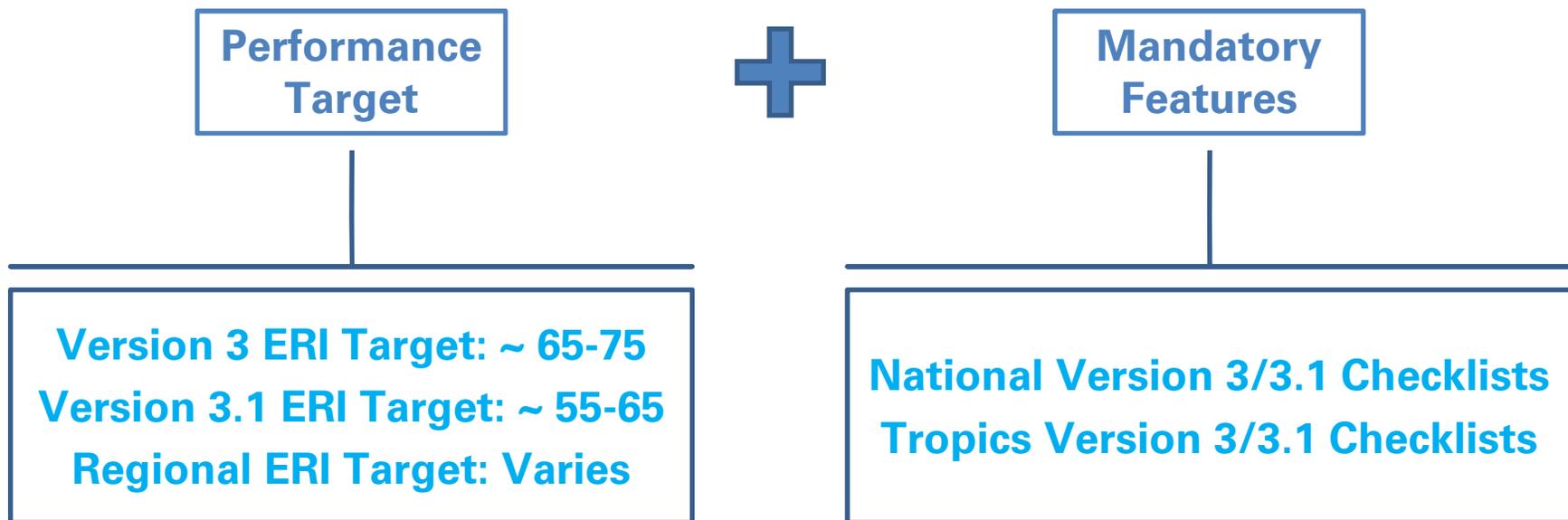
Energy Rating Companies

Functional Testing Agents



## Program Requirements Overview

- All ENERGY STAR Versions (e.g., v3, v3.1, Regional Versions) share the same two key components:







## Program Version Plans for 2019

- OR is scheduled to implement the WA/OR v3.2 program requirements for homes permitted after 4/1/2019.
- No other states are currently scheduled to implement a new version in 2019.
- However, NC, PA, OR, and VA are under review for possible implementation of the National Version 3.1 requirements.
- Working on better tailoring the program requirements for Puerto Rico and the US Virgin Islands.
- Refreshing program requirements for manufactured housing.

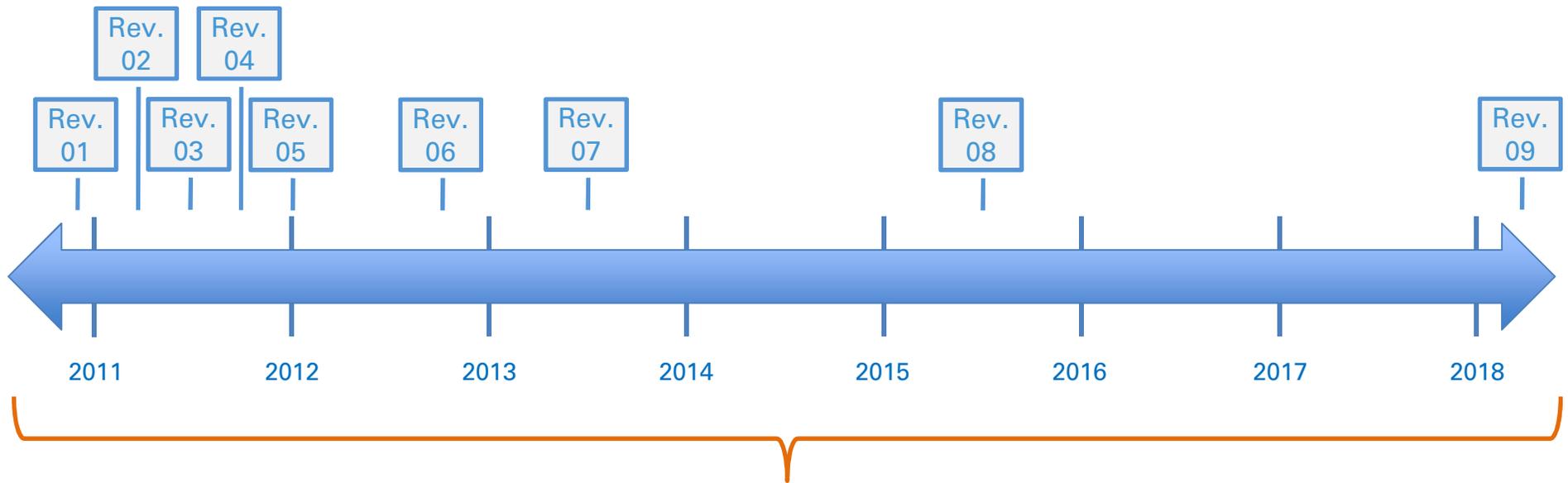


## What is a Revision?

- 1 It clarifies
- 2 It simplifies
- 3 It improves



## What is a Revision?



**1/3 reduction in rater tasks!**



## Rev. 09 **It's Fine.**

- No new checklists.
- No new checklist items.
- No fewer checklist items.
- No fewer checklists.
- Just modifications to a handful of existing checklist items.
- Backwards compatible.



## #1. 4- and 5-story building eligibility requirements

- Dwelling units in buildings  $\leq 5$  stories are eligible to participate regardless of their HVAC and water heating configuration.
- Footnote 5 has been revised to recommend that centralized heating, cooling, and hot water systems be modeled using the RESNET Guidelines for Multifamily Ratings.



## #2. Required rating and registration with Verification Oversight Org.

- We now explicitly require homes to receive a rating and be registered with an EPA-approved VOO.



### #3. Revised Effective Date section of National Program Requirements

- The Implementation Timeline tables have been revised for clarity.
- Includes information about both the applicable Version and Revision.

State	Applicable to Homes with the Following Permit Date
MA	On or after 01/01/2015
DC, IL, MD, RI	On or after 04/01/2015 (except for Calvert County and St. Mary's County in MD, for which the applicable permit date is on or after 07/01/2015)
IA	On or after 06/01/2015
DE	On or after 12/01/2015
MT,OR, WA	On or after 01/01/2016
MN, VT	On or after 04/01/2016
NV	On or after 07/01/2016
NJ	On or after 04/01/2017
TX	On or after 10/01/2017

Old Format

State / Territory	Homes Permitted <sup>14</sup> On or After This Date Must Meet the Adjacent Version & Revision	Version	Revision <sup>15</sup>
AL, AK, AZ, AR, CO, GA, IN, ID, KS, KY, LA, ME, MS, MO, NE, NH, NM, NC, ND, OH, OK, PA, SC, SD, TN, UT, VA, WV, WI, WY	07-01-2016	National v3	Rev. 08
	01-01-2019	National v3	Rev. 09
DC, DE, IA, IL, MA, MD, MN, MT, RI, VT	07-01-2016	National v3.1	Rev. 08
	01-01-2019	National v3.1	Rev. 09
NV	07-01-2016	National v3	Rev. 08
	10-01-2016	National v3.1	Rev. 08
	01-01-2019	National v3.1	Rev. 09
MI, NJ	07-01-2016	National v3	Rev. 08
	04-01-2017	National v3.1	Rev. 08
	01-01-2019	National v3.1	Rev. 09

New Format



## #4. Low-end bedroom pressure-balancing limit specified

- A low-end bedroom pressure-balancing limit has been specified.

### Old Policy

< 150 CFM: ? to +3 Pa

≥ 150 CFM: ? to +5 Pa

### New Policy

< 150 CFM: -3 to +3 Pa

≥ 150 CFM: -5 to +5 Pa

- Footnote has clarified door configurations during testing:
  - Doors separating bedrooms from the main body of the house shall be closed (e.g., a door between a bedroom and a hallway)
  - Doors to rooms that can only be entered from the bedroom shall be open (e.g., a closet, a bathroom)



## #5. Increased tolerances for HVAC Design

- Conditioned floor area used in the design can be:
  - 100 ft<sup>2</sup> smaller - 300 ft<sup>2</sup> larger than the rated home.
- Window area used in the design can be:
  - 15 ft<sup>2</sup> smaller - 60 ft<sup>2</sup> larger than the rated home, or,
  - For homes with > 500 ft<sup>2</sup> of windows, 3% smaller to 12% larger
- Heating capacity of furnaces paired with cooling can be:
  - 100 - 400% of the heating load.

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**Rev. 09**

**It's Fine.**





## Rev. 10? ~~Retraction.~~

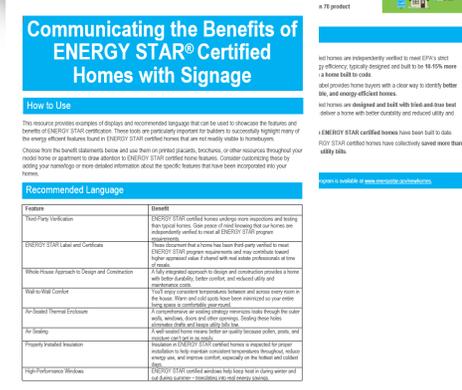
- To Do List:
  - Begin to integrate RESNET's new HVAC grading standard.
  - Provide flexibility for innovative vent. system products.
  - Other items tagged by partners as needing attention...
- Tentative release date: September 2019



# Builder Sales Training Kit



## Updated Builder Sales Training Kit



- The Sales Training Kit provides the tools and materials to implement an in-person builder sales training
- The goal of this training is to apply customized value propositions to various client profiles to sell more ENERGY STAR certified homes.
- The kit includes:
  - Presentation slide deck
  - Trainer’s guide
  - Participant guide
  - Take-away sales tools
- The training has four modules that can be completed in approximately two hours.



# Updated Builder Sales Training Kit



- Updated Customer Profiles
  - Data from Shelton Group’s 2017 Energy Pulse report
- New Resources
  - Selling ENERGY STAR
  - Communicating the Benefits of ENERGY STAR
  - Certificate of Completion Template + Printing Tool
- View Sales Training Kit [here](#) or by logging into your “My ENERGY STAR Account” (MESA).



## Updated Builder Sales Training Kit



1. If you have utilized the Sales Training Kit before, please raise your hand.
2. Are planning to use or would consider using this resource in the future?
3. Would you be interested in either of these options?
  - **Option 1:** A webinar for all interested partners where we provide a high-level overview of the training.
  - **Option 2:** A one-on-one, train-the-trainer session for your company to walk you through the training in greater depth.



## PSA: Give Credit Where Credit is Due!

- Mandatory contact update form in MESA must be completed.
- If not, homes submitted for certification cannot be approved.
- MESA login screen redirects to the form if it hasn't been filled out yet.
- Providers – please contact us at [energystarhomes@energystar.gov](mailto:energystarhomes@energystar.gov) if you want a list of your Raters and builders who haven't completed their form.
- Urge your clients to complete their form!

<b>Organization Name:</b> _____
<b>Market Sector:</b> Please identify <u>ALL</u> of the residential market sectors in which your organization is working. <input type="checkbox"/> Affordable Housing <input type="checkbox"/> Market Rate Housing <input type="checkbox"/> Modular Homes <input type="checkbox"/> Multifamily <input type="checkbox"/> Multifamily <input type="checkbox"/> Single Family
<b>Signatory Contact Name:</b> _____
<b>Email:</b> _____
<b>Primary Role and Specialties:</b> Please identify <u>ALL</u> of the signatory's roles in the organization. <input type="checkbox"/> Administrative <input type="checkbox"/> Architect (Please specify): _____ <input type="checkbox"/> Communications/Marketing <input type="checkbox"/> Energy/Environmental Manager <input type="checkbox"/> Engineer (Please specify): _____ <input type="checkbox"/> Executive/Owner (Please specify): _____ <input type="checkbox"/> Modeler (Please specify): _____ <input type="checkbox"/> Project Manager/Field Supervisor <input type="checkbox"/> Rater/ Field Inspector (Please provide Rater ID number): _____ <input type="checkbox"/> Reporting <input type="checkbox"/> Sales/Real Estate/Leasing <input type="checkbox"/> Warranty

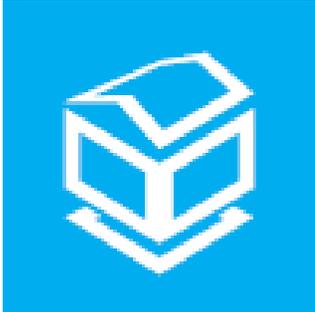


# Major Initiatives in 2019



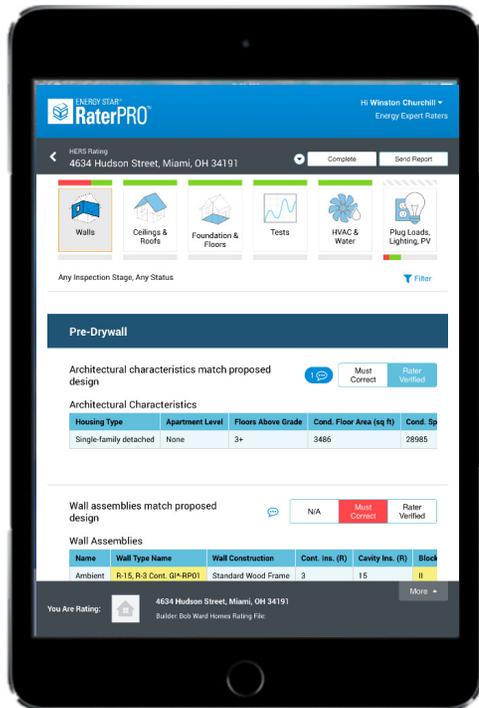
# RaterPRO

ENERGY STAR. The simple choice for energy efficiency.

A blue square icon containing a white 3D cube with a white outline of a house on top, representing energy efficiency.

ENERGY STAR<sup>®</sup>  
**RaterPRO<sup>™</sup>**

ENERGY STAR. The simple choice for energy efficiency.



EPA created RaterPRO to promote adoption of **high-quality ratings** across the industry by increasing their value and reducing their cost.





## RaterPRO Workflow

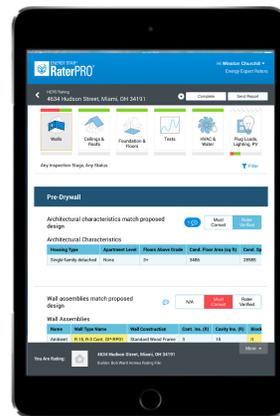
1. Import specifications from projected rating file
2. Inspect home using RaterPRO tablet app
3. Export confirmed rating back to HERS software

### Import

Rating Software  
Projected Rating



### Inspect



### Export

Rating Software  
Confirmed Rating



## RaterPRO Strengths

- **Practically eliminate raters' office time after inspection**
  - ✓ Energy Star Rater Field Checklist is synced

Drill plates sealed to foundation / sub-floor, plus gasket beneath		N/A	Builder Verified	Must Correct	Rater Verified
Garage walls sealed, plus sealed air barrier at floor cavity above		N/A	Builder Verified	Must Correct	Rater Verified
Air barrier at walls behind showers, tubs, staircases, & fireplaces		N/A	Builder Verified	Must Correct	Rater Verified
Air barrier at walls adjoining porch roofs or garages		N/A	Builder Verified	Must Correct	Rater Verified
Air barrier at double-walls and all other exterior walls			Builder Verified	Must Correct	Rater Verified



## RaterPRO Strengths

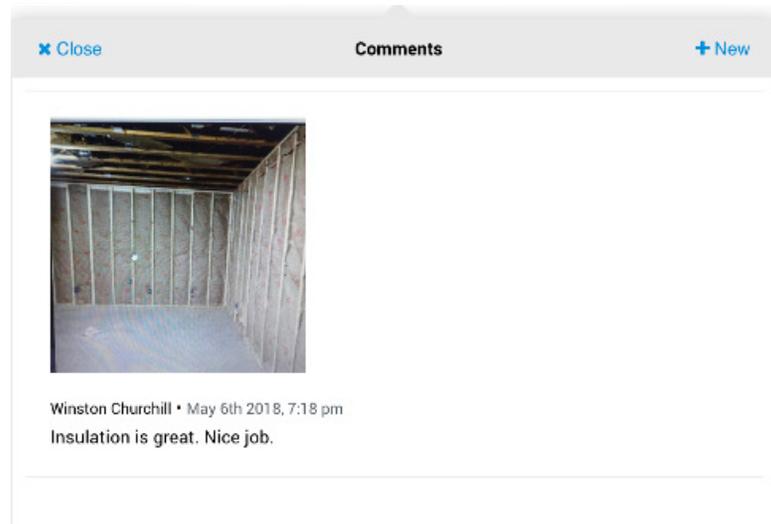
- **Practically eliminate raters' office time after the inspection**
  - ✓ Energy Star Rater Field Checklist is synced
  - ✓ Punchlist sent to builder

The image shows a screenshot of a RaterPRO Builder Action Report. The report header includes the RaterPRO logo, the title 'Builder Action Report', and the date '02/22/2019'. Below the header, the address '1215 Wishing Well Court, Bel Air, MD 21015' is listed, followed by the builder's name 'Bob Ward Homes', the rating organization 'RaterPRO Rating Co.', the rater's name 'Duane Casey', and the location 'Front'. A photograph of a two-story house is included. Below the photo, a note states: 'This report was generated as a result of an inspection of this home by the rater listed above. The following items require correction or builder verification.' A 'Must Correct' section is highlighted, showing the requirement 'Insulation is Grade I' and the specific note: 'Duane Casey (02/22/2019): "Trim insulation around outlet"'. A photograph of insulation is shown below the note. A larger, zoomed-in view of the 'Must Correct' section is shown to the right, highlighting the requirement and the note.



## RaterPRO Strengths

- **Practically eliminate raters' office time after the inspection**
  - ✓ Energy Star Rater Field Checklist is synced
  - ✓ Punchlist sent to builder
  - ✓ Photos and notes are automatically attached to the job





## RaterPRO Strengths

- **Practically eliminate raters' office time after the inspection**
  - ✓ Energy Star Rater Field Checklist is synced
  - ✓ Punchlist sent to builder
  - ✓ Photos and notes are automatically attached to the job
  - ✓ Edits to home specifications synced in real-time

windows match proposed design

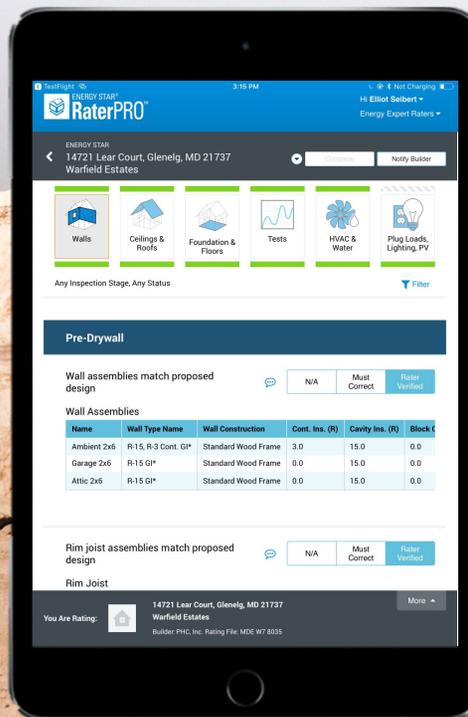
Correct

Windows

Name	Window Type Name	U-Value	SHGC	Area (sq ft)	Orientation	Overhang
Front	Window .30/.20*	0.300	0.200	South	120.0	0.0
Right	Window .30/.20*	0.300	0.27	East	60.0	0.0
Rear	Window .30/.20*	0.300	0.200	North	114.0	0.0
Left	Window .30/.20*	0.300	0.200	West	30.0	0.0
Left	Slider .28/.22*	0.280	0.220	West	42.0	0.0
Rear	Slider .28/.22*	0.280	0.220	North	42.0	0.0
Rear	Window .40/.28*	0.400	0.280	North	17.0	0.0

## RaterPRO Strengths

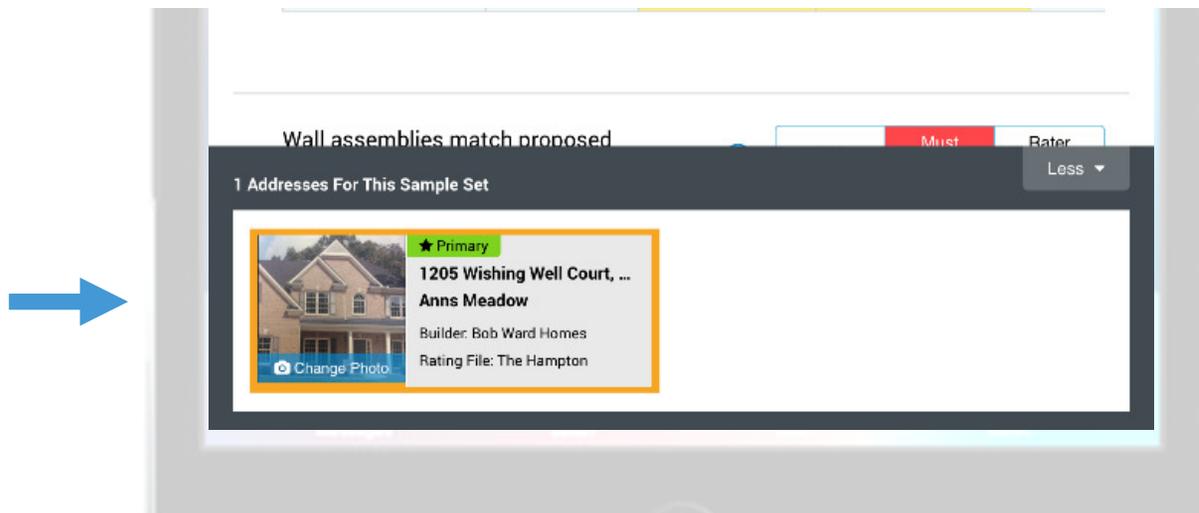
- **Built for the field**
  - Native app is fast and responsive
  - Cloud-based, with ability to work offline





## RaterPRO Strengths

- **Powerful Quality Assurance**
  - Front elevation photo required





## RaterPRO Strengths

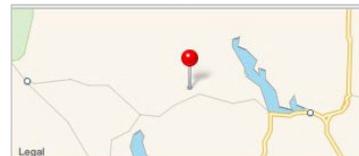
- **Powerful Quality Assurance**
  - Front elevation photo required
  - Job History with geo-location provides full accounting of inspection procedures

### Job History

Created: Feb 5, 2019 1:56:49 PM by Mario Tate

Edited: Feb 5, 2019 1:57:02 PM by Mario Tate

- Total Editing Time: 39 minutes
- 1 photo(s)
- 44 pre-drywall status update(s)
- 56 final status update(s)



Completed: Feb 5, 2019 2:35:58 PM by Mario Tate

Submitted to Provider: Feb 5, 2019 2:46:37 PM by Myron Gray



## RaterPRO Strengths

- **Powerful Quality Assurance**
  - Front elevation photo required
  - Job History with geo-location provides full accounting of inspection procedures
  - Archival report provides permanent record

**Archival Report** 12/14/2018

Home: 1215 Winking Owl Court, Bel Air MD  
Auradale, Lot 1234  
Manufacturer: Mansuettini  
Builder: Penn Barton Homebuilders, LLC  
Rating Organization: Ace Energy Raters  
Rater: Jan Doe

This report was generated as a result of an inspection of this home by the rater listed above. Items listed below are in one of two categories:

- Builder Must Correct** Items that must be corrected by the builder.
- Builder Must Verify** Items that must be verified by the builder under the direction of the Rater.

**Home Details**

Home Model: Sunflowe      Square Footage: 4899  
Home Type: Single Family      Sub-Plan Name: abcdefg  
Foundation: Conditioned Basement      Export File Name: xyz.pdf

**Exterior Photos**

Page 1 of 6

**Utility Meters and Equipment**

Utility Information	Utility Co. Name	Meter ID
Fuel Type: Electric	Pepco	21217933695
Fuel Type: Natural Gas	Washington Gas	1234567890124
Water Heaters		
Manufacturer: A.O. Smith	Model: QW1430522	Model: 21217933695
HVAC Equipment Furnace		
Manufacturer: Honeywell	Model: QW1430522	Model: 21217933695
AirConditioner Condenser		
Manufacturer: ACHV	Model: QW1430522	Model: 21217933695
Air Conditioner Evaporator		
Manufacturer: Honeywell	Model: QW1430522	Model: 21217933695

**Minimum Rated Features**

Features	Pre-Drywall Status	Final Status
Architectural characteristics match proposed design	Rater Verified	Rater Verified
Floor / Foundation assemblies match proposed design	Rater Verified	Rater Verified
Wall assemblies match proposed design	Rater Verified	Rater Verified
Roof / ceiling assemblies match proposed design	Rater Verified	Rater Verified
Roof joint assemblies match proposed design	Must Verify	Rater Verified
Doors match proposed design	Rater Verified	Rater Verified
Windows match proposed design	Rater Verified	Rater Verified
Skylights match proposed design	Rater Verified	Rater Verified
Water sensitive hot water equipment matches proposed design	Rater Verified	Must Correct
Water sensitive hot water equipment matches proposed design	Rater Verified	Rater Verified
Duct systems match proposed design	Rater Verified	Rater Verified
Heating and cooling equipment matches proposed design	Rater Verified	Rater Verified
Domestic hot water equipment matches proposed design	Rater Verified	Rater Verified
Domestic hot water distribution matches proposed design	Rater Verified	Must Correct
Thermostats match proposed design	Rater Verified	Rater Verified
Lighting matches proposed design	Rater Verified	Rater Verified
Refrigerators match proposed design	Rater Verified	Rater Verified
Dishwashers match proposed design	Rater Verified	Rater Verified
Ranges and ovens match proposed design	Rater Verified	Rater Verified
Clothes washers match proposed design	Rater Verified	Rater Verified

Page 2 of 6

Air sealing of penetrations, with blocking / flashing as needed	Rater Verified	Rater Verified
Recessed light fixtures ICAT labeled & gasketed	Rater Verified	Rater Verified
Recessed light fixtures ICAT labeled & gasketed, plus insulated	Must Verify	Rater Verified
SI plates sealed to foundation / sub-floor, plus gasket beneath	Rater Verified	Rater Verified
Continuous top plate or blocking at top of work, and sealed	Rater Verified	Rater Verified
Drywall sealed to top plates	Rater Verified	Rater Verified
Rough opening around windows & exterior doors sealed	Rater Verified	Must Correct
Garage walls sealed, plus sealed on interior of floor cavity above	Rater Verified	Rater Verified
Gas between corner wall and framing sealed	Rater Verified	Rater Verified
Doors sealed with weatherstripping or equivalent gasket	Rater Verified	Rater Verified
2 x 10 gasketed cover over attic stairs / access panels & whole-house fans	Rater Verified	Rater Verified
Mfr. & model of HVAC equipment matches (HVAC Design Report, Written approval from designer)	Must Correct	Rater Verified
External static pressure measured at contractor-provided test locations	Rater Verified	Rater Verified
Optional: HVAC Commissioning Checklist collected, with no items left blank	Rater Verified	Rater Verified
Ductwork installed without kinks, sharp bends, compressions	Rater Verified	Rater Verified
Bedrooms pressure-balanced to ± 3 Pa	Rater Verified	Rater Verified
All supply and return ducts in unconditioned space insulated to R-6	Rater Verified	Rater Verified
Measured total duct leakage is within ENERGY STAR limits with all hardware, all ducts, building cavities used as ducts, & duct boots installed	Rater Verified	Rater Verified
All duct boots sealed to finished surface	Rater Verified	Rater Verified
Measured total duct leakage is within ENERGY STAR limits with all hardware, all ducts, building cavities used as ducts, duct boots, & register gaskets installed	Rater Verified	Must Verify
Measured duct leakage to outdoors is within ENERGY STAR limits	Rater Verified	Rater Verified
Measured ventilation rate is within either 415 CFM or 415% of design value	Rater Verified	Rater Verified
Ready-to-accessible ventilation override control installed and labeled	Rater Verified	Rater Verified
Top outdoor intakes connected to HVAC system, unless control air installed	Rater Verified	Rater Verified
System fan rated 2 1/2 cfm/ft <sup>2</sup> minimum and 0.1 cfm/ft <sup>2</sup> maximum	Rater Verified	Rater Verified
If HVAC fan used, then R32/DM/FCM or similar labeled to reduce runtimes	Rater Verified	Rater Verified
Bedrooms fans are ENERGY STAR / used as part of whole-house system	Rater Verified	Rater Verified
All air inlet locations specified in the HVAC Design Report?	Rater Verified	Rater Verified
Indoor air quality ventilation or directly from outdoors, not from adjacent space	Must Verify	Rater Verified
Use a 2.0, 2.0+ static grille or roof deck, a 10% fan-combination system, not ceiling fan only, and a 3.0, 3.0+ fan-only exhaust & source ceiling fan only	Rater Verified	Rater Verified
Use a product with inlet / exhaust screen with ± 0.5 inch mesh	Rater Verified	Rater Verified
In each kitchen, a fan is integrated with range & exhausts directly to outdoors with measured airflow > 100 CFM. See Footnotes for alternatives.	Rater Verified	Rater Verified
For each kitchen exhaust fan, record using 33 scores recommended elsewhere. Fan and CFM score recommended for continuous fan.	Rater Verified	Must Correct

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## RaterPRO Strengths

- **Eliminates rater's back office time**
- **Built for the field**
- **Powerful quality assurance**



## Timeline

- Update: **RaterPRO Version 1.0** will be available in **June**
- v1 will include all Beta features, plus:
  - Geo-tagging
  - Archival report
  - Energy Gauge support



## Public Beta

- Beta has been available for almost a year
- 29 organizations have joined as beta users
- 100's of real-world homes rated
- Rolling updates every three weeks



REM/Rate or Ekotrope | iPad with iOS 10 or above  
Email: [energystarhomes@energystar.gov](mailto:energystarhomes@energystar.gov)

ENERGY STAR. The simple choice for energy efficiency.



# Open Source





## Open Source Background

- Community has consistently requested an open-source project for a variety of reasons:
  - To run on organizations' own servers for independent control
  - To integrate with existing systems (scheduling, billing, etc.)
  - To customize for individual needs
- Solicited input last year at a RESNET pre-conference session
- Offered three options to make RaterPRO more "open."  
Consensus was open source project would be the best path.
- EPA agrees – Making RaterPRO open-source fulfills EPA's goal of investing in the infrastructure of the rating industry at large



## Phased Rollout for Open Source

<p style="text-align: center;"><b>Phase 1: Code Preview</b></p> <ul style="list-style-type: none"><li>• Preview of pre-release source code</li><li>• Limited documentation</li></ul>	<p style="text-align: center;"><b>Available Today</b></p>
<p style="text-align: center;"><b>Phase 2: Free-to-Fork</b></p> <ul style="list-style-type: none"><li>• EPA will continue to own and operate 'RaterPRO'</li><li>• Version 1.0 source code released under MIT License<ul style="list-style-type: none"><li>• 3<sup>rd</sup> parties can fork versions on their own servers</li><li>• Can sell modified version as commercial product</li><li>• Must re-brand (can't use the name "RaterPRO")</li></ul></li><li>• Limited EPA support resources</li></ul>	<p style="text-align: center;"><b>Update: Available June 2019</b></p>

**Signup** with Elliot at RESNET conference or  
**Email:** [energystarhomes@energystar.gov](mailto:energystarhomes@energystar.gov)





## Future of Open Source

- EPA's focus in 2019 is on v1.0 users' needs, but excited to see what community does with open-source forks in meantime
- EPA interested in a collaborative open source project:
  - EPA would work with community to set development priorities
  - EPA would manage pull requests from community contributors
  - Features would appear in "canonical" RaterPRO that EPA hosts and be published for 3<sup>rd</sup>-party use in forked versions
- Depends on community uptake and interest. Let us know!



# Multifamily New Construction



## ES MF New Construction Prgrms: pre-2019

- Single Family Homes
- Factory Built Homes
- Low Rise Multifamily Buildings

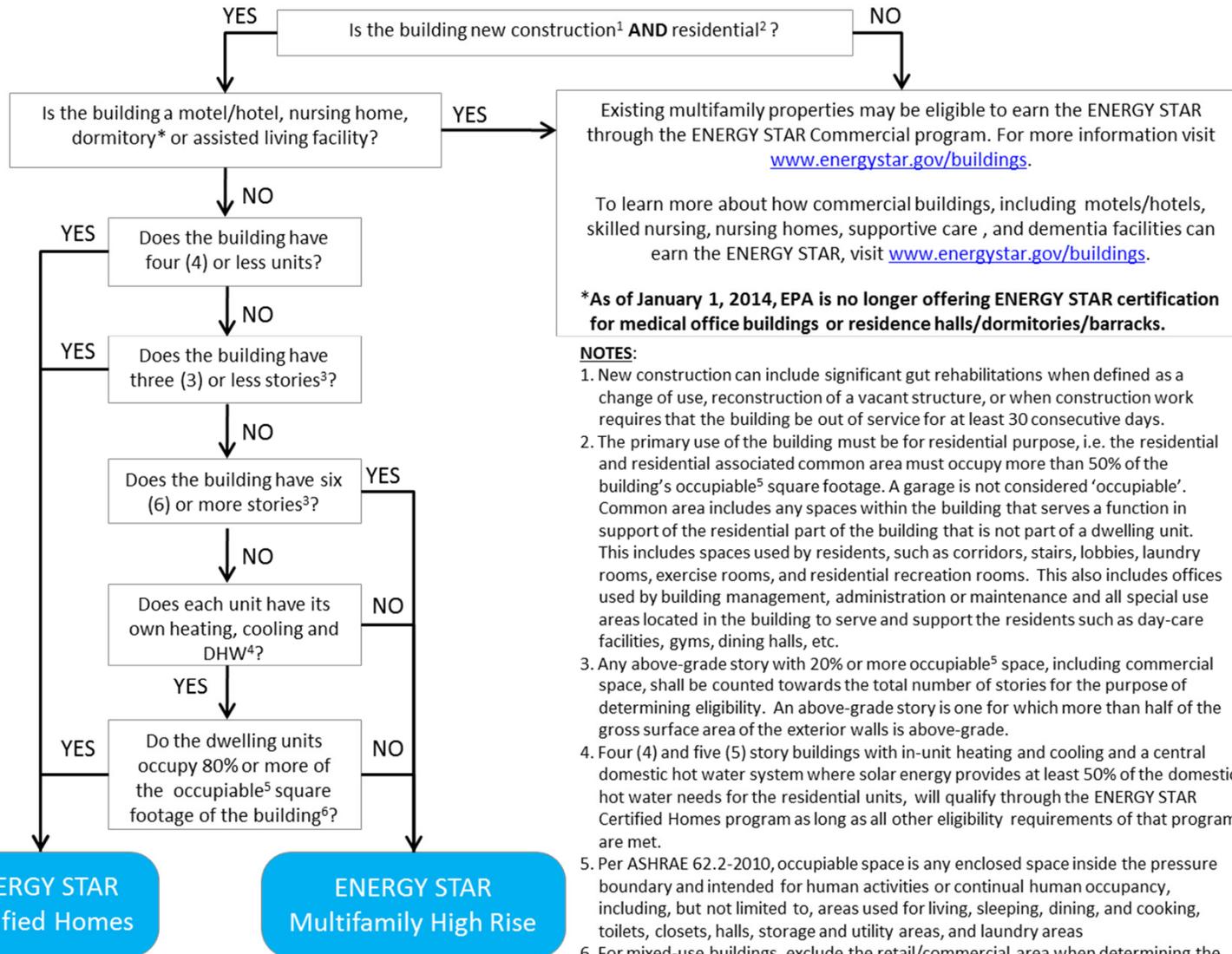


Certified Homes  
(ESCH)

- Mid and High Rise Multifamily Buildings
- Launched in 2011 to cover buildings previously ineligible for Certified Homes



MFHR





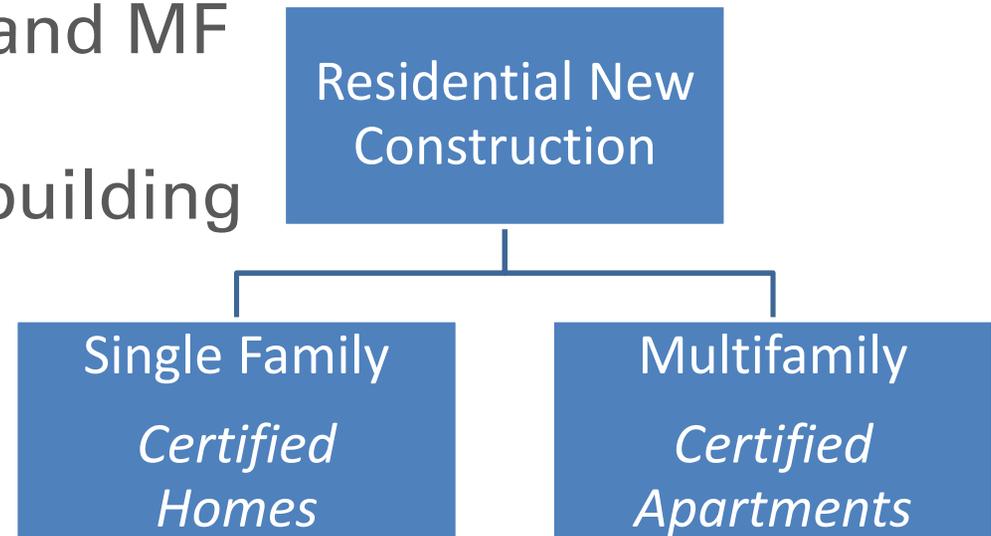
# Goal of ENERGY STAR MFNC Program

Delineation between SF and MF

One MF program for all building heights with common space requirements

What is Single-Family?

- Detached homes
- Two-family dwellings
- Townhomes (IRC definition)





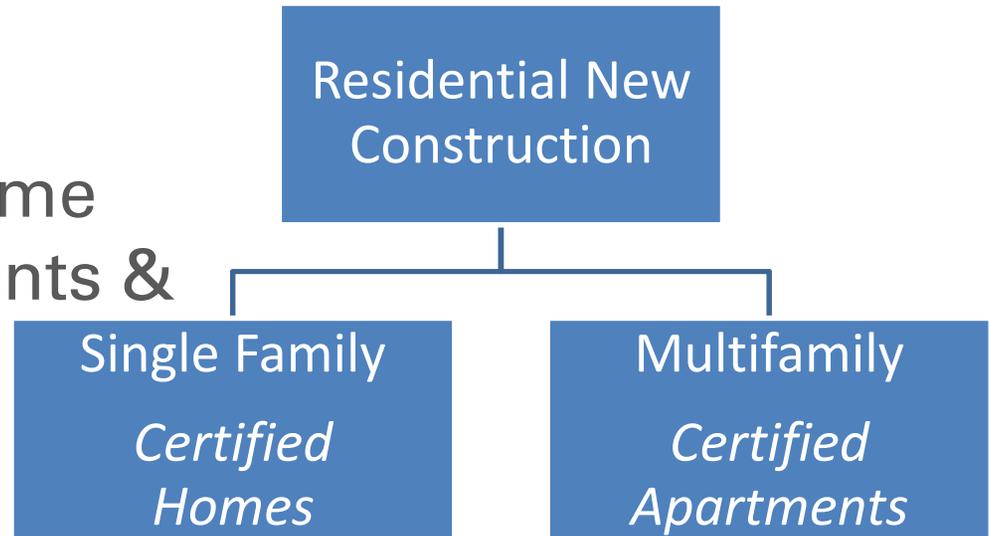
# What is Multifamily?

Most attached housing

Townhomes too, with some revised/added requirements & ESCH Reference Design

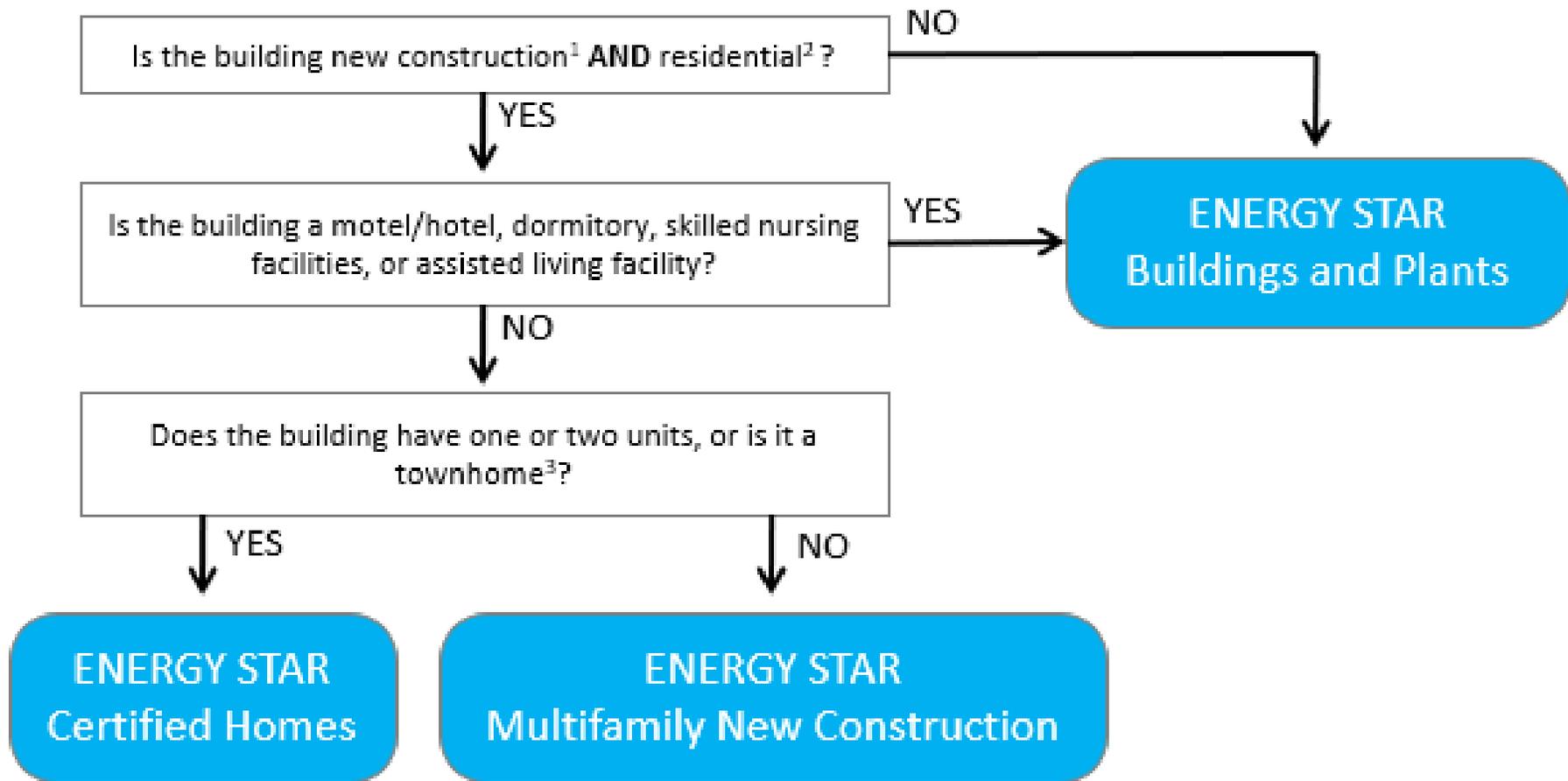
Mixed use, if residential is more than 50% by OSF

Not hotels, dorms, skilled nursing, or assisted living





# ENERGY STAR Program Decision Tree



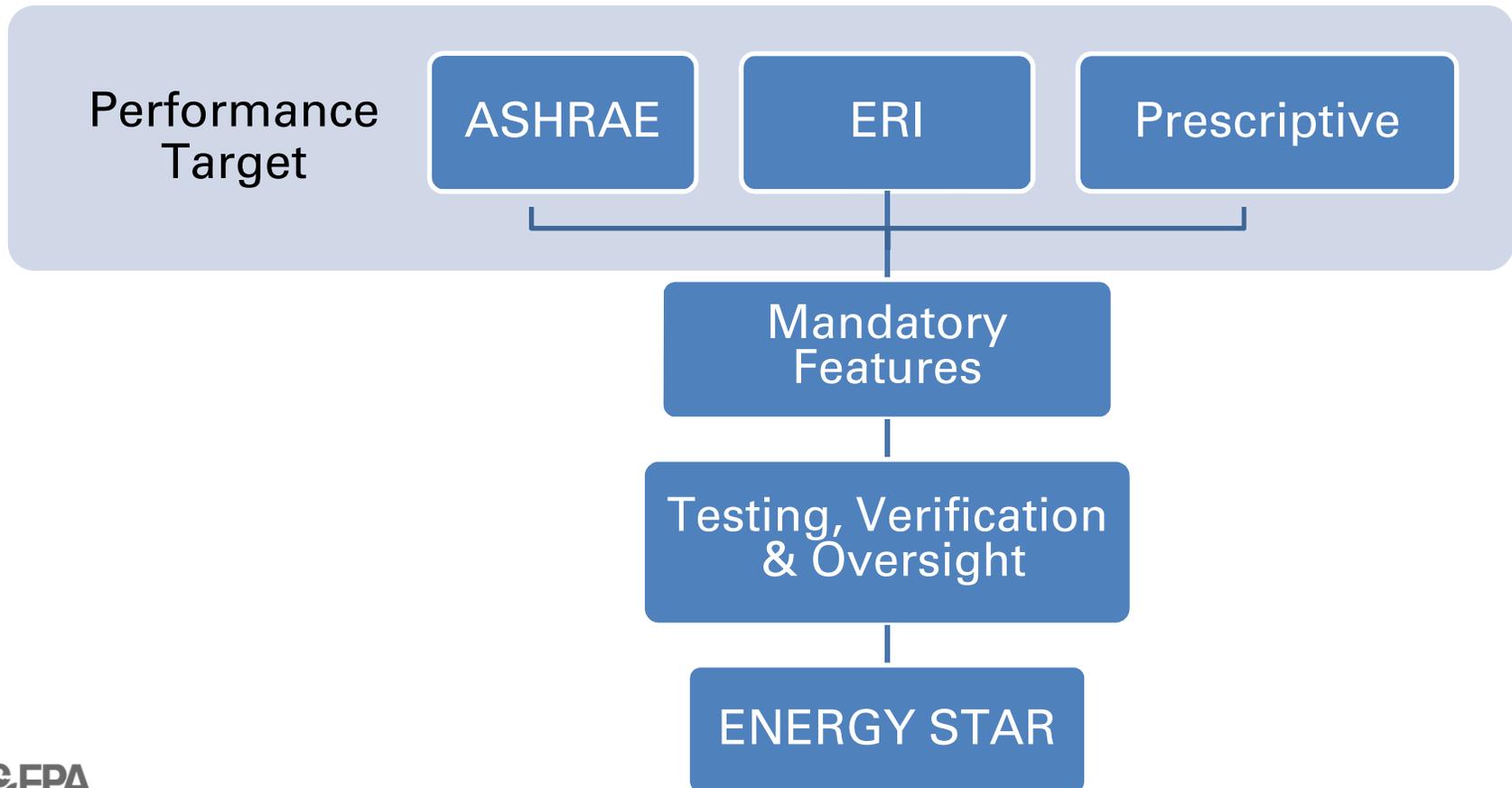


# ENERGY STAR MFNC Building Types





# Multifamily New Construction (MFNC) Requirements Overview





# ENERGY STAR MFNC Partners

## Builders & Developers

- Complete [online Partnership Agreement](#)
- View online orientation [video](#)
- Responsible for Water Management System Requirements
- Either the Builder OR Developer must be a partner



# ENERGY STAR MFNC Partners

## Raters

### Roles & Expectations

- Verify that all requirements have been met
- Collect the other documentation

### Requirements

- a) Be a Certified Rater, Approved Inspector, or an equivalent as determined by an Oversight Org
- b) Have completed an EPA-recognized training class
- c) Complete an [online Partnership Agreement](#)



# ENERGY STAR MFNC Partners

## Raters

### Training

- MFNC Rater Training (similar format as current ESCH Rater training)
  - MF add-on for current Rater Partners
  - MF/ESCH combo for new Rater Partners
- MFNC Rater Training is optional for ENERGY STAR Rater Partners until Jan 1, 2020



# ENERGY STAR MFNC Program Docs

## All Paths

- National Program Req's
- Rater Design Review Checklist
- Rater Field Checklist
- HVAC Design Report
- HVAC Functional Testing Checklist
- Water Management System Requirements

## Path Specific

- ERI:
  - Target Procedure
  - MF Workbook (optional)
- ASHRAE:
  - Performance Path Calculator
  - Simulation Guidelines
  - MF Workbook
- Prescriptive:
  - MF Workbook



# Multifamily Workbook

A	B	C	D	E	
1	<p><b>Rater Design Checklist (Reset All)</b></p> <p>Show all Footnotes</p> <p>Hide all Footnotes</p>	<p><b>SELECT PATHWAY</b> (Reset to All Paths)</p> <p>Prescriptive</p> <p>ASHRAE</p> <p>ERI</p>	<p>Title 24: Dwelling Unit Models</p> <p>Title 24: Whole Building Models</p> <p>(Reset to All Available)</p> <p>Required Only</p> <p>Optional Only</p>	<p><b>ALL F</b></p>	
3	Project Name: _____			Number of Units: _____	
4	Project Address: _____			City: _____	
6					
7	<b>Rater Design Review Checklist <sup>1</sup></b>				
8				<b>Must Correct</b>	<b>Rater <sup>3</sup> Verified</b>
9	<b>1. Partnership Status</b>				
12	<p>1.1 Rater has verified that builder or developer is an ENERGY STAR partner using <a href="http://energystar.gov/partnerlocator">energystar.gov/partnerlocator</a></p> <p>Builder Name: _____</p> <p>Developer Name: _____</p>				



# ENERGY STAR MFNC Now Online!

## ENERGY STAR RESIDENTIAL NEW CONSTRUCTION PROGRAM REQUIREMENTS

SINGLE FAMILY

MULTIFAMILY

MANUFACTURED

UNDERGOING GUT REHAB

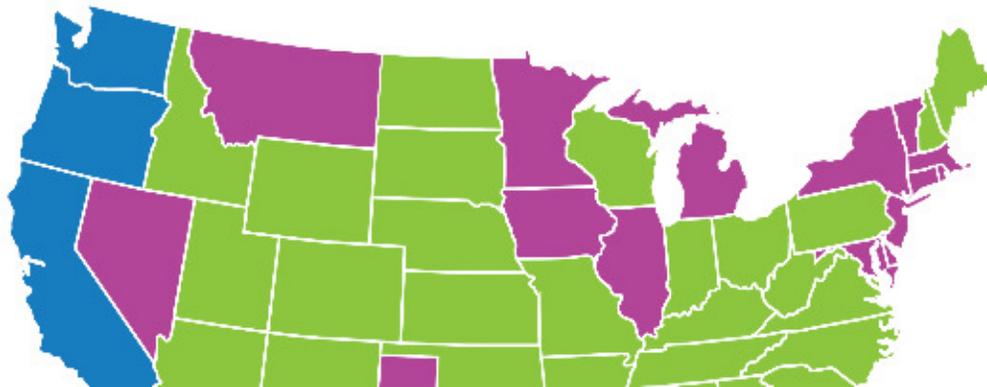
### PROGRAM VERSIONS AT A GLANCE

STEP 1: SELECT A PATH

- ERI and Prescriptive
- ASHRAE / Title 24

STEP 2:

Select State or Territory



### ELIGIBILITY

These requirements apply to most multifamily buildings. See [flow chart](#) (PDF, 85 KB) for the specific multifamily projects that are eligible. Multifamily projects permitted prior to January 1, 2021, may continue to certify through the [MFHR](#) or [Certified Homes program](#), based on the eligibility requirements of those programs.

### PROGRAM REQUIREMENTS

National Program Requirements

[MFNC National Program Requirements Version 1/1.1/OR-WA 1.2](#) (PDF, 490 KB)



## ES MFNC Timeline

- ✓ **Jan 2019:** MFNC website and program launch
- ✓ **Feb 2019:** Stakeholder webinar & RESNET sessions
- **Jan 2019 – Dec 2020:** Choose ESCH, MFHR, or MFNC
- **Jan 2019 – July 2019 (?):** ERI Path limited
  - Not yet available in all energy rating software
  - Need RESNET to approve ERI above 5 stories
- **Jan 2019- Dec 2019:** MFNC-specific training not req
- **Jan 2020:** Raters must complete MFNC training
- **Jan 2021:** MFNC required for buildings with permit dates January 1, 2021 and later



# MFNC RESNET Sessions

## Now Available! The ENERGY STAR Multifamily New Construction Program

Tuesday, February 26, 2019 - 8:30 AM-10:00 AM, Bayside A  
Presenters: Gayathri Vijayakumar and Rebecca Hudson

## ENERGY STAR Multifamily New Construction Program: Q&A

Wednesday, February 27, 2019 - 8:30 AM-10:00 AM, Bayside A  
Presenters: Gayathri Vijayakumar and Rebecca Hudson



## Summary

MFNC requirements: [www.energystar.gov/mfnc](http://www.energystar.gov/mfnc)

MFNC program available now! Applies to all multifamily buildings with three or more units

MFNC required if permitted on or after 1/1/2021

MFNC Rater Training available in 2019 but not required until January 2020

Contact [energystarhomes@energystar.gov](mailto:energystarhomes@energystar.gov) with any questions, for webinar recordings, or to be added to the stakeholder list for MF updates



# Earning HERS Points for Quality HVAC Design & Installation



## Installation defects in HVAC systems are commonplace

- Improper airflow.
- Incorrect refrigerant charge.

Study Author	State	Existing or New Home?	Sample Size	Average Airflow	Airflow <350 cfm	Airflow w/in 10% of 400/ton	Energy Savings Potential	Notes
Blasnik et al. 1995a	NV							
Blasnik et al. 1995b	CA							
Blasnik et al. 1996	AZ							
Hammarlund et al. 1992	CA							
Hammarlund et al. 1992	CA							
Neme et al. 1997	MD							
Palani et al. 1992	n.a.							
Parker et al. 1997	FL							
Proctor & Pemick 1992	CA							
Proctor 1991	CA							
Proctor et al. 1995a	CA							
Rodriguez et al. 1995	n.a.							
Rodriguez et al. 1995	n.a.							
VEIC/PEG 1997	NJ							
Average								

Study Author	State	Existing or New Homes?	Sample Size	Charge correct to mfg spec	% over charge	% under charge	Energy Savings Potential	Notes
Blasnik et al. 1995a	NV	New	30	35%	5%	59%	17%	Est @ 67% combined charge/air flow correction benefits
Blasnik et al. 1995b	CA	New	10				8%	Est @ 67% combined charge/air flow correction benefits
Blasnik et al. 1996	AZ	New	22	18%	4%	78%	21%	Est @ 67% combined charge/air flow correction benefits
Farzad & O'Neal 1993	n.a.	n.a.	n.a.				5%	Lab test of TXV; 8% loss @20% overchg; 2% loss @20% underchg
Farzad & O'Neal 1993	n.a.	n.a.	n.a.				17%	Lab test of Orifice; 13% loss @20% overchg; 21% loss @ 20% underchg
Hammarlund et al. 1992	CA	New	12				12%	Single family results
Hammarlund et al. 1992	CA	New	66	31%	61%	8%	12%	Multi-family results
Katz 1997	NC/SC	New	22	14%	64%	23%		Charge measured in 22 systems in 13 homes
Proctor & Pemick 1992	CA	Existing	175	44%	33%	23%		Results from PG&E Model Energy Communities Program
Proctor 1991	CA	Existing	15	44%				Fresno homes
Proctor et al. 1995a	CA	Existing	30	11%	33%	56%		
Proctor et al. 1997a	NJ	New	52				13%	Est @ 67% combined charge/air flow correction benefits
Rodriguez et al. 1995	n.a.	n.a.	n.a.				5%	Lab test of TXV EER; 5% loss at both 20% overchg & 20% underchg
Rodriguez et al. 1995	n.a.	n.a.	n.a.				15%	Lab test of Orifice EER; 7% loss @20% overchg, 22% loss @ 20% underchg
Average				28%	33%	41%	12%	



## The installation process impacts airflow and refrigerant charge

- Airflow is impacted by the installation:
  - Fan-speed setting
  - Components attached to the system (like the filter)
  - Duct system installed
- Refrigerant charge is impacted by the installation:
  - Length of refrigerant line



## Why is this relevant to HERS / ERI ratings?

- Today, installation faults have zero impact on a HERS or ERI rating.
- Not only do these faults impact efficiency, they impact performance.
- ENERGY STAR has promoted quality installation since 2011.
- However, uniform and practical procedures for Raters to assess systems will be a more effective approach.
- And, HERS / ERI points can be granted in exchange.



## Guiding principles of the standard

- Take a 'carrot' rather than a 'stick' approach.
- Reward incremental improvement by HVAC professionals and Raters.
- Rely upon procedures that deliver value in and of themselves.

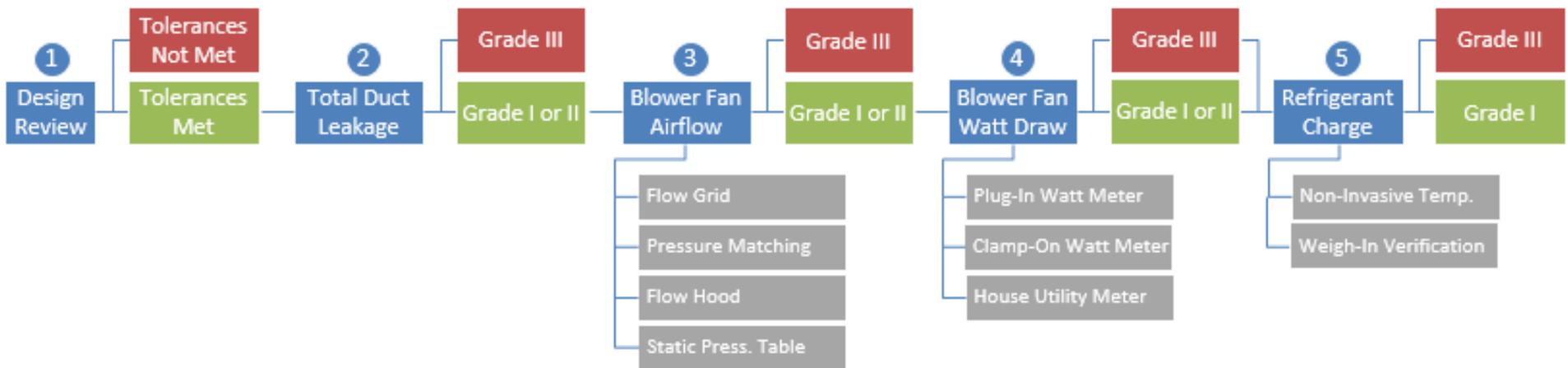


## Conceptual overview of standard

- Follow the insulation quality-installation model:
  - Grade III:
    - The default.
    - HVAC system installation quality is not assessed.
    - No HERS points earned (but no penalty either).
  - Grade II:
    - Rater assesses HVAC system.
    - HVAC system installation quality is so-so.
    - Some HERS points are earned.
  - Grade I:
    - Rater assesses HVAC system.
    - HVAC system installation quality is pretty good.
    - Full HERS points are earned.



## Std. 310: Standard for Grading the Installation of HVAC Systems





## Next Steps

- Q2 – Q4 19: Public comment process.  
Develop Rater training.  
Draft HERS software modifications.
- Q1 – Q2 20: Begin using standard?



## Summary

- A major step towards unifying ENERGY STAR and HERS ratings.
- For Raters: provide additional value during site visits.
- For ENERGY STAR builders: earn HERS points for things they're basically already investing in.
- For utilities: quantify savings from proper HVAC design and installation.
- Overall, will help slowly transform HVAC design and installation.
- Learn more about this exciting topic tomorrow, 10:30, in Grand Chenier.



# Verification Oversight Organization Eligibility Criteria



## VOO Eligibility Criteria

- In August, we released a Request For Information about expanding VOO eligibility criteria to include ISO/IEC 17065 accreditation.
- ISO/IEC 17065 is an international standard for recognizing organizations that certify products, processes, and services.
- 11 individual organizations and groups submitted comments.
- We also conducted additional outreach to ensure key stakeholders had their viewpoint represented and understood the possible changes.
- We expect to release a Response to Comments in early March.



# Wrap Up





## EPA & DOE Conference Sessions

All Sessions Located in Bayside A Unless Otherwise Noted

Session	Monday
1	
2	ENERGY STAR: The Year Ahead
3	Tour of Zero
4	



## EPA & DOE Conference Sessions

**All Sessions Located in Bayside A Unless Otherwise Noted**

Session	Monday	Tuesday
1		Now Available! The ENERGY STAR Multifamily New Construction Program
2	ENERGY STAR: The Year Ahead	How to Upserve Your High-Performance Builders
		Earning HERS Points for Quality HVAC Design & Installation <b>(Grand Chenier)</b>
3	Tour of Zero	Selling WaterSense
4		What I Learned on the Way to 'Zero'



## EPA & DOE Conference Sessions

**All Sessions Located in Bayside A Unless Otherwise Noted**

Session	Monday	Tuesday	Wednesday
1		Now Available! The ENERGY STAR Multifamily New Construction Program	ENERGY STAR Multifamily New Construction Program: Q&A
2	ENERGY STAR: The Year Ahead	How to Upserve Your High-Performance Builders	4 <sup>th</sup> Annual Zero Energy Ready Home Leading HERS Rater Roundtable – Part I
		Earning HERS Points for Quality HVAC Design & Installation <b>(Grand Chenier)</b>	
3	Tour of Zero	Selling WaterSense	4 <sup>th</sup> Annual Zero Energy Ready Home Leading HERS Rater Roundtable – Part II
4		What I Learned on the Way to 'Zero'	The Top 10 Technical Challenges of Zero Energy Ready Homes



## Parting Thought

- ENERGY STAR team is making major investments in you and the rest of the RESNET community:
  - Standard 310 - HVAC grading. More HERS points.
  - Multifamily New Construction program. More rating types.
  - RaterPRO. Less tedium.
  - Volunteering on multiple RESNET sub-committees
- We are working hard to help you succeed.

Thank you for your hard work!



# ENERGY STAR Certified Homes

## Web & Email:

Main: [www.energystar.gov/newhomespartners](http://www.energystar.gov/newhomespartners)  
Technical: [www.energystar.gov/newhomesguidelines](http://www.energystar.gov/newhomesguidelines)  
Training: [www.energystar.gov/newhomestraining](http://www.energystar.gov/newhomestraining)  
HVAC: [www.energystar.gov/newhomesHVAC](http://www.energystar.gov/newhomesHVAC)  
Email: [energystarhomes@energystar.gov](mailto:energystarhomes@energystar.gov)

## Social Media:



@energystarhomes



facebook.com/energystar

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### Elliot Seibert

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