



ENERGY STAR Certified Homes

The Year Ahead

RESNET Building Performance Conference

February 27th, 2017





Agenda

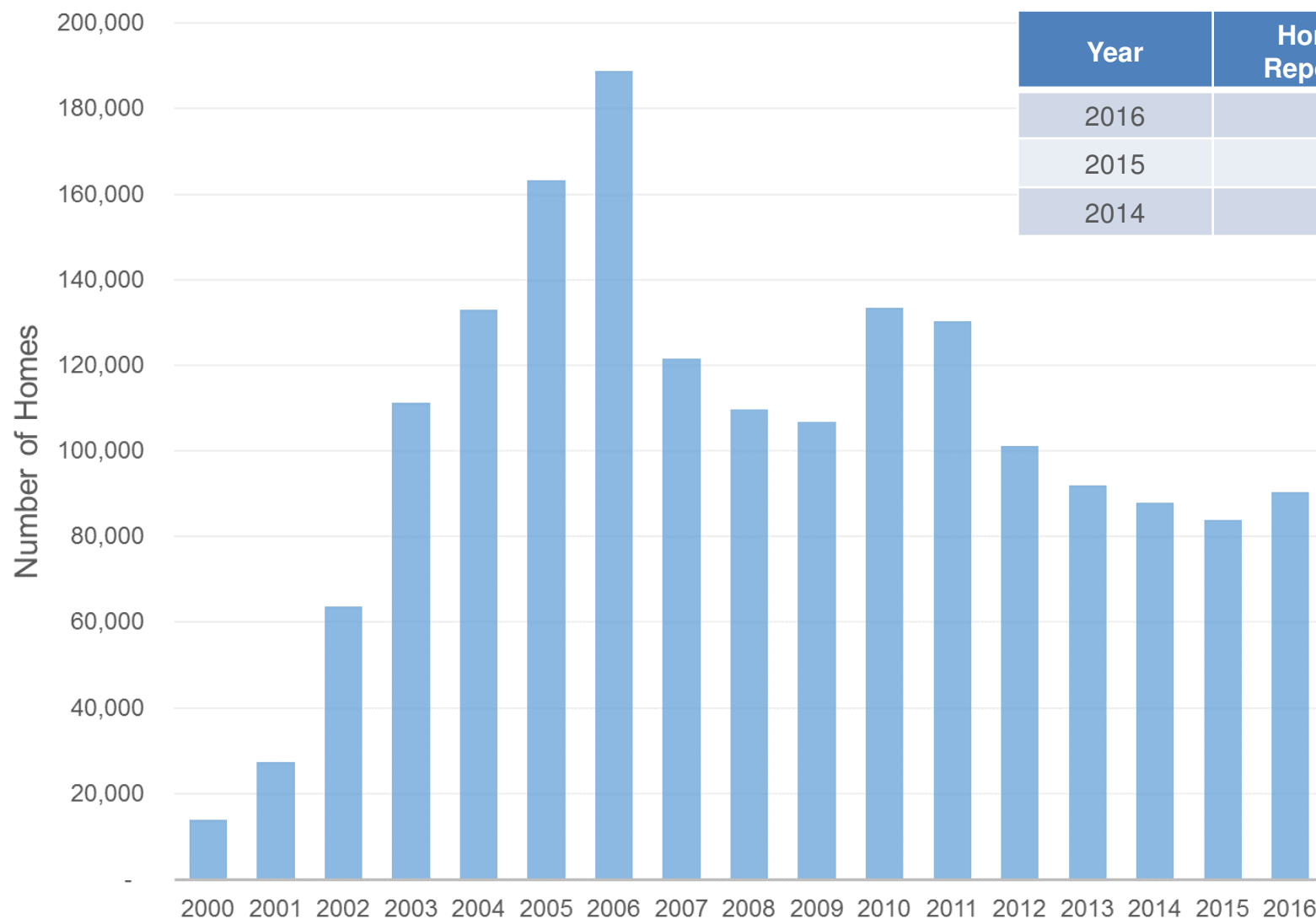
- The numbers
- Since we last met
- Checking in on program requirements
- Looking forward
- Updated & new resources
- Conference track
- Q&A

The Numbers

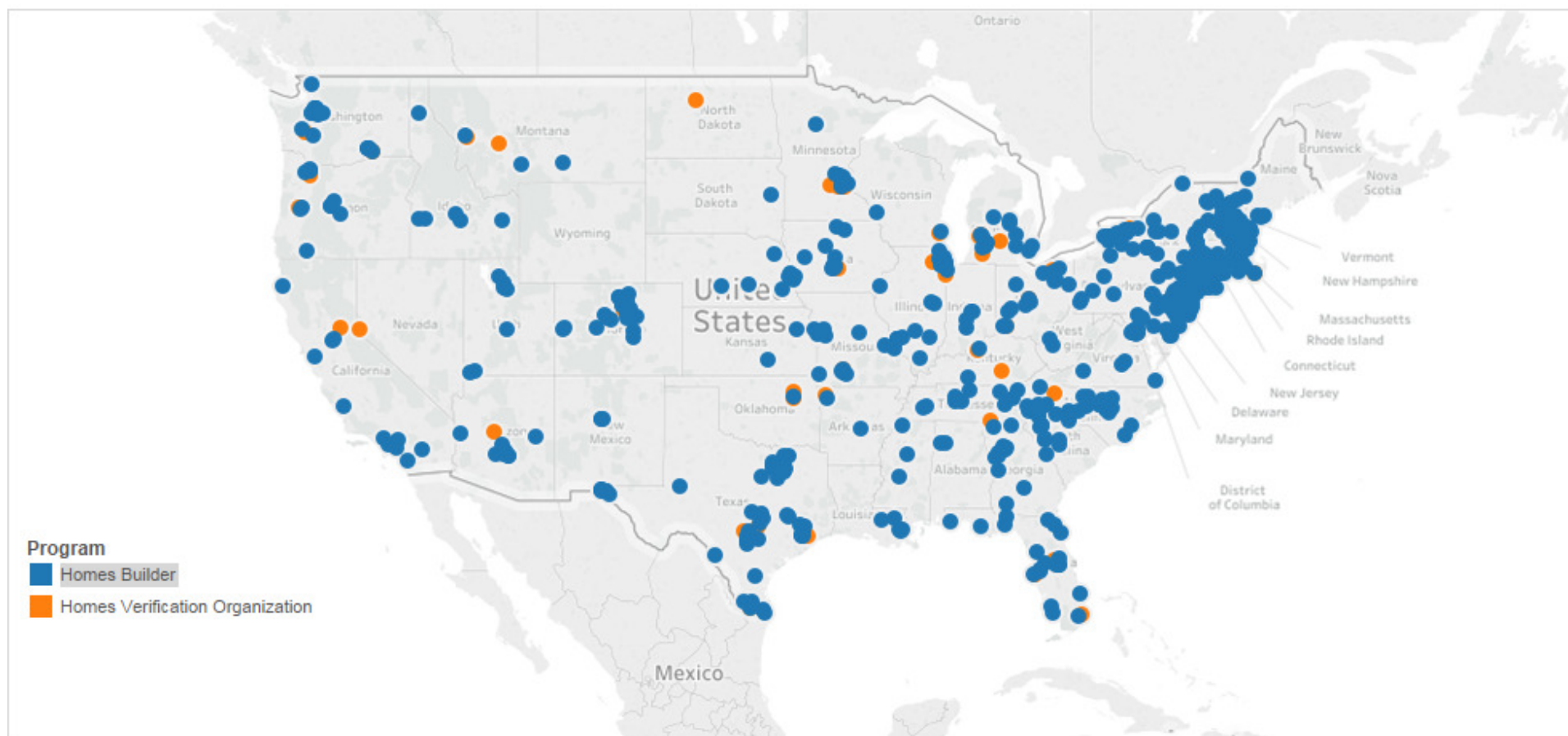




Annual ENERGY STAR Certified Homes Built

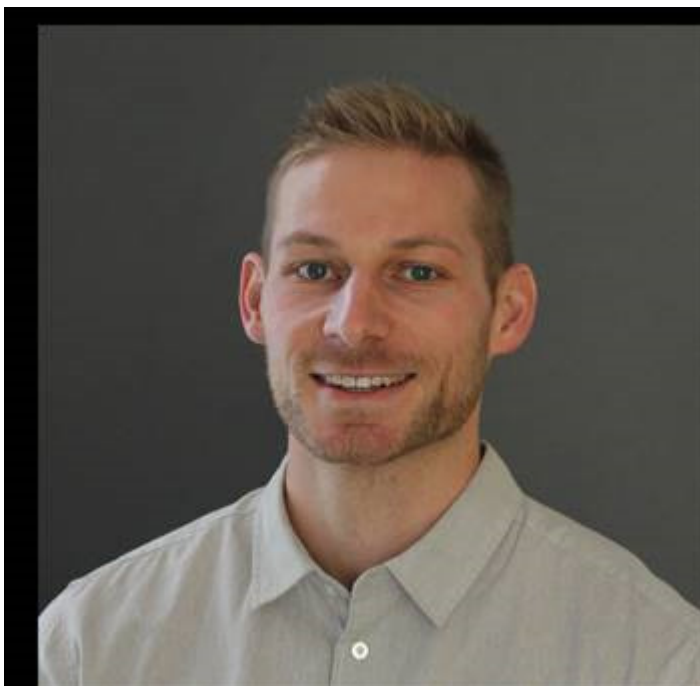


~650 New Partners in 2016!



Since We Last Met

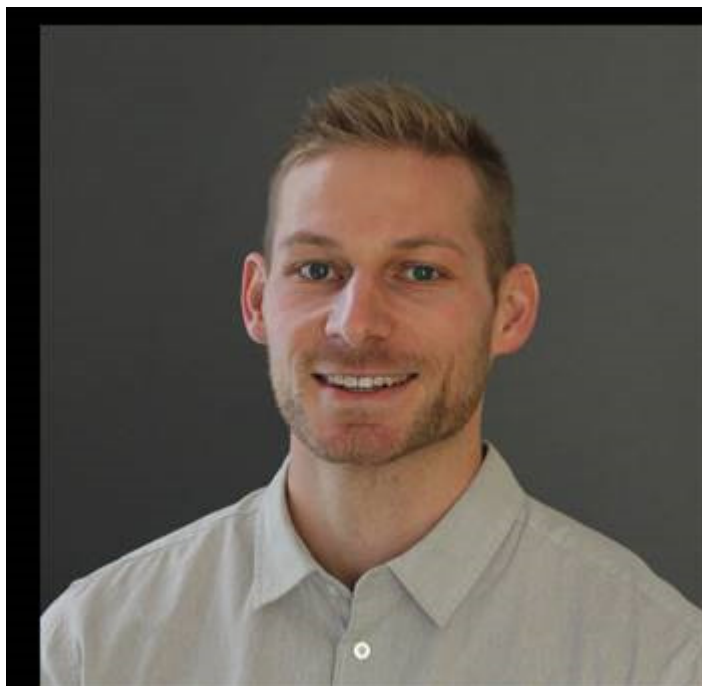




Brice Lang



Elliot Seibert



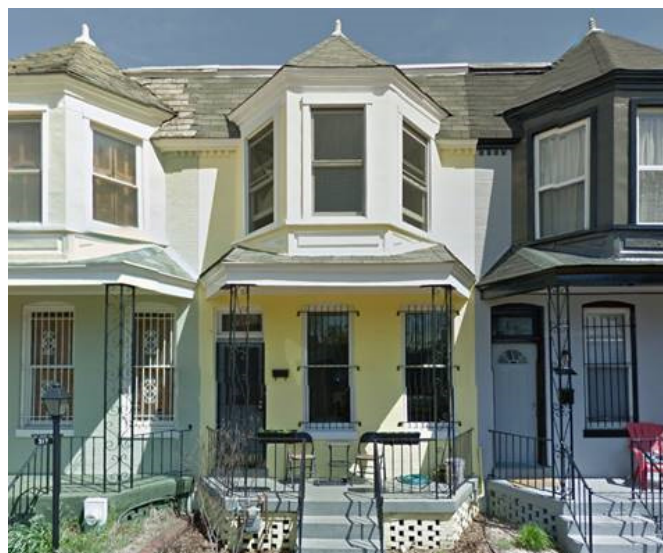
- Six years of experience.
- Will help with operations and partner support.
- Former semi-pro disc golfer.

Brice Lang



Elliot Seibert

- Over eight years of experience.
- Will manage our implementation efforts – technical tools and resources to help you succeed.
- Lives in net-zero home built in 1906.

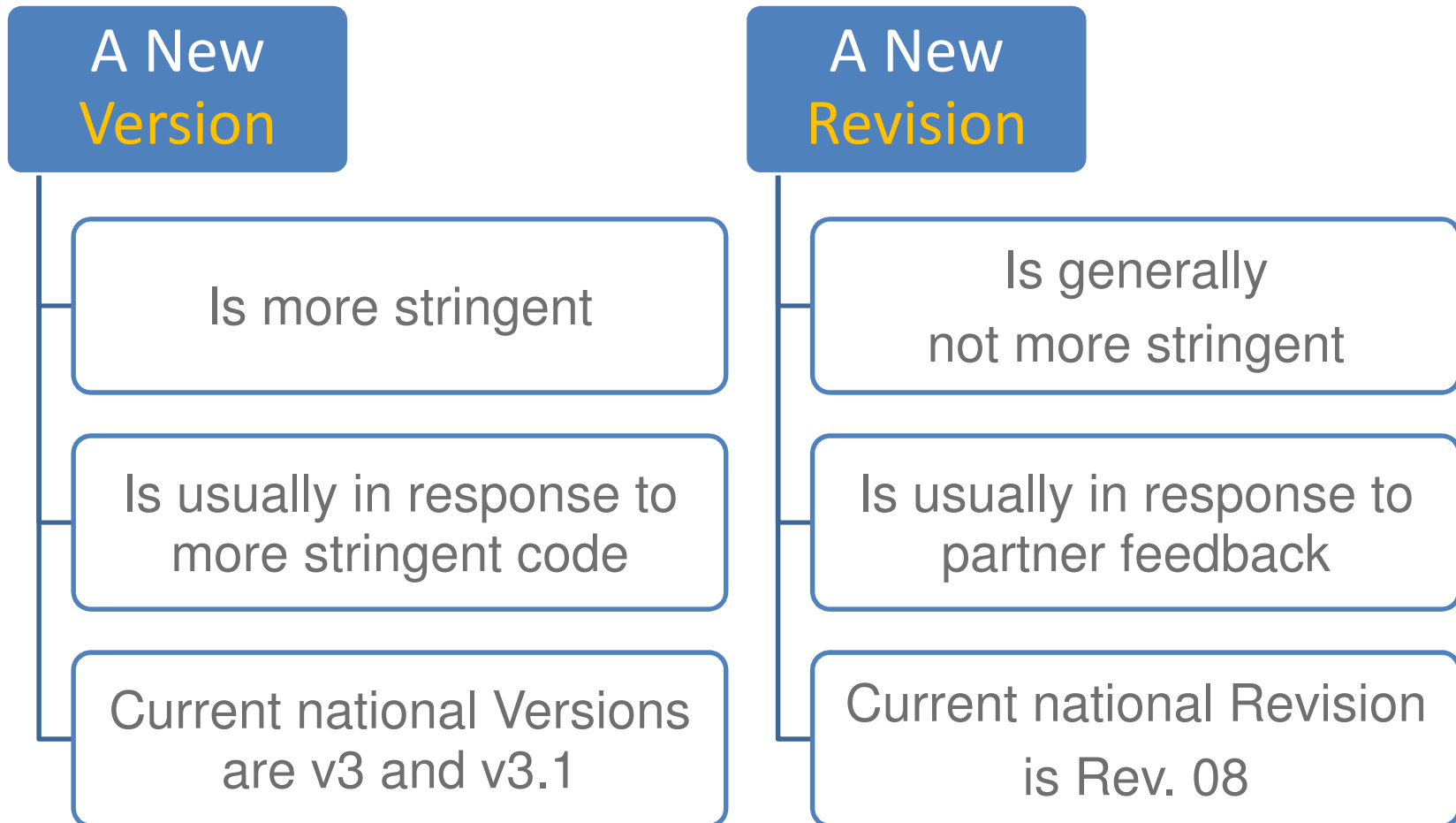


Checking in on Program Requirements





Versions vs. Revisions



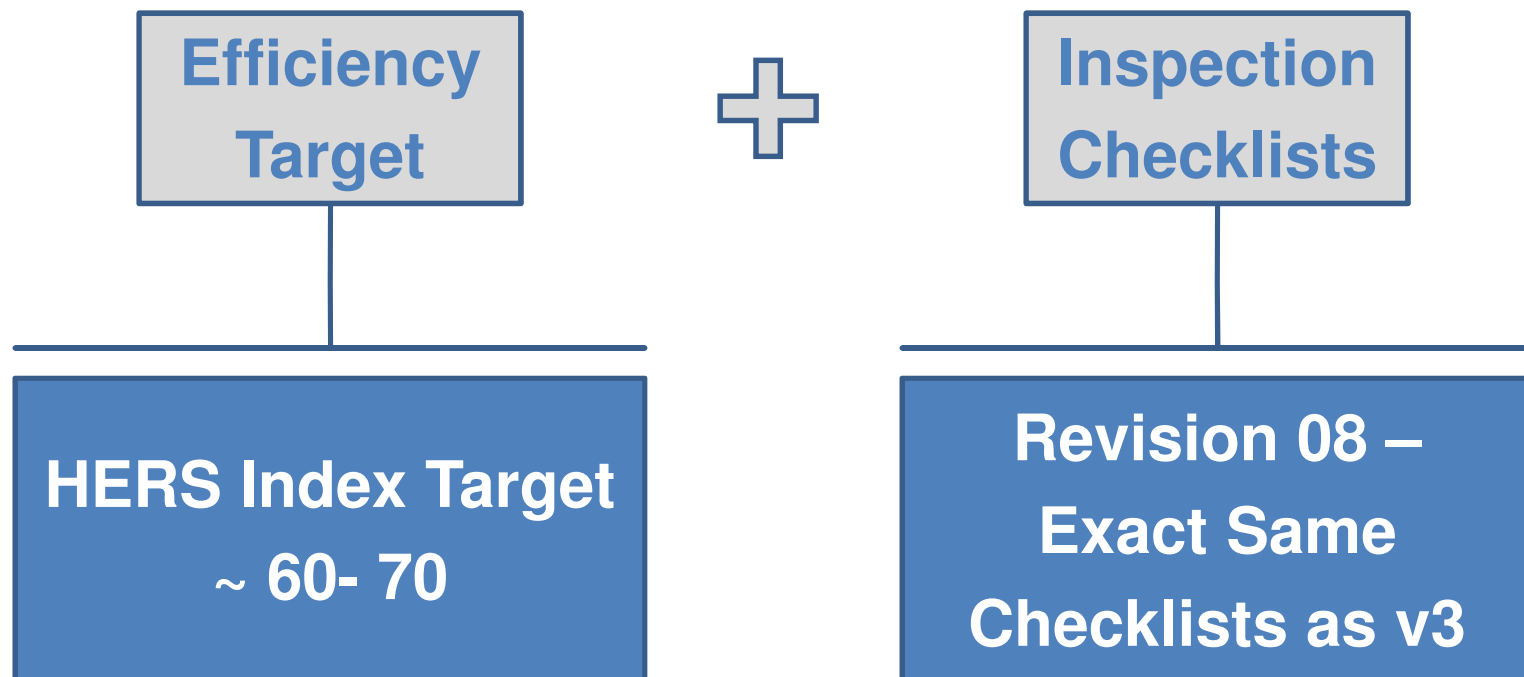


Version 3



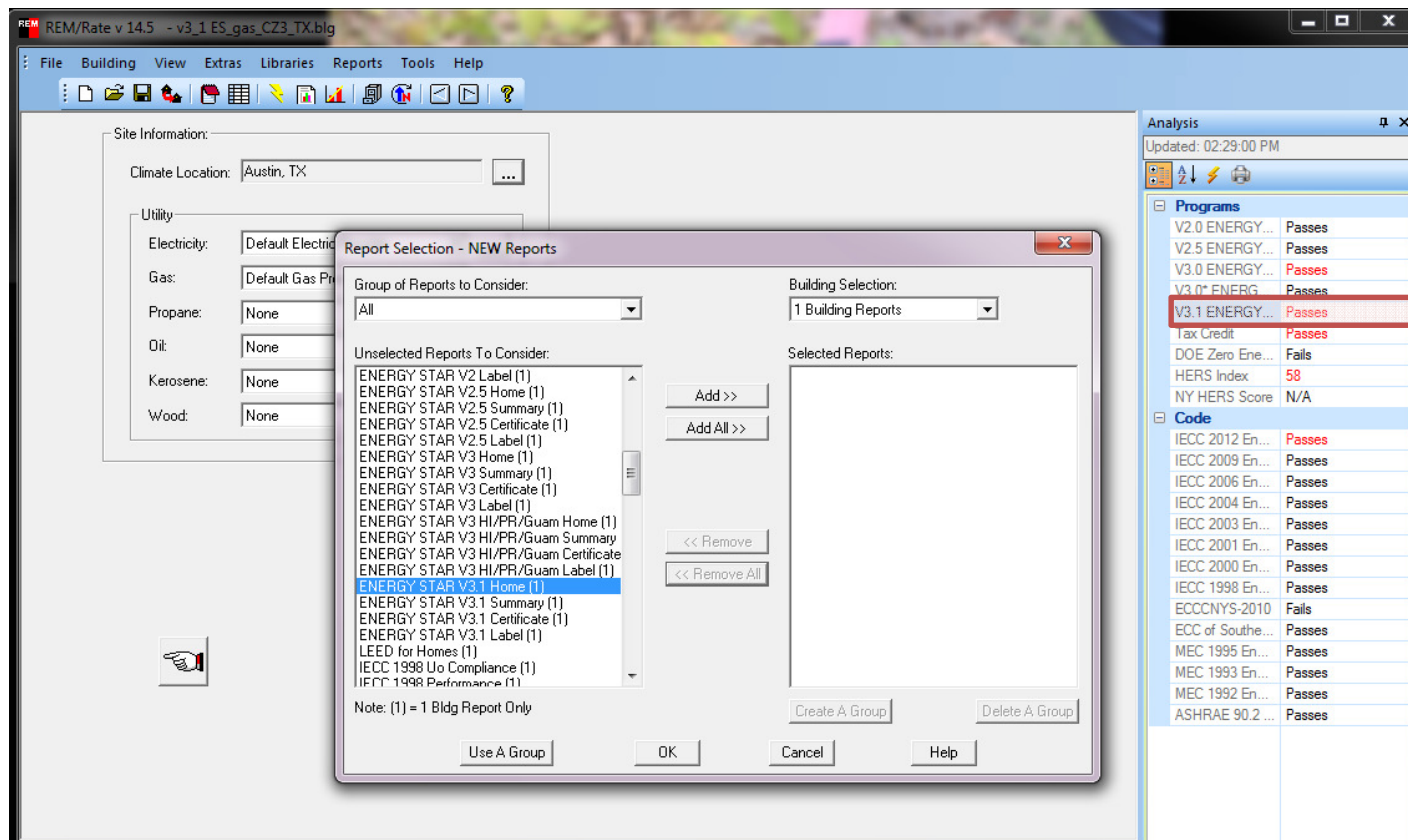
Version 3.1

What you need to know about Version 3.1



What you need to know about Version 3.1

- REM/Rate can run v3.1 compliance report today, even for states that have yet to adopt v3.1.





What you need to know about Version 3.1

- No new mandatory measures in v3.1!
- To hit the lower HERS index target, you'll likely need to make incremental improvements to:
 - Infiltration,
 - Windows,
 - HVAC efficiency,
 - Lighting, and,
 - Either ducts in conditioned space or high-efficiency water heaters.

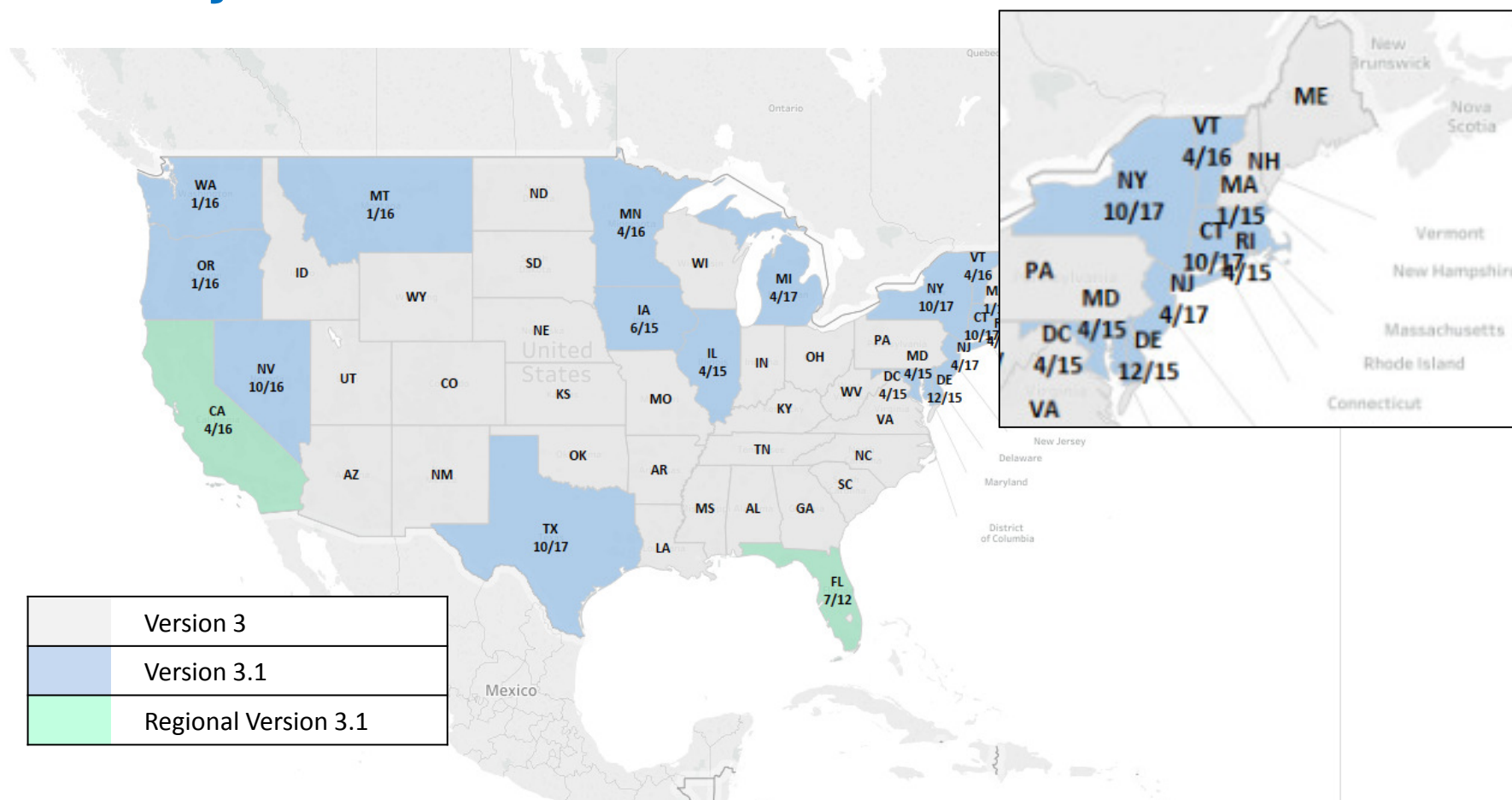


What you need to know about Version 3.1

- There are now **17** states, plus DC, with an implementation date for v3.1, plus regional v3.1 requirements in CA & FL:

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
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 10/01/2016
MI, NJ	On or after 04/01/2017
CT, NY, TX	On or after 10/01/2017

What you need to know about Version 3.1





Quiz #1

- How many new mandatory checklist measures does v3.1 include?

– 0

– 1

– 365



Quiz #2

- What's the typical HERS range for a v3.1 home?
 - 70-80
 - 60-70
 - 0



Version 3.2

What you need to know about Version 3.2

- Not much, unless you live in CA or WA.



- These two states now have the most stringent energy codes in the country.
- In response, we're developing Version 3.2.
- Same concept as Version 3.1 –
 - More aggressive performance target
 - Exact same mandatory requirements



Revision 08.

It's Great.
^
Still

Partner Reaction





HVAC design policy updates

- The tolerance for the conditioned floor area used in the loads has been increased.

Old Policy

0 - 300 ft² larger
than the rated home

New Policy

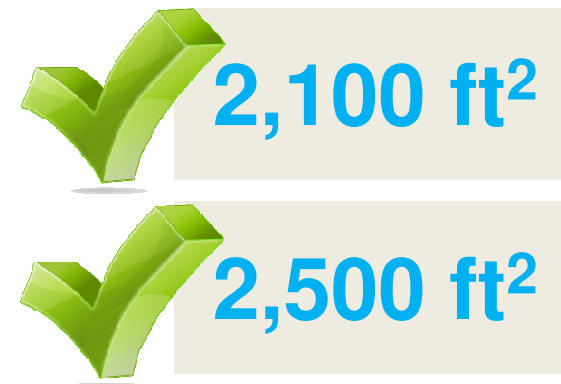
100 ft² smaller - 300 ft² larger
than the rated home

HVAC design policy updates

- The tolerance for the conditioned floor area used in the loads has been increased.



Rated Home



HVAC Design Home



HVAC design policy updates

- The heating sizing limit for furnaces paired with cooling has been increased.

Old Policy

Recommended: 100 - 140%

Allowed: 100 - 200%

New Policy

Recommended: 100 - 140%

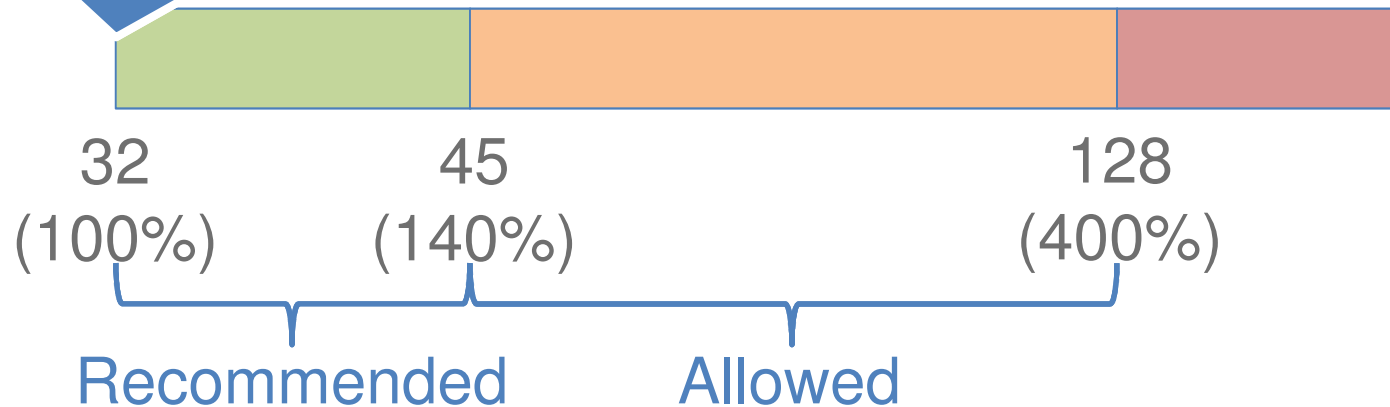
Allowed: 100 - 400%



HVAC design policy updates

- The heating sizing limit for furnaces paired with cooling has been increased.

Heating Load = 32 kBtuh





HVAC Design Report automation

- Wrightsoft can print out a completed HVAC Design Report!
- Tell your friends about this important feature.
- Elite RHVAC is working on adding this, too.



Revision 09.

Will be Fine.

Looking Forward





HERS Credit for HVAC Quality Design & Installation



Ample evidence that HVAC systems are not properly installed

- Improper airflow:
 - Average airflow 14% below design (Proctor 1997)
 - Improper airflow in 44% of systems (Mowris et al. 2004)
 - Measured airflow ranging from 130 - 510 CFM / ton (Parker 1997)
- Incorrect refrigerant charge:
 - In 57% of systems (Downey/Proctor 2002)
 - In 62% of systems (Proctor 2004)
 - In 72% of systems (Mowris et al. 2004)
 - In 82% of systems (Proctor 1997)



Lessons Learned So Far on HVAC Commissioning

1. It deserves attention – it's important and has been overlooked for too long.
2. Builders are starting to understand the rationale and value for it.
3. Commissioning requirements easily verified by Raters have taken hold.

But:

4. The industry, as a whole, still needs a lot of support to deliver it.
5. Lack of uniform, practical, standards leads to conflict and confusion.
6. No credit in the HERS index is a significant obstacle.



What's Next?

HVAC Grading System Concept

- Follow the insulation quality-installation model:
 - Grade III:
 - The default. No verification is done.
 - No penalty and no credit.
 - Grade II:
 - Rater verifies key design and installation parameters.
 - Verification indicates that the system is good but not great.
 - Partial credit awarded.
 - Grade I:
 - Rater duplicates the tasks in Grade II.
 - But, the verification indicates that the system is great.
 - Full credit awarded.



What's Next?

HERS Credit for HVAC Quality Installation

- EPA is leading a RESNET working group to turn this concept into a standard.
- Key benefits of such a standard include:
 - Ability to gain HERS points for proper HVAC design & installation.
 - Standardization of procedures for Raters and contractors.
 - Reward incremental improvement by the industry.
 - Better align ENERGY STAR with HERS ratings.
- Learn more 10:30 tomorrow morning at [Rating the Performance of HVAC Systems in a HERS Rating](#).



One Multifamily

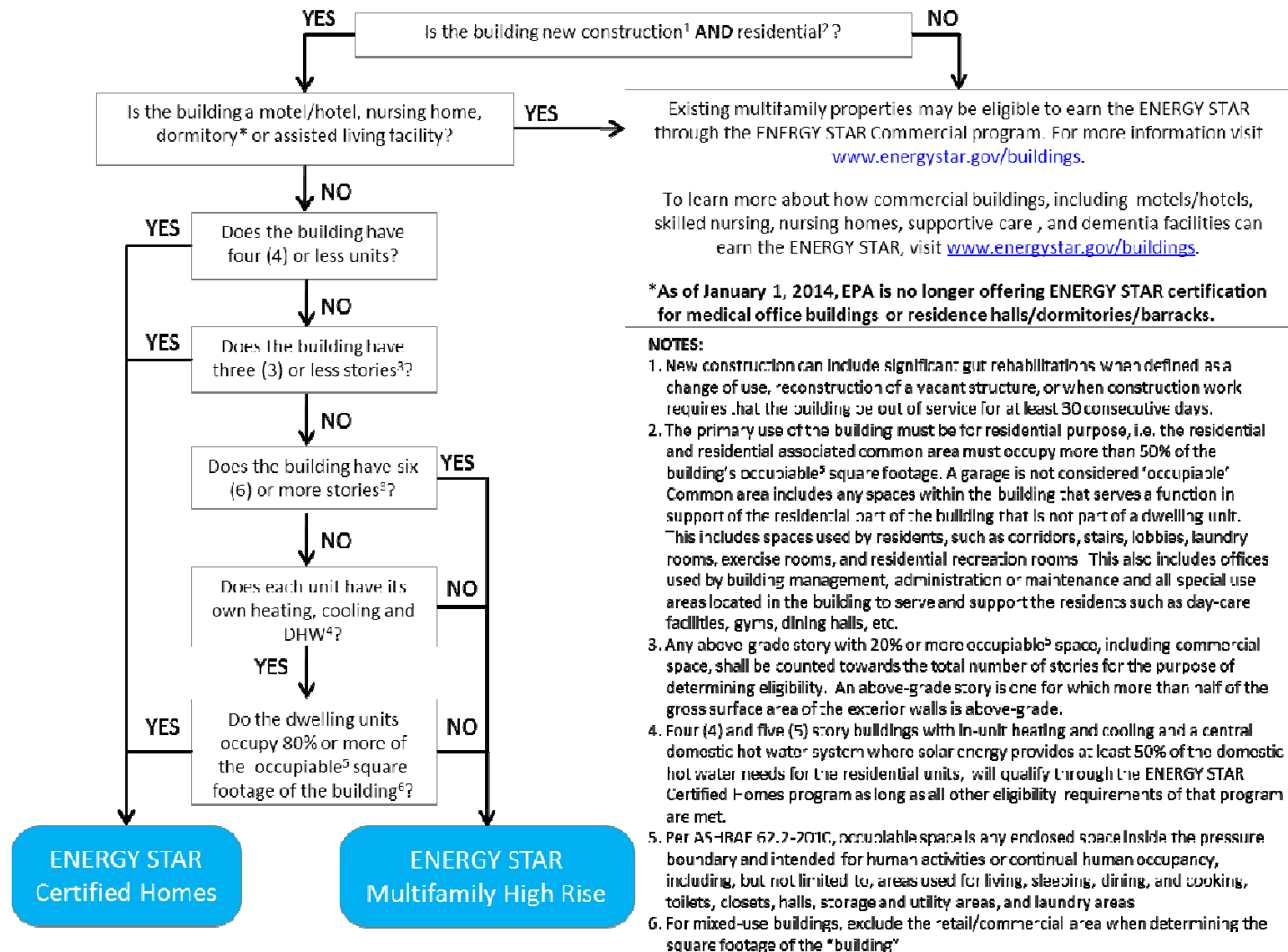


ENERGY STAR for Multifamily New Construction

Has guidelines that apply to new (or gut rehab):

- Single Family Homes (detached and attached)
 - Factory Built Homes (manufactured and modular)
 - Low & Mid Rise Multifamily Buildings
- } Certified Homes
-
- Mid & High Rise Multifamily Buildings
 - Covers buildings previously ineligible for Certified Homes
 - Launched in June 2011
- } MFHR

ENERGY STAR Multifamily Program Decision Tree*



*As of January 2017



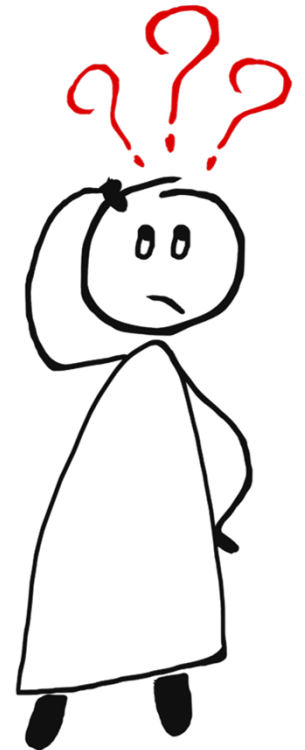
Multifamily Challenges

Eligibility

- Confusion/Frustration
- Inconsistency with code/incentive program eligibilities
- Designing to program, instead of what's best for the building

Requirements

- Based on program and not building features
- Reference design not optimized for multifamily
- Lack of credential for MF testing and verification
- Ownership of MFHR verification can be unclear





Multifamily Updates

- RESNET Multifamily Subcommittee
 - ANSI/RESNET/ICC 305, Standard for the Calculation and Labeling of the Energy Performance of Multi-Family Dwellings using an Energy Rating Index (draft standard)
 - HERS rating software updated for MF calculations
 - Enforceable language
 - Units in multifamily buildings of any height
 - Multifamily amendment to ANSI/RESNET/ICC 380

Multifamily Guidelines are Becoming a Standard!

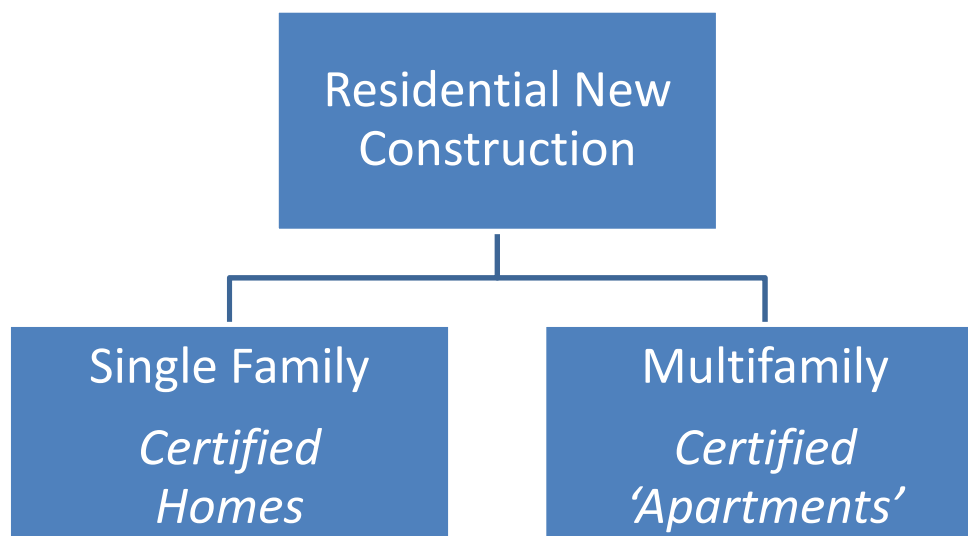
Presenters: Brian Christensen, Gayathri Vijayakumar,
Rebecca Hudson, Thiel Butner

Room: Apache II

Monday, 1:30-3:00



New Premise



- Delineation between SF and MF
- Consistent specification for multifamily (any height)

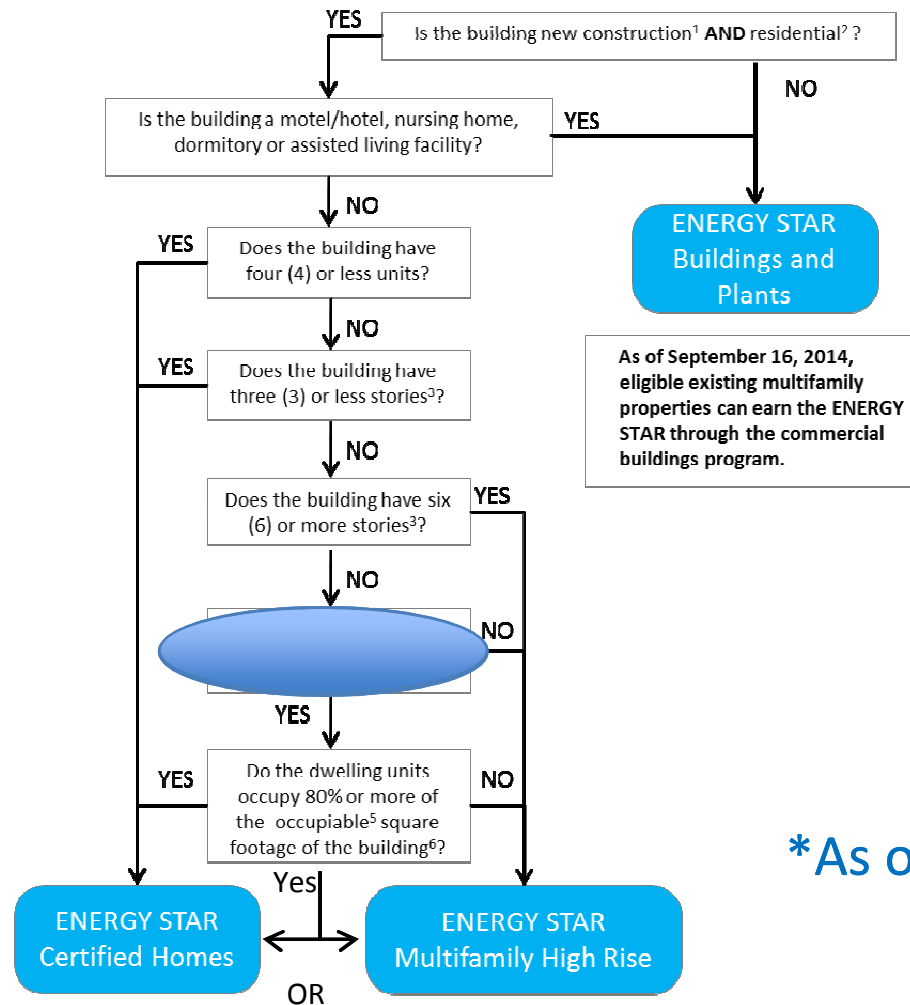


Status Update



BREAKING NEWS!

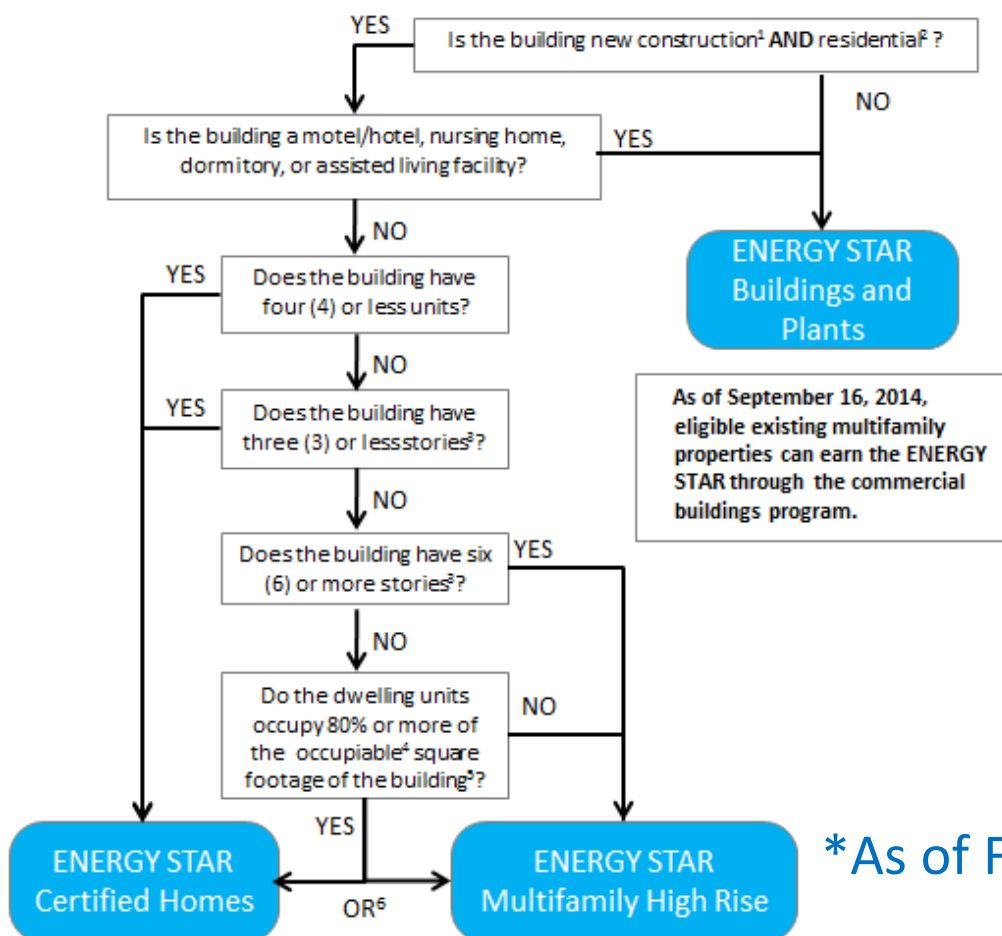
ENERGY STAR Multifamily Program Decision Tree*



*As of February 2017



ENERGY STAR Multifamily Program Decision Tree*



*As of February 2017



ENERGY STAR Multifamily Program Eligibility*

Certified Homes

- All Multifamily buildings with ≤ 3 stories or ≤ 4 units
 - 4 and 5 story multifamily buildings with less than 20% residential associated common space



Multifamily High Rise

- All buildings with ≥ 4 stories and > 4 units





Status Update

Completed

- Eligibility Update – Released February

In Progress

- EPA Internal Analysis – Ongoing

Future

- Stakeholder Input - Tentative: Draft ready for comment next winter



Learn More

One ENERGY STAR for Multifamily New Construction

Presenters: Rebecca Hudson, EPA & Gayathri
Vijayakumar, Steven Winter

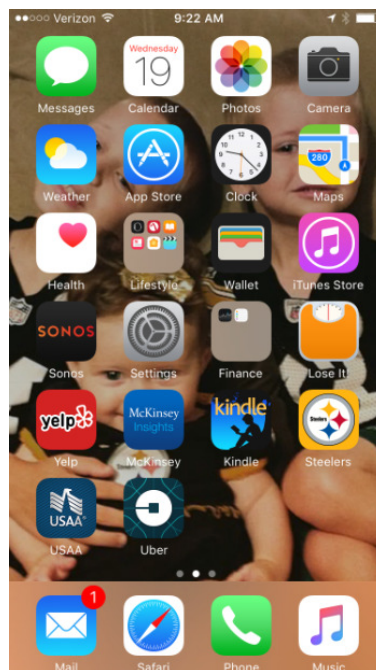
Tuesday 8:30-10am

Room: Arizona II

ENERGY STAR. The simple choice for energy efficiency.



Apps Are Problem Solvers





Problems to Solve

The Granite Problem

- Missing granite countertops can be easily spotted.



The 'Not Granite' Problem

- Missing blower door test cannot be easily spotted.





The 'Not Granite' Problem

- 1st Problem: The value of a third-party field inspection is invisible for too many people.

The 'Carrier Pigeon' Problem

- Antiquated tools make it harder to get the job done.





The 'Carrier Pigeon' Problem

- 2nd Problem: The baseline tools provided today take too much effort to do a high-quality field inspection.



Goal of RaterPRO

- Provide a tool that facilitates the collection of high-quality field data during the pre-drywall and final inspections.
- This helps increase the value, and reduce the cost, of a high-quality third-party rating.

ENERGY STAR. The simple choice for energy efficiency.



A Better Way



A Better Way

1

Import
Proposed
Rating Into
App

- Complete HERS modeling of proposed home in HERS software. Then import into app.
- HERS Raters and Field Inspectors will be able to see the features of the proposed design when performing field inspections.



A Better Way



- Create a job in the app for each home that will be built using the proposed rating that was imported.
- You can create multiple jobs using the same proposed rating.



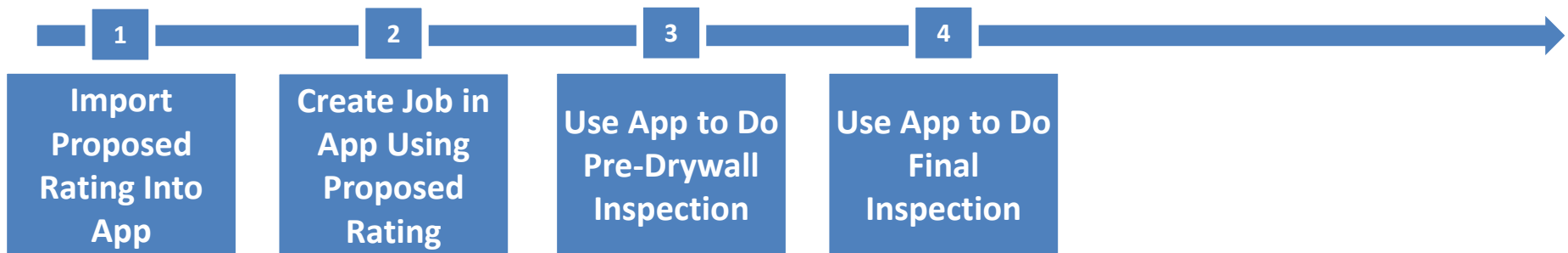
A Better Way



- Any Rater in the group can access that job in the field to complete the pre-drywall inspection.
- All features of the proposed rating are at your fingertips, plus all inspection items for ENERGY STAR homes.
- As you inspect, you can change features, check off checklist items, take notes, and even take photos.
- All info is automatically synced when you finish.



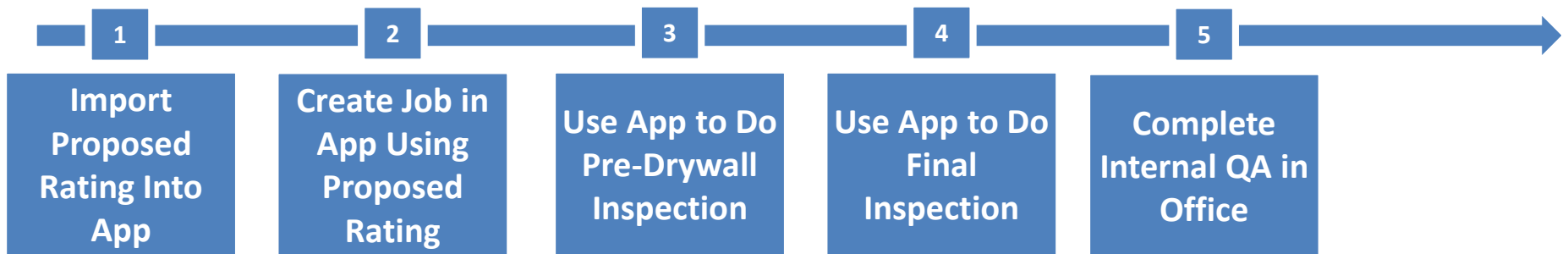
A Better Way



- Any Rater in the group can access that job in the field to complete the final inspection.
- Same information and features are available, but tailored to final inspection tasks.
- Can open and use apps for connected devices from Retrotec and The Energy Conservatory.
- All info is automatically synced when you finish.



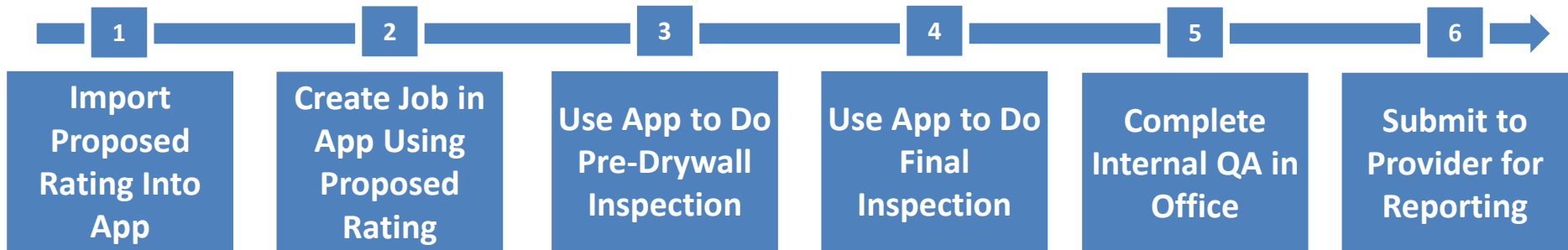
A Better Way



- Jobs can be tagged for internal QA.
- Updated HERS rating file can be generated with the press of a button.



A Better Way



- Use app to submit job to your Provider.
- Provider completes QA, downloads HERS file, and submits home via HERS software, just like today.

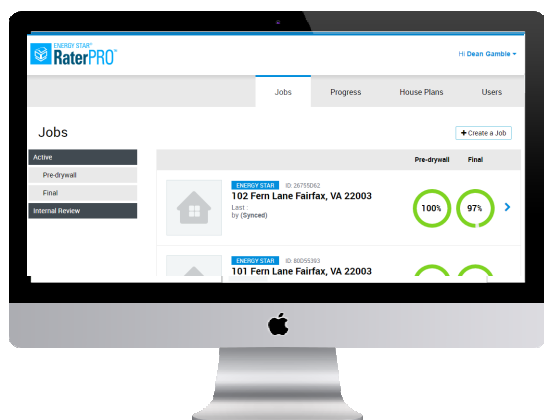


Summary: A Better Way

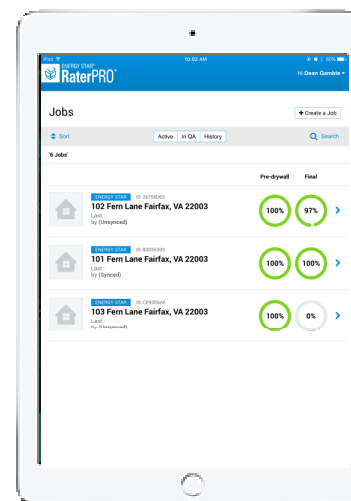
- More robust record helps demonstrate the value of third-party inspections.
- State of the art technology makes it easier to collect and manage high-quality field data.

ENERGY STAR RaterPRO Tour

Cloud
Hosted



Web-Based Admin Site



Field App



ENERGY STAR RaterPRO Tour

- Want to see more?
- Come to our session [RaterPRO Preview](#) at 3:30 today in Arizona I.
- You'll hear more about RaterPRO in the year ahead.

Updated & New Resources





Updated Cost & Savings Analysis

- Cost & Savings Estimates have been updated for both v3 and v3.1 to reflect Rev. 08 and changes in federal equipment standards.
- The annual savings have decreased a bit because baseline water heaters, AC's, and heat pumps are more efficient now.
- However, the incremental costs have dropped even more, due to lower component costs and streamlined requirements in Rev. 08.



Updated Cost & Savings Analysis

- The updated analyses have been posted on our website.

Cost & Savings Estimates

ENERGY STAR
Certified Homes,
Version 3 (Rev. 08)

October 1, 2016

Cost & Savings Estimates

ENERGY STAR
Certified Homes,
Version 3.1 (Rev. 08)

December 15, 2016



Updated Training Content

- Version 3 training content has been updated to reflect Rev. 08.
- Links to the Building America Solutions Center have been added for every checklist item, so trainers can get expanded content.
- This will be a great resource for RESNET training providers. It's available today through your My ENERGY STAR Account.

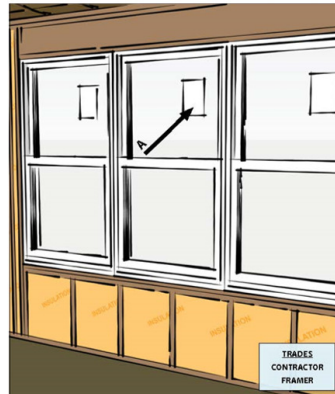
Rater Field Checklist	
1	High-Performance Fenestration & Insulation
1	Fenestration matches proposed design



Scope:

- A. Verify that installed windows, doors, & skylights meet or exceed the performance that was specified per Item 2.1 of the Rater Design Review Checklist.

The most common place to specify the performance is in the HERS rating software file for that home.



5

Rater Field Checklist	
1	High-Performance Fenestration & Insulation
1	Fenestration matches proposed design



Examples



Window has no NFRC label, so Rater cannot assess its performance



Window has NFRC label, so Rater can verify that it meets or exceeds specified performance



New ENERGY STAR vs Code Factsheets

- Eternal question – does an ENERGY STAR home meet code?
- We've created new factsheets to better explain the overlap.
- Great resource for Raters, builders, and utilities.



Homes that earn the ENERGY STAR label are certified under the program's requirements. This fact

What is an ENERGY STAR Certified Home?
ENERGY STAR certified homes are the most energy-efficient homes in the market today, delivering better quality and lower energy costs.



REDUCED LEAKS
AND DRAFTS

ENERGY STAR® & Code: How Version 3 Certified Homes



Code Section	Overview of Code Requirement	Commentary
The ENERGY STAR Certified Homes (ESCH) program partially or fully satisfies all of the following mandatory code requirements.		
Labeling		
401.3	Certificate with key efficiency features posted at electrical panel.	ESCH program mandates that a label be affixed to the panel. The code required label can be easily generated and applied at the same time.
Building Thermal Envelope		
402.4.1	Building thermal envelope durably sealed to limit infiltration.	ESCH program mandates sealing at all code locations except site-built fenestration and rim joist junctions.
402.4.2	Air sealing of building demonstrated through blower door test.	ESCH program satisfies this requirement if blower door test results in infiltration ≤ 7 ACH50.
402.4.5	Recessed luminaires ICAT rated and installed with gasket.	ESCH program satisfies this requirement.
402.5	Area-weighted fenestration performance meet code limits.	ESCH program satisfies this requirement.
Heating, Cooling, and Water Heating Systems		
403.2.2	Ducts, air handlers, and filter boxes sealed. Duct leakage also measured, unless 100% in conditioned space.	Mandatory duct sealing details in code will likely be achieved to meet ESCH program leakage limit.
403.5	Mech. vent. outdoor air intakes and exhausts have automatic / gravity dampers that close when system not in use.	ESCH program satisfies this requirement.
403.6	Heating and cooling equipment sized in accordance with ACCA Manual S.	ESCH program generally satisfies this requirement, but provides some allowances above Manual S.
405.2	When using Simulated Performance Alternative, ducts not inside building thermal envelope insulated \geq R-6.	ESCH program satisfies this requirement.

ENERGY STAR. The simple choice for energy efficiency.



Overhaul of ENERGY STAR Technical Website

Home > Partner Resources > For New Home Construction Professionals > Version 3 Guidelines > Training Requirements and Resources

Version 2.5 and 3 Training Resources

Training Presentations

- [Webinars](#) — ENERGY STAR offers free webinars to help you get the most out of your partnership and prepare for Version 3.
- [How to Measure Whole-House Ventilation Airflow \(EXIT-3\)](#) (< 5 minutes each) — Watch these four short videos to see how to measure whole-house ventilation airflow— one critical commissioning task for ENERGY STAR certified homes.

Technical Guidance Documents

- [Slab Edge Insulation Exemption Details](#) (207KB) — This document provides explanations and illustrations of slab edge insulation exemptions.
- [Kitchen Exhaust Guidance](#) (121KB) — This document provides guidance on alternative compliance options for meeting the kitchen mechanical exhaust requirements.
- [Attic Hatch Details](#) (139KB) — This document provides explanations and illustrations of insulation details for attic entrances.
- [HVAC Design Temperatures \(EXIT-3\)](#) — This document lists the 1% and 99% ACCA Manual J outdoor design conditions that HVAC designers are required to use and Raters are required to verify per the Version 3 guidelines.
- [ENERGY STAR Version 3 HERS Index Target Procedure](#) (221KB) — This document provides detailed instructions for manually determining the ENERGY STAR HERS Index Target.

Inspection Checklist Technical Guides

[Technical guides](#) for the ENERGY STAR Inspection Checklists are available at the [Building America Solutions Center](#), created by the U.S. Department of Energy. These free guides replace EPA's Inspection Checklist Field Guidebooks and provide a wealth of building science and energy-efficiency information. They are intended to be aligned with, and used as a supplemental resource to, the [Version 3 guidelines](#) but do not represent the official policy of the ENERGY STAR Certified Homes Program. Where questions arise, please contact energystarhomes@energystar.gov.



Overhaul of ENERGY STAR Technical Website

ENERGY STAR Certified Homes Program Requirements

SITE-BUILT **MODULAR** **MANUFACTURED** **UNDERGOING GUT REHAB**

Select Program Version OR Select State

PROGRAM REQUIREMENTS

National Program Requirements
 Version 3 (PDF)
 Version 3.1 (PDF)
 Regional Program Requirements
 Tropics Version 3 (PDF)
 CA Version 3.1 (PDF)
 FL Version 3.1 (PDF)

The program requirements reference the following documents, which are mandatory for all certified homes:

Rater Design Review & Rater Field Checklist (PDF)
 Rater Design Review & Rater Field Checklist (Tropics) (PDF)
 HVAC Design Report (PDF)
 HVAC Commissioning Checklist (PDF)
 Water Management System Builder Requirements (PDF)

REQUIREMENTS VERSIONS AT A GLANCE

Map of the United States showing regions color-coded by version status:

- Blue: Version 3 currently in effect
- Orange: Regional versions currently in effect
- Green: Version 3.1 currently in effect
- Light Green: Version 3.1 implementation date defined

ADDITIONAL RESOURCES

ENERGY STAR Policy Record
 ENERGY STAR Training & Education
 Building America Solutions Center
 Version 3 Cost & Savings Document (PDF)
 Version 3 ENERGY STAR Reference Design (PDF)

IMPLEMENTATION TIMELINE

Version 3 National Program Requirements	
State	Permit Date
AZ, GA, KY, LA, MI, NV, OH, OK, PA, SD, VA	07/01/2012

Conference Track





EPA & DOE Conference Sessions

All Sessions Located in Arizona II

(Except RaterPRO Preview in Arizona I)

Session	Monday
1	
2	ENERGY STAR: The Year Ahead
3	A Better High-Performance Home Doesn't Mean Anything if Consumers Don't Buy It: 7 Proven Strategies for Behavior Change
4	RaterPRO Preview



EPA & DOE Conference Sessions

All Sessions Located in Arizona II (Except RaterPRO Preview in Arizona I)

Session	Monday	Tuesday
1		One ENERGY STAR for Multifamily New Construction
2	ENERGY STAR: The Year Ahead	Rating the Performance of HVAC Systems in a HERS Rating
3	A Better High-Performance Home Doesn't Mean Anything if Consumers Don't Buy It: 7 Proven Strategies for Behavior Change	Critical Differentiation is Easier than you Think: The Easy Lift from ENERGY STAR to DOE Zero Energy Ready Home
4	RaterPRO Preview	What do Leading Raters Know That You Don't: How to Upserve Builders with Lower Risk and Greater Differentiation



EPA & DOE Conference Sessions

All Sessions Located in Arizona II (Except RaterPRO Preview in Arizona I)

Session	Monday	Tuesday	Wednesday
1		One ENERGY STAR for Multifamily New Construction	Making ENERGY STAR Appeal to the Builders' Bottom-Line
2	ENERGY STAR: The Year Ahead	Rating the Performance of HVAC Systems in a HERS Rating	Moving from ENERGY STAR to Indoor airPLUS: Builder and Rater Perspectives
3	A Better High-Performance Home Doesn't Mean Anything if Consumers Don't Buy It: 7 Proven Strategies for Behavior Change	Critical Differentiation is Easier than you Think: The Easy Lift from ENERGY STAR to DOE Zero Energy Ready Home	Getting Zero to Stick: ZERH Marketing Tools 101
4	RaterPRO Preview	What do Leading Raters Know That You Don't: How to Upserve Builders with Lower Risk and Greater Differentiation	Designing Zero Energy Ready Homes Right...The First Time: 10 Steps to a Durable, Efficient, and Comfortable Home



ENERGY STAR Certified Homes

Web & Email:

Main: www.energystar.gov/newhomespartners
Technical: www.energystar.gov/newhomesguidelines
Training: www.energystar.gov/newhomestraining
HVAC: www.energystar.gov/newhomesHVAC
Email: energystarhomes@energystar.gov

Social Media:



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