

# DOE Zero Energy Ready Home

Tech Training Webinar Series

U.S. DEPARTMENT OF  
**ENERGY**

Energy Efficiency &  
Renewable Energy



Zero Energy Ready Homes

# RESOURCES



# The Home of the Future...Today



# Zero Energy Ready Homes:



- **Marketing Resources**
  - Brand Consumers Can Trust
  - Bankable Value Propositions
  - Value Proposition Messaging
- **Recognition Resources**
  - Consumer Recognition
  - Award Recognition
  - Appraisal Recognition
- **Knowledge Resources**
  - Zero Energy Ready Home Training
  - Building America Solution Center
  - Building Science Translator



**Marketing**

**Recognition**

**Knowledge**



# **Brand Consumers Can Trust**



Marketing

Recognition

Knowledge



Independent Voice of Authority vs. “Trust me.”

Marketing

Recognition

Knowledge

Nearly 1 in 3 consumers indicated they

**do not trust**

home building and real estate companies.

Source: The business of Trust – The Most Trusted Builders in America,  
Lifestory Research, January 2013

**Marketing**

**Recognition**

**Knowledge**



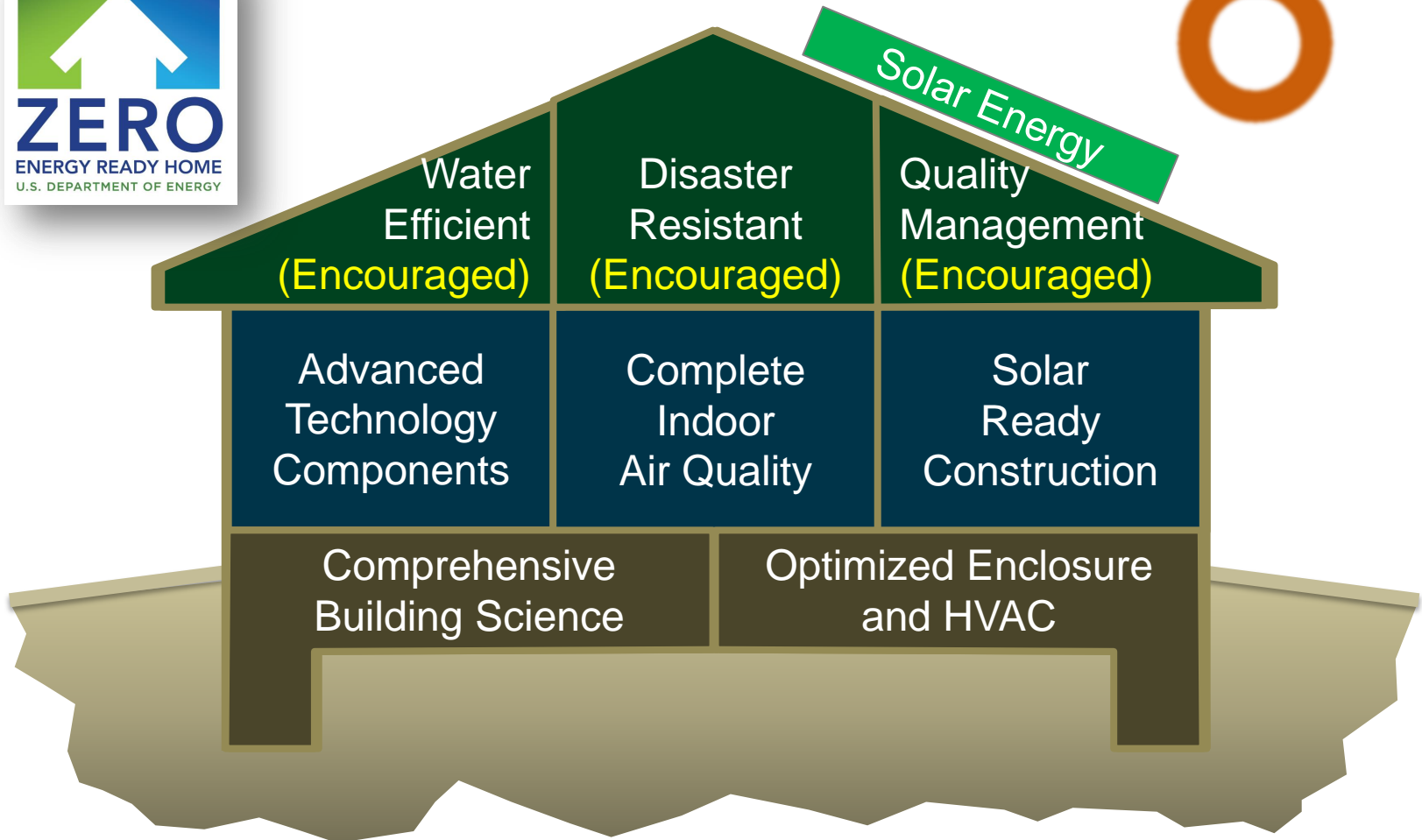
# **Bankable Value Propositions**



Marketing

Recognition

Knowledge



# ZERH Value Propositions

**Marketing**

**Recognition**

**Knowledge**

**Lives  
Better**

Engineered  
Comfort

Healthier  
Living

**Exclusivity**

**Works  
Better**

Ultra-Low  
Utility Bills

Advanced  
Technology

**Visionary**

**Lasts  
Better**

Quality  
Construction

More  
Durability

**Smart**

# ZERH Value Proposition Translated

U.S. DEPARTMENT OF  
**ENERGY**

Energy Efficiency &  
Renewable Energy

Marketing

Recognition

Knowledge



**My power bill is \$5.  
What's yours?**

- Heather Robbins, Garbett Homeowner

**garbettHOMES.com**  
Now you're living.



**ZERO**  
ENERGY READY HOME  
U.S. DEPARTMENT OF ENERGY



# Translating ZERH Value Proposition

U.S. DEPARTMENT OF  
**ENERGY**

Energy Efficiency &  
Renewable Energy

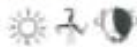
de young properties®



“My Cool Mom’s August Electric Bill Was **\$-57.97!**  
**What Was Yours?”**

- **Ali Domino**  
Resident of a De Young  
Net Zero **EnergySmart™** Home

PACIFIC GAS AND ELECTRIC COMPANY  
NET ENERGY METERING ELECTRIC STATEMENT  
Service Dates July 14, 2013 to August 13, 2013  
\*Energy provided from Jan. 2013 to Mar. 2013



Ali and her mother Leah are enjoying the savings and comfort of their De Young Net Zero **EnergySmart™** home. De Young homes,

de young properties®

YOU DON'T NEED TO

*Imagine*

A HOME IN THE YEAR 2020...

IT'S ALREADY HERE!





Marketing

Recognition

Knowledge



# Value Proposition Messaging



## Marketing

## Recognition

## Knowledge



**Call us at:**  
**303-231-4567**

**NewTown@net**  
**.com**

### A Symbol of Excellence

#### HEALTHFUL ENVIRONMENT



#### COMFORT PLUS



#### ADVANCED TECHNOLOGY



#### ULTRA EFFICIENT



#### QUALITY BUILT



#### DURABILITY



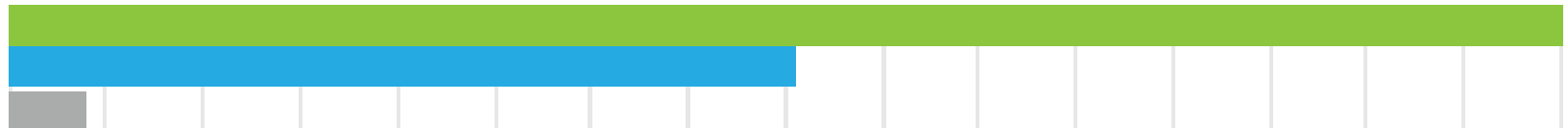
**KEY**

- DOE Zero Energy ReadyHome
- ENERGY STAR Certified Home
- Existing Home

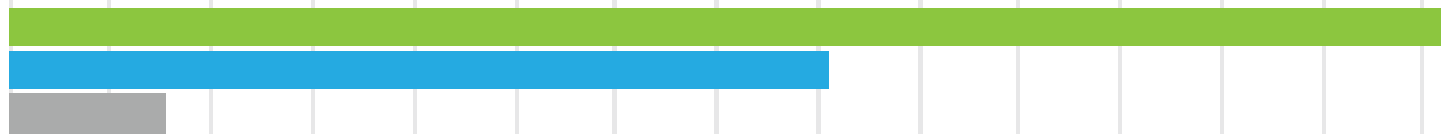
This label indicates relative performance of this DOE Zero Energy Ready Home to existing homes (built between 1990 and 2010) and ENERGY STAR Certified Homes. Actual performance may vary.



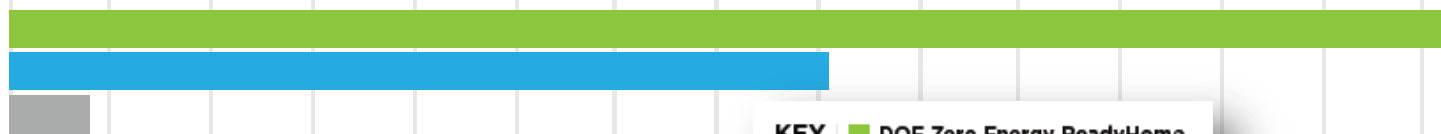
# HEALTHFUL ENVIRONMENT



# COMFORT PLUS



# ADVANCED TECHNOLOGY



**KEY**

- DOE Zero Energy ReadyHome
- ENERGY STAR Certified Home
- Existing Home

# ULTRA EFFICIENT



## Marketing

## Recognition

## Knowledge



### Lives Better

#### HEALTHFUL ENVIRONMENT

Every DOE Zero Energy Ready Home has a comprehensive package of measures to minimize dangerous pollutants, provide continuous fresh air, and effectively filter the air you breathe.

#### COMFORT PLUS

Superior insulation, windows, air sealing and space conditioning systems included in every DOE Zero Energy Ready Home surround you with even temperatures, low-humidity, and quiet in every room on every floor.

**KEY** ■ DOE Zero Energy Ready Home  
■ ENERGY STAR Certified Home  
■ Existing Home



### Works Better

#### ADVANCED TECHNOLOGY

Every DOE Zero Energy Ready Home begins with solid building science specified by ENERGY STAR for Homes, and then adds advanced technologies and practices from DOE's world-class research program, Building America.

#### ULTRA EFFICIENT

Compared to a typical home, an ultra efficient Zero Energy Ready Home is inexpensive to own. In fact, every DOE Zero Energy Ready Home is so energy efficient, a small solar electric system can easily offset most, or all, of your annual energy consumption. We call this Zero Net-Energy Ready.



### Lasts Better

#### QUALITY BUILT

Advanced construction practices and technologies are specified for every DOE Zero Energy Ready Home. Then they are enforced by independent verifiers with detailed checklists and prescribed diagnostics.

#### DURABILITY

The advanced levels of energy savings, comfort, health, durability, quality and future performance in every DOE Zero Energy Ready Home provide value that will stand the test of time, and will meet and exceed forthcoming code requirements.

LEARN MORE AT: [buildings.energy.gov/zero](http://buildings.energy.gov/zero)

### The Future of Housing—Today

Only a select group of the top builders in the country meet the extraordinary levels of excellence and quality specified by U.S. Department of Energy guidelines.



LEARN MORE AT:  
[buildings.energy.gov/zero](http://buildings.energy.gov/zero)



Call us at:  
303-231-4567

[NewTown@net.com](mailto:NewTown@net.com)



### A Symbol of Excellence

#### HEALTHFUL ENVIRONMENT



#### COMFORT PLUS



#### ADVANCED TECHNOLOGY



#### ULTRA EFFICIENT



#### QUALITY BUILT



#### DURABILITY



**KEY** ■ DOE Zero Energy Ready Home  
■ ENERGY STAR Certified Home  
■ Existing Home

This label indicates relative performance of this DOE Zero Energy Ready Home to existing homes (built between 1990 and 2010) and ENERGY STAR Certified Homes. Actual performance may vary.



Front Cover

Inside Spread

Flap

Back Cover



Marketing

Recognition

Knowledge



# Consumer Recognition

Marketing

Recognition

Knowledge

## Links Buyers to Leading Edge Builders:

- Contact Information
- Optional Commitments



- # Labeled Homes
- Website link

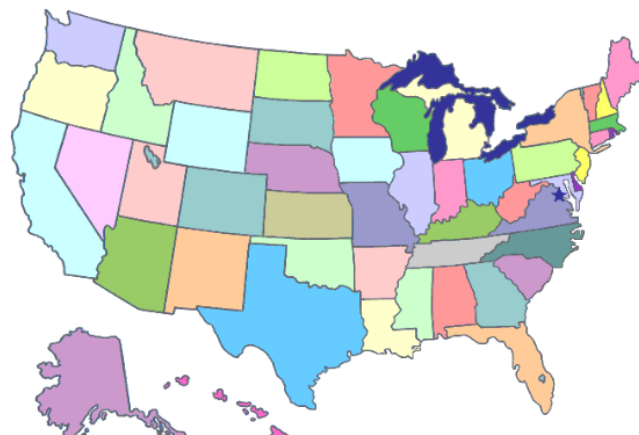
For All Active Partners

### DOE Challenge Home Partner Locator

Find out who is taking the challenge. Locate [DOE Challenge Home](#) partners near you! First choose a partner type and select a state. You can also enter a company name and find DOE Challenge Home partners that match your search.

*Please note: Partners began registering for the new DOE CHALLENGE HOME on April 2, 2012. The locator will not produce large results of partners in the program for several weeks. Please check back to watch our progress.*

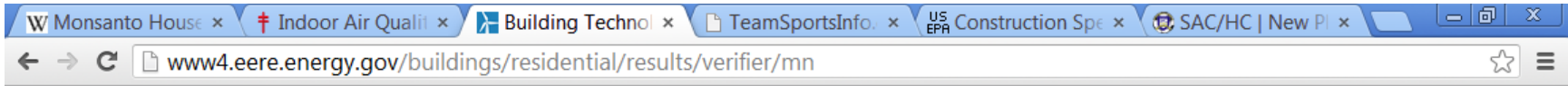
Organization Type:  Choose a State:  [See Results](#)



## Marketing

## Recognition

## Knowledge



- About
- Take Action to Save Energy
- Partner With DOE
- Activities
  - Solar Decathlon
  - Building America
  - Home Energy Score
  - Home Performance with ENERGY STAR
  - Better Buildings Neighborhood Program
  - Challenge Home
    - Partner Log In
    - Become a Partner
    - Criteria
    - Partner Locator
    - Events
  - Guidelines for Home Energy Professionals
  - Technology Research, Standards, & Codes

### DOE Challenge Home: Results

These are all verifiers who are located (or do business) in Minnesota.

[\[Modify Search\]](#) [\[New Search\]](#)

First
Prev
1
2
Next
Last

| 100% Partners                                    |             |             |       |                                  |  |
|--------------------------------------------------|-------------|-------------|-------|----------------------------------|--|
| Name                                             | Commitments | City        | State | # of DOE Challenge Home Projects |  |
| <a href="#">Building Science Institute Inc.</a>  |             | HINSDALE    | IL    |                                  |  |
| <a href="#">Habitat for Humanity of Ohio-Ky</a>  |             | HAMILTON    | OH    |                                  |  |
| <a href="#">Midwestern Energy Solutions, LLC</a> |             | OELWEIN     | IA    |                                  |  |
| <a href="#">SustainMax, LLC</a>                  |             | MINNEAPOLIS | MN    |                                  |  |

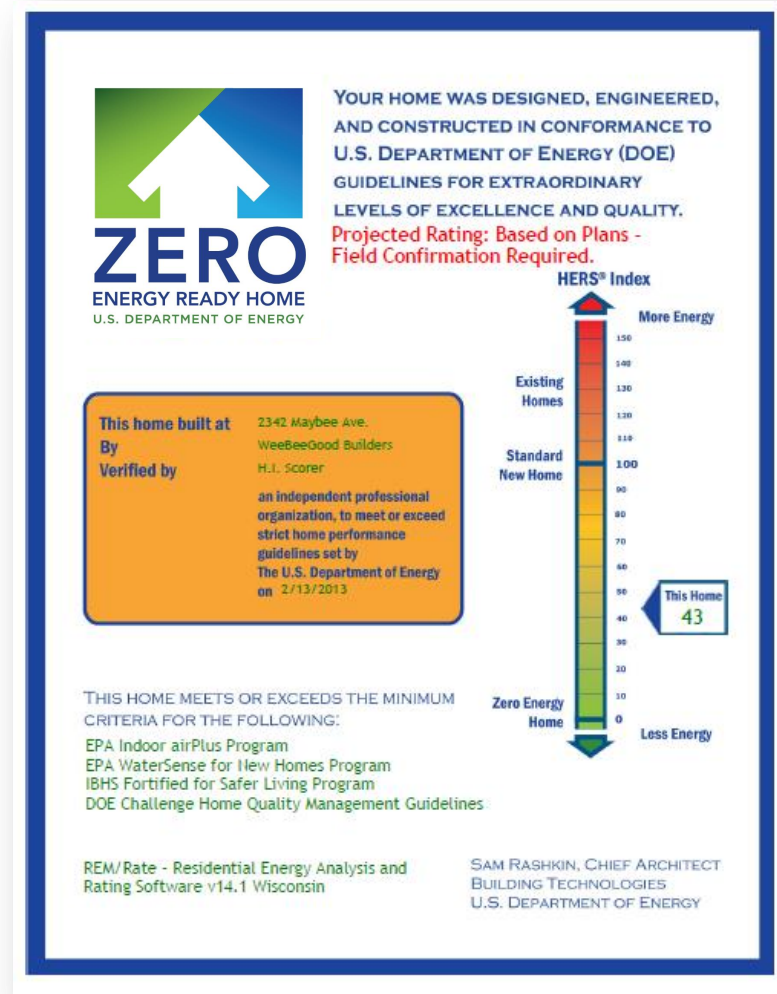
| Name                                          | Commitments | City         | State | # of DOE Challenge Home Projects |  |
|-----------------------------------------------|-------------|--------------|-------|----------------------------------|--|
| <a href="#">Bluegill Energy Management</a>    |             | KATY         | TX    |                                  |  |
| <a href="#">Building Efficiency Resources</a> |             | HOLCOMBVILLE | NY    |                                  |  |

Marketing

Recognition

Knowledge

- **Rater Prints Certificate**  
from rating software
- **Certificate Includes:**
  - Rating Details
  - Graphic HERS Index
  - Optional Programs



## Marketing

## Recognition

## Knowledge

U.S. DEPARTMENT OF **ENERGY** | Energy Efficiency & Renewable Energy

**BUILDING TECHNOLOGIES PROGRAM**

**DOE CHALLENGE HOME CASE STUDY**

**e2 Homes**  
Winter Park, Florida



**BUILDER PROFILE**

**e2 Homes**  
President: Rob Smith  
P.O. Box 3300  
Winter Park, FL 32790  
407-923-4229  
rob@e2homes.com

- FEATURED HOME/DEVELOPMENT:**
- First Certified Challenge Home—October 2012, Wilson Residence, Winter Park, FL
  - 4 bedrooms, 4 baths
  - 4,305 conditioned space (8,000 with lanai, garage, etc.)
  - Date completed: May/June 2012
  - Performance Data: HERS Index without Solar PV: 57
  - HERS Index with Solar PV: -7
  - Modeled utility bills for a standard home of this size in this utility area: \$3,378
  - Projected utility costs for this home: \$2,297
  - Projected annual energy cost savings for this home (without solar): \$1,081  
PV Production = \$2,420
  - Projected annual energy cost savings for this home (with solar): \$-123



**The Nation's First Certified DOE Challenge Home Leaves a BIG Impression with a SMALL Footprint**

The first certified DOE Challenge Home—the “Wilson Residence” in Winter Park, Florida—produces more energy than it uses with construction costs one-third less than originally proposed. Completed in May 2012, this 4-bedroom, 4-bath 8,000-ft<sup>2</sup> (4,305-ft<sup>2</sup> in conditioned space) custom home scores a HERS 57, which is well below the HERS 100 for a standard home built to code. With its photovoltaic system, the home produces better than net-zero energy, with a score of HERS -7, which translates into no electric utility bills and even \$123 annually in the homeowner's pocket from the utility.

The homeowner, Mr. Wilson, hired e2 Homes to build his dream home. From the start, Rob Smith (the president of e2 Homes) worked with the homeowner, his HERS rater, and his mechanical contractor to study how differing efficiency measures would impact cost, energy-efficiency, comfort, and durability. “The DOE Challenge Home is data driven and performance driven, based on all the standards...and it addresses concerns of different climates,” said Smith. The team used the Challenge Home requirements (along with specifications from LEED for Homes, the Florida Green Building Coalition, the Florida Water Star Gold, and other programs) to analyze best practices in their climate zone compared to costs.

As specified in the Challenge Home requirements, the envelope was designed to meet all ENERGY STAR Version 3 requirements and 2012 IECC insulation levels. Final blower door tests show a tight envelope at 1.77 ACH 50.


The exterior walls were constructed of Aercon Autoclaved Aerated Concrete (AAC) blocks. “My client wanted AACs to avoid using drywall [in this hot humid climate],” said Smith. Like concrete block, AAC is also mold-resistant, non-combustible, and not penetrable by termites or pests, but the unique foam-like structure of the AAC also makes it insulating (R-8 for an 8-inch block), strong resistant, lightweight (one-fifth the weight of concrete), easy to saw or drill, and sound (AAC blocks and panels come structurally reinforced with rebar).

The window package they ultimately selected is ENERGY STAR, low-E 366 glass blocks 95% of ultraviolet and infrared light, double-pane, and vinyl with a U-factor of 0.27.

The roof is light-colored Galvalume standing-seam metal assembled over engineered roof trusses that are spray foamed underneath to R-20, to create a sealed, conditioned attic that keeps summer temperatures down to 85°F instead of a typical 150°F.

**DOE CHALLENGE HOME e2 HOMES**

All of the 962-square-foot porch roof is comprised of solar panels with a 13.4-Kw solar array system. The 69 panels don't sit on top of the roof, they are the roof. The completely water-tight structure allows about 15% of natural light to filter through the panels, lighting the space below. The panels are dual surface meaning they can produce power from any sunlight reflected up onto their lower surface, for up to 30% greater than rated power production. All wiring is hidden within the canopy's aluminum support beams.



- CHALLENGE HOME CERTIFIED:**
- BASELINE**  
Certified ENERGY STAR home
  - ENVELOPE**  
meets or exceeds 2012 IECC levels
  - DUCT SYSTEM**  
located with the home's thermal boundary
  - WATER EFFICIENCY**  
meets or exceeds the EPA WaterSense Section 3.3 specs
  - LIGHTING AND APPLIANCES**  
ENERGY STAR qualified
  - INDOOR AIR QUALITY**  
meets or exceeds the EPA Indoor airPLUS Verification Checklist
  - RENEWABLE READY**  
meets EPA Renewable Energy-Ready Home Solar Electric and Thermal Checklists

Every DOE Challenge Home combines building science specified by ENERGY STAR for Homes and advanced technologies and practices from DOE's Building America research program.



As required by the Challenge Home, the ducts and air handler are located within conditioned space—in the unvented, insulated attic. The home is heated and cooled by three systems: on the first floor a heat pump (SEER-18, HSPF 9.5), in the master bedroom a ducted mini-split heat pump (SEER 16, HSPF 10), and on the second floor another heat pump (SEER 16.5, HSPF 9).

The team designed the ventilation system to create a slight positive pressure in the house to help control humidity. The “economy ventilation system” includes a fresh air duct to the outside of the home that is set to an electric damper regulated by the thermostat to meet ASHRAE ventilation standards.

The home is water efficient in several ways. Two tankless, propane-fired water heaters are located as close to their points of use as possible to minimize water and energy waste (i.e., one near the master bedroom and the other near the kitchen, laundry room, and other bedrooms). Also, the house is double piped so that a 7,000-gallon cistern collects and supplies rain water to all toilets, urinals, and plants in the backyard.

With the home designed for maximum energy and water conservation, the 13.5-kw Sanyo photovoltaic system completes the house. Rather than mounting the 69 solar panels on the roof, the company Superior Solar, fit them together to form a watertight structure that literally is the roof of the home's 962-ft<sup>2</sup> lanai. The Sanyo HIT Double 195 Watt solar panels are bifacial, meaning they can generate some electricity from reflected light that hits the bottom side of the panels. The panels also permit about 15% of the daylight to filter through them, lighting the porch area beneath. The hybrid inverter, a SolarEdge Power Optimizer and Inverter system, converts the panel-produced direct current power into a utility-compatible alternating current, using a unique technology that overcomes the limitations of traditional central string inverter systems but at a much lower cost than micro-inverter systems.

“At the end of the day, my message for builders considering [building to] Challenge Home is that this program is very rigorous, so it should help builders stand out from the crowd,” said Smith. “If you start early in the process, there doesn't have to be a cost differential to implement high-performance building.”

U.S. DEPARTMENT OF **ENERGY** | Energy Efficiency & Renewable Energy

For more information on the DOE Challenge Home, go to [www.buildingamerica.gov/challenge](http://www.buildingamerica.gov/challenge)

PNHL-SA-XXXXX November 2012

**Building America**  
U.S. Department of Energy  
[www.BuildingAmerica.gov](http://www.BuildingAmerica.gov)



Marketing

Recognition

Knowledge



# Award Recognition

# Housing Innovation Awards

Marketing

Recognition

Knowledge



Marketing

Recognition

Knowledge



# Appraisal Recognition

# Step One: Document 3rd-Party Certification

Marketing

Recognition

Knowledge

A wide array of programs qualify as green or energy efficient including the DOE Zero Energy Ready Home. Use the Verification Form to document program compliance.

## DOE Challenge Home Verification

Projected Rating: Based on Plans - Field Confirmation Required.

| Energy Performance                                         |                                                        |
|------------------------------------------------------------|--------------------------------------------------------|
| House Type                                                 | DOE Challenge Home Builder Partner ID#                 |
| Single-family detached                                     | 12345                                                  |
| Year built                                                 | Square footage of Conditioned Space including Basement |
| 2013                                                       | 3968.0                                                 |
| Number of Bedrooms                                         | Square footage of Conditioned Space without Basement   |
| 4                                                          | 2368.0                                                 |
| Site address (if not available, list the site Lot #)       | Registered Builder                                     |
| 555 Main Street                                            |                                                        |
| Cold City                                                  | Certified Rater                                        |
| MN, 20853                                                  |                                                        |
| HERS Index without On-site Generation                      | Date of Rating                                         |
| 46                                                         |                                                        |
| HERS Index with On-site Generation                         | Rating Software                                        |
| 46                                                         | REM/Rate - v14.2                                       |
| HERS Index of the Target Home using size adjustment factor | Estimated annual energy costs(\$)                      |
| 46                                                         | 1372                                                   |
| Estimated annual energy use                                | Estimated annual energy savings                        |
| Electric: 10825 kWh \ Natural Gas: 773 Therms              | Electric: 4081 kWh \ Natural gas: 1171 Therms          |
| Energy cost rates                                          | Estimated annual emissions reductions                  |
| Electric: 0.08 \$/kWh \ Natural Gas: 0.50 \$/Therms        | CO2: 10.2 tons / SO2: 16.4 lbs / NOx: 31.2 lbs         |

### DOE Challenge Home Certification

As the certified Rater for this house, I certify this house meets/complies with all mandatory requirements of the DOE Challenge home guidelines, including the following:

|                                     |                                                                                                                                                                             |
|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> | Compliance with all ENERGY STAR Qualified Homes Version 3 requirements and checklists                                                                                       |
| <input checked="" type="checkbox"/> | Compliance with Mandatory Fenestration Requirements                                                                                                                         |
| <input checked="" type="checkbox"/> | Compliance with Mandatory Insulation Requirements                                                                                                                           |
| <input checked="" type="checkbox"/> | Compliance with Mandatory Duct Location Requirements                                                                                                                        |
| <input checked="" type="checkbox"/> | Compliance with Mandatory Appliance Requirements                                                                                                                            |
| <input checked="" type="checkbox"/> | Compliance with Mandatory Lighting Requirements                                                                                                                             |
| <input checked="" type="checkbox"/> | Compliance with Mandatory Fan Efficiency Requirements                                                                                                                       |
| <input checked="" type="checkbox"/> | Compliance with Mandatory Indoor Air Quality Requirements                                                                                                                   |
| <input checked="" type="checkbox"/> | Compliance with Mandatory Renewable Energy Ready Solar Electric Requirements                                                                                                |
| <input checked="" type="checkbox"/> | Compliance with Mandatory Renewable Energy Ready Solar Hot Water Requirements                                                                                               |
|                                     | This home was qualified via sampling in lieu of testing, in accordance with allowable sampling provisions as stated in the DOE Challenge Home National Program Requirements |

### Optional Compliance for Builder Recognition

I further certify that the following also apply to this house:

| YES                                 | NO                       | DONT KNOW                | Optional Home Builder Commitments for Recognition |
|-------------------------------------|--------------------------|--------------------------|---------------------------------------------------|
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Certified under the EPA Indoor airPLUS Program*   |

\*Certification under the DOE Challenge Home permits limited exceptions to full compliance with Indoor airPLUS. Builders seeking the Indoor airPLUS label must achieve full compliance with the Indoor airPLUS Verification Checklist.

REM/Rate - Residential Energy Analysis and Rating Software v14.2

This information does not constitute any warranty of energy cost or savings.

© 1985-2013 ArchitecturalEnergy Corporation, Boulder, Colorado.

# Step Two: Specify Green Appraiser

Marketing

Recognition

Knowledge

In many markets you are eligible to specify an appraiser only from the Green Residential Appraiser List. These appraisers have been trained to recognize the value of high-performance home improvements.

Need Help? Call 888-7JOINAI (756-4624)

AI Resources Find an Appraiser Education Publications / Store Professional Practice Lum Library News / Advocacy About Us

Home > Find An Appraiser > Professional Development Program Registry > Valuation of Sustainable Buildings: Residential

Find an Appraiser

### Professional Development Program Registry

#### Valuation of Sustainable Buildings: Residential

**NOTE:** This Registry only lists Appraisal Institute Designated Members who have successfully passed the Valuation of Sustainable Buildings Professional Development Program examinations.

There may be other qualified Appraisal Institute Designated members, Candidates for Designation, or Practicing Affiliates who may handle green/sustainability assignments but have not taken the Valuation of Sustainable Buildings Professional Development Program. Visit the [Find an Appraiser directory](#) to find Designated members, Candidates for Designation, or Practicing Affiliates who have identified green/sustainability as a specialty.

[View Program FAQs](#)

Please read this notice regarding Professional Development Programs

\* Has not completed the Residential and Commercial Valuation of Solar course. Those on the registry have until May 1, 2014 to complete Residential and Commercial Valuation of Solar to remain on the registry.

Select State/Province

| Name                                                     | Company                                  | City, State        | Accepts Fee Assignments |
|----------------------------------------------------------|------------------------------------------|--------------------|-------------------------|
| <a href="#">SELECT</a> Sandra K. Adomatis, SRA           | Adomatis Appraisal Service               | Punta Gorda, FL    | Yes                     |
| <a href="#">SELECT</a> John T. Ashworth, III, SRA *      | Ashworth Appraisal Services              | Auburn, CA         | Yes                     |
| <a href="#">SELECT</a> Robert D. Binow, MAJ *            | Principal Real Estate Investors          | Des Moines, IA     | Yes                     |
| <a href="#">SELECT</a> David P. Bouvent, SRA *           | Key Appraisal Services                   | Sarasota, FL       | Yes                     |
| <a href="#">SELECT</a> Donald N. Briggs, MAJ, SRA        | Briggs Associates, Inc.                  | Emmitsburg, MD     | Yes                     |
| <a href="#">SELECT</a> Thedi W. Chappell, MAJ            | Sustainable Values, Inc.                 | Park City, UT      | Yes                     |
| <a href="#">SELECT</a> Lynn N. Christensen, SRA *        | Lynn Christensen Appraising Inc.         | Layton, UT         | Yes                     |
| <a href="#">SELECT</a> Steven D. Clauson, MAJ            | Real Estate Science, Inc.                | Washington, DC     | Yes                     |
| <a href="#">SELECT</a> Michael D. Colias, SRA *          | JP Morgan Chase                          | Tampa, FL          | No                      |
| <a href="#">SELECT</a> Benjamin B. Davidson, MAJ *       | Blake and Associates, LLC                | Conifer, CO        | Yes                     |
| <a href="#">SELECT</a> Lisa K. Desmarais, SRA *          | Peak to Peak Appraising, LLC             | Broomfield, CO     | Yes                     |
| <a href="#">SELECT</a> Christopher B. Dullard, MAJ *     |                                          | Skillman, NJ       | Yes                     |
| <a href="#">SELECT</a> Lamar H. Ellis, III, SRA *        |                                          | Atlanta, GA        | Yes                     |
| <a href="#">SELECT</a> Anthony L. Gines, Jr., MAJ *      | Real Property Consultants, Inc.          | Clark, NJ          | Yes                     |
| <a href="#">SELECT</a> Karen L. Goforth, MAJ *           | Wells Fargo Bank - RETECHS               | St. Petersburg, FL | Yes                     |
| <a href="#">SELECT</a> Franklin Frederick Griffin, SRA * | Griffin Real Estate & Appraisals         | Tampa, FL          | Yes                     |
| <a href="#">SELECT</a> Steve L. Hales, SRA *             | Residential Appraisal Services, LLC      | Ogden, UT          | Yes                     |
| <a href="#">SELECT</a> Margaret A. Hambleton, SRA *      | Hambleton, Inc.                          | Columbus, OH       | Yes                     |
| <a href="#">SELECT</a> Christopher T. Hansen, MAJ *      | Appraisal Group, Inc.                    | Midvale, UT        | Yes                     |
| <a href="#">SELECT</a> Michael H. Hatch, SRA *           | Michael Hatch Real Estate Appraisal, Inc | Las Vegas, NV      | Yes                     |
| <a href="#">SELECT</a> Craig S. Heaton, SRA *            | C. S. Heaton Appraisals, Inc.            | Mesa, AZ           | Yes                     |
| <a href="#">SELECT</a> Robert D. Hiersley, MAJ *         | CB Richard Ellis, Inc.                   | Walnut Creek, CA   | Yes                     |
| <a href="#">SELECT</a> Joni L. Hemdon, SRA *             | Real Property Analysts/Gulf Coast        | Tampa, FL          | Yes                     |
| <a href="#">SELECT</a> Michael Hobbs, SRA                | Pahroo Appraisal & Consultancy           | Chicago, IL        | Yes                     |
| <a href="#">SELECT</a> Daniel J. Houhan, MAJ *           | Houhan & O'Malley Real Estate Services   | Bronxville, NY     | Yes                     |
| <a href="#">SELECT</a> Richard W. Hughes, MAJ, SRA *     |                                          | Adel, IA           | Yes                     |
| <a href="#">SELECT</a> Anthony C. Iacolo, MAJ *          | Blake & Iacolo LLC                       | Manhasseton, NY    | Yes                     |
| <a href="#">SELECT</a> Blake Ingram, SRA *               | Blake Ingram Appraisal Group, Inc.       | Salt Lake City, UT | Yes                     |
| <a href="#">SELECT</a> Mary A. Jewell, SRA *             | Morgan Starkey                           | Tampa, AZ          | No                      |
| <a href="#">SELECT</a> Jeffrey R. Jorgensen, SRA *       | Jorgensen Residential Appraisal          | Draper, UT         | Yes                     |

[Visit Lum Library](#)

[Sign up for Appraiser News Online](#)



# Step Three: Complete Green Appraiser Form

Marketing


Recognition

Knowledge

Download Appraisal Institute Form 820.04: Residential Green and Energy Efficient Addendum from:

[www.appraisalinstitute.org/educationongreen\\_energy\\_addendum.aspx](http://www.appraisalinstitute.org/educationongreen_energy_addendum.aspx)

Complete the form and provide a copy to the lender as guidance to for including all DOE ZERH Home improvements in the final report.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                   |                                                                           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|---------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Client File #:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Appraisal File #:                                                 |                                                                           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>Residential Green and Energy Efficient Addendum</b>                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                   |                                                                           |
| Client: Joe Doe                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Subject Property: Climate Zone 5a                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                   |                                                                           |
| City: Anytown                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | State: USA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Zip: 12345                                                        |                                                                           |
| <p>Additional resources to aid in the valuation of green properties and the completion of this form can be found at <a href="http://www.appraisalinstitute.org/education/green_energy_addendum.aspx">http://www.appraisalinstitute.org/education/green_energy_addendum.aspx</a></p> <p>The appraiser hereby certifies that the information provided within this addendum:</p> <ul style="list-style-type: none"> <li>has been considered in the appraiser's development of the appraisal of the subject property only for the client and intended user(s) identified in the appraisal report and only for the intended use stated in the report.</li> <li>is not provided by the appraiser for any other purpose and should not be relied upon by parties other than those identified by the appraiser as the client or intended user(s) in the report.</li> <li>is the result of the appraiser's routine inspection of and inquiries about the subject property's green and energy efficient features. Extraordinary assumption: Data provided herein is assumed to be accurate and if found to be in error could alter the appraiser's opinions or conclusions.</li> <li>is not made as a representation or as a warranty as to the efficiency, quality, function, operability, reliability or cost savings of the reported items or of the subject property in general, and this addendum should not be relied upon for such assessments.</li> </ul> <p><b>Green Building:</b> The practice of creating structures and using processes that are environmentally responsible and resource-efficient throughout a building's lifecycle from siting to design, construction, operation, maintenance, renovation, and deconstruction. This practice expands and complements the classic building design concerns of economy, utility, durability, and comfort.<sup>1</sup> High Performance building and green building are often used interchangeably.</p> <p><b>Six Elements of Green Building:</b> A green building has attributes that fall into the six elements of green building known as (1) site, (2) water, (3) energy, (4) materials, (5) indoor air quality, and (6) maintenance and operation. A Green Building will be energy efficient but an energy efficient building is not synonymous with Green Building.</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                   |                                                                           |
| <b>Green Features</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                   |                                                                           |
| The following items are considered within the appraised value of the subject property:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                   |                                                                           |
| <b>Certification</b> DOE Challenge Home                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Year Certified: 2013                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Certifying Organization:<br><input type="checkbox"/> Home Innovation Research Labs (ICC-700)<br><input type="checkbox"/> USGBC (LEED) <input checked="" type="checkbox"/> Other:                                                                                                                                                                                                                                                                                                                                                                             | <input checked="" type="checkbox"/> Verification Reviewed on site | <input checked="" type="checkbox"/> Certification attached to this report |
| <b>Rating Certified</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Score: N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <input type="checkbox"/> LEED Certified: <input type="checkbox"/> LEED Silver <input type="checkbox"/> LEED Gold <input type="checkbox"/> LEED Platinum<br><input type="checkbox"/> ICC-700 National Green Building Standard Certified: <input type="checkbox"/> Bronze <input type="checkbox"/> Silver <input type="checkbox"/> Gold <input type="checkbox"/> Emerald<br>Green Certifying Organization URL (website) <a href="http://www1.eere.energy.gov/buildings/residential/ch_index.html">www1.eere.energy.gov/buildings/residential/ch_index.html</a> |                                                                   |                                                                           |
| <b>Additions</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Explain any additions or changes made to the structure since it was certified: N/A                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                   |                                                                           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Do changes require recertification to verify rating is still applicable? <input type="checkbox"/> Yes <input type="checkbox"/> No                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                   |                                                                           |
| <b>Comments</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Attach the rating worksheet that provides the ratings for each element to provide a better understanding of the features. The worksheet will assist in comparing the subject to sales rated by different organizations. <p>If a property is built green but not formally certified, it still deserves proper description and analysis to value the features. The market analysis is of the structure's physical, economic, and locational attributes and not an analysis of its label alone.</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                   |                                                                           |
| <p>The objective of this Addendum is to standardize the communication of the high performing features of residential properties. Identifying the features not found on the 1004 form provides a basis for comparable selection and analysis of the features. Builders, contractors, homeowners, and third party verifiers are encouraged to complete this Addendum and present to appraisers, agents, lenders, and homeowners.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                   |                                                                           |

<sup>1</sup> U.S. Environmental Protection Agency at [www.epa.gov/greenbuildings/pubs/about.htm](http://www.epa.gov/greenbuildings/pubs/about.htm).



# Residential Green and Energy Addendum

## Marketing

## Recognition

## Knowledge

|                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                  |                                                                                                                                                                                                     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Client: Joe Doe                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                     | Client File #:                                                                                                                                                   |                                                                                                                                                                                                     |
| Subject Property: Climate Zone 5                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                     | Appraisal File #:                                                                                                                                                |                                                                                                                                                                                                     |
| <b>ENERGY EFFICIENT ITEMS</b>                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                  |                                                                                                                                                                                                     |
| The following items are considered within the appraised value of the subject property:                                                                                                                                            |                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                  |                                                                                                                                                                                                     |
| Insulation                                                                                                                                                                                                                        | <input type="checkbox"/> Fiberglass Blow-In <input checked="" type="checkbox"/> Foam Insulation <input type="checkbox"/> Cellulose <input type="checkbox"/> Fiberglass Batt Insulation                                                                                                              |                                                                                                                                                                  | R-Value:                                                                                                                                                                                            |
|                                                                                                                                                                                                                                   | <input type="checkbox"/> Other (Describe): High Density SPF                                                                                                                                                                                                                                         |                                                                                                                                                                  | <input type="checkbox"/> Walls 35<br><input type="checkbox"/> Ceiling 49<br><input type="checkbox"/> Floor 30                                                                                       |
| <input checked="" type="checkbox"/> Basement Insulation (Describe):<br><input type="checkbox"/> HERS Insulation Installed Rating: <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 (See Glossary) |                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                  |                                                                                                                                                                                                     |
| Envelope                                                                                                                                                                                                                          | Envelope Tightness: 1.25   Unit: <input type="checkbox"/> CFM25 <input type="checkbox"/> CFM50 <input checked="" type="checkbox"/> ACH50 <input type="checkbox"/> ACHnatural                                                                                                                        |                                                                                                                                                                  |                                                                                                                                                                                                     |
| <input checked="" type="checkbox"/> Envelope Tightness based on Blower Door Test                                                                                                                                                  |                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                  |                                                                                                                                                                                                     |
| Water Efficiency                                                                                                                                                                                                                  | <input type="checkbox"/> Reclaimed Water System (Explain):                                                                                                                                                                                                                                          |                                                                                                                                                                  | Location of cistern:                                                                                                                                                                                |
|                                                                                                                                                                                                                                   | <input type="checkbox"/> Cistern - Size: Gallons                                                                                                                                                                                                                                                    |                                                                                                                                                                  |                                                                                                                                                                                                     |
| <input type="checkbox"/> Greywater reuse system                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                  |                                                                                                                                                                                                     |
| Windows                                                                                                                                                                                                                           | <input checked="" type="checkbox"/> ENERGY STAR® <input type="checkbox"/> Low E <input type="checkbox"/> High Impact <input type="checkbox"/> Storm <input type="checkbox"/> Double Pane <input type="checkbox"/> Triple Pane <input type="checkbox"/> Tinted <input type="checkbox"/> Solar Shades |                                                                                                                                                                  |                                                                                                                                                                                                     |
|                                                                                                                                                                                                                                   | <input type="checkbox"/> Skylights - #:<br><input type="checkbox"/> Solar Tubes - <input type="checkbox"/> Other (Explain):                                                                                                                                                                         |                                                                                                                                                                  | <input checked="" type="checkbox"/> ENERGY STAR Light Fixtures                                                                                                                                      |
| Appliances                                                                                                                                                                                                                        | ENERGY STAR® Appliances:                                                                                                                                                                                                                                                                            | Water Heater:                                                                                                                                                    | Appliance Energy Source:                                                                                                                                                                            |
|                                                                                                                                                                                                                                   | <input checked="" type="checkbox"/> Dishwasher<br><input checked="" type="checkbox"/> Refrigerator all appliances<br><input type="checkbox"/> Other:                                                                                                                                                | <input type="checkbox"/> Solar<br><input checked="" type="checkbox"/> Heat Pump<br><input type="checkbox"/> Tankless <input type="checkbox"/> Coil<br>Size: Gal. | <input type="checkbox"/> Propane <input checked="" type="checkbox"/> Electric <input checked="" type="checkbox"/> Natural Gas<br><input type="checkbox"/> Other (Describe):                         |
| HVAC (Describe in Comments Area)                                                                                                                                                                                                  | <input checked="" type="checkbox"/> High Efficiency HVAC SEER: 14<br>Efficiency Rating: % AFUE* 95 %<br>*Annual Fuel-Utilization Efficiency                                                                                                                                                         |                                                                                                                                                                  | <input type="checkbox"/> Thermostat/Controllers <input type="checkbox"/> Passive Solar (Defined in Glossary)<br><br><input type="checkbox"/> Radiant Floor Heat <input type="checkbox"/> Geothermal |
|                                                                                                                                                                                                                                   | <input checked="" type="checkbox"/> Heat Pump Efficiency Rating:<br>COP:   HSPF: 9   SEER:                                                                                                                                                                                                          |                                                                                                                                                                  |                                                                                                                                                                                                     |
|                                                                                                                                                                                                                                   | <input checked="" type="checkbox"/> Programmable Thermostat                                                                                                                                                                                                                                         |                                                                                                                                                                  |                                                                                                                                                                                                     |
| Energy Rating                                                                                                                                                                                                                     | <input checked="" type="checkbox"/> ENERGY STAR® Home - Version: 3<br><br><input type="checkbox"/> Other (Describe):<br>Home Energy Score (HES) (Score range 1-10): 46<br><br><input checked="" type="checkbox"/> Certification Attached                                                            |                                                                                                                                                                  |                                                                                                                                                                                                     |
| Indoor Air Quality                                                                                                                                                                                                                | <input checked="" type="checkbox"/> Indoor Air PLUS Package <input type="checkbox"/> Energy Recovery Ventilator Unit or Whole Building Ventilation System <input type="checkbox"/> Non Toxic Pest Control                                                                                           |                                                                                                                                                                  |                                                                                                                                                                                                     |
| HERS Information                                                                                                                                                                                                                  | Rating: 46                                                                                                                                                                                                                                                                                          | Monthly Energy Savings on Rating: \$ 18.50                                                                                                                       | Date Rated: 5/15/13                                                                                                                                                                                 |
| Utility Costs                                                                                                                                                                                                                     | Average Annual Utility Cost: \$ 141 per month based on: REM/rate                                                                                                                                                                                                                                    |                                                                                                                                                                  | # of Occupants: 4                                                                                                                                                                                   |
| Energy Audit N/A                                                                                                                                                                                                                  | <input type="checkbox"/> Infrared Photograph Attached<br>Has an energy audit/rating been performed on the subject property? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown<br>If yes, comment on work completed as result of audit.                      |                                                                                                                                                                  |                                                                                                                                                                                                     |
| Comments (Include source for information provided in this section)<br><br>Attach documents or reference them in your workfile<br><br>The energy element is the most measurable element of green or high performance housing.      | Information was provided by: Rater's Name and Company                                                                                                                                                                                                                                               |                                                                                                                                                                  |                                                                                                                                                                                                     |
|                                                                                                                                                                                                                                   | Attach REM/rate reports, filled out checklists for EPA indoor airPLUS, EPA renewable ready home solar electric and EPA renewable ready home solar thermal                                                                                                                                           |                                                                                                                                                                  |                                                                                                                                                                                                     |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |                                                                                                                                                                                                                                                     |                                                                         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| Client: Joe Doe                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     | Client File #:                                                                                                                                                                                                                                      |                                                                         |
| Subject Property: Climate Zone 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     | Appraisal File #:                                                                                                                                                                                                                                   |                                                                         |
| <b>Solar Panels</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |     |                                                                                                                                                                                                                                                     |                                                                         |
| The following items are considered within the appraised value of the subject property: RENEWABLE READY HOME                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |     |                                                                                                                                                                                                                                                     |                                                                         |
| Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | N/A | Array #1 <input type="checkbox"/> Leased <input type="checkbox"/> Owned                                                                                                                                                                             | Array #2 <input type="checkbox"/> Leased <input type="checkbox"/> Owned |
| kw (size)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     | <input type="checkbox"/> If Active System - type <input type="checkbox"/> Solar Thermal Water Heating System<br><input type="checkbox"/> If Passive System - type <input type="checkbox"/> Integral collector <input type="checkbox"/> Thermosyphon |                                                                         |
| Manufacturer of Panels                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     | Storage Tank Size   # Gallons:                                                                                                                                                                                                                      |                                                                         |
| Warranty on Panels                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     | Collector Type<br><input type="checkbox"/> Flat-Plate Collector<br><input type="checkbox"/> Integral Collector<br><input type="checkbox"/> Evacuated-Tube Solar                                                                                     |                                                                         |
| Age of Panels                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     | Back-Up System<br><input type="checkbox"/> Conventional Water Htr<br><input type="checkbox"/> Tankless On Demand<br><input type="checkbox"/> Tankless Heat Pump                                                                                     |                                                                         |
| Energy Production kWh per Array                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     | Age of System                                                                                                                                                                                                                                       |                                                                         |
| Source for Energy Production Estimate                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     | Warranty Term                                                                                                                                                                                                                                       |                                                                         |
| Location (Roof, Ground, Etc.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     | Manufacturer                                                                                                                                                                                                                                        |                                                                         |
| Tilt/Slope for Array                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     | Solar Energy Factor (SEF)<br>(Rating range 1 to 11 - higher number is more efficient)                                                                                                                                                               |                                                                         |
| Azimuth per Array                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |     | Manufacturer                                                                                                                                                                                                                                        |                                                                         |
| Age of Inverter(s)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     | Warranty Term                                                                                                                                                                                                                                       |                                                                         |
| Manufacturer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |     |                                                                                                                                                                                                                                                     |                                                                         |
| Warranty Term                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |                                                                                                                                                                                                                                                     |                                                                         |
| Name of Utility Company:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     | Cost per kWh charged by Company: \$ /kWh                                                                                                                                                                                                            |                                                                         |
| Comments (Discuss source of information and define other renewable energy sources, such as wind, hydropower, biomass power, etc.<br>This home is renewable ready for solar electric and thermal.<br><br>Discuss incentives available for new panels, condition of current panels, and any maintenance issues. If leased, provide the lease terms.)<br><br>A free online tool and manual for valuing the energy production of the Solar PV System is available at <a href="http://www.pvvalue.com">www.pvvalue.com</a><br><br>Download the PV Value™ Manual for explanation of the solar terms on this form and inputs used in the PV Value Tool. |     |                                                                                                                                                                                                                                                     |                                                                         |

# Residential Green and Energy Addendum

## Marketing

## Recognition

## Knowledge

|                                                                                        |                                                                                                                                                                                                             |                                                                                           |                                                                             |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| Client:                                                                                | Joe Doe                                                                                                                                                                                                     | Client File #:                                                                            |                                                                             |
| Subject Property:                                                                      | Climate Zone 5                                                                                                                                                                                              | Appraisal File #:                                                                         |                                                                             |
| <b>Location - Site</b>                                                                 |                                                                                                                                                                                                             |                                                                                           |                                                                             |
| The following items are considered within the appraised value of the subject property: |                                                                                                                                                                                                             |                                                                                           |                                                                             |
| Walk Score <b>N/A</b>                                                                  | Score:                                                                                                                                                                                                      | Source:                                                                                   | (Example: <a href="http://www.walkscore.com">http://www.walkscore.com</a> ) |
| Public Transportation <b>N/A</b>                                                       | <input type="checkbox"/> Bus - Distance: Blocks                                                                                                                                                             | <input type="checkbox"/> Train - Distance: Blocks                                         | <input type="checkbox"/> Subway - Distance: Blocks                          |
| Site                                                                                   | Orientation - front faces:<br><input type="checkbox"/> East/West <input checked="" type="checkbox"/> North/South                                                                                            | Landscaping:<br><input type="checkbox"/> Water Efficient <input type="checkbox"/> Natural |                                                                             |
| Comments                                                                               | DOE Challenge Home certification concentrates only on the actual physical building and its high performance aspects.                                                                                        |                                                                                           |                                                                             |
| <b>Incentives - Amount of Incentive and Terms</b>                                      |                                                                                                                                                                                                             |                                                                                           |                                                                             |
| The following items are considered within the appraised value of the subject property: |                                                                                                                                                                                                             |                                                                                           |                                                                             |
| Federal                                                                                |                                                                                                                                                                                                             |                                                                                           |                                                                             |
| State                                                                                  |                                                                                                                                                                                                             |                                                                                           |                                                                             |
| Local                                                                                  |                                                                                                                                                                                                             |                                                                                           |                                                                             |
| Source<br>(For example <a href="http://www.dsir.usa.org">www.dsir.usa.org</a> )        |                                                                                                                                                                                                             |                                                                                           |                                                                             |
| Comments                                                                               | Incentives offset cost and should be reported in the cost approach section of the report. Incentives are typically not a sales comparison approach concession since they do not transfer with the property. |                                                                                           |                                                                             |
| Completed by: <b>Builder or Rater</b>                                                  | Title: <b>GC or Rater</b>                                                                                                                                                                                   | Date: <b>5/15/13</b>                                                                      |                                                                             |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |                   |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------------------|--|
| Client:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  | Client File #:    |  |
| Subject Property:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  | Appraisal File #: |  |
| <b>Residential Green and Energy Efficient Addendum<br/>Glossary and Resources</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                   |  |
| <p><b>ICC-700 National Green Building Standard (NGBS):</b> An ANSI-approved residential green building standard developed by the National Association of Home Builders (NAHB) and the International Code Council (ICC). It is applicable to single and multifamily projects, renovations and additions and residential land development. To comply, all buildings must incorporate sustainable lot development techniques and address energy, water &amp; material resource efficiency and indoor environmental quality. Also, all owners must be educated about building operation and maintenance. Certification to the NGBS is provided by the Home Innovation Research Labs. <a href="http://www.nahb.org/page.aspx/generic/sectionID=2510">http://www.nahb.org/page.aspx/generic/sectionID=2510</a> or <a href="http://www.homeinnovation.com/">http://www.homeinnovation.com/</a></p> <p><b>LEED: Leadership in Energy and Environmental Design</b> is redefining the way we think about the places where we live, work and learn. As an internationally recognized mark of excellence, LEED provides building owners and operators with a framework for identifying and implementing practical and measurable green building design, construction, operations and maintenance solutions. <a href="http://www.usgbc.org/DisplayPage.aspx?CMSPageID=1988">http://www.usgbc.org/DisplayPage.aspx?CMSPageID=1988</a></p> <p><b>Energy Star®:</b> ENERGY STAR certified new homes must meet strict energy efficiency guidelines set by the U.S. Environmental Protection Agency. These homes are independently verified to be at least 15% more energy efficient than homes built to the 2009 International Energy Conservation Code (IECC), and feature additional measures that deliver a total energy efficiency improvement of up to 30 percent compared to typical new homes and even more compared to most resale homes. <a href="http://www.energystar.gov/index.cfm?c=new_homes.hm_index">http://www.energystar.gov/index.cfm?c=new_homes.hm_index</a></p> <p><b>Home Energy Score (HES):</b> The Home Energy Score is similar to a vehicle's mile-per-gallon rating. The Home Energy Score allows homeowners to compare the energy performance of their homes to other homes in the area. It also provides homeowners with suggestions for improving their homes' efficiency.</p> <p>The process starts with a home energy assessor collecting energy information during a brief home walk-through. The assessor then scores the home on a scale of 1 to 10, with a score of 10 indicating that the home has excellent energy performance. A score of 1 indicates that the home needs extensive energy improvements. In addition to providing the score, the home energy assessor provides the homeowner with a list of recommended energy improvements and the associated cost savings estimates. <a href="http://www.1.energystar.gov/buildings/residential/hes_index.html">http://www.1.energystar.gov/buildings/residential/hes_index.html</a></p> <p><b>HERS Index:</b> The Home Energy Rating System (HERS) Index is the Industry Standard by which a home's energy efficiency is measured. It's also the nationally recognized system for inspecting and calculating a home's energy performance. <a href="http://www.resnet.us/hers-index">http://www.resnet.us/hers-index</a>. This index is assessed by a qualified third party certifier based on the physical characteristics of the house. The energy estimates from this assessment may vary depending on the lifestyle of the occupants, increasing utility expenses, and changes in the maintenance or characteristics of the energy features.</p> <p><b>Building Envelope:</b> The building envelope is everything that separates the building's interior from the exterior. This includes the foundation, exterior walls, roof, doors and windows.</p> <p><b>Geothermal:</b> A geothermal heat pump uses the constant below ground temperature of soil or water to heat and cool your home. <a href="http://energy.gov/energysaver/articles/geothermal-heat-pumps">http://energy.gov/energysaver/articles/geothermal-heat-pumps</a></p> <p><b>Low-E:</b> Low emittance indicates a coating is added to the glass surface. The coating allows visible light to pass through the glass while stopping the radiant heat energy from the sun and heat sources in the building from passing through the glass. Approximately 40% of the sun's harmful ultra violet rays are blocked and insulation enhanced.</p> <p><b>Whole Building Ventilation System:</b> A whole building ventilation system assists in a controlled movement of air in tight envelope construction and may include air-purifying systems. Whole building ventilation equipment is often a part of the forced air heating or cooling systems.</p> <p><b>Energy Recovery Ventilation System:</b> Often called Heat Recovery Ventilators (HRV). These systems replenish the indoor air without wasting all the energy already used to heat the indoor air. In some climates, these systems are also used to handle water vapor in the incoming air.</p> <p><b>Passive Solar:</b> Passive solar is technology for using sunlight to light and heat buildings with no circulating fluid or energy conversion system. <a href="http://medic.nrel.gov/solar/glossary">http://medic.nrel.gov/solar/glossary</a>. A complete passive solar building design has the following five elements: (1) aperture (collector) (2) absorber (3) thermal mass (4) distribution (5) control. <a href="http://www.nrel.gov/docs/fy01osti/21954.pdf">http://www.nrel.gov/docs/fy01osti/21954.pdf</a></p> <p><b>SEER:</b> Seasonal energy efficiency ratio - The higher the SEER rating, the more energy efficient the equipment is. A higher SEER can result in lower energy costs. <a href="http://www.energystar.gov/index.cfm?c=tax_credits_b_definitions&amp;data=ssps_mcs_seer_eer">http://www.energystar.gov/index.cfm?c=tax_credits_b_definitions&amp;data=ssps_mcs_seer_eer</a></p> <p><b>Water Sense:</b> EPA released its Final Version 1.1 WaterSense New Home Specification. This specification will be effective January 1, 2013 and establishes the criteria for new homes labeled under the WaterSense program and is applicable to newly constructed single-family and multi-family homes. <a href="http://www.epa.gov/watersense/new_homes/homes_final.html">http://www.epa.gov/watersense/new_homes/homes_final.html</a></p> <p><b>Water Heaters:</b> Solar, Heat Pump, Tankless On Demand or Tankless Coil water heaters are described at the following location: <a href="http://energy.gov/energysaver/articles/solar-water-heaters">http://energy.gov/energysaver/articles/solar-water-heaters</a>.</p> <p><b>Green Certifying Organizations:</b> A partial list of organizations can be found at: <a href="http://www.usgbc.org/ShowFile.aspx?DocumentID=2001">http://www.usgbc.org/ShowFile.aspx?DocumentID=2001</a></p> <p><b>HERS Insulation Installed Rating:</b> Rating 1 is the best with 3 the lowest rating. <a href="http://www.resnet.us/standards/Enhancements_to_National_Rating_Standards.pdf">http://www.resnet.us/standards/Enhancements_to_National_Rating_Standards.pdf</a></p> <p><b>SAVE Act:</b> The SAVE Act is proposed legislation to improve the accuracy of mortgage underwriting used by federal mortgage agencies by ensuring that energy costs are included in the underwriting process. <a href="http://www.irs.org/finance-and-leasing/save-act">http://www.irs.org/finance-and-leasing/save-act</a></p> |  |                   |  |

Marketing

Recognition

Knowledge



# Zero Energy Ready Home Training

Marketing

Recognition

Knowledge

## Zero Energy Ready Homes:



- Definition
- The Visible Future
- Visible Future Builders
- Value Proposition
- Business Case

Marketing

Recognition

Knowledge

## Zero Energy Ready Homes:



- **Technical Specs Overview**
  - ENERGY STAR for Homes v3 Baseline
  - Super Air-Tight Construction
  - 2012 IECC Insulation
  - Advanced Windows
  - Ducts in Conditioned Space
  - Efficient Hot Water Distribution
  - Efficient Components
  - Indoor Air Quality
  - Renewable Ready Construction
  - Performance Threshold
- **Recognition**
- **Local Solution**

Marketing

Recognition

Knowledge

# Zero Energy Ready Homes:



- Building Science
- High-R Enclosures
- Low-Load HVAC
- Whole-House Ventilation
- Ducts in Conditioned Space
- Efficient Hot Water Distribution
- Indoor Air Quality
- Renewable Ready Construction
- Water Efficiency
- Disaster Resistance
- Quality Management



Marketing

Recognition

Knowledge

# Zero Energy Ready Homes:



- **Knowledge Matters**  
Building America Solution Center
- **Words Matter**  
Building Science Translator
- **Resonance Matters**  
ZERH Brochure and Fact Sheet
- **Questions Matter**  
Uncover Customer Needs/Commonalities
- **Process Matters**  
45-Second Mini-Close

Marketing

Recognition

Knowledge



# Building America Solution Center

# World-Class Expert Guidance...

Building America Solution Center  
[BASC.energy.gov](http://BASC.energy.gov)



...At Your  
Fingertips

## Marketing

## Recognition

## Knowledge

### **Building Components**

Find how-to Guides and reference documents describing construction techniques for each part of the house.

### **ENERGY STAR Checklist**

Find Guides to help you implement each item on the four ENERGY STAR Version 3 checklists.

### **Guides Alphabetically**

You can also find images, CAD drawings, references, and other resources under **FIND RESOURCES**.

### **Building Science Publications**

Use this information mapping tool to link to hundreds of references from the Building America library and beyond.

### Building America Solution Center

EERE » BTO » Building America » Solution Center »

#### Solution Center Home

#### About

#### FIND YOUR TOPIC BY:

- Building Components
- Guides A-Z
- ▶ **Program Checklists**
- ENERGY STAR
- Challenge Home
- Indoor airPLUS
- Solar Ready PV
- Solar Ready Hot Water

#### RESOURCES:

- References
- CAD Files
- Images
- Case Studies
- Videos
- Presentations

#### Building Science Publications

### Program Checklists



ENERGY STAR Qualified Homes, Version 3 (Rev. 6) Checklist into the Checklist Manager. Additional ENERGY STAR program requirements and information can be found at the [ENERGY STAR Website](#).



DOE Challenge Homes National Program Requirements (Rev. 02). DOE Challenge Home offers both a Prescriptive Path and Performance Path to meet program requirements. Additional Information can be found at the [DOE Challenge Home Website](#).



EPA's Indoor airPLUS Program checklist helps builders construct homes with improved indoor air quality. This checklist is a component of the Challenge Home Checklist. Additional information can be found at the [EPA Indoor airPLUS Program Website](#).



The Renewable Energy Ready Home Solar Photovoltaic Checklist was designed for builders constructing single family homes with pitched roofs. This checklist is a component of the Challenge Home Checklist. Additional information can be found at the [EPA Renewable Energy Ready Homes Website](#).



The Renewable Energy Ready Home Solar Water Heating Checklist was designed for builders constructing single family homes with pitched roofs. This checklist is a component of the Challenge Home Checklist. Additional information can be found at the [EPA Renewable Energy Ready Homes Website](#).

geoff.elliott@pnnl.gov [Account](#) [Log Out](#)

#### MOBILE FIELD KITS

[Field Kit Number 1 Title](#)  
12 items



Marketing

Recognition

Knowledge

Solution Center Home  
Help

**FIND YOUR TOPIC BY:**

- Building Components
- Guides A-Z
- ▼ Program Checklists
  - ENERGY STAR
  - Challenge Home
  - Indoor airPlus
  - Renewable Ready


**FIND RESOURCES:**

- References and Resources
- CAD Files
- Image Gallery
- Case Studies

**FIND PUBLICATIONS:**

- Building Science Publications

### DOE Challenge Home Program Requirements (Rev. 02)



The Building America Solution Center has integrated the DOE Challenge Homes National Program Requirements (Rev. 02) into the Program Checklists. Use the boxes to access specific parts of the Requirements, which have been numbered and titled to be consistent with the DOE Challenge Home National Program Requires. Additional information can be found at the [DOE Challenge Home Website](#).

#### Exhibit 1: Mandatory Requirements for All Labeled Homes

- ▶ 1. ENERGY STAR for Homes Baseline
- ▶ 2. Energy Star Qualified Under ENERGY STAR Qualified Homes Version 3.0
- ▶ 3. Duct System
- ▶ 4. Water Efficiency
- ▶ 5. Lighting & Appliances
- ▶ 6. Indoor Air Quality
  - EPA Indoor airPLUS Verification Checklist and Construction Specifications
  - Alternative: ENERGY STAR for Homes V3 Water Management System Builder Checklist
- ▶ 7. Renewable Ready
  - Consolidated Renewable Energy Ready Checklist

#### Exhibit 2: Target Home

- ▶ HVAC Equipment
- ▶ Insulation and Infiltration
- ▶ Windows
- ▶ Water Heater
- ▶ Thermostat
- ▶ Lighting & Appliances

Marketing

Recognition

Knowledge

Solution Center Home

Help

**FIND YOUR TOPIC BY:**

Building Components

Guides A-Z

▼ Program Checklists

ENERGY STAR

Challenge Home

Indoor airPLUS

Renewable Ready

**FIND RESOURCES:**

References and  
Resources

CAD Files

Image Gallery

Case Studies

**FIND PUBLICATIONS:**

Building Science  
Publications

## Indoor airPLUS Qualified Homes Program Requirements



EPA's Indoor airPLUS Program checklist helps builders construct homes with improved indoor air quality. This checklist is a component of the Challenge Home Checklist. Additional information can be found at the [EPA Indoor airPLUS Program Website](#).

### ▶ ENERGY STAR for Homes Baseline

- Thermal Enclosure System Rater Checklist completed.
- HVAC System Quality Installation Contractor Checklist completed.
- HVAC System Quality Installation Rater Checklist completed.
- Water Management System Builder Checklist completed.

### ▶ Moisture Control

### ▶ Radon

### ▶ Pests

### ▶ HVAC Systems

### ▶ Combustion Pollutants

### ▶ Materials

### ▶ Final

Marketing

Recognition

Knowledge

The screenshot shows the 'Building America Solution Center' website. At the top, there is a navigation bar with the U.S. Department of Energy logo and 'Energy Efficiency & Renewable Energy'. Below this is a search bar with 'Login' and 'Register' links. The main heading is 'Building America Solution Center'. A breadcrumb trail reads 'EERE » BTO » Building America » Solution Center » Checklists'. The main content area is titled 'ENERGY STAR Qualified Homes, Version 3 (Rev. 06)'. On the left, there is a 'Component Explorer' menu with 'Checklist Manager' selected. The 'Checklist Manager' section features the ENERGY STAR logo and a text block explaining that the manager provides links to technical guides for ENERGY STAR Qualified Homes. Below this, a list of checklists is displayed, with an orange arrow pointing to the first item: 'Thermal Enclosure System Rater Checklist (TES)'. Other items include 'HVAC System Quality Installation Contractor Checklist (HVAC/C)', 'HVAC System Quality Installation Rater Checklist (HVAC/R)', and 'Water Management System Builder Checklist (WMS)'. The footer contains 'Contact Us', 'Web Site Policies', 'U.S. Department of Energy', 'USA.gov', and 'Content Last Updated: 12/13/2012'.

Marketing

Recognition

Knowledge

The screenshot shows the 'Building America Solution Center' website. At the top, there is a navigation bar with the U.S. Department of Energy logo and 'Energy Efficiency & Renewable Energy'. Below this is a search bar with 'Login' and 'Register' links. The main heading is 'Building America Solution Center'. A breadcrumb trail reads 'ERE » BTQ » Building America » Solution Center » Checklists'. The left sidebar contains a 'Component Explorer' with 'Checklist Manager' selected, and 'ENERGY STAR' as a sub-item. The main content area is titled 'ENERGY STAR Qualified Homes, Version 3 (Rev. 06)'. It features the Energy Star logo and a paragraph explaining that the Checklist Manager provides links to technical guides for each measure. Below this is a list of checklists under the heading 'Thermal Enclosure System Rater Checklist (TES)'. An orange arrow points to 'TES 1. High-Performance Fenestration'. Other checklists include 'TES 2. Quality-Installed Insulation', 'TES 3. Fully-Aligned Air Barriers', 'TES 4. Reduced Thermal Bridging', 'TES 5. Air Sealing', 'HVAC System Quality Installation Contractor Checklist (HVAC/C)', 'HVAC System Quality Installation Rater Checklist (HVAC/R)', and 'Water Management System Builder Checklist (WMS)'. The footer contains 'Contact Us', 'Web Site Policies', 'U.S. Department of Energy', 'USA.gov', and 'Content Last Updated: 12/13/2012'.

Marketing

Recognition

Knowledge

The screenshot shows the 'Building America Solution Center' website. At the top, there is a navigation bar with the U.S. Department of Energy logo and 'Energy Efficiency & Renewable Energy' text. Below this, the page title 'Building America Solution Center' is displayed. A search bar with a 'SEARCH' button is located in the top right corner. The main content area features a breadcrumb trail: 'EERE » BTO » Building America » Solution Center » Checklists'. A sidebar on the left contains navigation links: 'Solution Center Home', 'Component Explorer', 'Checklist Manager' (highlighted), 'ENERGY STAR', 'Building Science Explorer', 'Browser', 'Guides', 'CAD Files', 'Case Studies', 'Image Gallery', and 'References'. The main content area is titled 'ENERGY STAR Qualified Homes, Version 3 (Rev. 06)' and includes an 'ENERGY STAR' logo. A paragraph of text explains that the Checklist Manager provides links to technical guides for ENERGY STAR Qualified Homes, Version 3 (Rev. 6). Below this text is a tree view of checklists. The 'Thermal Enclosure System Rater Checklist (TES)' is expanded, showing three main categories: 'TES 1. High-Performance Fenestration', 'TES 2. Quality-Installed Insulation', and 'TES 3. Fully-Aligned Air Barriers'. Under 'TES 3. Fully-Aligned Air Barriers', there are two sub-sections: 'TES 3.1. Walls' and 'TES 3.2. Floors'. Under 'TES 3.1. Walls', there are nine items: 'TES 3.1.1. Walls behind showers and tubs', 'TES 3.1.2. Walls behind fireplace', 'TES 3.1.3. Attic knee walls', 'TES 3.1.4. Skylight shaft walls', 'TES 3.1.5. Wall adjoining porch roof', 'TES 3.1.6. Staircase walls', 'TES 3.1.7. Double walls', 'TES 3.1.8. Garage rim / band joist adjoining conditioned space', and 'TES 3.1.9. All other exterior walls'. Under 'TES 3.2. Floors', there are three items: 'TES 3.2.1. Floor above garage', 'TES 3.2.2. Cantilevered floor', and 'TES 3.2.3. Floor above unconditioned basement or unconditioned crawlspace'. An orange arrow points to the 'TES 3.1.3. Attic knee walls' item.

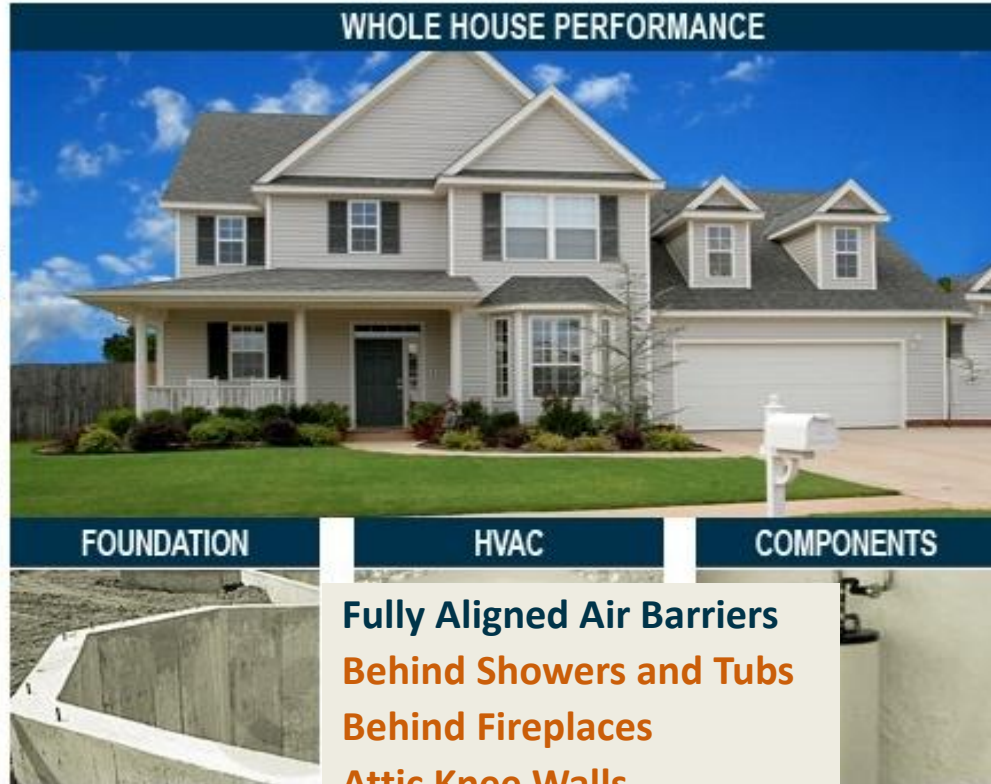


# BASC Component Explorer

Marketing

Recognition

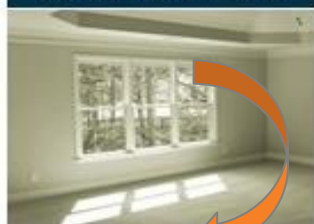
Knowledge



ROOF/FLOOR/CEILING



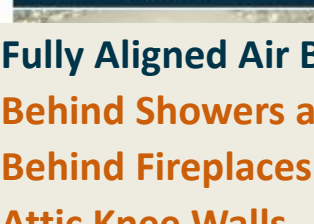
WALLS/OPENINGS



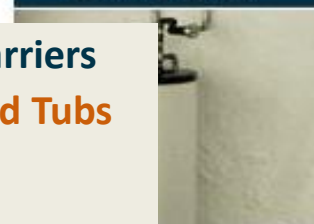
FOUNDATION



HVAC



COMPONENTS



QA/QC



DESIGN



Minimum Thermal Bridging  
Insulation  
Air Sealing  
Fully Aligned Air Barriers

Fully Aligned Air Barriers  
Behind Showers and Tubs  
Behind Fireplaces  
Attic Knee Walls  
Skylight Shaft  
Walls Adjoining Porch  
Double Walls  
Garage Rim/Band Joist

## Marketing

## Recognition

## Knowledge

[Solution Center Home](#)

[Component Explorer](#)

[Checklist Manager](#)

[Building Science Explorer](#)

[Browser](#)

[Guides](#)

[CAD Files](#)

[Case Studies](#)

[Image Gallery](#)

[References](#)

## Attic Knee Walls

Please [Register](#) or [Login](#) to Provide Feedback.

[Scope](#) [Description](#) [Ensuring Success](#) [Climate](#) [Training](#) [CAD](#) [Compliance](#) [More Info.](#)

### Scope

#### Fully Aligned Air Barrier

- Install a top and bottom plate or blocking at the top and bottom of all knee wall cavities.
- Back attic knee walls with a rigid air barrier or other supporting material to prevent insulation from sagging and create a continuous thermal barrier\*.
- Seal all seams, gaps, and holes of the air barrier with caulk or foam.
- Install insulation without misalignments, compressions, gaps, or voids in all knee wall cavities.



\* ENERGY STAR recommends using a rigid air barrier, but it is not a requirement.



### MOBILE FIELD KIT

The Building America Field Kit allows you to save items to your profile for review or use on-site.

[Sign Up](#)

or

[Log In](#)

**Scope:** Clearly defines and bounds the topic in a way builders and remodelers can contractually obligate their subcontractors.

## Marketing

## Recognition

## Knowledge

[Solution Center Home](#)

[Component Explorer](#)

[Checklist Manager](#)

[Building Science Explorer](#)

[Browser](#)

[Guides](#)

[CAD Files](#)

[Case Studies](#)

[Image Gallery](#)

[References](#)

### Attic Knee Walls

Please [Register](#) or [Login](#) to Provide Feedback.

Scope Description Ensuring Success Climate Training CAD Compliance More Info.

#### Description

Knee walls, the walls that separate conditioned from unconditioned space in an attic, can be a source of significant air leakage if a continuous air barrier is not provided to prevent unconditioned air from flowing under the knee wall and under the floor boards of the attic room. There are two ways to block off this air flow: either a continuous air barrier can be provided from the top of the knee wall down to the attic floor, including the spaces between the attic floor joists from the bottom of the knee wall to the ceiling deck below, or a continuous air barrier can be installed from the top of the knee wall along the attic roofline to the top plate of the home's exterior wall. With either method the air barrier should be installed before installing attic floor insulation to the unconditioned portion of the attic. An air barrier is defined as any durable, solid material that blocks air flow between conditioned space and unconditioned space, including necessary sealing to block excessive air flow at edges and seams and adequate support to resist positive and negative pressures without displacement or damage. Air barrier material can include thin sheet goods such as rigid insulation, dry wall, OSB, plywood, or rolled batt insulation that is covered with spray foam. These materials may be installed by insulators, framers, or drywallers. This task should be included in the contract for the appropriate trade depending on the workflow at the specific job site.

Air barrier effectiveness is measured at the whole-house level. High-performance branding programs



#### MOBILE FIELD KIT

The Building America Field Kit allows you to save items to your profile for review or use on-site.

[Sign Up](#)

or

[Log In](#)

**Description:** Provides an explanation of the building topic and in some cases specific “how-to” implementation steps.

## Marketing

## Recognition

## Knowledge

[Solution Center Home](#)

[Component Explorer](#)

[Checklist Manager](#)

[Building Science Explorer](#)

[Browser](#)

[Guides](#)

[CAD Files](#)

[Case Studies](#)

[Image Gallery](#)

[References](#)

### Attic Knee Walls

Please [Register](#) or [Login](#) to Provide Feedback.

[Scope](#) [Description](#) [Ensuring Success](#) [Climate](#) [Training](#) [CAD](#) [Compliance](#) [More Info.](#)

#### Ensuring Success

Blower door testing, conducted as part of whole-house energy performance testing, may help indicate whether air leakage at knee walls has been successfully sealed. An infrared camera may also be used to determine air leakage at the knee wall, if a sufficient temperature difference exists between the attic and the conditioned space of the house to see the leakage. An experienced technician can also check for air leaks beneath the knee walls with a smoke pencil or by feeling for leaks with the back of the hand.



#### MOBILE FIELD KIT

The Building America Field Kit allows you to save items to your profile for review or use on-site.

[Sign Up](#)

or

[Log In](#)

**Ensuring Success:** Related health, safety, durability, performance issues, test-in/test-out requirements, and scheduling and sequencing considerations.



## Marketing

## Recognition

## Knowledge

[Solution Center Home](#)

[Component Explorer](#)

[Checklist Manager](#)

[Building Science Explorer](#)

[Browser](#)

[Guides](#)

[CAD Files](#)

[Case Studies](#)

[Image Gallery](#)

[References](#)

### Attic Knee Walls

Please [Register](#) or [Login](#) to Provide Feedback.

[Scope](#) [Description](#) [Ensuring Success](#) [Climate](#) [Training](#) [CAD](#) [Compliance](#) [More Info.](#)

#### Climate

##### [ENERGY STAR Version 3. \(Rev. 6\)](#)

Thermal Enclosure Checklist, Fully-Aligned Air Barriers. A complete air barrier shall be provided that is fully aligned with the insulation at exterior surface of walls in all climate zones; and also at interior surface of walls for Climate Zones 4-8.

##### [DOE Challenge Home](#)

[Energy 2013 DOE Challenge Home Thermal Enclosure Checklist \(ACH50\) Zones 4, 5, 6, 7, 8](#)

5  
a



#### MOBILE FIELD KIT

The Building America Field Kit allows you to save items to your profile for review or use on-site.

[Sign Up](#)

or

[Log In](#)

**Climate:** Climate-specific codes, standards, ENERGY STAR, and Challenge Home guidance.



## Marketing

## Recognition

## Knowledge

[Solution Center Home](#)

### Attic Knee Walls

[Component Explorer](#)

Please [Register](#) or [Login](#) to Provide Feedback.

[Checklist Manager](#)

[Building Science Explorer](#)

[Browser](#)

[Guides](#)

[CAD Files](#)

[Case Studies](#)

[Image Gallery](#)

[References](#)

[Scope](#) [Description](#) [Ensuring Success](#) [Climate](#) [Training](#) [CAD](#) [Compliance](#) [More Info.](#)

#### Right and Wrong Images



#### Presentations

None Available



#### MOBILE FIELD KIT

The Building America Field Kit allows you to save items to your profile for review or use on-site.

[Sign Up](#)

or

[Log In](#)

**Training:** resources such as Right and Wrong/ Sequencing installation images.

**COMING: Videos and presentations**

## Marketing

## Recognition

## Knowledge

[Solution Center Home](#)

[Component Explorer](#)

[Checklist Manager](#)

[Building Science Explorer](#)

[Browser](#)

[Guides](#)

[CAD Files](#)

[Case Studies](#)

[Image Gallery](#)

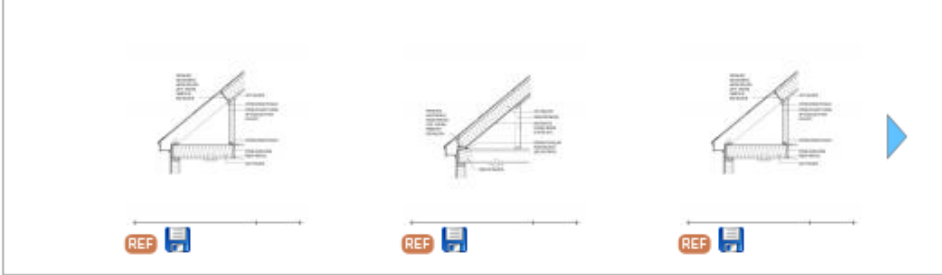
[References](#)

### Attic Knee Walls

Please [Register](#) or [Login](#) to Provide Feedback.

Scope Description Ensuring Success Climate Training **CAD** Compliance More Info.

#### CAD Images



The image shows three architectural cross-sections of an attic knee wall. Each drawing is accompanied by a red 'REF' icon and a blue download icon. A blue arrow points to the right between the second and third drawings.



#### MOBILE FIELD KIT

The Building America Field Kit allows you to save items to your profile for review or use on-site.

[Sign Up](#)

or

[Log In](#)

**CAD:** Architectural CAD files of the building topic in DWG and PDF forms.

## Marketing

## Recognition

## Knowledge

Solution Center Home

Component Explorer

Checklist Manager

Building Science  
Explorer

Browser

Guides

CAD Files

Case Studies

Image Gallery

References

### Attic Knee Walls

Please [Register](#) or [Login](#) to Provide Feedback.

The screenshot shows a web interface with a navigation bar containing tabs: Scope, Description, Ensuring Success, Climate, Training, CAD, Compliance (selected), and More Info. Below the tabs, the 'Compliance' section is displayed, featuring three sub-sections with links and descriptive text:

- [ENERGY STAR Version 3, \(Rev. 6\)](#)**  
*Thermal Enclosure Checklist, Fully-Aligned Air Barriers.* A complete air barrier shall be provided that is fully aligned with the insulation at exterior surface of walls in all climate zones; and also at interior surface of walls for Climate Zones 4-8. All insulated vertical surfaces are considered walls (e.g., above and below grade exterior walls, knee walls) and must meet the air barrier requirements for walls, with the exception of adiabatic walls in multifamily dwellings.
- [DOE Challenge Home](#)**  
*Exhibit 2: DOE Challenge Home Target Home.* Certified under ENERGY STAR Qualified Homes Version 3. Infiltration (ACH50): Zones 1-2: 3; Zones 3-4: 2.5; Zones 5-7: 2; Zone 8: 1.5. Envelope leakage shall be determined by an approved verifier using a RESNET-approved testing protocol. Building envelope assemblies, including exterior walls and unvented attic assemblies (where used), shall comply with the relevant vapor retarder provisions of the 2012 International Residential Code.
- [ASTM E1677-11](#)**  
*Standard Specification for Air Barrier (AB) Material or System for Low-Rise Framed Building Walls*



#### MOBILE FIELD KIT

The Building America Field Kit allows you to save items to your profile for review or use on-site.

Sign Up

or

Log In

**Compliance:** Specific compliance references/links from applicable codes and standards.

## Marketing

## Recognition

## Knowledge

[Solution Center Home](#)

### Attic Knee Walls

[Component Explorer](#)

Please [Register](#) or [Login](#) to Provide Feedback.

[Checklist Manager](#)

[Building Science Explorer](#)

[Browser](#)

[Guides](#)

[CAD Files](#)



[Case Studies](#)

[Image Gallery](#)

[References](#)

Scope Description Ensuring Success Climate Training CAD Compliance More Info.

#### Case Studies

- David Weekley Homes: Eagle Springs & Waterhaven, Houston, TX**  
PNNL. 2012. Building America Case Study: David Weekley Homes, Eagle Springs & Waterhaven, Houston, TX, PNNL-SA-87333, prepared by the Pacific Northwest National Laboratory for the U.S. Department of Energy.  
[Link to Document](#) 
- Tommy Williams Homes: Longleaf Village & Belmont, Gainesville, FL**  
PNNL. 2012. Building America Case Study: Tommy Williams Homes, Longleaf Village & Belmont, Gainesville, FL, PNNL-SA-87331, prepared by the Pacific Northwest National Laboratory for the U.S. Department of Energy.  
[Link to Document](#) 

#### References



#### MOBILE FIELD KIT

The Building America Field Kit allows you to save items to your profile for review or use on-site.

[Sign Up](#)

or

[Log In](#)

### More Info:

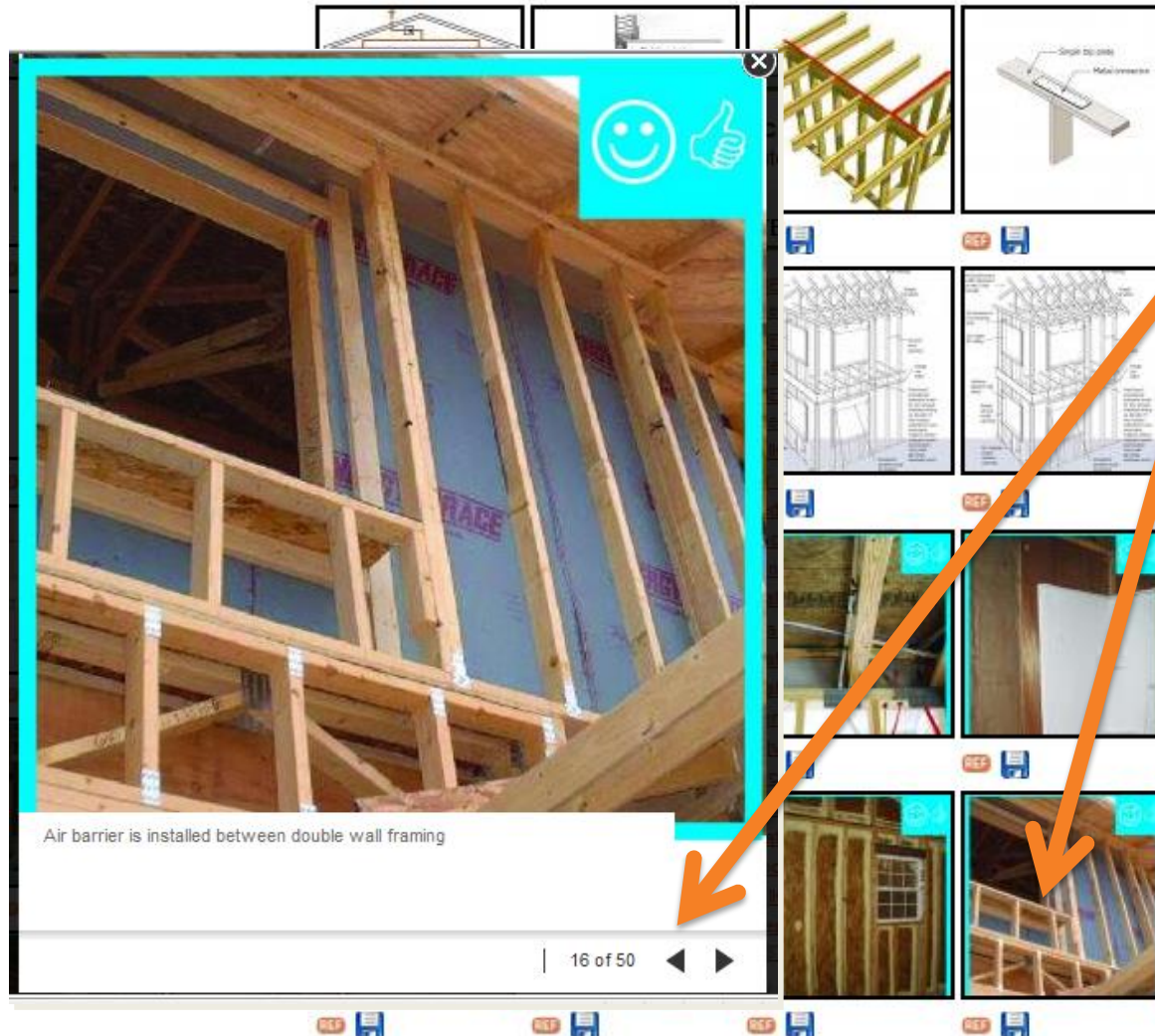
- References - Full citations with links for content
- Case Studies - Whole-house best practices
- Resources - Relevant info not previously cited

# BASC Browser Image Gallery

Marketing

Recognition

Knowledge



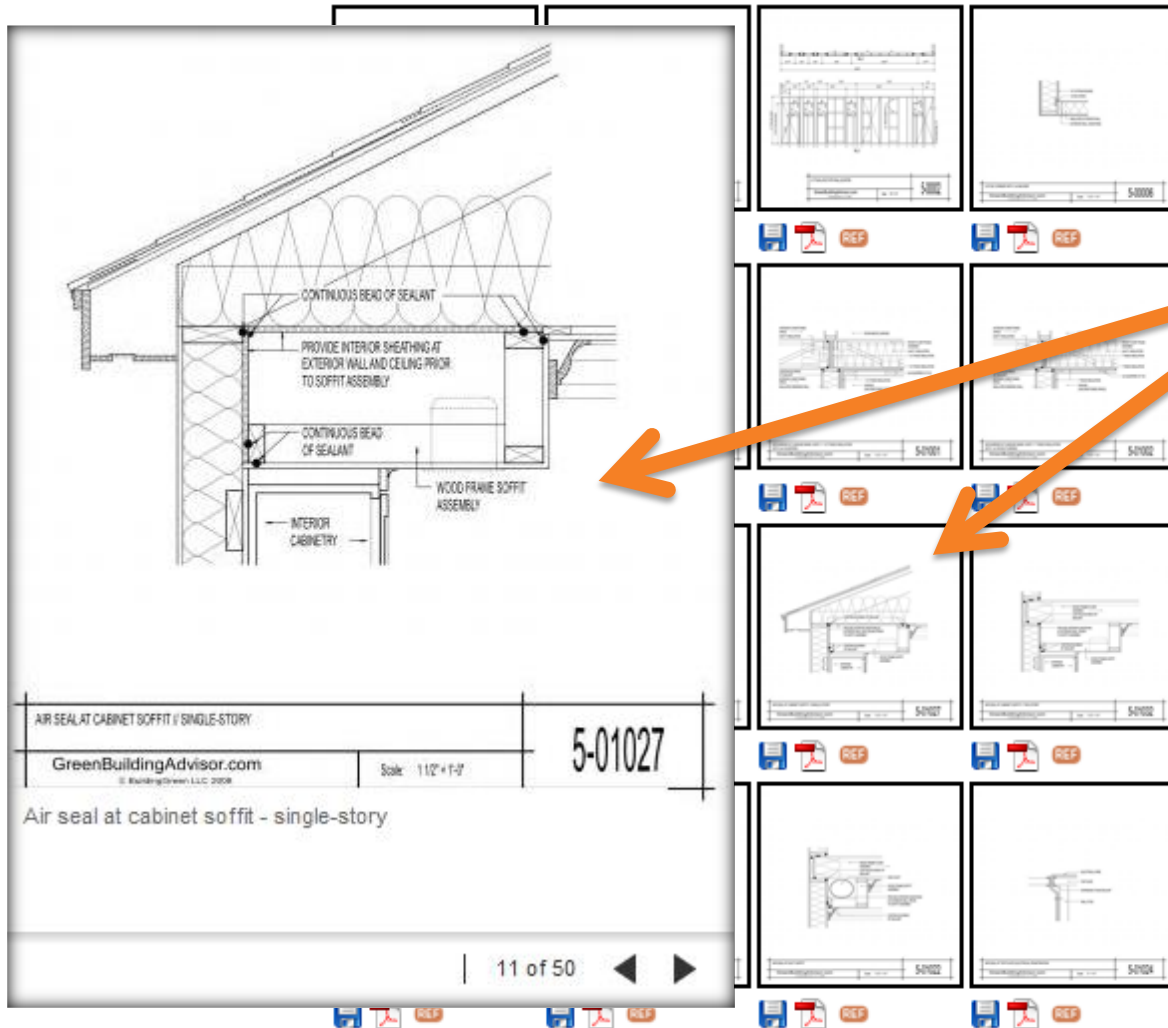
- Click an image to enlarge in a sliding window.



## Marketing

## Recognition

## Knowledge



- Click the CAD file image to load in a slider window.

# BASC Mobile Application

Marketing

Recognition

Knowledge

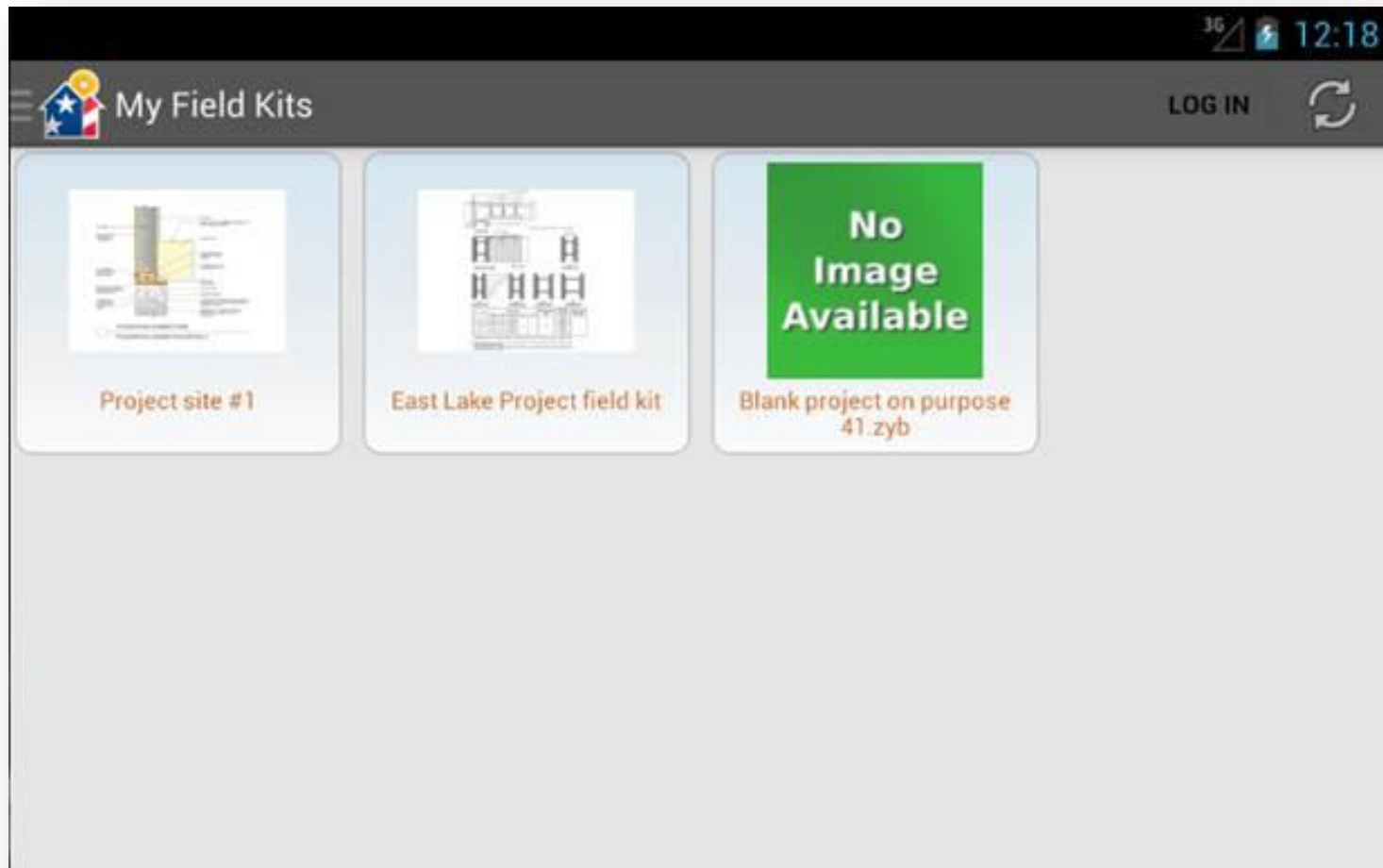


# BASC Mobile Application

Marketing

Recognition

Knowledge



Marketing

Recognition

Knowledge



# Building America Building Science Translator

# Power Words:

Marketing

Recognition

**Knowledge**

## Words Matter



# Power Words:

Marketing

Recognition

Knowledge

**It's really difficult to sell...**

Patagonian *Toothfish*

# Power Words:

Marketing

Recognition

Knowledge

**It's much easier to sell an...**

# Chilean Sea Bass

# Power Words:

Marketing

Recognition

Knowledge

**It's really difficult to rally opinion against an...**

***Estate Tax***

# Power Words:

Marketing

Recognition

Knowledge

**It's much easier to rally opinion against a...**

# Death Tax

# Power Words:

Marketing

Recognition

Knowledge

**It's really difficult to sell an...**

Energy **Audit**



# Power Words:

Marketing

Recognition

Knowledge

**It's much easier to sell an...**

Energy **Check-up**

# Power Words:

Marketing

Recognition

Knowledge

**It's really difficult to sell...**

# Payback

# Power Words:

Marketing

Recognition

Knowledge

**It's much easier to sell...**

**Lower Cost** of Ownership

Marketing

Recognition

Knowledge

**It's even easier to sell...**

**Lower Cost** of Ownership

for a **Better Home**

Marketing

Recognition

Knowledge

It's really difficult to sell a...

# Transfer Grill





# Power Words:

Marketing

Recognition

Knowledge

It's much easier to sell a...

# Comfort Vent



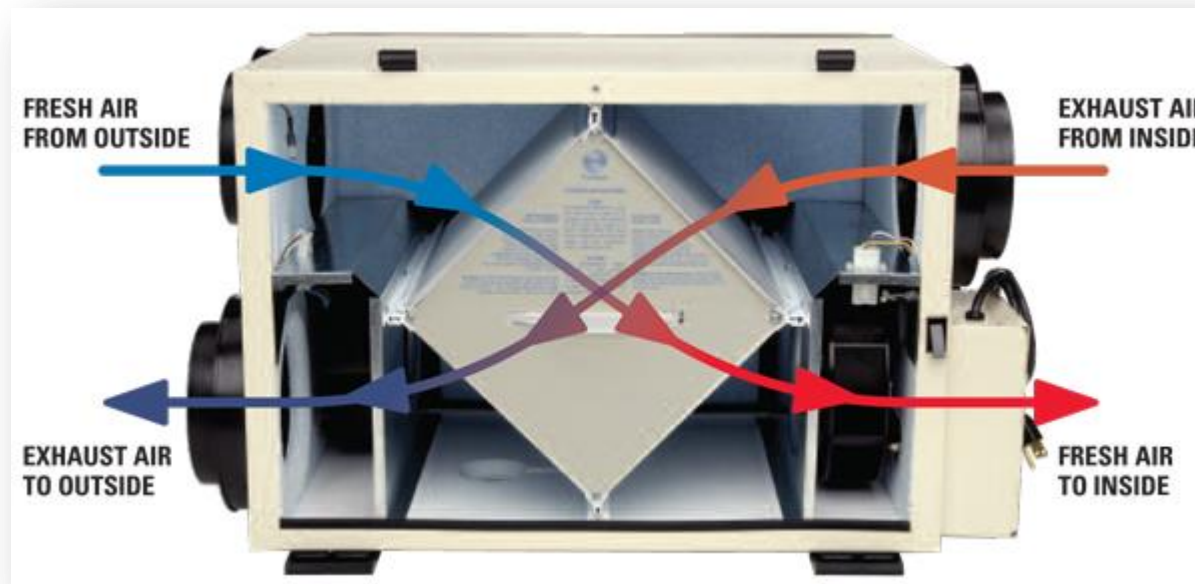
Marketing

Recognition

Knowledge

It's really difficult to sell a...

# Ventilation System



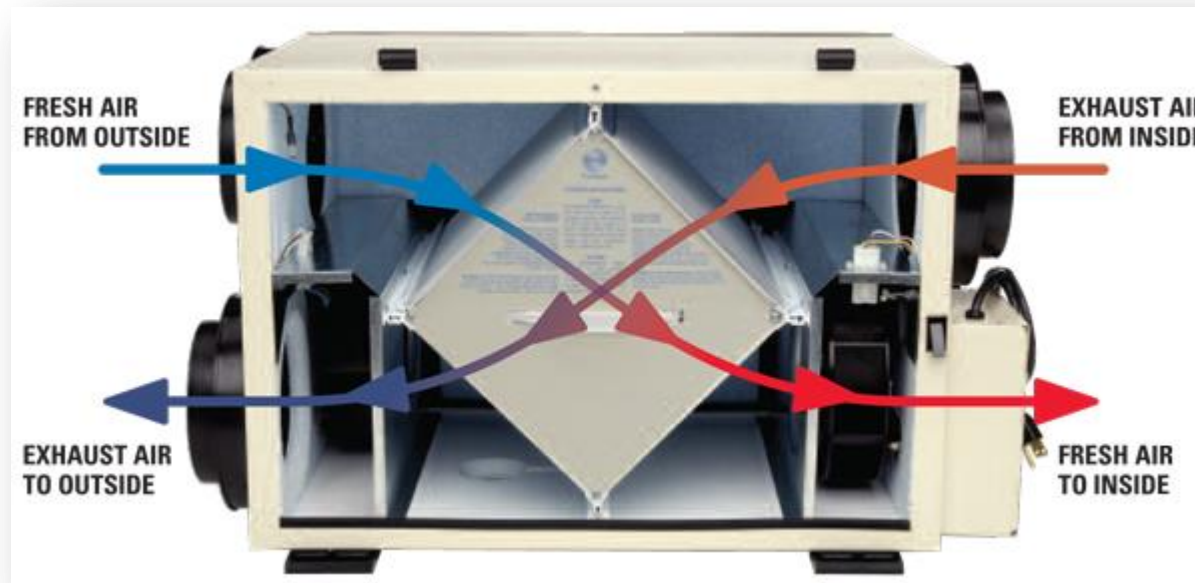
Marketing

Recognition

Knowledge

It's much easier to sell a...

# Fresh-Air System



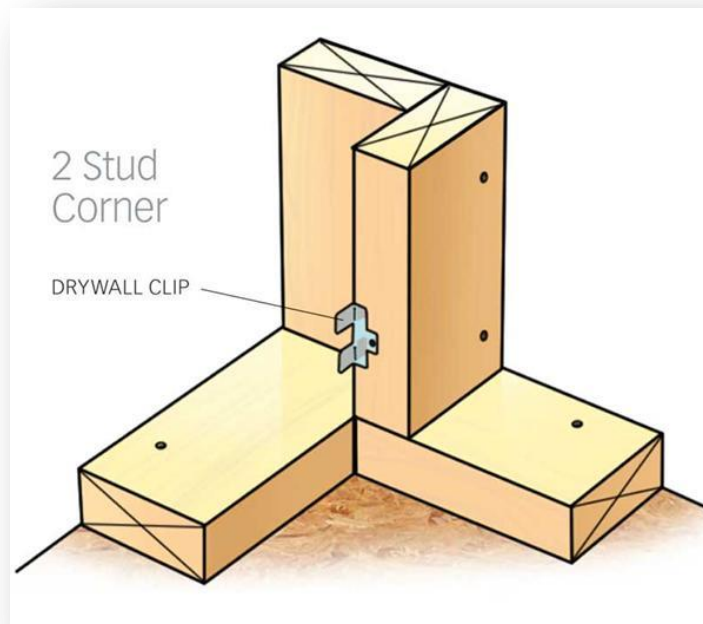
Marketing

Recognition

Knowledge

**It's really difficult to sell a...**

# 2-Stud Corner with Drywall Clip



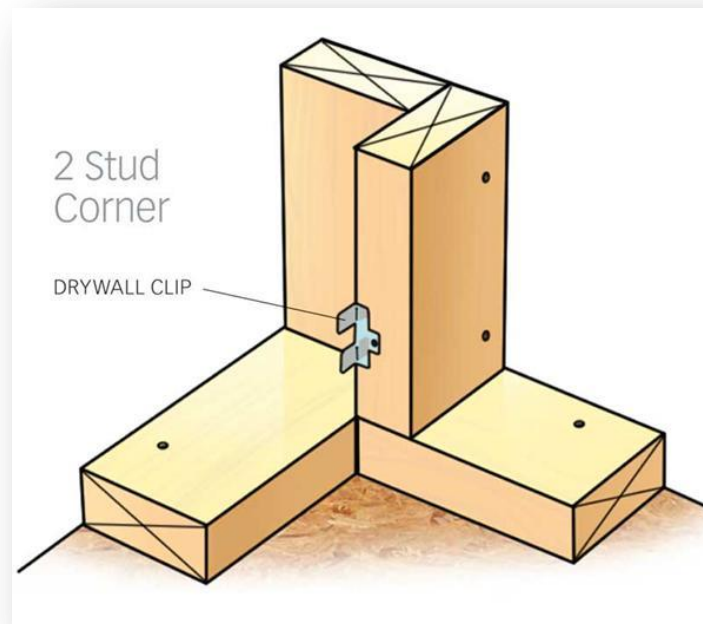
Marketing

Recognition

Knowledge

It's much easier to sell a...

# Crack-Free Corner



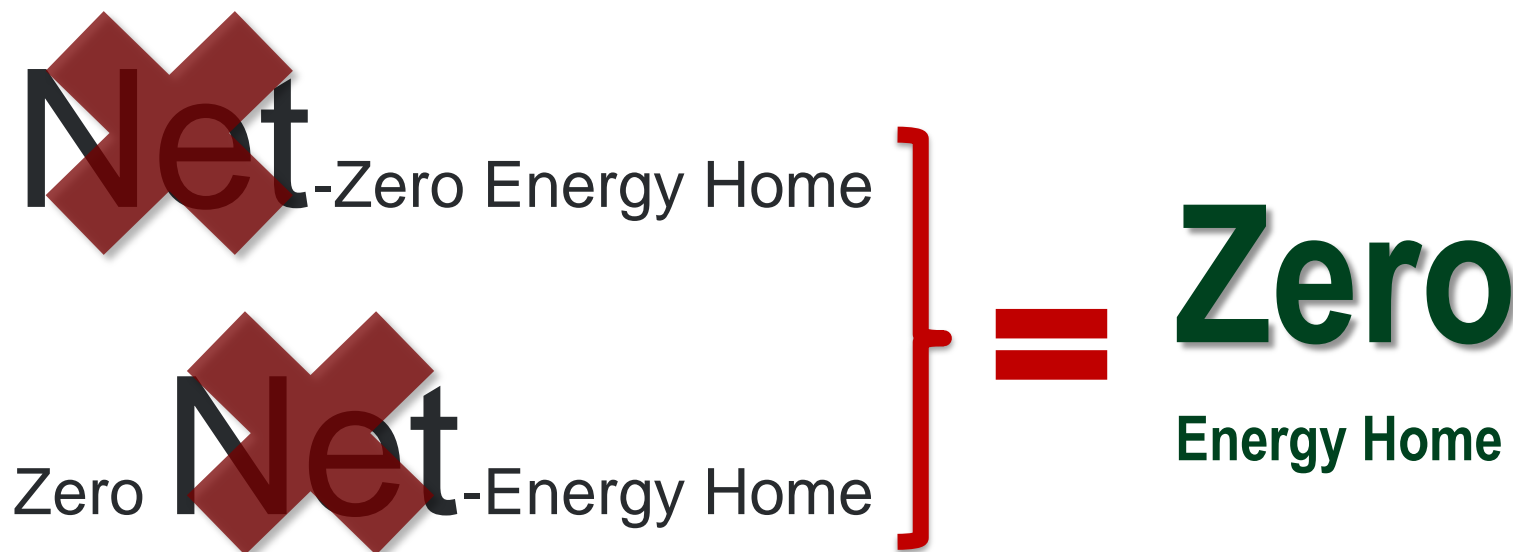


# Terminology Options:

Marketing

Recognition

Knowledge



**I am going to make you a promise...**  
**“Net” is not your power word.**

# Terminology Variations:

Marketing

Recognition

Knowledge

**With Solar:**

**Zero** Energy Home

**Without Solar:**

**Zero** Energy Ready Home

Marketing

Recognition

Knowledge

**It's hard to sell the...**

# Technical Function

Marketing

Recognition

Knowledge

**It's much easier to set the...**

# Customer Experience

Marketing

Recognition

Knowledge

**It's difference between...**

# Technical Jargon

and

# Language of 'Value'

Marketing

Recognition

Knowledge

## Building America Solution Center

Log In | Register

[EERE](#) » [BTO](#) » [Building America](#) » [Solution Center](#) » [Guides](#)

[Solution Center Home](#)

[Help](#)

FIND YOUR TOPIC BY:

[Building Components](#)

[Guides A-Z](#)

[ENERGY STAR](#)

FIND RESOURCES:

[References and Resources](#)

[CAD Files](#)

[Image Gallery](#)


[Case Studies](#)

FIND PUBLICATIONS:

[Building Science Publications](#)

## Transfer Grilles

Please [Register](#) or [Login](#) to Provide Feedback.

 [Print this page](#) [Feedback](#) [Version](#)

Scope | Description | Ensuring Success | Climate | Training | CAD | Compliance | More Info. | Translator

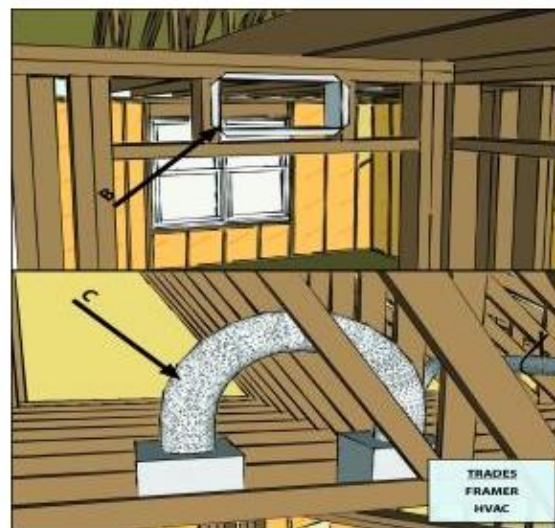
### Scope

#### Pressure Balancing Bedrooms

##### Option A.

Bedrooms pressure-balanced using any combination of transfer grills, jump ducts, dedicated return ducts, and/or undercut doors to provide 1 square inch of free area opening per 1 CFM of supply air, as reported on the contractor-provided balancing report:

- A. Refer to the balancing report provided by the HVAC contractor for the bedroom air flows to size the transfer grills and/or jumper ducts.
- B. Install and seal properly sized transfer grills during framing. Both openings of the transfer grill must have the required free area.



### MOBILE FIELD KIT

The Building America Field Kit allows you to save items to your profile for review or use on-site.

[Sign Up](#)

or

[Log In](#)



Marketing

Recognition

Knowledge

## Building America Solution Center

[Log In](#) | [Register](#)

[EERE](#) » [BTO](#) » [Building America](#) » [Solution Center](#) » [Guides](#)

[Solution Center Home](#)

[Help](#)

**FIND YOUR TOPIC BY:**

[Building Components](#)

[Guides A-Z](#)

[ENERGY STAR](#)

**FIND RESOURCES:**

[References and Resources](#)

[CAD Files](#)

[Image Gallery](#)

[Case Studies](#)

**FIND PUBLICATIONS:**

[Building Science Publications](#)

## Transfer Grilles

Please [Register](#) or [Login](#) to Provide Feedback.

[Print this page](#)

[Feedback](#)

|       |             |                  |         |          |     |            |            |            |
|-------|-------------|------------------|---------|----------|-----|------------|------------|------------|
| Scope | Description | Ensuring Success | Climate | Training | CAD | Compliance | More Info. | Translator |
|-------|-------------|------------------|---------|----------|-----|------------|------------|------------|

## Transfer Grill = Comfort Vent



### Technical Description:

Most new homes only have a central return. When doors are closed, conditioned bedroom air cannot flow adequately to the central return which can block air flow from the ducts. This can compromise comfort and pressurize the room so warm humid air is driven into wall assemblies for added risk of moisture damage. Transfer Grilles are a through-wall vent sized to allow adequate flow of air to the hallway central return while also including baffles for sound and visual privacy.

### Related Measures:

- Jump Duct
- Pressure Balancing
- Room-by-Room Return Ducts

### Alternate Terms:

- Comfort Balancing Technology
- Premium Comfort System

### Comfort Vent Sales Message:

Comfort vents at each bedroom ensure a continuous flow of heating and cooling even when the doors are closed. What this means to you is that you will no longer have to



### MOBILE FIELD KIT

The Building America Field Kit allows you to save items to your profile for review or use on-site.

[Sign Up](#)

or

[Log In](#)

# Transfer Grill = **Comfort Vent**

## Technical Description:

Most new homes only have a central return. When doors are closed, conditioned bedroom air cannot flow adequately to the central return which can block air flow from the ducts. This can compromise comfort and pressurize the room so warm humid air is driven into wall assemblies for added risk of moisture damage. Transfer Grills are a through-wall vent sized to allow adequate flow of air to the hallway central return while also including baffles for sound and visual privacy.

## Related Measures:

- Jump Duct
- Pressure Balancing
- Room-by-Room Return Ducts

## Alternate Terms:

- Comfort Balancing Technology
- Premium Comfort System

## Comfort Vent Sales Message:

Comfort vents at each bedroom ensure a continuous flow of heating and cooling even when the doors are closed. What this means to you is that you will no longer have to compromise comfort when you keep your bedroom doors closed. Wouldn't you agree bedroom doors shouldn't have to be kept open to maintain comfort?



# Translating Challenge Home Value

## Marketing

## Recognition

## Knowledge



**A Symbol of Excellence**

Every Challenge Home offers a cost-effective, high performance package of energy savings, comfort, health, and durability unparalleled in today's marketplace.



### Lives Better

#### HEALTHFUL ENVIRONMENT

Every DOE Challenge Home has a comprehensive package of measures to minimize dangerous pollutants, provide continuous fresh air, and effectively filter the air you breathe.

#### COMFORT PLUS

Superior insulation, windows, air sealing and space conditioning systems included in every DOE Challenge Home surround you with even temperatures, low-humidity, and quiet in every room on every floor.

**KEY**

- DOE Challenge Home
- ENERGY STAR Home
- Existing Home



### Works Better

#### ADVANCED TECHNOLOGY

Every DOE Challenge Home begins with solid building science specified by ENERGY STAR for Homes, and then adds advanced technologies and practices from DOE's world-class research program, Building America.

#### ULTRA EFFICIENT

Compared to a typical home, an ultra efficient Challenge Home is inexpensive to own. In fact, every DOE Challenge Home is so energy efficient, a small solar electric system can easily offset most, or all, of your utility bills. We call this Zero Net-Energy Ready.



### Lasts Better

#### QUALITY BUILT

Advanced construction practices and technologies are specified for every DOE Challenge Home. Then they are enforced by independent verifiers with detailed checklists and prescribed diagnostics.

#### DURABILITY

The advanced levels of energy savings, comfort, health, durability, quality and future performance in every DOE Challenge Home provide value that will stand the test of time, and will meet and exceed forthcoming code requirements.

LEARN MORE AT: [buildings.energy.gov/challenge](http://buildings.energy.gov/challenge)



**A Symbol of Excellence**

#### HEALTHFUL ENVIRONMENT

#### COMFORT PLUS

#### ADVANCED TECHNOLOGY

#### ULTRA EFFICIENT

#### QUALITY BUILT

#### DURABILITY

**KEY**

- DOE Challenge Home
- ENERGY STAR Home
- Existing Home

This label indicates relative performance of this DOE Challenge Home to existing homes (built between 1990 and 2010) and ENERGY STAR qualified homes. Actual performance may vary.



## The Future of Housing—Today

Only a select group of the top builders in the country meet the extraordinary levels of excellence and quality specified by U.S. Department of Energy guidelines.



LEARN MORE AT:  
[buildings.energy.gov/challenge](http://buildings.energy.gov/challenge)

Front Cover

Inside Spread

Back Cover

Flap

Marketing

Recognition

Knowledge

## Garson Homes

Lives Better: **Healthful Environment**



### Certified Formaldehyde-Free Board Products:

All of the board products used throughout the home have been carefully selected to eliminate dangerous formaldehyde. This means your family can breathe easier knowing they are safe from one more harmful chemical.



### Certified VOC-Free Paint:

All of the paints used throughout your home have been carefully selected to eliminate dangerous volatile organic chemicals. This means your family can breathe easier knowing they are safe from one more harmful chemical.



### Certified VOC-Free Carpet:

All of the carpets and pads used throughout your home have been carefully selected to eliminate dangerous volatile organic chemicals. This means your family can breathe easier knowing they are safe from one more harmful chemical.



### Advanced Filtration:

Specially designed air filters can effectively eliminate air particles that



# Program Communications Support

## Marketing

## Recognition

## Knowledge

### Garçon Homes

Lives Better

- Fresh Air
- Quiet:
- Moisture
- Pest Control
- Outdoor
- Chemical
- Fume Control

### Garçon Homes

Lives Better

- Thermal
- Draft Protection
- Thermal
- Engine
- Natural
- On-Deck

### Garçon Homes

Works Better

- High-Performance
- High-Performance
- High-Performance
- High-Performance
- Water Savings

### Garçon Homes

Works Better

- Advanced
- Advanced
- Advanced
- Advanced

### Garçon Homes

Lasts Better

- Premium
- Premium
- Quality Construction
- Certified

### Garçon Homes

Lasts Better: Durability

- Durable Thermal Enclosure
  - Moisture Managed Lower Level
  - Moisture Controlled Wall Assembly
  - Moisture Sealed Home
  - UV Protection Window
- Whole-House Water Protection System
  - Foundation Water Protection System
  - Water Protected Slab Lining and Drainage
  - Wall Water Barrier
  - Window and Door Opening Water Barrier
  - Roof-Wall Water Deflection System
  - Roof Water Barrier
  - Interior Water Protection System
- Durable Components
  - Extended Warranty Comfort System
  - Extended Warranty Water Heater
  - Extended Warranty Dishwasher
  - Extended Warranty Refrigerator
  - Extended Warranty Clothes Washer
  - 20,000 Hour Lifetime Lighting
- Disaster Resistant Home
  - Severe Storm Resistant Home

# Thank You





## Website

- [www.buildings.energy.gov/zero/](http://www.buildings.energy.gov/zero/)
- Events:
  - Upcoming in-person ZERH Trainings
  - Technical Training webinars
  - Conference Presentations
- Partner Locator
- Program Specifications
- Webinar Recordings



## Building America Solution Center

- <http://basc.pnnl.gov/>

# Thank You



## For More Information:

[www.buildings.energy.gov/zero](http://www.buildings.energy.gov/zero)

## Email:

[zero@newportpartnersllc.com](mailto:zero@newportpartnersllc.com)