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
~650 New Partners in 2016!
Since We Last Met
Brice Lang

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

Elliot Seibert
Checking in on Program Requirements
Versions vs. Revisions

**A New Version**
- Is more stringent
- Is usually in response to more stringent code
- Current national Versions are v3 and v3.1

**A New Revision**
- Is generally not more stringent
- Is usually in response to partner feedback
- Current national Revision is Rev. 08
Version 3
Version 3.1
What you need to know about Version 3.1

- Efficiency Target
  - HERS Index Target
    - ~ 60-70

- Inspection Checklists
  - Revision 08 – Exact Same Checklists as v3
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:

<table>
<thead>
<tr>
<th>State</th>
<th>Applicable to Homes with the Following Permit Date</th>
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<tbody>
<tr>
<td>MA</td>
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<td>DC, IL, MD, RI</td>
<td>On or after 04/01/2015</td>
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<td>IA</td>
<td>On or after 06/01/2015</td>
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<tr>
<td>DE</td>
<td>On or after 12/01/2015</td>
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<td>MT, OR, WA</td>
<td>On or After 01/01/2016</td>
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<tr>
<td>MN, VT</td>
<td>On or after 04/01/2016</td>
</tr>
<tr>
<td>NV</td>
<td>On or after 10/01/2016</td>
</tr>
<tr>
<td>MI, NJ</td>
<td>On or after 04/01/2017</td>
</tr>
<tr>
<td>CT, NY, TX</td>
<td>On or after 10/01/2017</td>
</tr>
</tbody>
</table>
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.
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 kBtu/h**

- **32 (100%)** - Recommended
- **45 (140%)** - Allowed
- **128 (400%)** - Allowed
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
- Mid & High Rise Multifamily Buildings
  - Covers buildings previously ineligible for Certified Homes
  - Launched in June 2011
ENERGY STAR Multifamily Program Decision Tree*

**As of January 2017**

**ENERGY STAR Certified Homes**

**ENERGY STAR Multifamily High Rise**

*Existing multifamily properties may be eligible to earn the ENERGY STAR through the ENERGY STAR Commercial program. For more information visit [www.energystar.gov/buildings](http://www.energystar.gov/buildings).

To learn more about how commercial buildings, including motels/hotels, skilled nursing, nursing homes, supportive care, and dementia facilities can earn the ENERGY STAR, visit [www.energystar.gov/buildings](http://www.energystar.gov/buildings).

*As of January 1, 2014, EPA is no longer offering ENERGY STAR certification for medical office buildings or residence halls/dormitories/barracks.*

**NOTES:**
1. New construction can include significant gut rehabilitations when defined as a change of use, reorientation of a vacant structure, or when construction work requires that the building be out of service for at least 50 consecutive days.
2. The primary use of the building must be for residential purpose i.e., the residential and residential-associated common area must occupy more than 50% of the building’s occupiable square footage. A garage is not considered occupiable Common area includes any spaces within the building that serve a function in support of the residential part of the building that is not part of a dwelling unit. This includes spaces used by residents, such as corridors, stairs, lobbies, laundry rooms, exercise rooms, and residential recreation rooms. This also includes offices used by building management, administration or maintenance and all special use areas located in the building to serve and support the residents such as day care facilities, gyms, dining halls, etc.
3. Any above-grade story with 20% or more occupiable space, including commercial space, shall be counted towards the total number of stories for the purpose of determining eligibility. An above-grade story is one for which more than half of the gross square area of the exterior walls is above-grade.
4. Four (4) and five (5) story buildings with in-unit heating and cooling and a central domestic hot water system where solar energy provides at least 50% of the domestic hot water needs for the residential units will qualify through the ENERGY STAR Certified Homes program as long as all other eligibility requirements of that program are met.
5. Per ASHRAE 62.2-2010, renewable spaces are any enclosed space inside the perimeter boundary intended for human activities or continual human occupancy, including, but not limited to, areas used for living, sleeping, dining, and cooking, toilets, doors, halls, storage and utility areas, and laundry areas.
6. For mixed-use buildings, include the "retail/commercial area" when determining the square footage of the "building."
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**
    - 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

*As of February 2017

ENERGY STAR Multifamily High Rise

*As of February 2017

ENERGY STAR Buildings and Plants

As of September 16, 2014, eligible existing multifamily properties can earn the ENERGY STAR through the commercial buildings program.
ENERGY STAR Multifamily Program Decision Tree*

*As of February 2017
ENERGY STAR Multifamily Program Eligibility*

Certified Homes

- All Multifamily buildings with \( \leq 3 \) stories or \( \leq 4 \) units

Multifamily High Rise

- All buildings with \( \geq 4 \) stories and \( > 4 \) units
  - 4 and 5 story multifamily buildings with less than 20% residential associated common space

*As of February 2017
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
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

• 2\textsuperscript{nd} 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.
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

1. Import Proposed Rating Into App
2. Create Job in App Using Proposed Rating

- 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

1. Import Proposed Rating Into App
2. Create Job in App Using Proposed Rating
3. Use App to Do Pre-Drywall Inspection

- 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

1. Import Proposed Rating Into App
2. Create Job in App Using Proposed Rating
3. Use App to Do Pre-Drywall Inspection
4. Use App to Do Final Inspection

- 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

1. Import Proposed Rating Into App
2. Create Job in App Using Proposed Rating
3. Use App to Do Pre-Drywall Inspection
4. Use App to Do Final Inspection
5. Complete Internal QA in Office

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

1. Import Proposed Rating Into App
2. Create Job in App Using Proposed Rating
3. Use App to Do Pre-Drywall Inspection
4. Use App to Do Final Inspection
5. Complete Internal QA in Office
6. Submit to Provider for Reporting

- 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.
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.
Overhaul of ENERGY STAR Technical Website

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** ([video](https://www.youtube.com/watch?v=5y5z5555)) — 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](https://www.energy.gov/energy-efficient-homes/documents/slab-edge-insulation-exemption-details)) — This document provides explanations and illustrations of slab edge insulation exemptions.
- **Kitchen Exhaust Guidance** ([121KB](https://www.energy.gov/energy-efficient-homes/documents/kitchen-exhaust-guidance)) — This document provides guidance on alternative compliance options for meeting the kitchen mechanical exhaust requirements.
- **Attic Hatch Details** ([139KB](https://www.energy.gov/energy-efficient-homes/documents/attic-hatch-details)) — This document provides explanations and illustrations of insulation details for attic entrances.
- **HVAC Design Temperatures** ([221KB](https://www.energy.gov/energy-efficient-homes/documents/hvac-design-temperatures)) — This document lists the 1% and 99% ACCA Manual J outdoor design conditions that HVAC designers are required to use and Rates are required to verify per the Version 3 guidelines.
- **ENERGY STAR Version 3 HERS Index Target Procedure** ([221KB](https://www.energy.gov/energy-efficient-homes/documents/energy-star-version-3-heritage-index-target-procedure)) — This document provides detailed instructions for manually determining the ENERGY STAR HER Index Target.

Inspection Checklist Technical Guides

[Technical guidelines](https://www.energy.gov/energy-efficient-homes/documents/technical-guidelines) for the ENERGY STAR Inspection Checklists are available at the Building America Solutions Center, created by the U.S. Department of Energy. These guidelines 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@energy.gov.
Overhaul of ENERGY STAR Technical Website

ENERGY STAR Certified Homes Program Requirements

PROGRAM REQUIREMENTS

- Rational 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:
  - Rate Design Review & Rating Field Checklist (PDF)
  - Rate Design Review & Rating Field Checklist (Tropics) (PDF)
  - HVAC Design Report (PDF)
  - HVAC Commissioning Checklist (PDF)
  - Water Management System Builder Requirements (PDF)

REQUIREMENTS VERSIONS AT A GLANCE

ADDITIONAL RESOURCES

- ENERGY STAR Policy Record
- ENERGY STAR Training & Education
  - Building America Solutions Center
- Version 3 Cost & Savings Document (PDF)
- Version 3 ENERGY STAR Branding Toolkit (PDF)

IMPLEMENTATION TIMELINE

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<th>State</th>
<th>Proposal Date</th>
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<tr>
<td>AZ, CA, KY, LA, MI, NV, OH, OK, PA, SD, VA</td>
<td>07/01/2012</td>
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Conference Track
### EPA & DOE Conference Sessions

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

<table>
<thead>
<tr>
<th>Session</th>
<th>Monday</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
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<td>Moving from ENERGY STAR to Indoor airPLUS: Builder and Rater Perspectives</td>
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<td>Getting Zero to Stick: ZERH Marketing Tools 101</td>
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<td>Designing Zero Energy Ready Homes Right...The First Time: 10 Steps to a Durable, Efficient, and Comfortable Home</td>
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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
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