



ENERGY STAR Certified Homes

The Year Ahead

October 25th, 2016





ENERGY STAR. The simple choice for energy efficiency.





Agenda

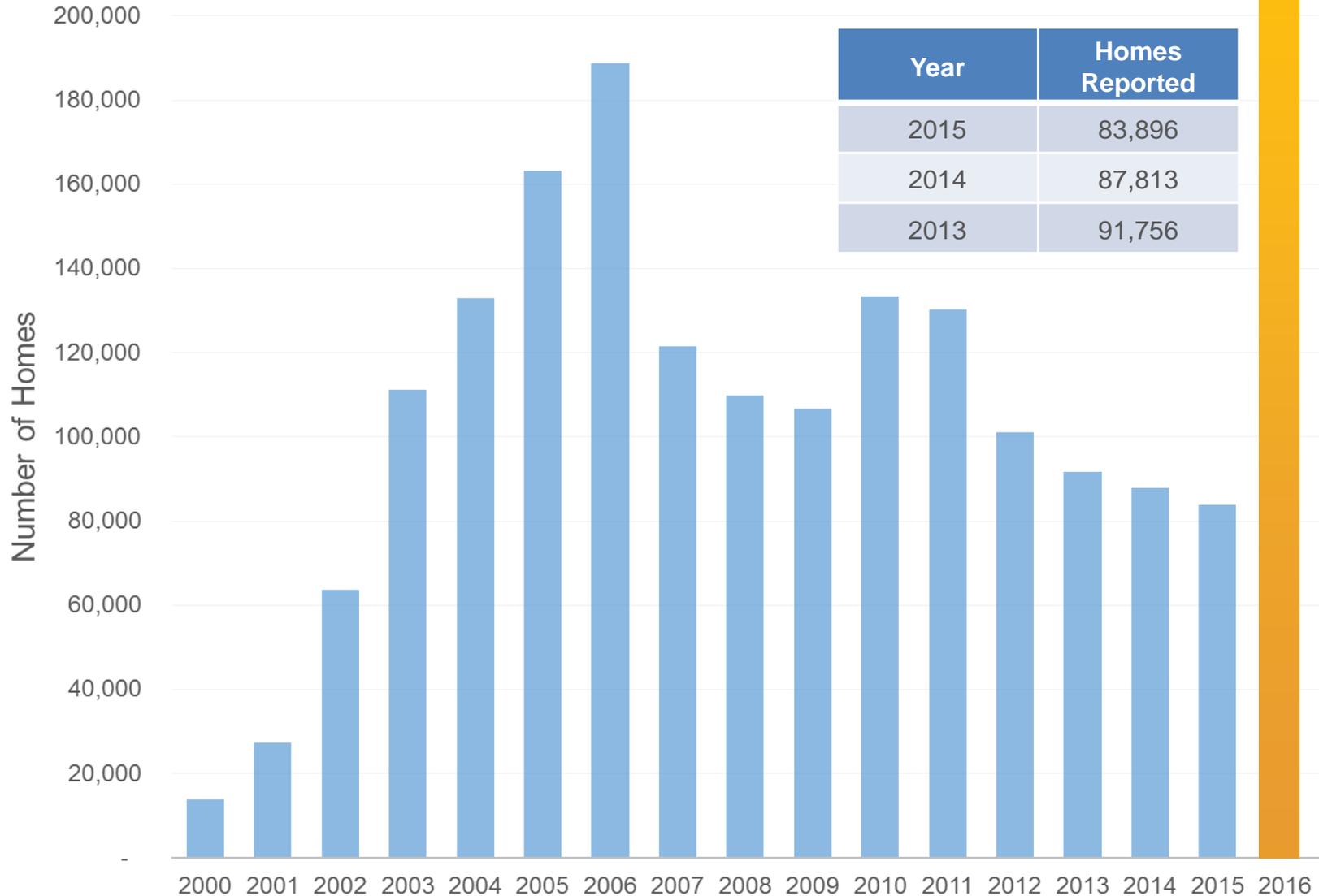
- The numbers
- Checking in on program requirements
- Revision 09?
- ENERGY STAR Certified Homes RaterPro app
- HERS credit for HVAC quality design & installation
- Updated & new resources

The Numbers

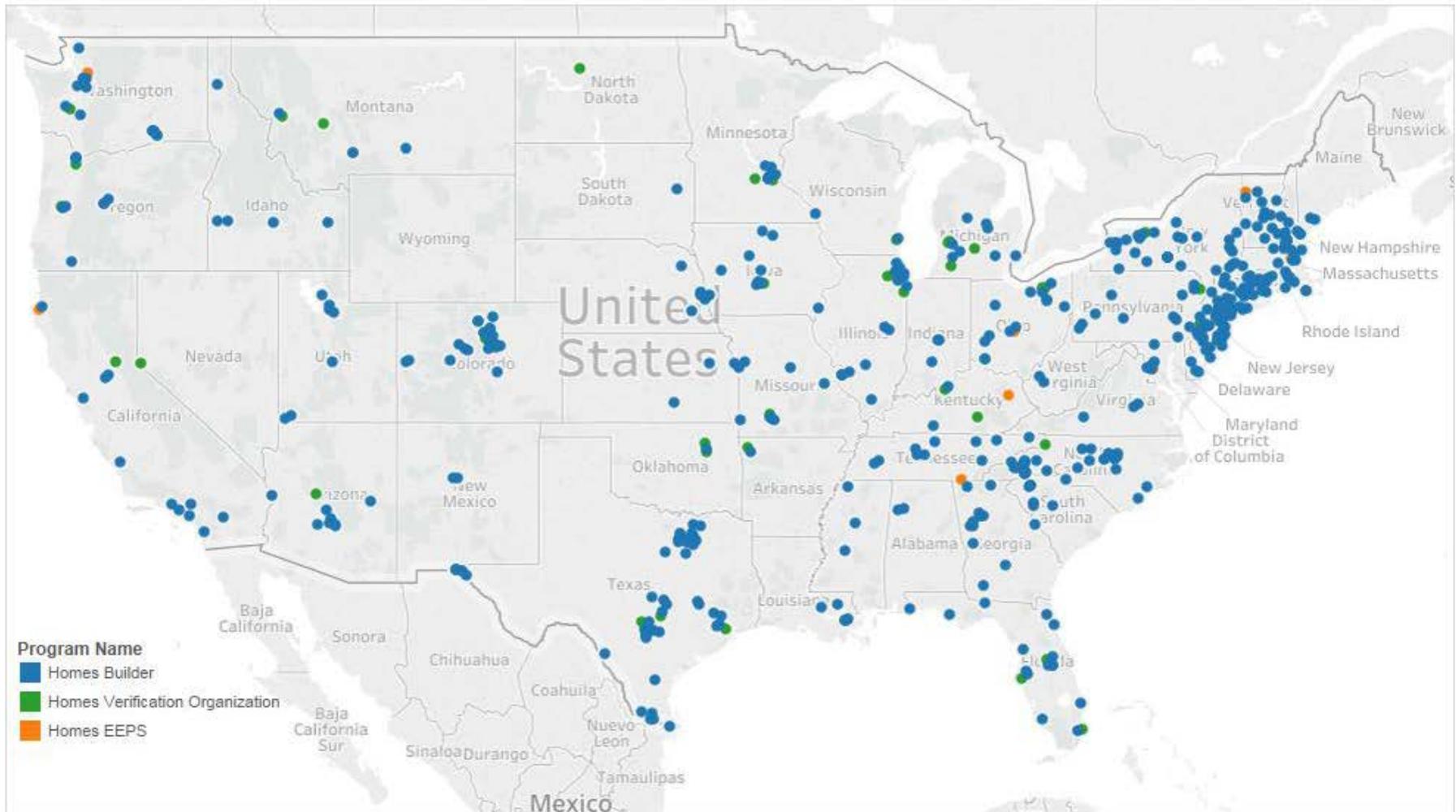




Annual ENERGY STAR Certified Homes Built



555 New Partners in 2016 to Date!



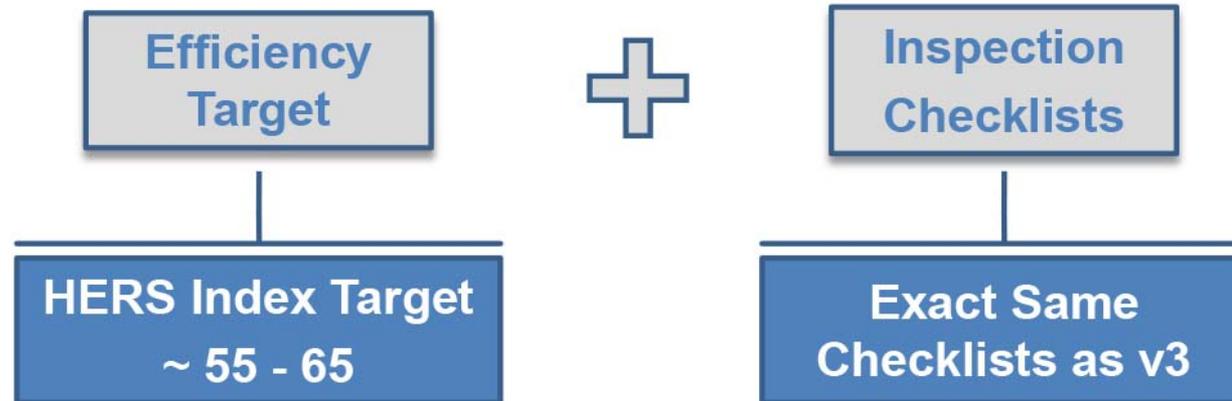
Checking in on Program Requirements: Version 3.1





What you need to know about Version 3.1

- Maintains meaningful savings in states that adopt the 2012 IECC or equivalent.



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.

The screenshot displays the REM/Rate software interface. A 'Report Selection - NEW Reports' dialog box is open, showing a list of reports to consider. The 'ENERGY STAR V3.1 Home (1)' report is highlighted in blue. The 'Building Selection' dropdown is set to '1 Building Reports'. The 'Analysis' panel on the right shows a list of programs and codes, with 'V3.1 ENERGY...' highlighted in red and a red arrow pointing to it.

Report Selection - NEW Reports

Group of Reports to Consider: All

Building Selection: 1 Building Reports

Unselected Reports To Consider:

- ENERGY STAR V2 Label (1)
- ENERGY STAR V2.5 Home (1)
- ENERGY STAR V2.5 Summary (1)
- ENERGY STAR V2.5 Certificate (1)
- ENERGY STAR V2.5 Label (1)
- ENERGY STAR V3 Home (1)
- ENERGY STAR V3 Summary (1)
- ENERGY STAR V3 Certificate (1)
- ENERGY STAR V3 Label (1)
- ENERGY STAR V3 HI/PR/Guam Home (1)
- ENERGY STAR V3 HI/PR/Guam Summary
- ENERGY STAR V3 HI/PR/Guam Certificate
- ENERGY STAR V3 HI/PR/Guam Label (1)
- ENERGY STAR V3.1 Home (1)**
- ENERGY STAR V3.1 Summary (1)
- ENERGY STAR V3.1 Certificate (1)
- ENERGY STAR V3.1 Label (1)
- LEED for Homes (1)
- IECC 1998 Uo Compliance (1)
- IECC 1998 Performance (1)

Note: (1) = 1 Bldg Report Only

Analysis

Updated: 02:29:00 PM

Programs

V2.0 ENERGY...	Passes
V2.5 ENERGY...	Passes
V3.0 ENERGY...	Passes
V3.1 ENERGY...	Passes
V3.1 ENERGY...	Passes
Tax Credit	Passes
DOE Zero Ene...	Fails
HERS Index	58
NY HERS Score	N/A

Code

IECC 2012 En...	Passes
IECC 2009 En...	Passes
IECC 2006 En...	Passes
IECC 2004 En...	Passes
IECC 2003 En...	Passes
IECC 2001 En...	Passes
IECC 2000 En...	Passes
IECC 1998 En...	Passes
ECCCNYS-2010	Fails
ECC of Southe...	Passes
MEC 1995 En...	Passes
MEC 1993 En...	Passes
MEC 1992 En...	Passes
ASHRAE 90.2 ...	Passes



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, along with the District of Columbia, for which the implementation date has been defined for v3.1, plus regional v3.1 requirements for CA and 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
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



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?
 - 65-75
 - 55-65
 - 0

Checking in on Program Requirements: Version 3.2



What you need to know about Version 3.2

- Not much, unless you live in California or Washington State.



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



What you need to know about Version 3.2

- To hit the new performance target, you'll likely need to pursue:
 - More insulation
 - Very good windows
 - Ducts in conditioned space
 - Very high-efficiency HVAC and water heaters, and,
 - Efficient ventilation
- We plan to enforce v3.2 starting with homes permitted one year after the new codes go into effect:
 - WA: 07/01/2017
 - CA: 01/01/2018

Revision 09?





Recap of Revision 08

- Major improvements in Rev. 08:
 1. Greatly reduced paperwork
 2. Greatly improved workflow
 3. Reduced HVAC oversight role for Raters, for time-being

Partner Reaction

“Rev. 08 truly is an improvement and will make implementation better for Raters & builders.”



“Rev. 08 dramatically reduces the amount of paperwork Raters have to process.. To their credit, the ENERGY STAR team listened to the industry and made much needed changes.”



“Our experience with Rev. 08 to date has proven that its goals have come to fruition. We are seeing the streamlined paperwork result in fewer delays which has ultimately lead to greater builder satisfaction.”



Partner Reaction

“What, you mean you actually like it now?”



"I don't believe it! They've managed the impossible! What an achievement! Bravo, bravo!"

“No, they've made it even worse!”



Revision 08.

It's Great.



Revision 09?

- Since the release of Rev. 08 in July 2015, we've only made a handful of small policy adjustments.
- Eventually we'll want to roll these improvements into the program documents, which will result in the creation of Rev. 09.
- No set timeline yet for when this will occur, but it's not imminent.
- In summary, Rev. 09 is shaping up to be a very minor revision.

ENERGY STAR Certified Homes RaterPRO App





Why are we developing an app?

- Raters are currently the only subcontractor who don't leave an observable imprint on the house.
- Raters are the cheapest expense when building a house.
- Partners have called for technology to enhance QA, simplify and speed the process, and better demonstrate the value of verification.



What's the goal of the app?

- Provide a tool that helps Raters collect high-quality field data during the pre-drywall and final inspection of a home.
- Meet the needs of our partners in a way that is also beneficial to both RESNET and the homebuilders they serve.



What key features will be included in the app?

- Developed in collaboration with stakeholders.
- Can be used for stand-alone HERS ratings and ENERGY STAR certification.
- Ability to collect robust data, such as geo-location, photos, & notes.
- Ability to communicate with rating software and other connected devices.
- Voluntary and freely available.



What key benefits will result from the app?

- Enhances the value of HERS ratings and other third-party verifications.
- Make it faster & easier to complete a high-quality rating.
- Provides both a foundation and a model for private-sector investments.
- Can eliminate the use of paper checklists.

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.

Updated & New Resources





Updated Cost & Savings Analysis

- Our Cost & Savings Estimates have been updated for both v3 and v3.1 to reflect Rev. 08 and changes in federal minimum equipment standards.
- The annual savings have decreased a bit because water heaters, AC's, and heat pumps are more efficient now.
- However, the incremental costs have dropped even more, due to some lower component costs and the elimination of certain requirements with Rev. 08.
- The updated analyses will be posted on our website in the near future.



Updated Cost & Savings Analysis for Version 3

#	CZ	Location	Found.	HVAC Equipment Type	Original Values			Updated Values			Difference		
					Annual Purchased Energy Savings	Total Upgrade Cost		Annual Purchased Energy Savings	Total Upgrade Cost		Annual Purchased Energy Savings	Total Upgrade Cost	
1	1	Miami, FL	Slab	Elec. Air-Source HP	\$322	17%	\$2,187	\$294	16%	\$1,463	-\$27	-1%	-\$725
2	1	Miami, FL	Slab	Gas Furnace / Elec. AC	\$321	18%	\$2,124	\$288	16%	\$1,517	-\$33	-2%	-\$608
3	2	Tampa, FL	Slab	Elec. Air-Source HP	\$308	16%	\$2,187	\$276	14%	\$1,463	-\$32	-2%	-\$725
4	2	Tampa, FL	Slab	Gas Furnace / Elec. AC	\$315	18%	\$2,124	\$285	16%	\$1,517	-\$30	-2%	-\$608
5	3	Fort Worth, TX	Slab	Elec. Air-Source HP	\$546	23%	\$2,421	\$502	22%	\$1,696	-\$44	-2%	-\$725
6	3	Fort Worth, TX	Slab	Gas Furnace / Elec. AC	\$376	19%	\$2,358	\$360	17%	\$1,750	-\$16	-1%	-\$608
7	4	St. Louis, MO	Bsmt.	Elec. Air-Source HP	\$574	20%	\$2,176	\$464	16%	\$1,589	-\$110	-4%	-\$587
8	4	St. Louis, MO	Bsmt.	Gas Furnace / Elec. AC	\$366	17%	\$2,145	\$362	16%	\$1,915	-\$4	-1%	-\$230
9	5	Indianapolis , IN	Bsmt.	Elec. Air-Source HP	\$720	25%	\$2,571	\$732	24%	\$2,059	\$13	-1%	-\$512
10	5	Indianapolis , IN	Bsmt.	Gas Furnace / Elec. AC	\$415	20%	\$2,350	\$471	21%	\$2,117	\$56	1%	-\$233
11	6	Burlington, VT	Bsmt.	Elec. Air-Source HP	\$1,117	29%	\$2,667	\$1,028	27%	\$2,155	-\$88	-2%	-\$512
12	6	Burlington, VT	Bsmt.	Gas Furnace / Elec. AC	\$547	23%	\$2,350	\$535	22%	\$2,117	-\$12	-1%	-\$233
13	7	Duluth, MN	Bsmt.	Gas Furnace / Elec. AC	\$673	25%	\$2,350	\$701	25%	\$2,117	\$28	0%	-\$233



Updated Training Content

- The original 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.



New ENERGY STAR vs Code Factsheets

- Perennial question – does an ENERGY STAR home meet code?
- New factsheets have been developed to better explain the overlap.
- We'll be discussing this in more detail later this afternoon.



Overhaul of ENERGY STAR Technical Website

The screenshot displays the ENERGY STAR website interface. At the top, there are navigation links for 'ABOUT ENERGY STAR' and 'PARTNER RESOURCES', along with a search bar. The main header features the slogan 'The simple choice for energy efficiency.' and four primary categories: 'ENERGY EFFICIENT products', 'ENERGY SAVINGS at home', 'ENERGY EFFICIENT new homes', and 'ENERGY STRATEGIES FOR buildings & plants'. Below this, a breadcrumb trail reads: 'Home > Partner Resources > For New Home Construction Professionals > Version 3 Guidelines > Training Requirements and Resources'. The main content area is titled 'Version 2.5 and 3 Training Resources' and is divided into two sections: 'Training Presentations' and 'Technical Guidance Documents'. The 'Training Presentations' section lists two items: 'Webinars' and 'How to Measure Whole-House Ventilation Airflow [EXIT+]'. The 'Technical Guidance Documents' section lists four items: 'Slab Edge Insulation Exemption Details', 'Kitchen Exhaust Guidance', 'Attic Hatch Details', and 'HVAC Design Temperatures [EXIT+]'. A 'Join ENERGY STAR' button is visible in the bottom right corner of the content area.



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

■ Version 3 currently in effect ■ Version 3.1 currently in effect
■ Regional versions currently in effect ■ 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

What's Missing?

