RESNET 2013 Annual Conference

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

Building America Solution Center

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Chief Architect, BTO

MICHAEL BAECHLER
Pacific Northwest National Laboratory

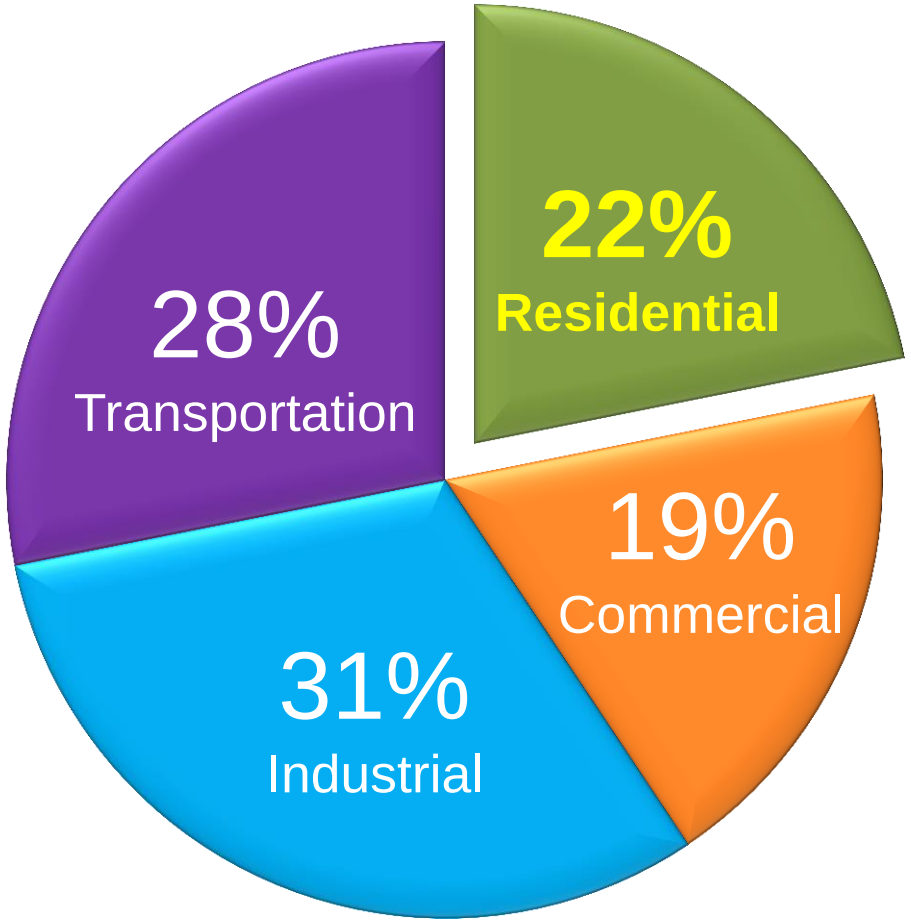
Outline

- Business Case:
  Why Building America
- Business Model:
  Building America Strategy
- Business Tool:
  Building America Solution Center
- Building America Solution Center Tour

Business Case

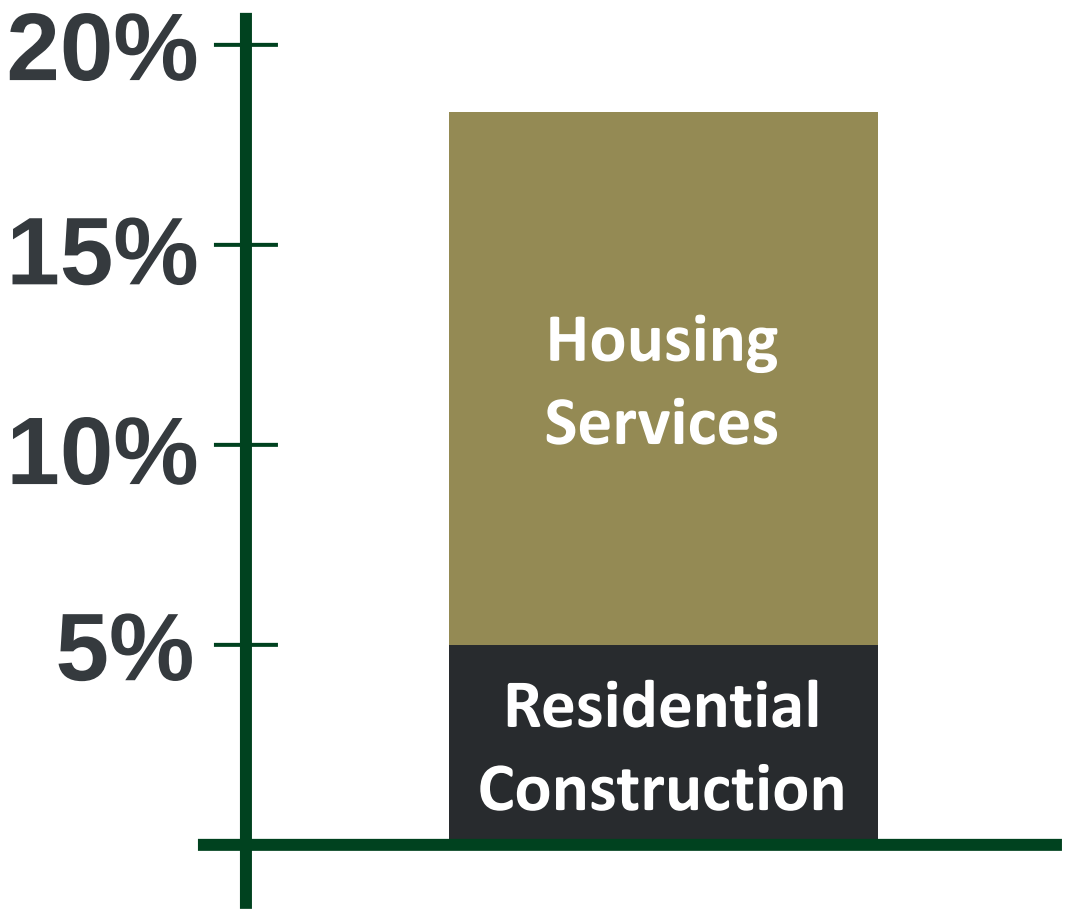
Why Building America

Residential Energy Use Significant



U.S. Energy Consumption

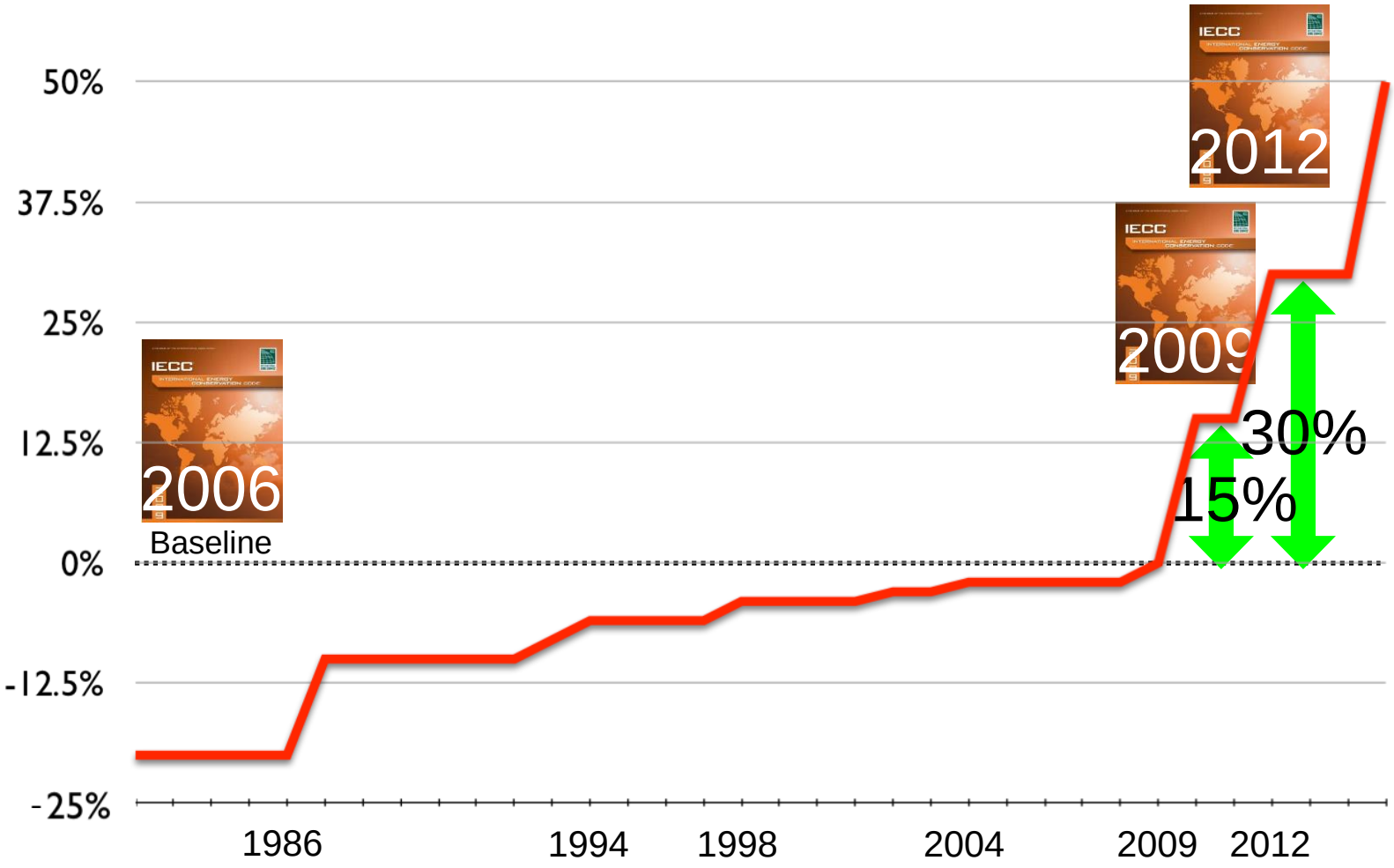
Residential Economic Impact



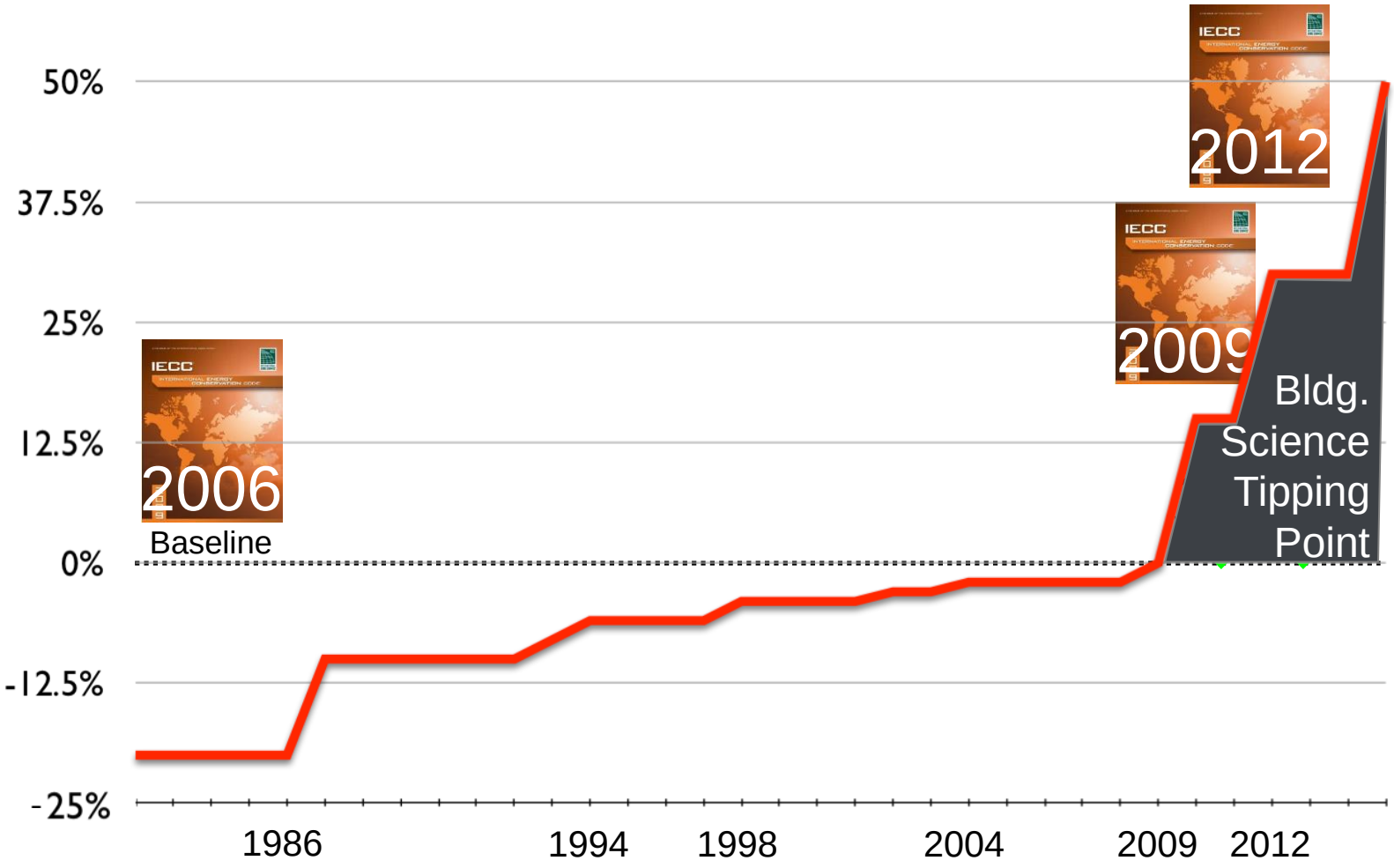
Housing Sector Percent of GNP

Source: NAHB data through Q1 2012

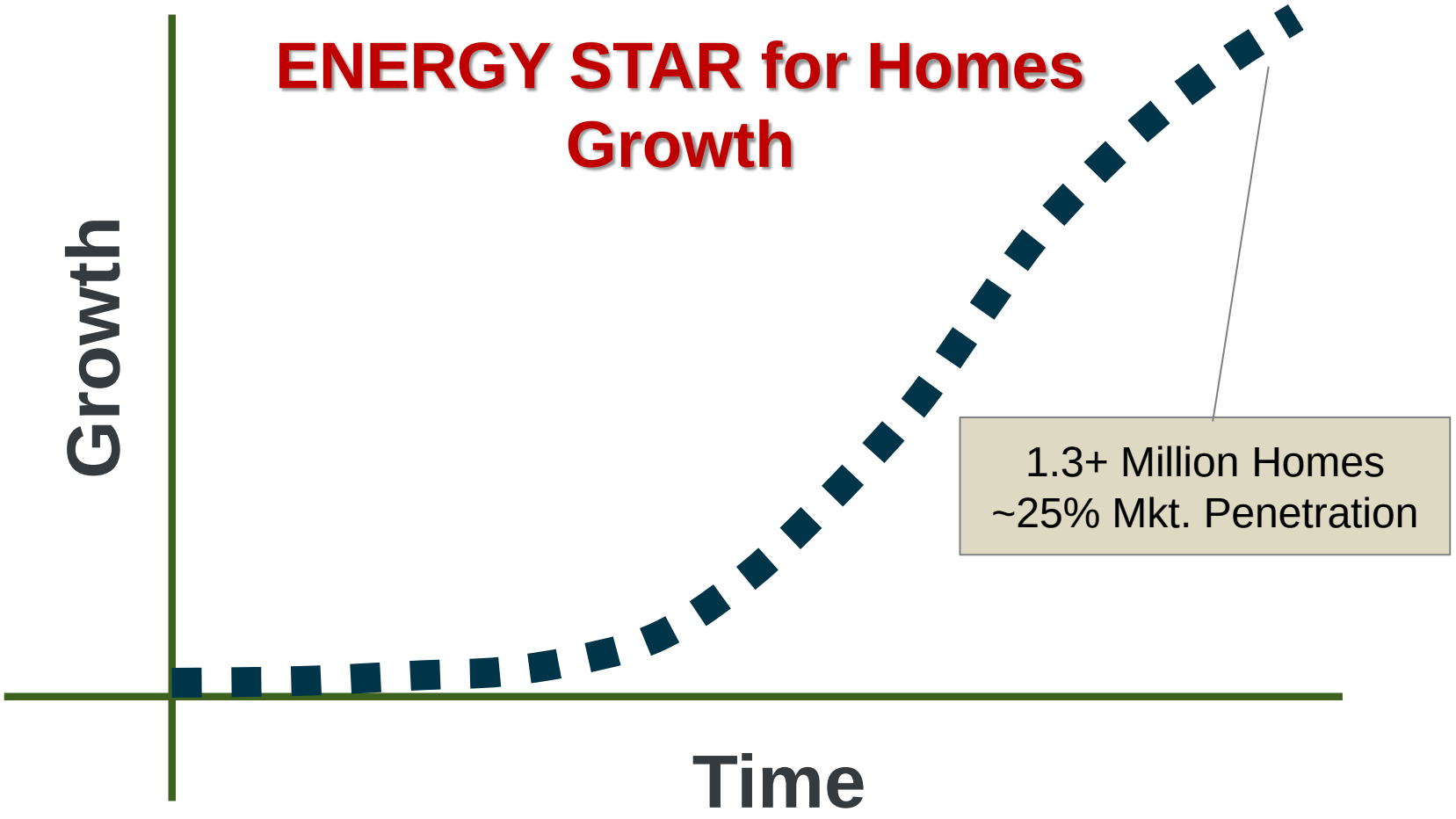
Building Science Imperative



Building Science Imperative



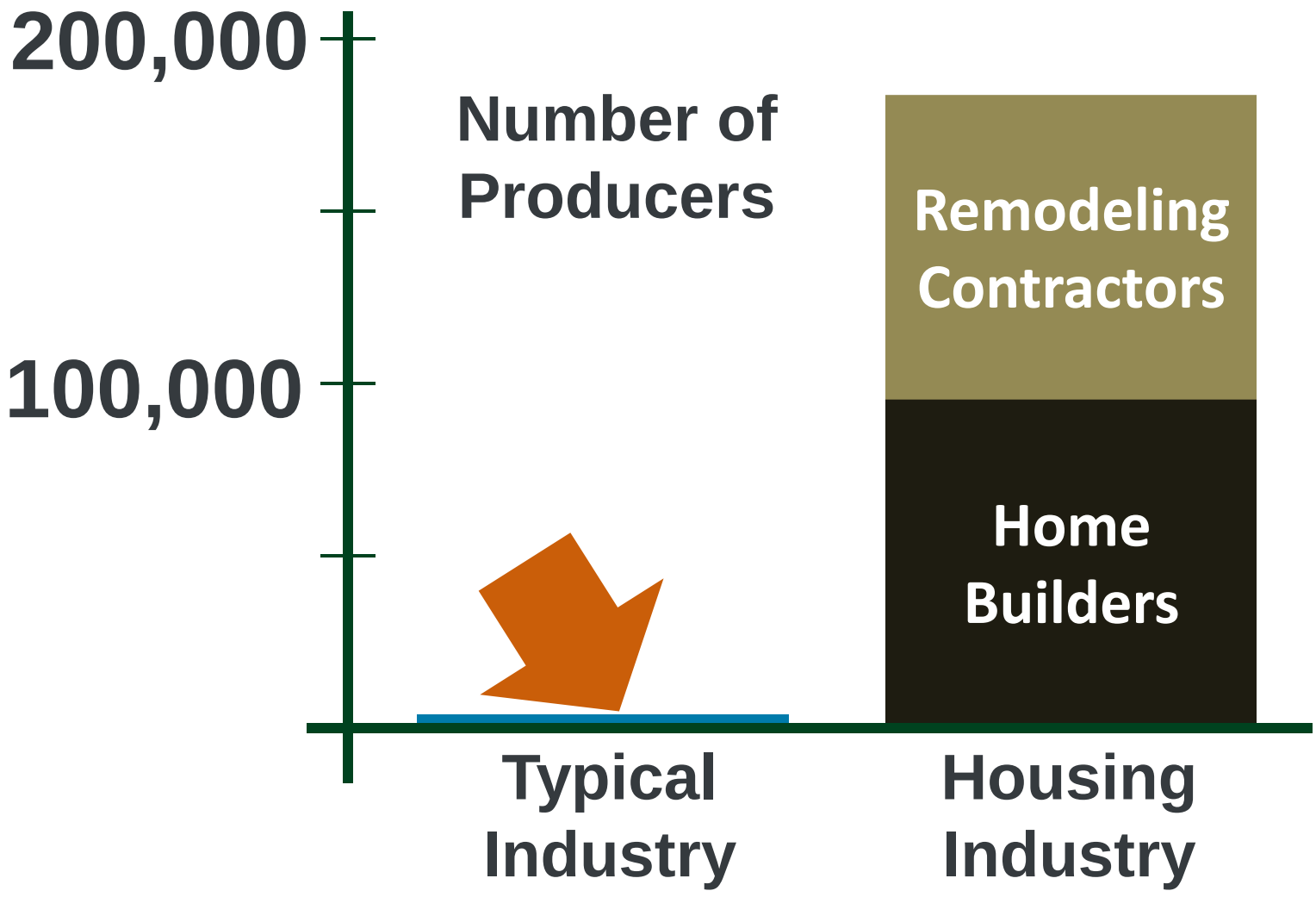
Home Performance Imperative



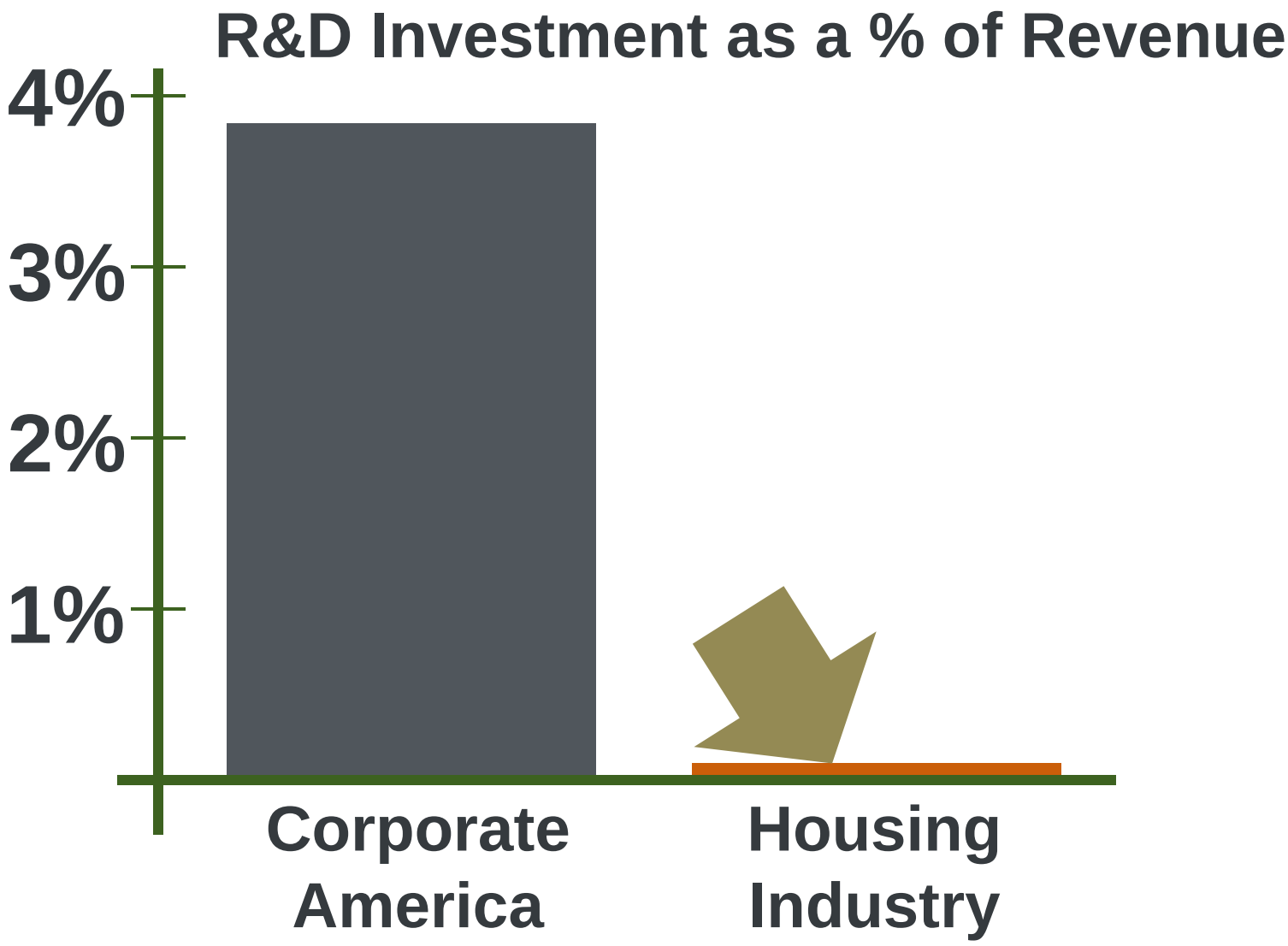
High-Performance Home Opportunity

- Jobs
- Clean Air
- Energy Independence
- Stronger Communities
- Healthier Households

Disaggregated Housing Industry



Lack of Housing R&D



Building America Fills Market Need for a

High-Performance Home

HUB of Innovation

Business Model

Building America Strategy

Building America Objective

1. Efficiency

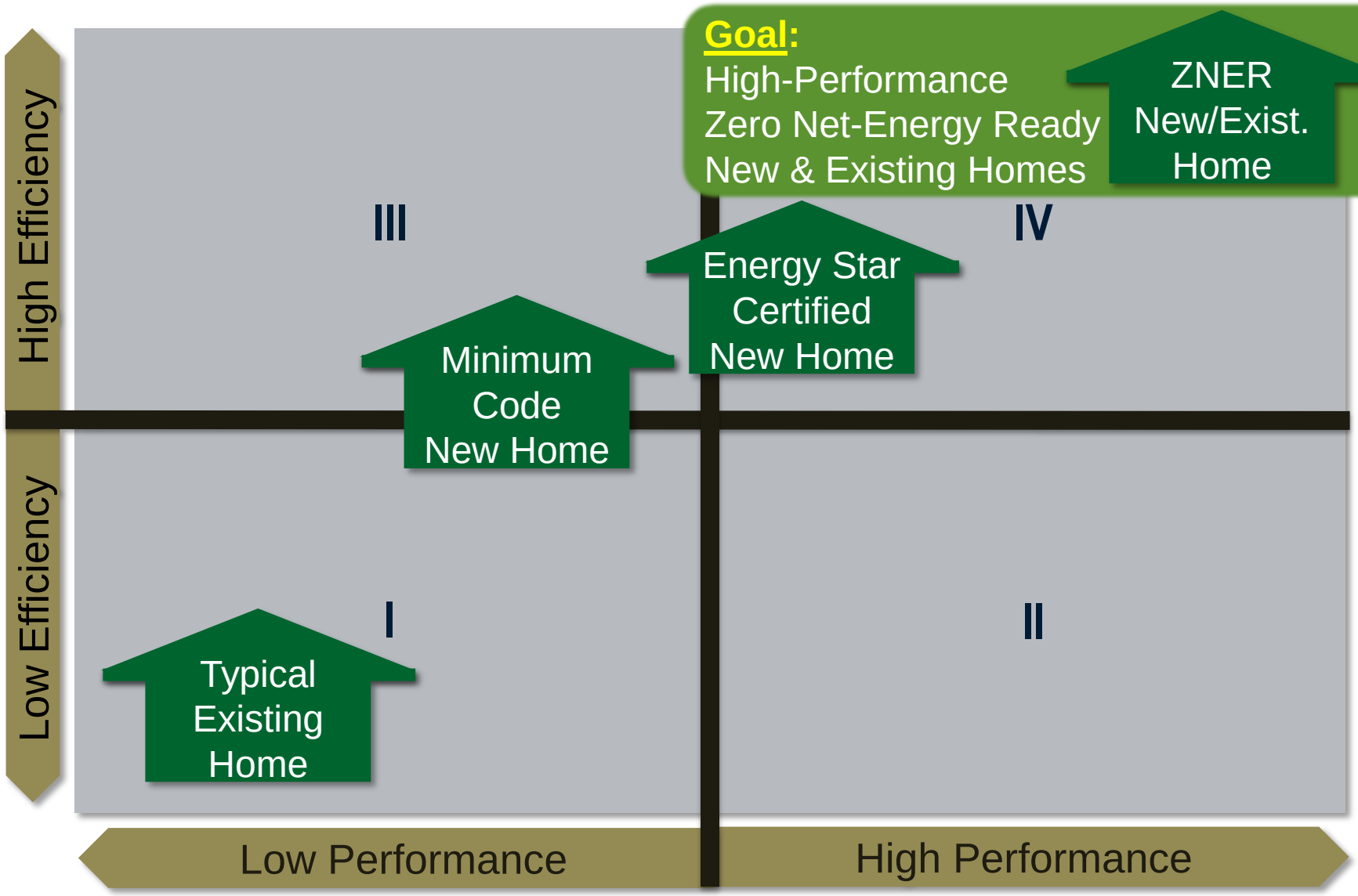
- Enclosure
- Low-Load HVAC
- Components

2. Performance

- Comfort
- Health
- Durability
- Renewable Readiness/Integration
- Water Conservation
- Disaster Resistance

Building America Goal

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

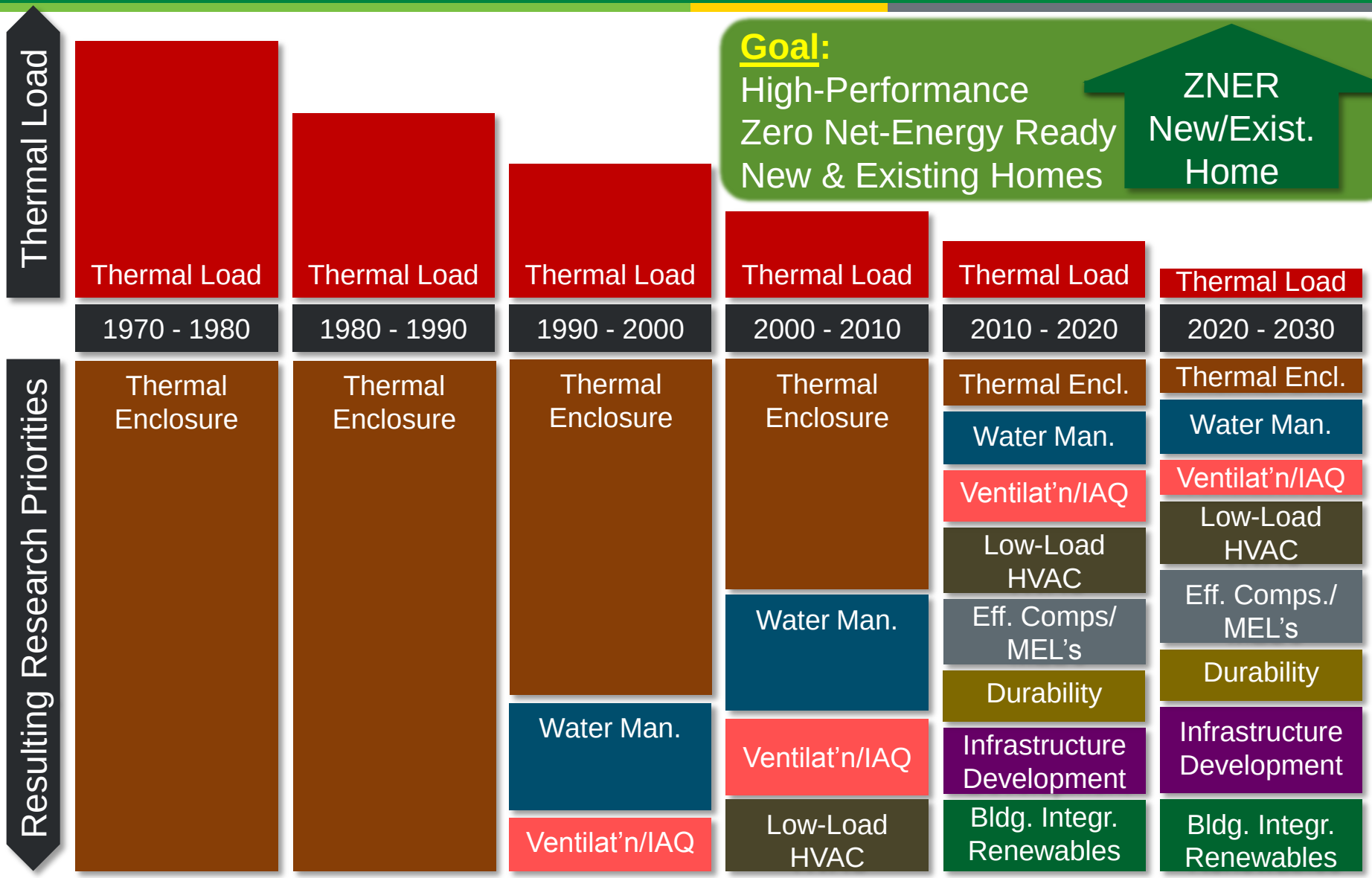


Building America Path

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

Goal:
High-Performance
Zero Net-Energy Ready
New & Existing Homes

ZNER
New/Exist.
Home



Building America Process

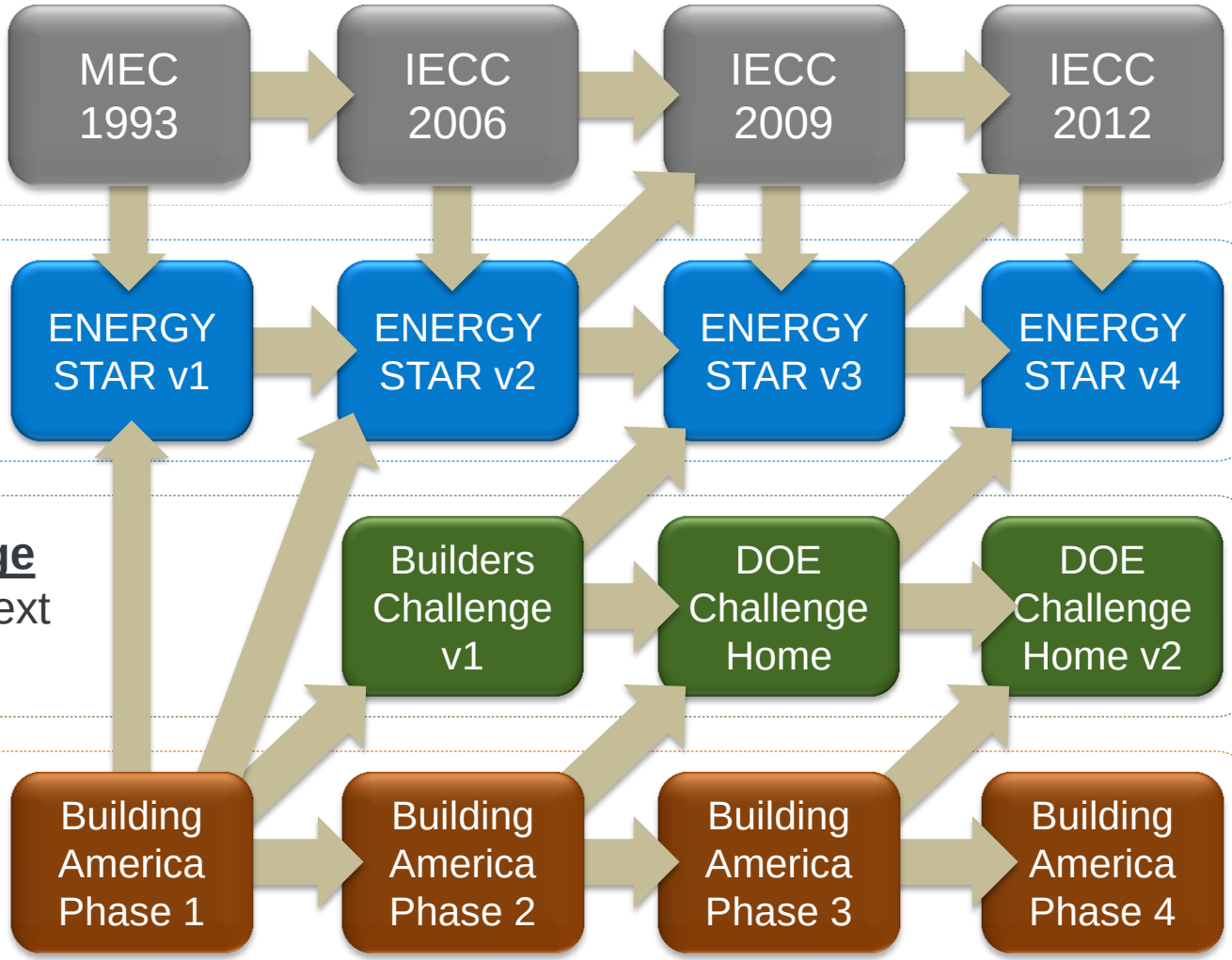
U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Codes
Drive ENERGY STAR spec

ENERGY STAR
Drives code changes, market

Builders Challenge
ENERGY STAR Next Gen Farm System

Building America
Develop & demo Solutions



Business Tool

Building America Solution Center

World-Class Expert Guidance…

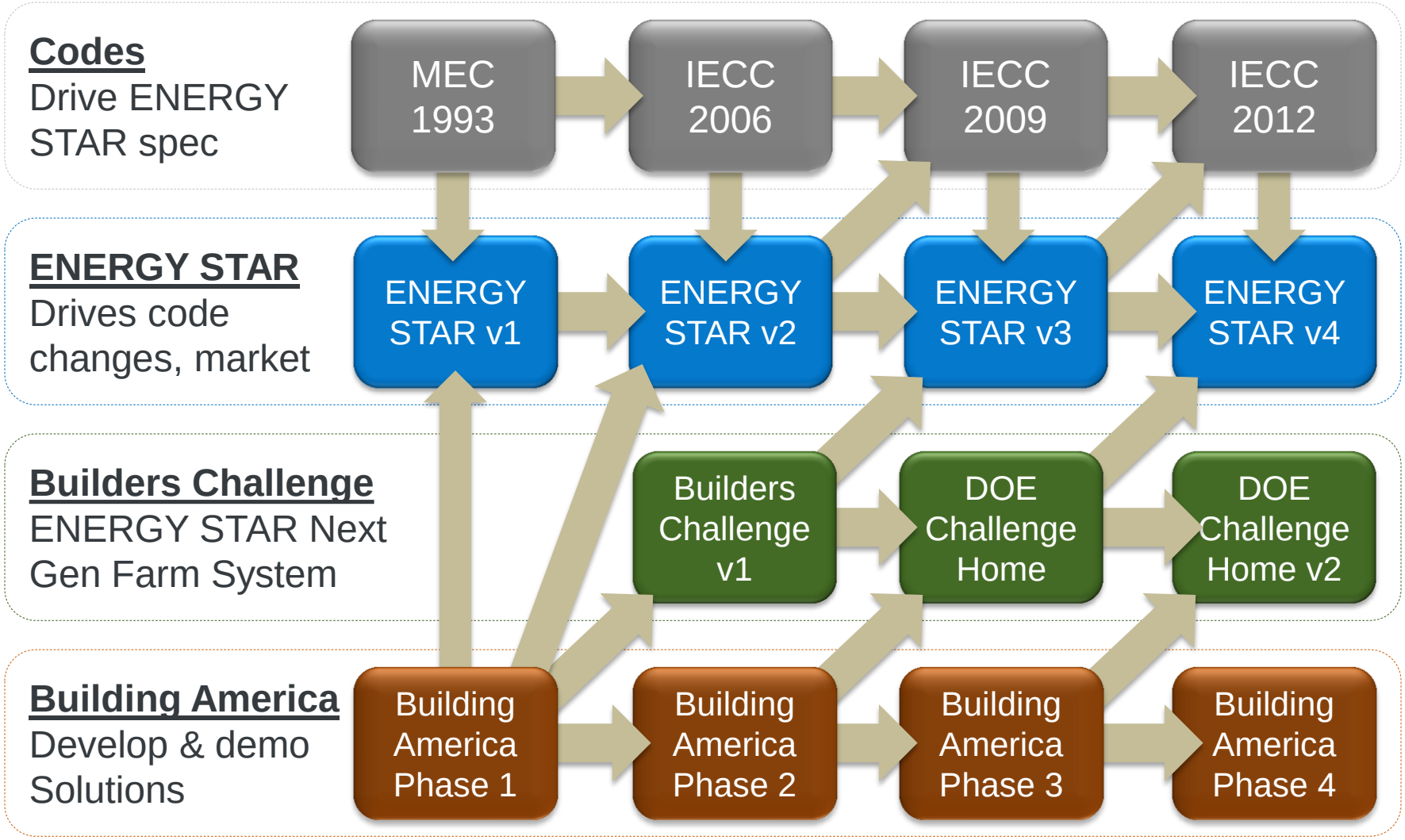
Building America Solution Center

BASC.energy.gov

…At Your Fingertips

Market Transformation Context

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



Problem/Solution

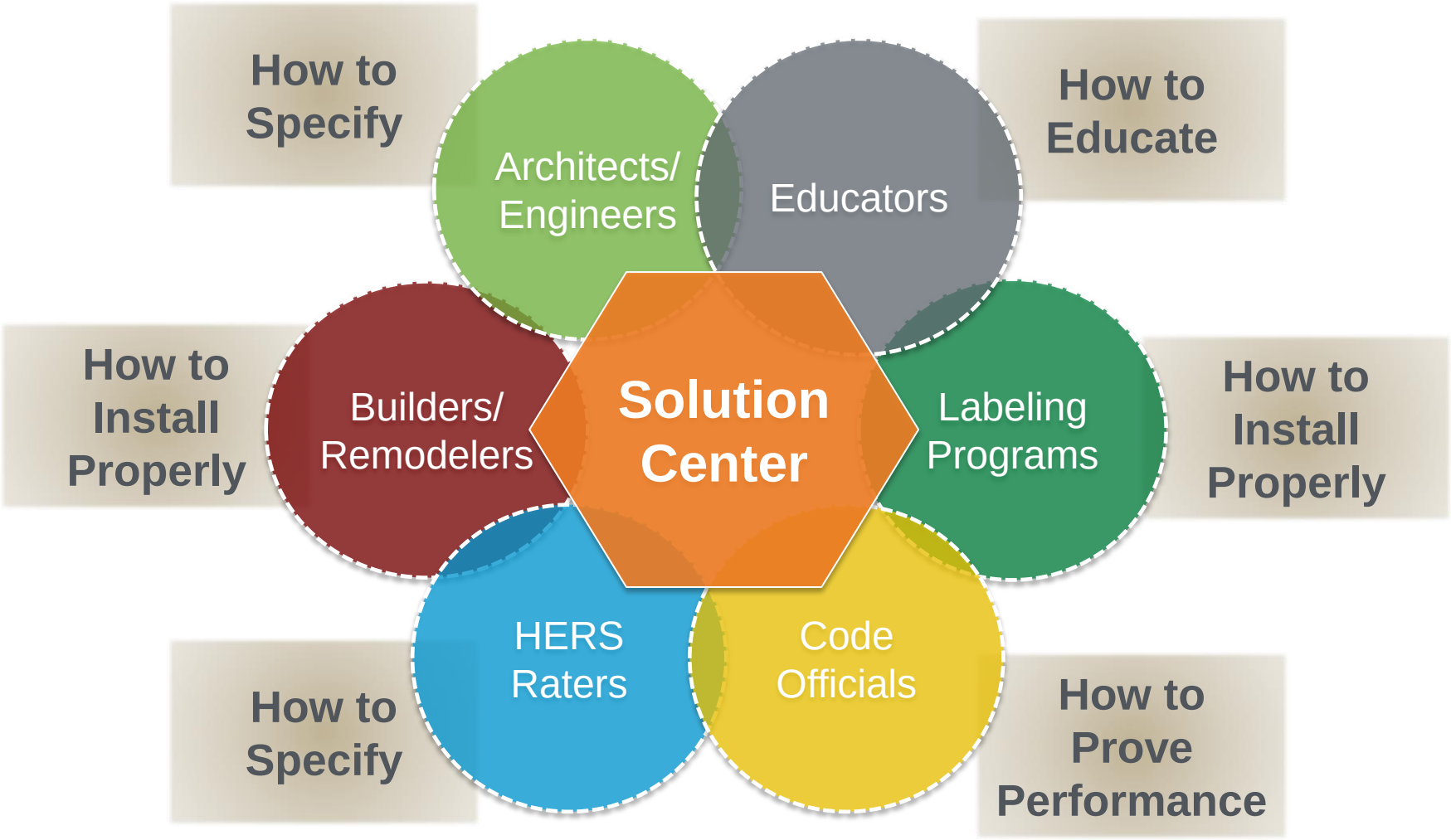
- Lack of Clear Goal
- Poor Customer Focus
- Slow
- Fixed Content
- No Customization
- Hard to Find

- Clear Goal
- More Customer Focus
- Faster
- Continuous Improvement
- Full Customization
- Easy Access

Clear Goal of BA Resource Tool

Serve the market transformation process by disseminating content most critical for customers to apply proven innovations.

More Customer Focused



Is:

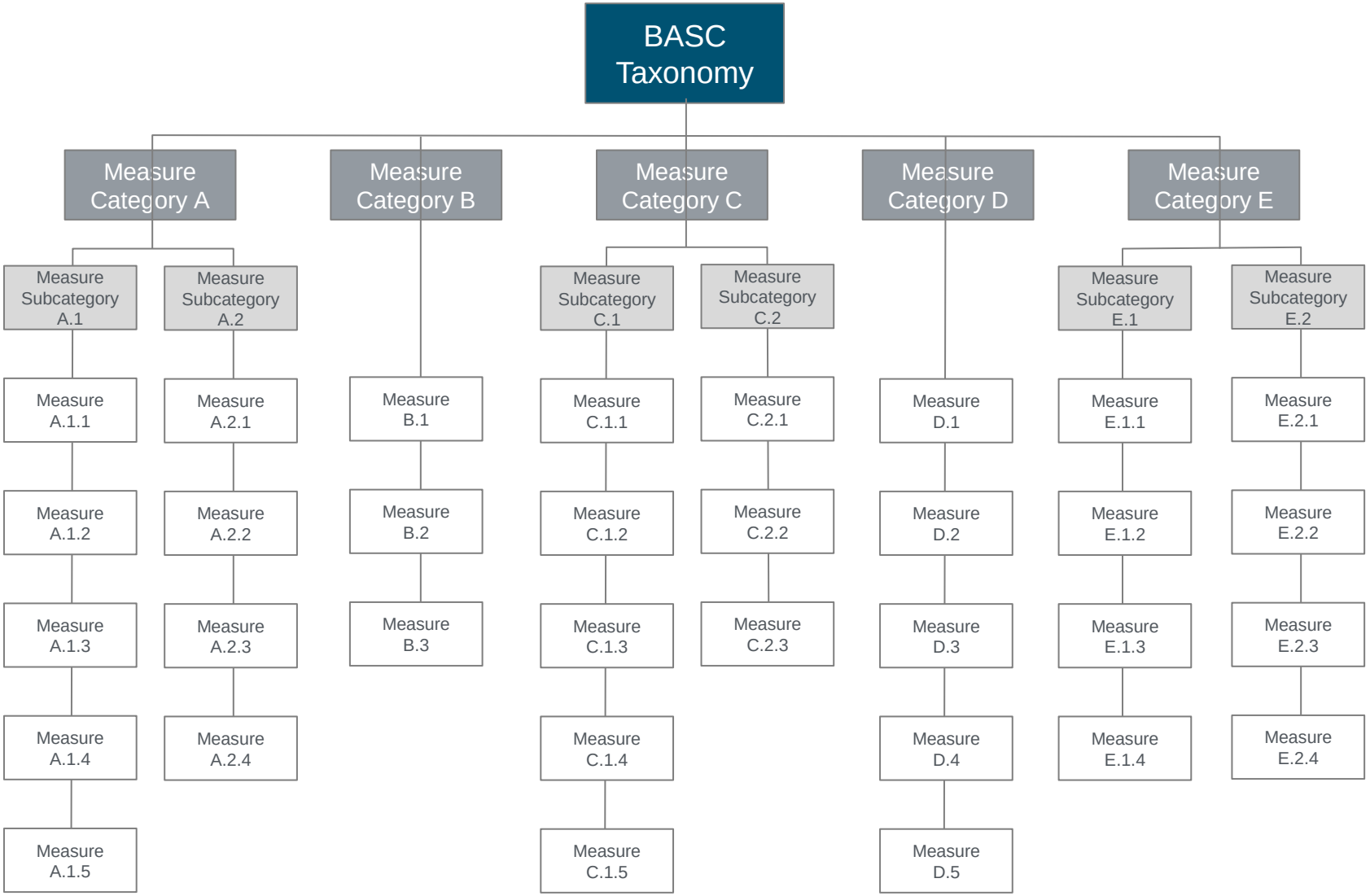
Content for Applying Proven Innovations:

- How to Specify
- How to Install Properly
- How to Prove Performance
- How to Educate

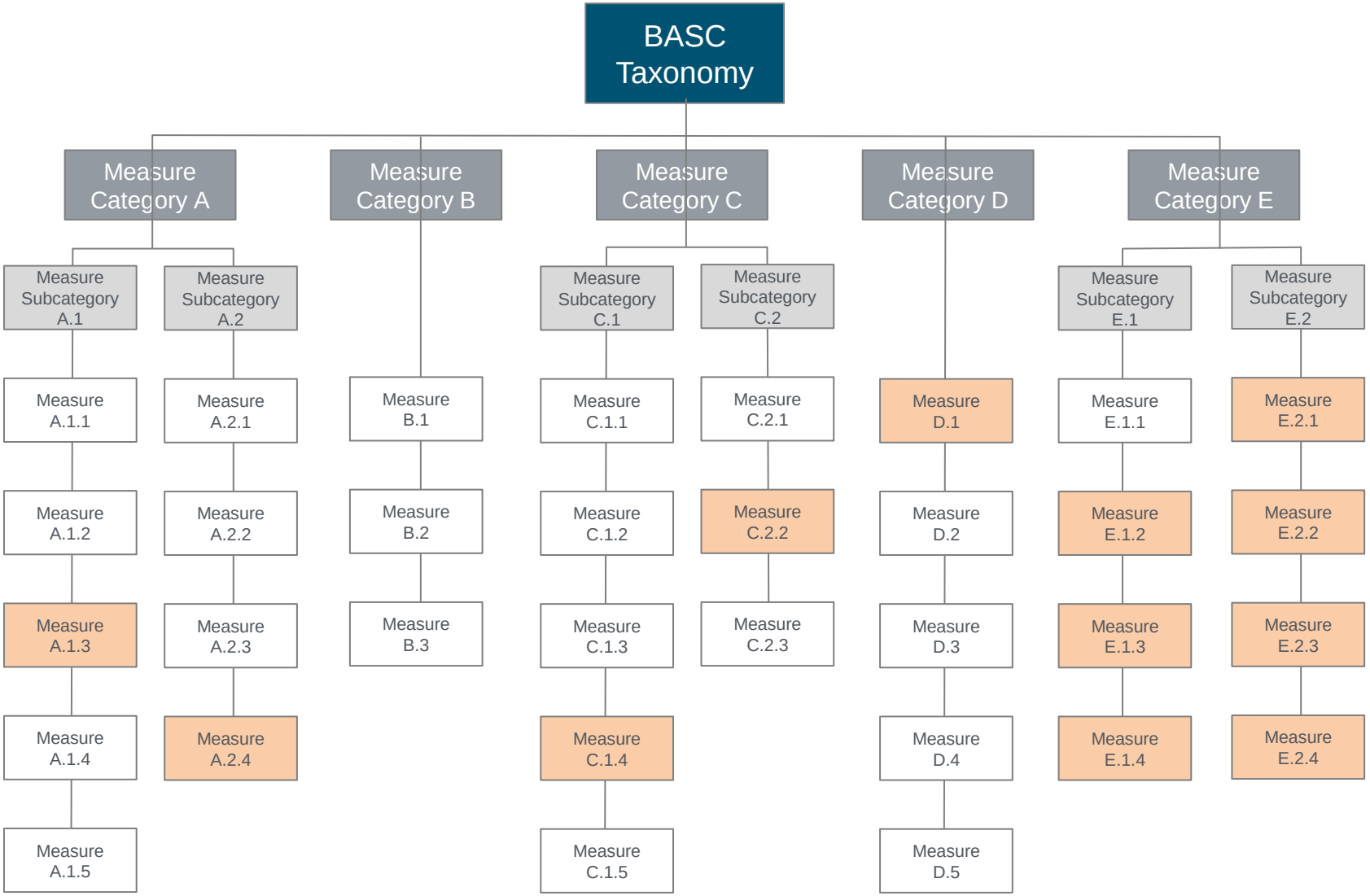
Is *Not*:

- Design Tool for Customized Energy Packages

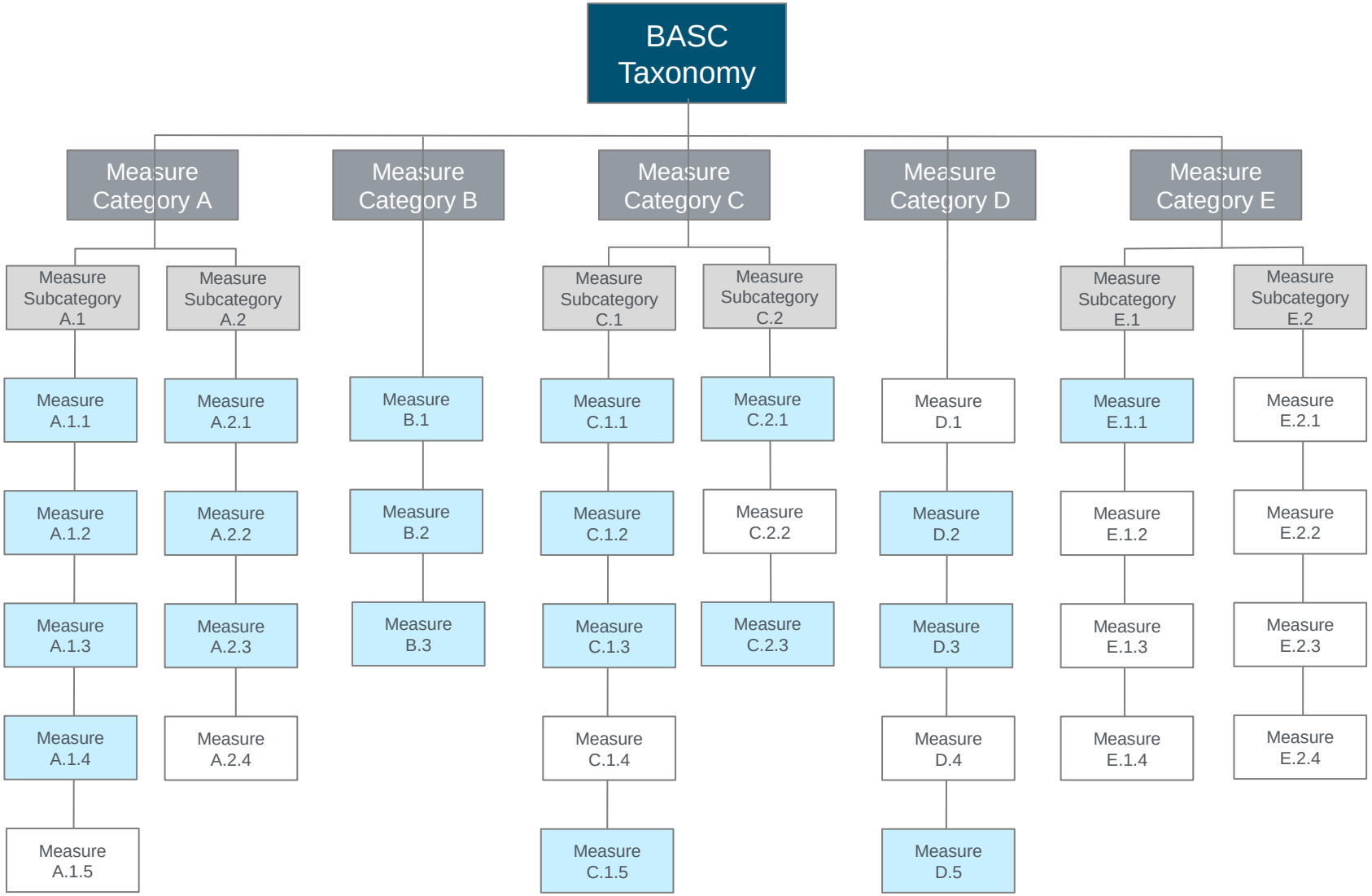
Taxonomy and Data Base



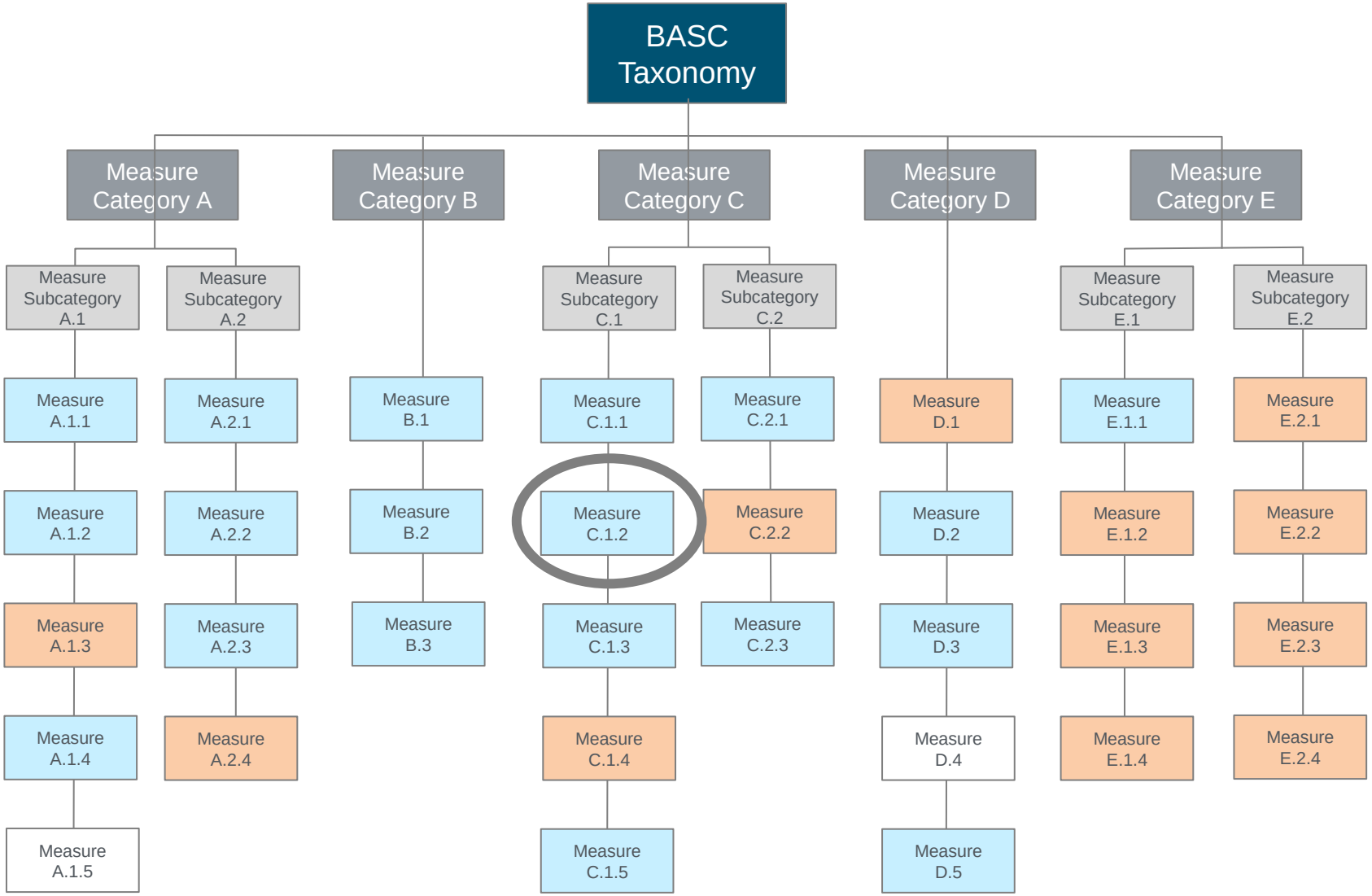
Taxonomy and Data Base

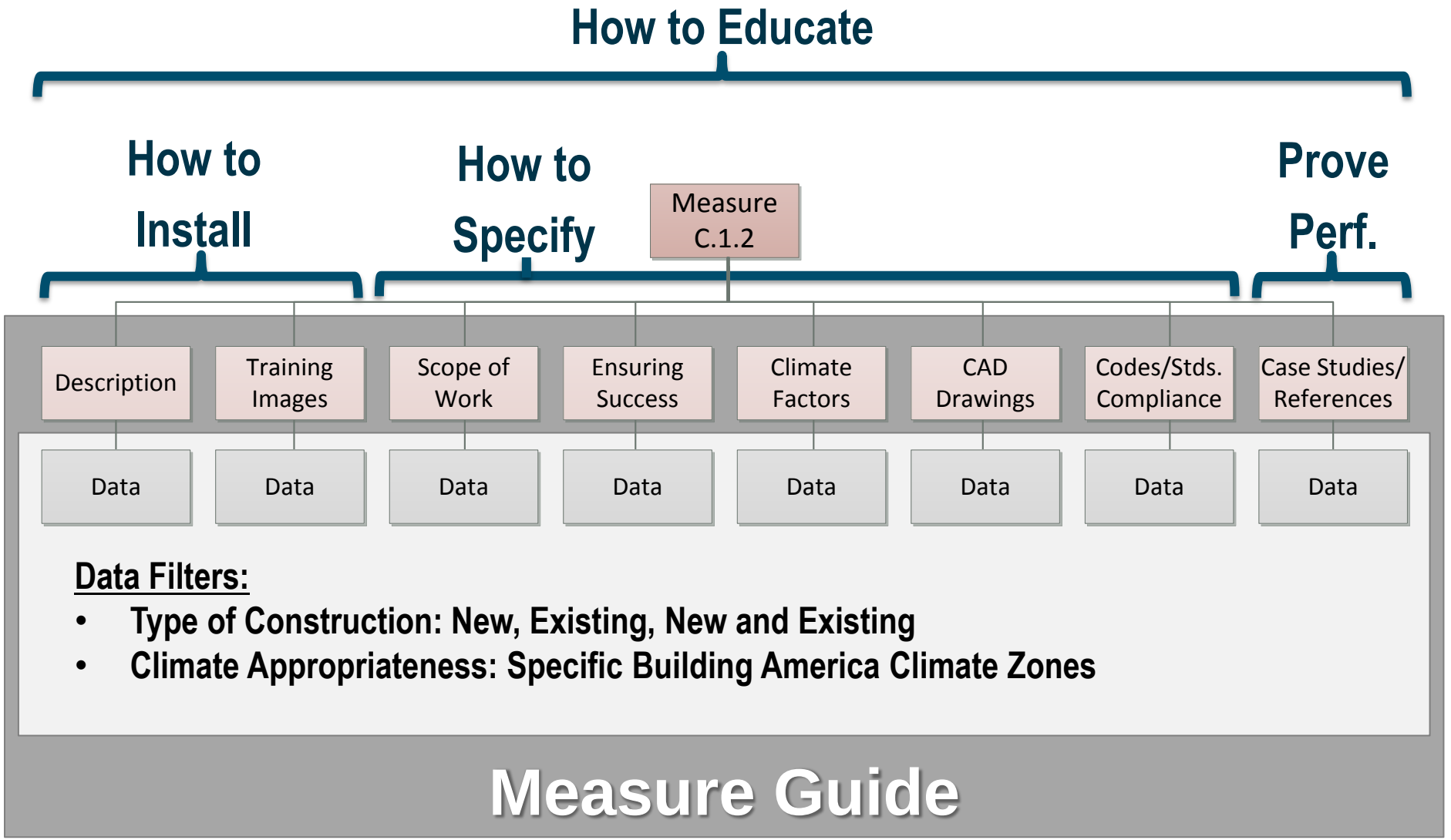


Taxonomy and Data Base

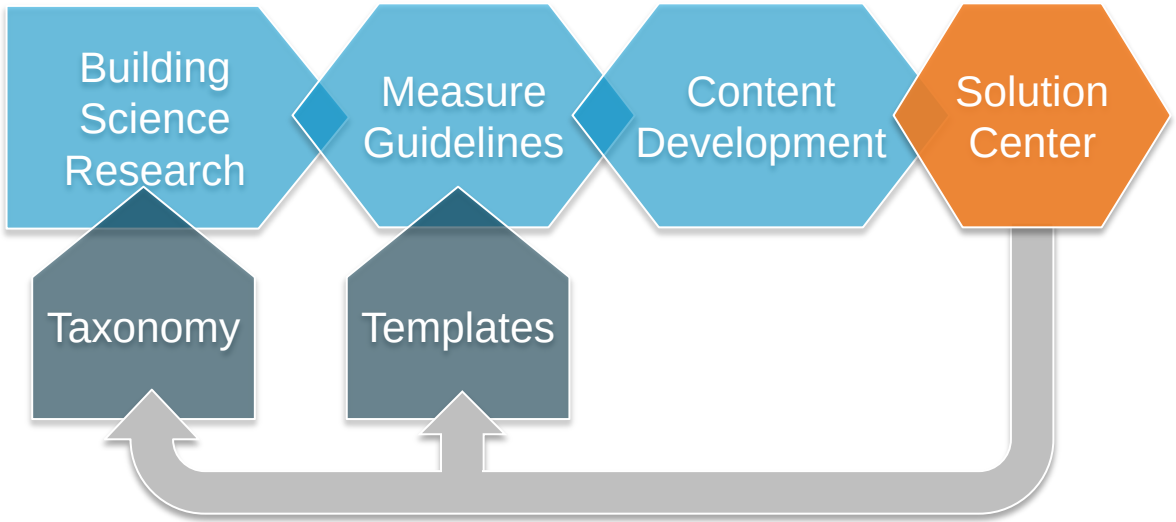


Taxonomy and Data Base

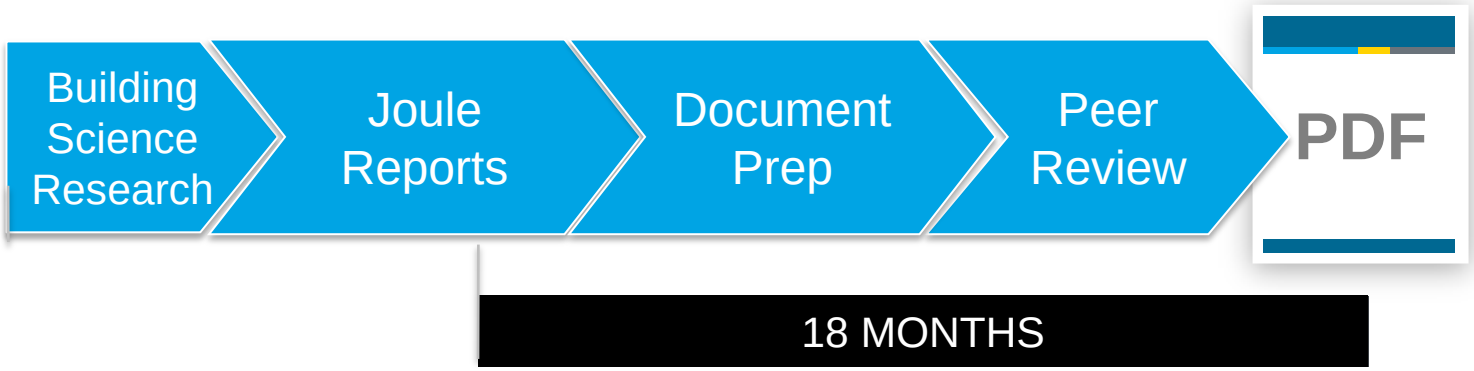



How to Educate
How to Install
How to Specify
Measure C.1.2
Prove Perf.
Description
Training Images
Scope of Work
Ensuring Success
Climate Factors
CAD Drawings
Codes/Stds. Compliance
Case Studies/ References
Data
Data
Data
Data
Data
Data
Data
Data
Data Filters:
• Type of Construction: New, Existing, New and Existing
• Climate Appropriateness: Specific Building America Climate Zones
Measure Guide

Content Development Process



Old Development Process

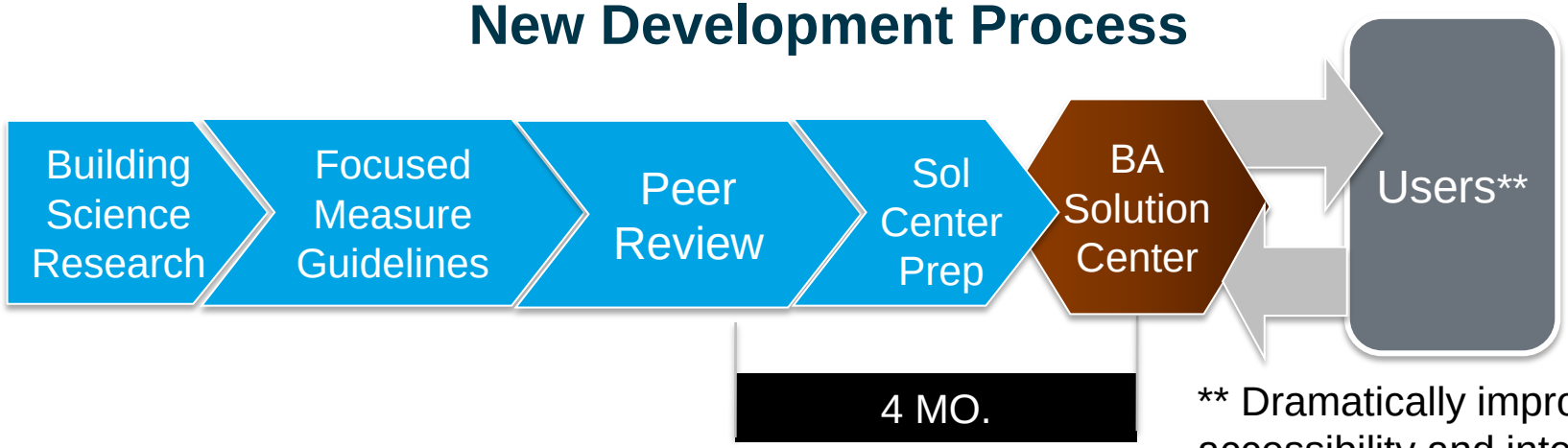


New Development Process

Old Development Process

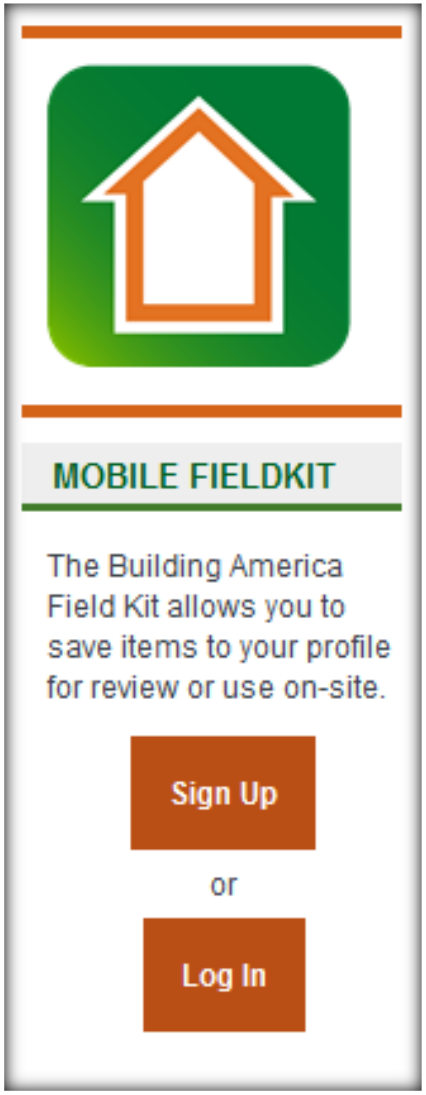
* If they can find it

New Development Process



** Dramatically improved accessibility and interaction

More Customizable



More Accessible

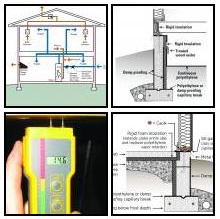
Home/Entry Page

Component Explorer

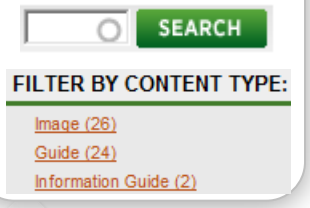
Checklist Manager

Building Science Explorer

Browse



Faceted Search



Content

Building America Solution Center Tour

Solution Center Tour

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

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

Customization

Login | Register

SEARCH

Solution Center Search | Search Help

Building America Solution Center

Search

EERE » BTP » Building America » Solutions Center »

Bread Crumbs

- Solutions Center Home
- Component Explorer
- Checklist Manager
- Building Science Explorer
- Browser
  - Guides
  - Case Studies
  - Image Gallery
  - CAD Files
- References

Component

Checklist

Building Science

Browser

Recent Content

The U.S. Department of Energy's Building America program strives to develop integrated energy systems that dramatically reduce annual energy use and peak energy loads in existing and new homes while also improving overall building quality, comfort, safety, and durability.

RECENTLY ADDED REFERENCES

International Mechanical Code: 804.3.8 Mechanical Draft Systems for Manually Fired Appliances and Fireplaces
Posted: February 20, 2013
NFPA 211: Standard for Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances, 2013 Edition
Posted: February 20, 2013
Combustion Appliance Safety & Efficiency Testing
Posted: February 19, 2013
More References

RECENTLY ADDED GUIDES

Unvented Combustion Appliances
Posted: January 15, 2013
Quantity and Location of Supply and Return Duct Terminals Match Contractor Balancing Report
Posted: January 13, 2013
Capillary Break Beneath Slab - Polyethylene Sheeting or Rigid Insulation Over Aggregate
Posted: October 16, 2012
More Guides

Building AMERICA U.S. Department of Energy

Log In for Customization

Log In for Customization (cont.)

demo's Field Kit

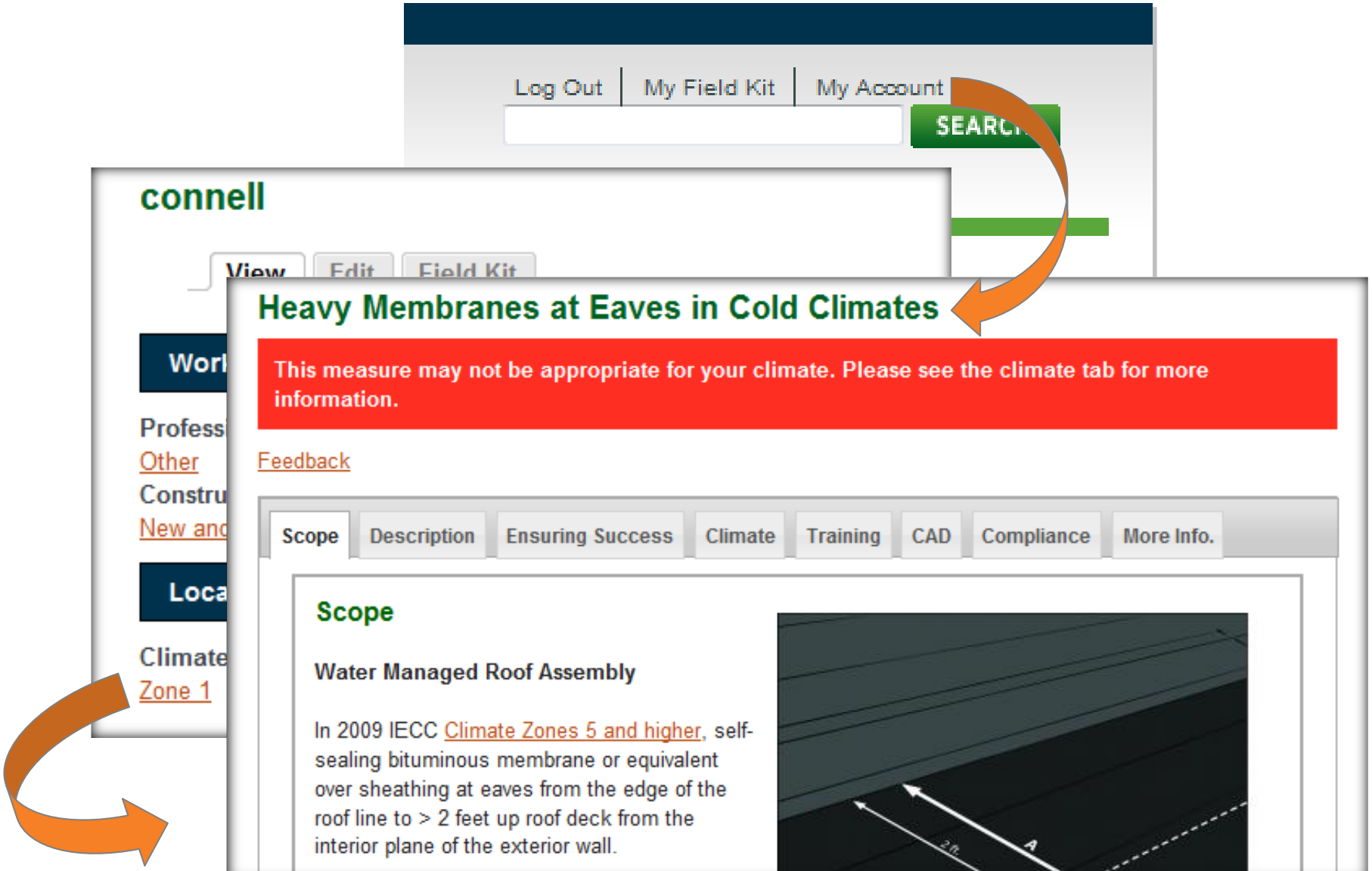
View | Edit | **Field Kit**

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

Type	Title
CAD File	Air barrier at garage band joist - 1 inch rigid insulation with 1x3 wood furring
CAD File	2 foot plan layout with wall elevation
CAD File	2-stud corner with 1x4 backer
Image	Air barrier is present between the dropped ceiling/soffit and the attic
Image	Neatly cut holes have been properly sealed with caulk and foam
Resource Guide	Walls Behind Fireplaces
Resource Guide	Garage Rim/Band Joist Adjoining Conditioned Space
Resource Guide	Cantilevered Floor
Resource Guide	Jump Ducts
Resource Guide	Step and Kick-Out Flashing at Roof-Wall Intersections

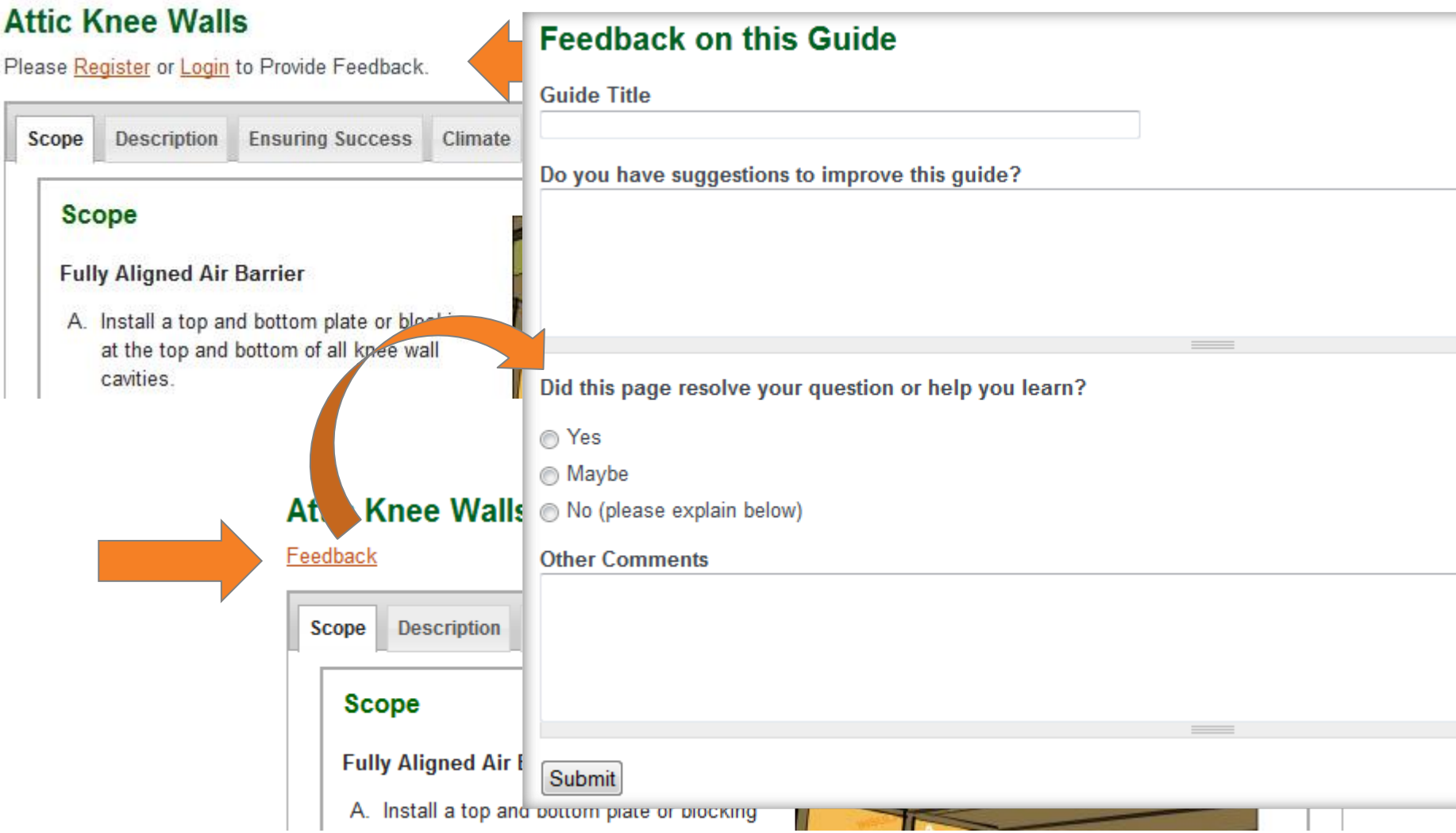
- Look for the Field Kit icon to add content
- COMING: Mobile access to your Field Kit.

Log In for Customization (cont.)



Log In for Customization (cont.)

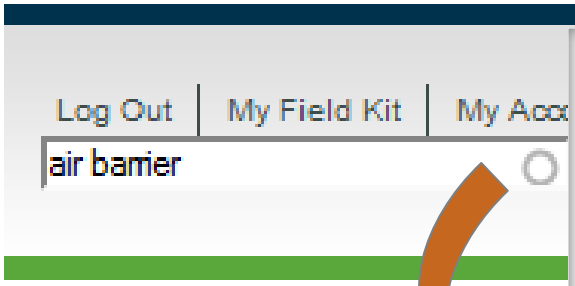
U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy



Register and log in to

- Build and track your Field Kit
- Customize content to your climate
- Track your searches
- Provide comments and content
- Help DOE understand how the tool is used

Search



Search is based on keywords, titles, Guide text, components, and component subcategories

Search results include Guides, Images, Case Studies, References, and anything else associated with a Guide

Navigation Terminology: Taxonomy

- The Solution Center is organized around a single, hierarchical taxonomy.
- All content is associated with at least one taxonomy term, but can be associated with many terms.
- All Guides fall into a parent (highest level) taxonomy category.
- When a Guide is loaded, an icon is used to identify this parent.

Thermal Enclosure

HVAC

Water Management

Navigation Terminology: Taxonomy

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

Attic Knee Walls

Please Register or Login to Provide Feedback.

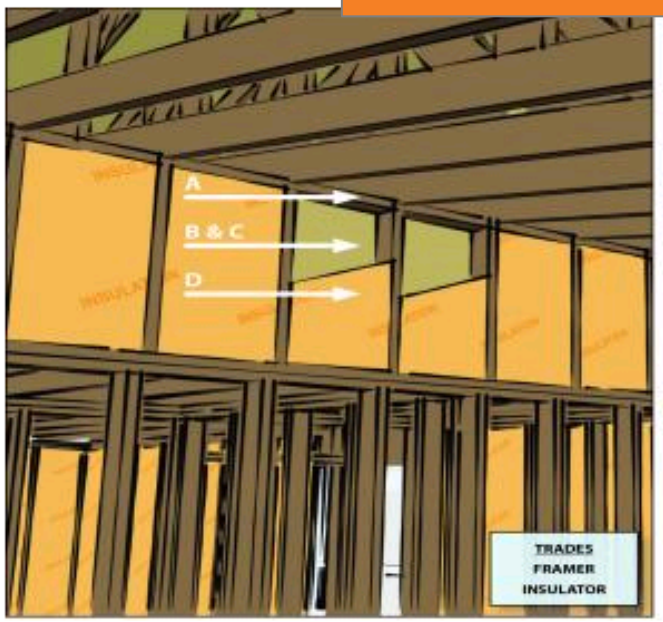
Scope | Description | Ensuring Success | Climate | Training | CAD | Com

Taxonomy: Thermal Enclosures

Scope

Fully Aligned Air Barrier

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



MOBILE FIELDKIT

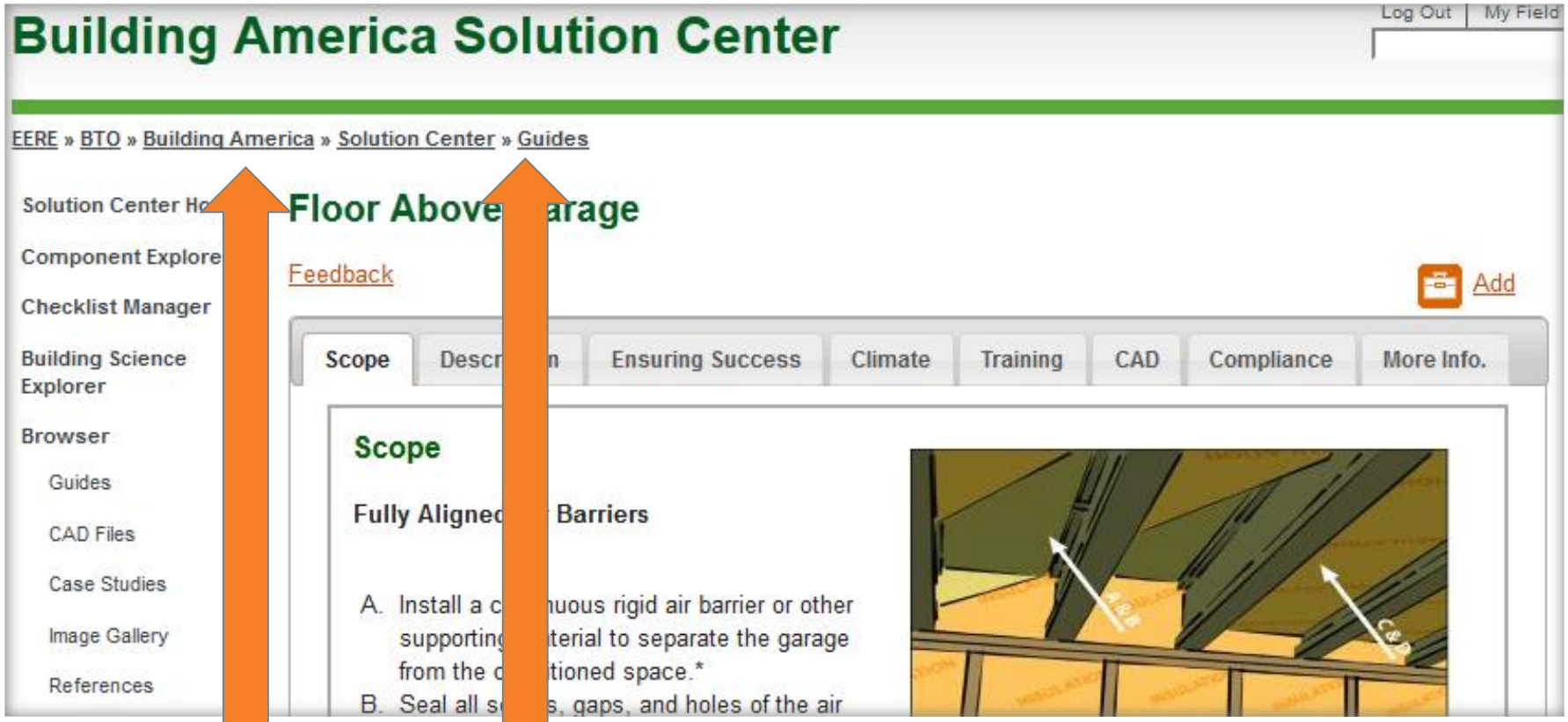
The Building America Field Kit allows you to save items to your profile for review or use on-site.

Sign Up

or

Log In

Bread Crumbs



Bread crumbs take you to EERE, BTO, Building America, and the Solution Center Home Page.

Bread crumbs also help you know how you got here….

Component Explorer

- The Component Explorer displays images representing eight building-related component areas
- Each component is further organized into Component Subcategories (e.g., air sealing, insulation, etc.)
- After selecting a subcategory, all guides associated with that subcategory are displayed.

Component Explorer (cont.)

Foundation

Water Managed Foundation
Minimum Thermal Bridging
Insulation
Air Sealing
Fully Aligned Air Barriers

Click a component to display subcategories
Click subcategories to display Guides

Component Explorer (cont.)

Component Explorer

Foundation » Insulation

IECC Code Level Insulation

Insulation Installation (RESNET Grad

Slab Edge Insulation

Slab Edge Insulation

Please Register or Login to Provide Feedback.

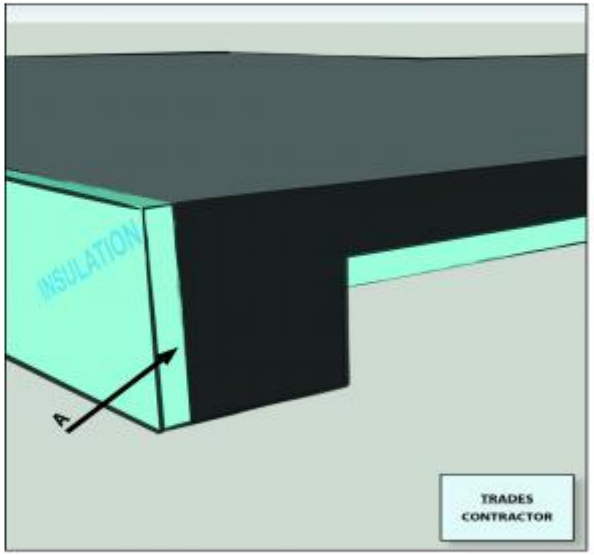
Scope | Description | Ensuring Success | Climate | Training | CAD | Compliance | More Info.

Scope

Reduced Thermal Bridging

For slabs on grade in Climate Zone 4 and higher, 100% of the slab edge is insulated to ≥ R-5 at the depth specified by the 2009 IECC and aligned with thermal boundary of the walls.

A. Install slab edge insulation to extend to the top of the slab so it provides a complete thermal break.



Notes:

Consistent with the 2009 IECC, slab edge insulation is only required for slab-on-grade floors with a floor surface less than 12 inches below grade. Slab insulation shall extend to the top of the slab to provide a complete thermal break. If the top edge of the insulation is installed between the exterior wall and the edge of the interior slab, it shall be permitted to be cut at a 45-degree angle away from the exterior wall.

Checklist Manager

- The Checklist Manager currently allows exploration of content specific to ENERGY STAR Version 3 checklists.
- The Checklist Manager does not provide pathways to additional, non-related data .
- Topics are displayed in the same order as they appear on the ENERGY STAR checklists.
- Users can drill down into the checklist to display Guides associated with each requirement.
- Checklists supporting other programs will be added in the future.

Checklist Manager (cont.)

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

ENERGY STAR Qualified Homes, Version 3 (Rev. 06)

Checklist Manager provides links to technical guides that align with each measure included in the checklists for ENERGY STAR Qualified Homes, Version 3 (Rev. 6). The numbers and titles included in the Checklist Manager follow the same order as the four ENERGY STAR Inspection Checklists for National Program Requirements. To view programmatic footnotes, see the original program checklists. Portions of the programmatic footnotes have been added to the Scope tabs in the guides. For additional ENERGY STAR program requirements and information, visit the ENERGY STAR Website.

- Thermal Enclosure Sys
  - TE 1. High-Perfor
    - TE 1.1. Pres
    - TE 1.2. Perfo
  - TE 2. Quality-Inst
  - TE 3. Fully-Aligne
  - TE 4. Reduced Th
  - TE 5. Air Sealing

ENERGY STAR Windows

Please Register or Login to Provide Feedback.

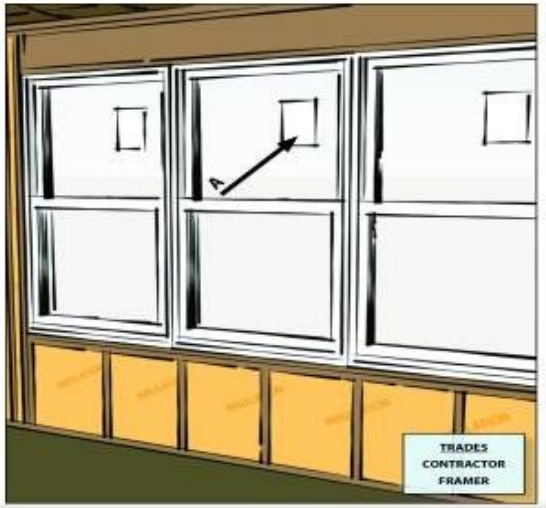
Scope | Description | Ensuring Success | Climate | Training | CAD | Compliance | More Info.

Scope

ENERGY STAR Windows

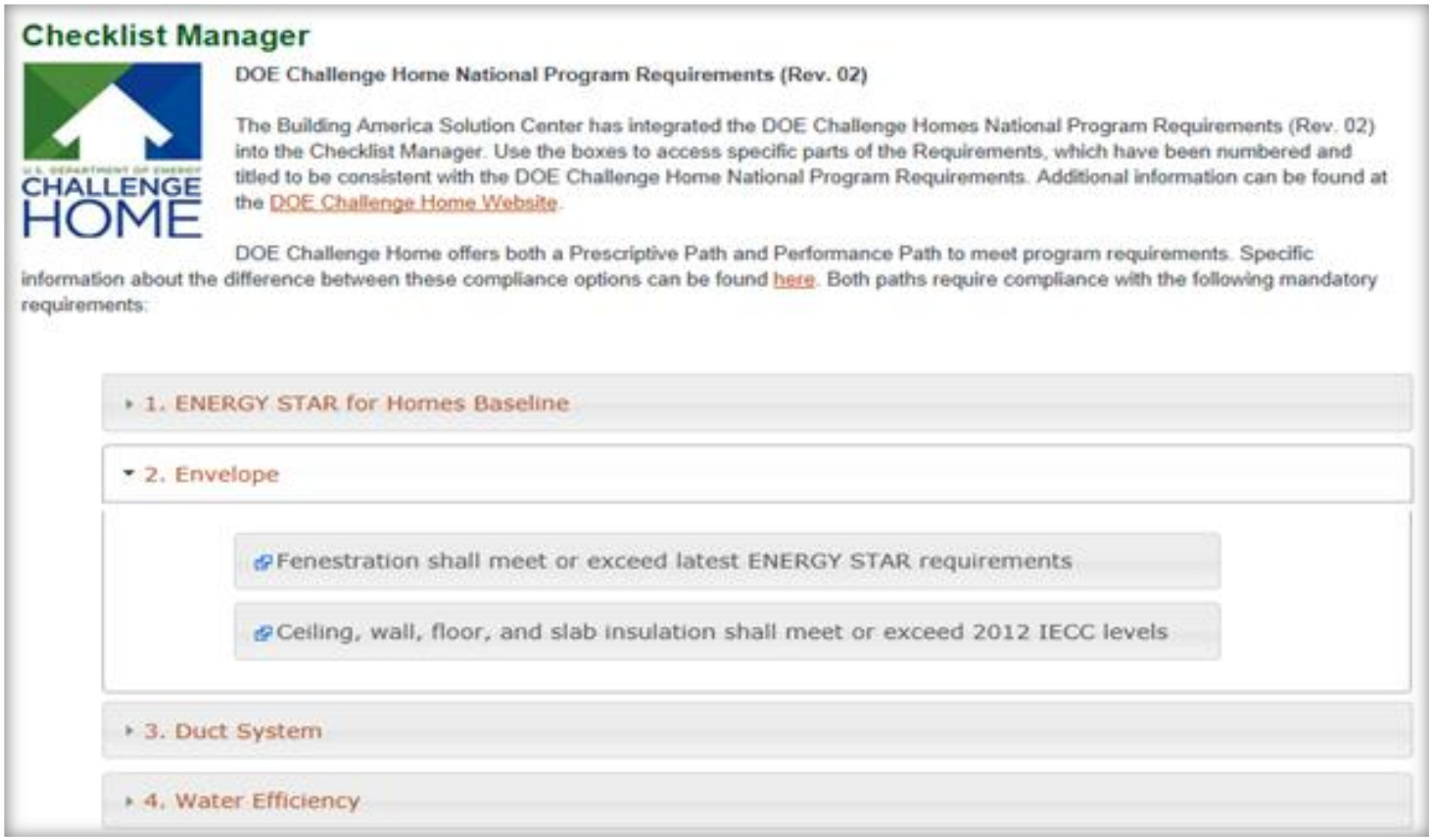
Prescriptive Path: Fenestration shall meet or exceed ENERGY STAR requirements

A. Select windows, doors, and skylights to meet ENERGY STAR program requirements for windows, doors, and skylights.
B. Note that the U-value and the Solar Heat Gain Coefficient (SHGC) for doors apply to the whole door, not just the glazing portion.



Checklist Manager (cont.)

- COMING: Additional checklists will be added
  - DOE Challenge Home Checklists
  - Existing homes



Guides

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

Scope

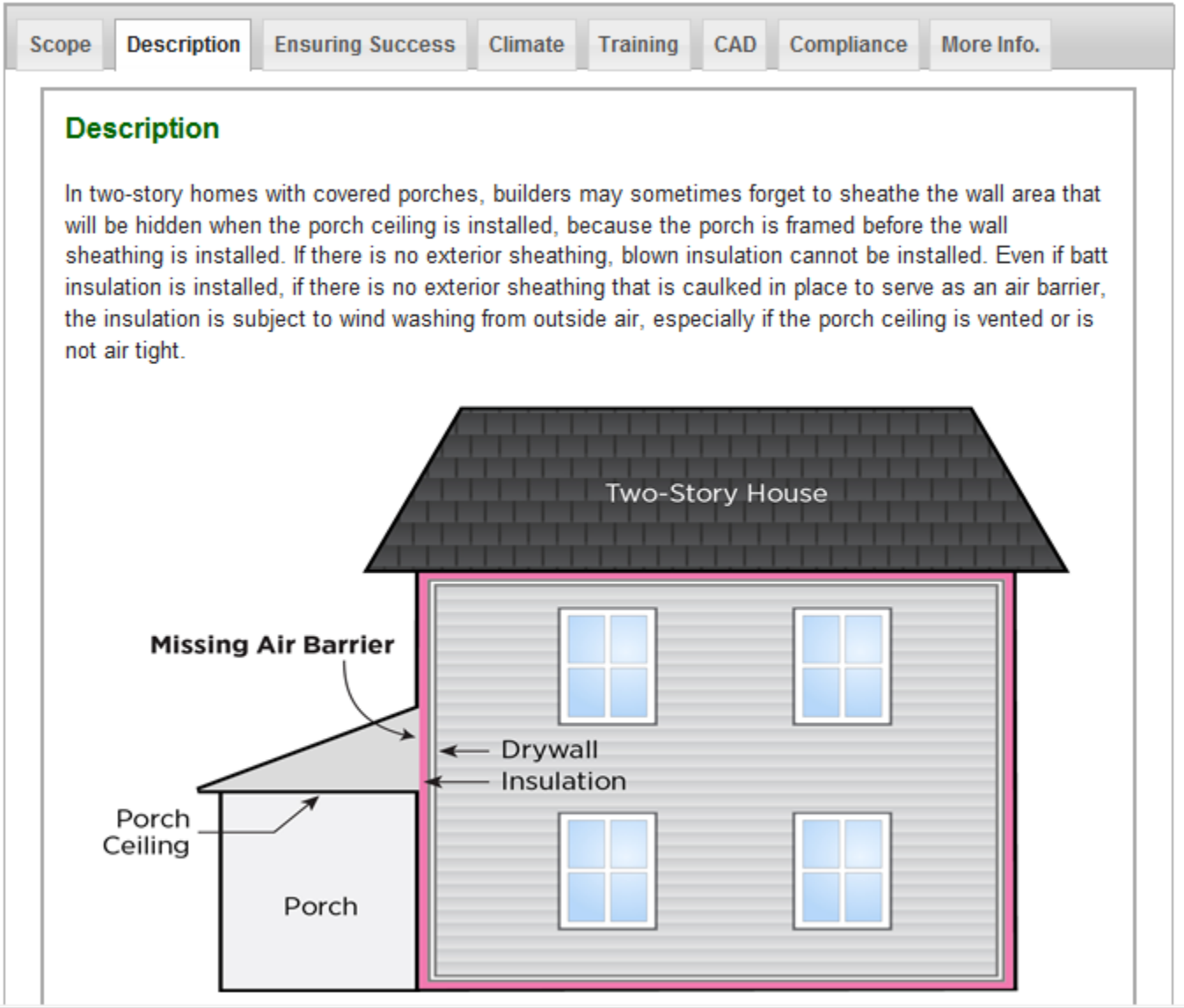
Fully Aligned Air Barrier

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

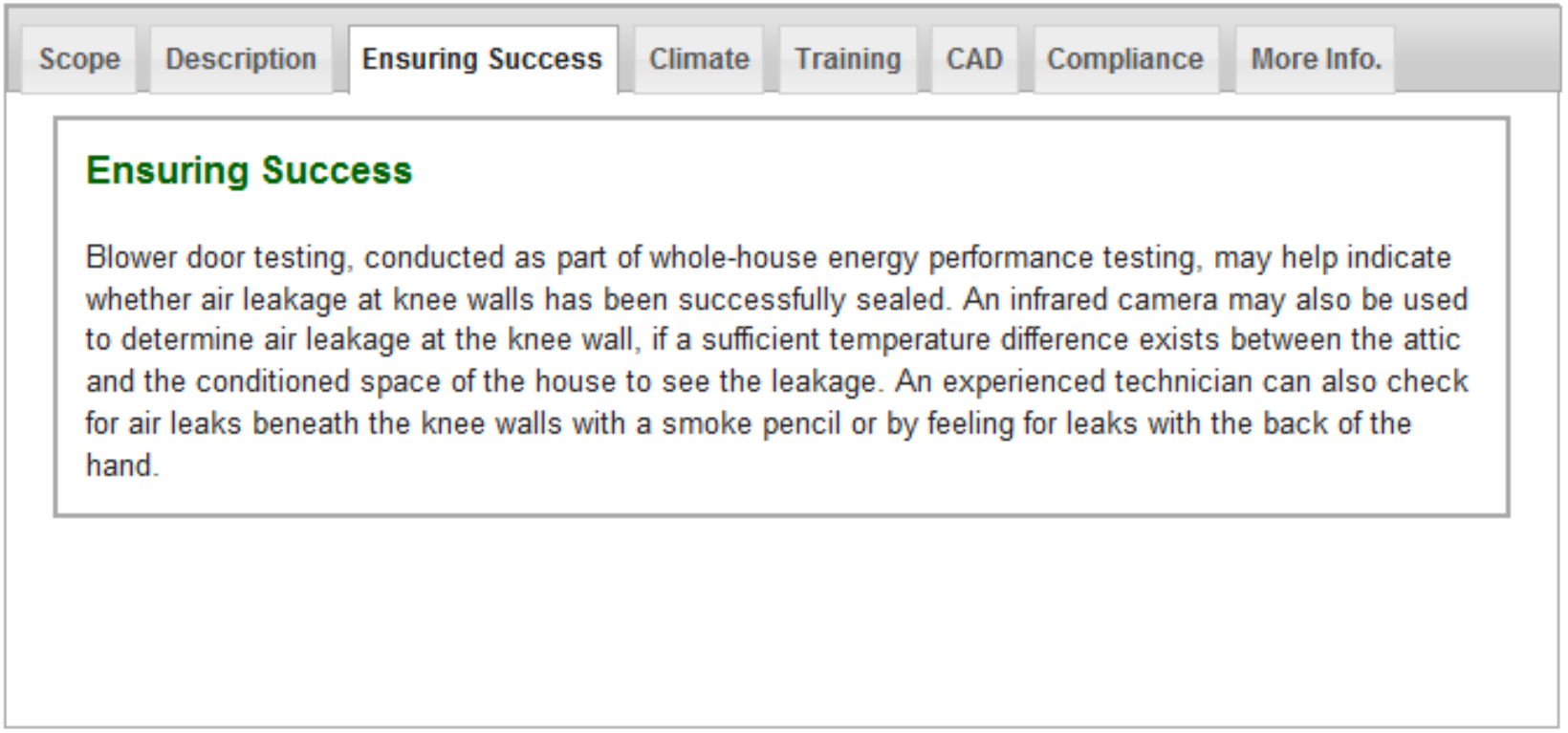
Scope: Clearly defines and bounds the building topic in a way builders and remodelers can use to contractually obligate their subcontractors.

Guides (cont.)

Description: Provides an explanation of the building topic and specific "how-to" steps for implementing.



Guides (cont.)



Ensuring Success: A big-picture discussion of health, safety, durability, performance issues, test-in/test-out requirements, and scheduling and sequencing considerations.

Guides (cont.)

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

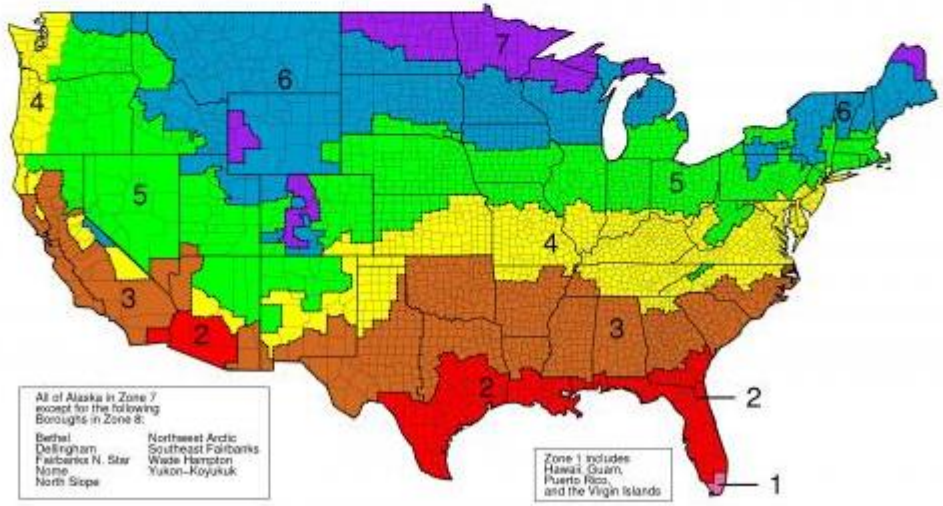
Climate

ENERGY STAR Version 3, (Rev. 5)

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.

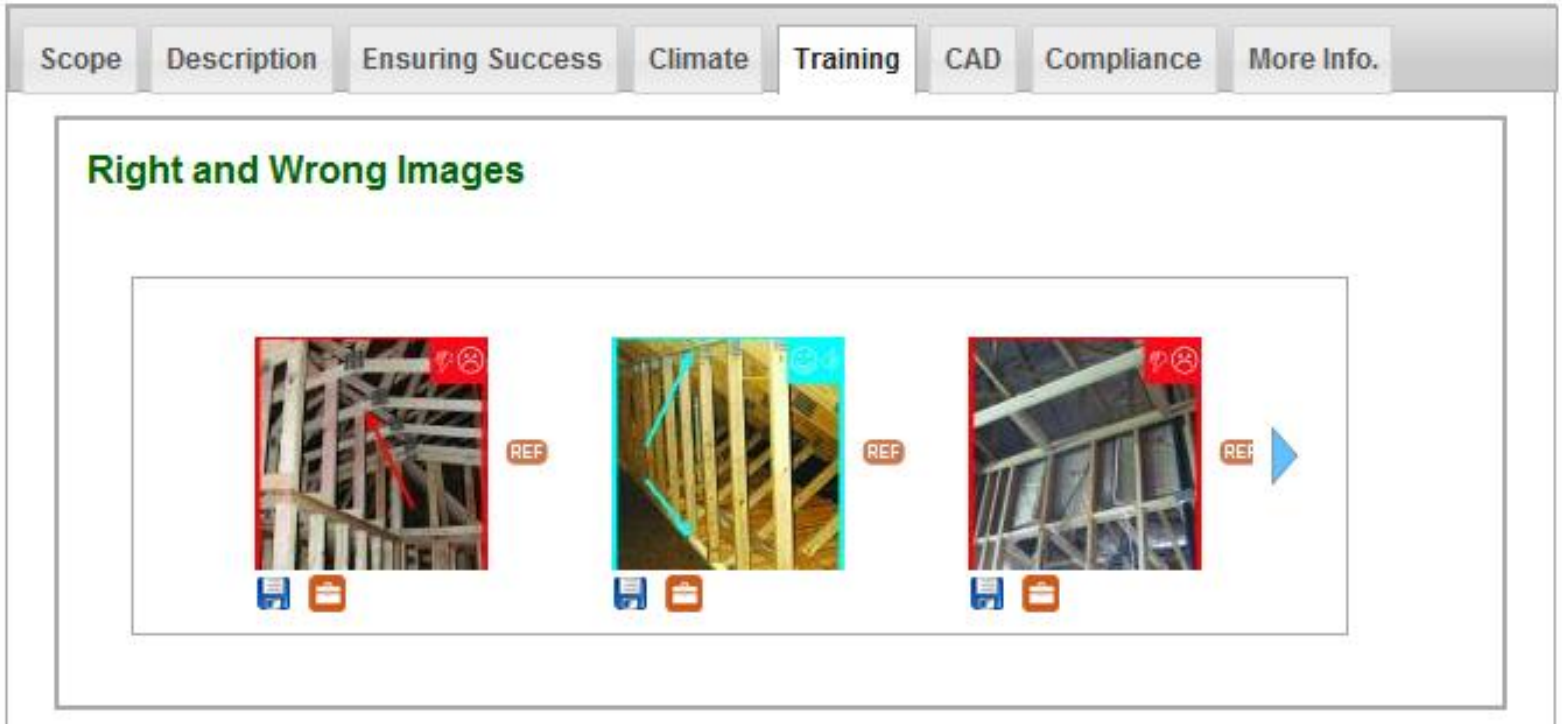
DOE Challenge Home

Exhibit 2: DOE Challenge Home Target Home. 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.



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

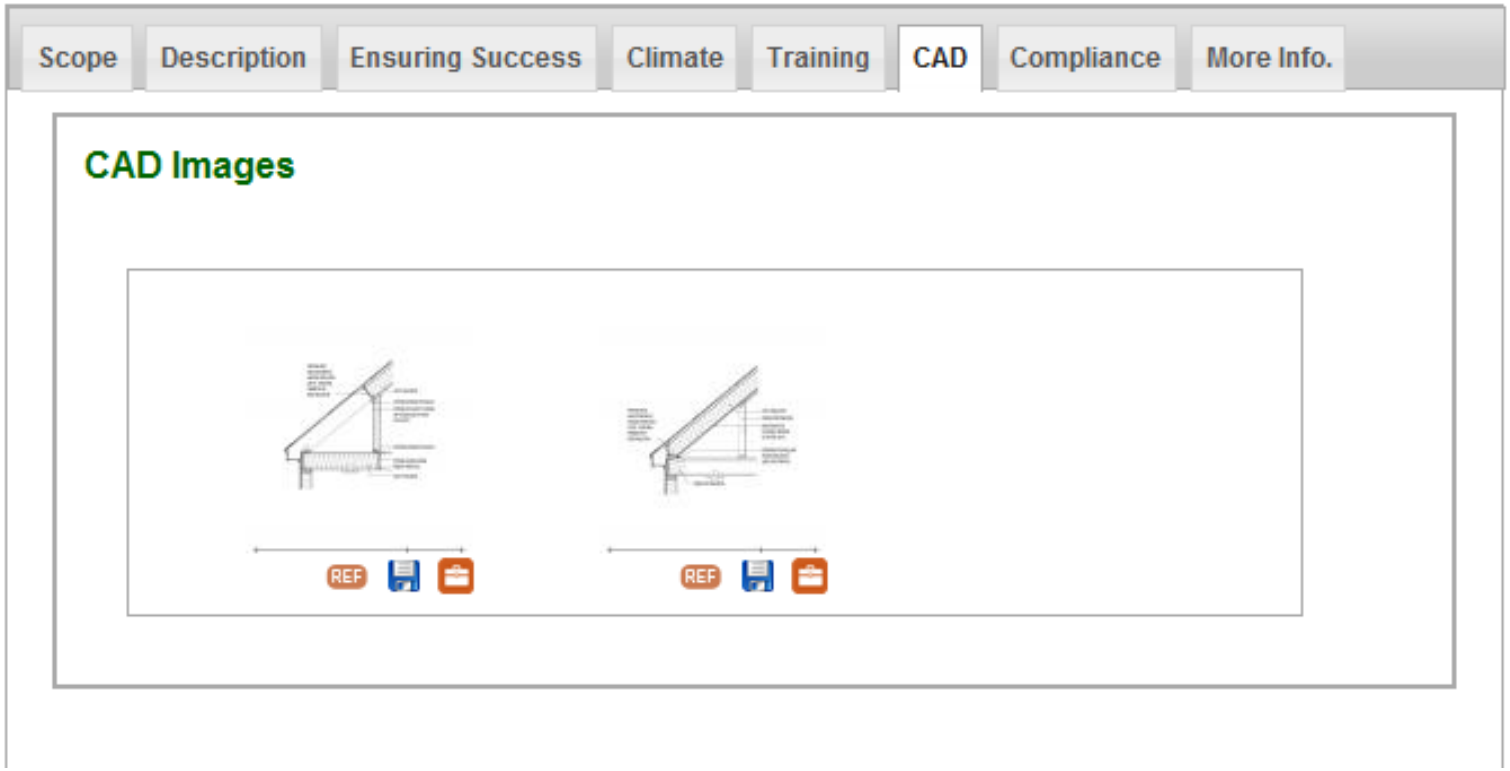
Guides (cont.)



Training: Includes educational resources such as Right/Wrong photographs of proper and improper installation.

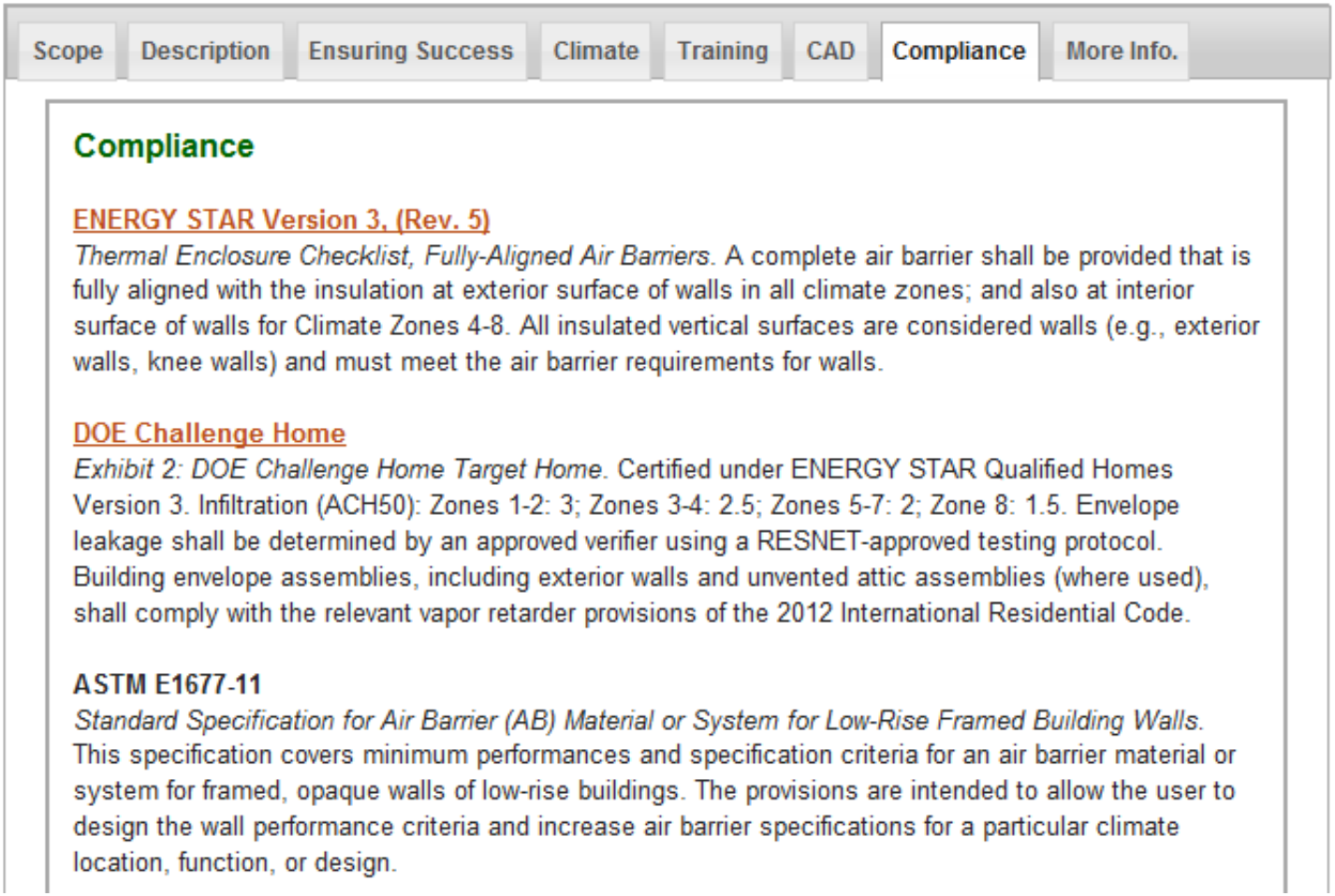
COMING: Videos and presentations

Guides (cont.)



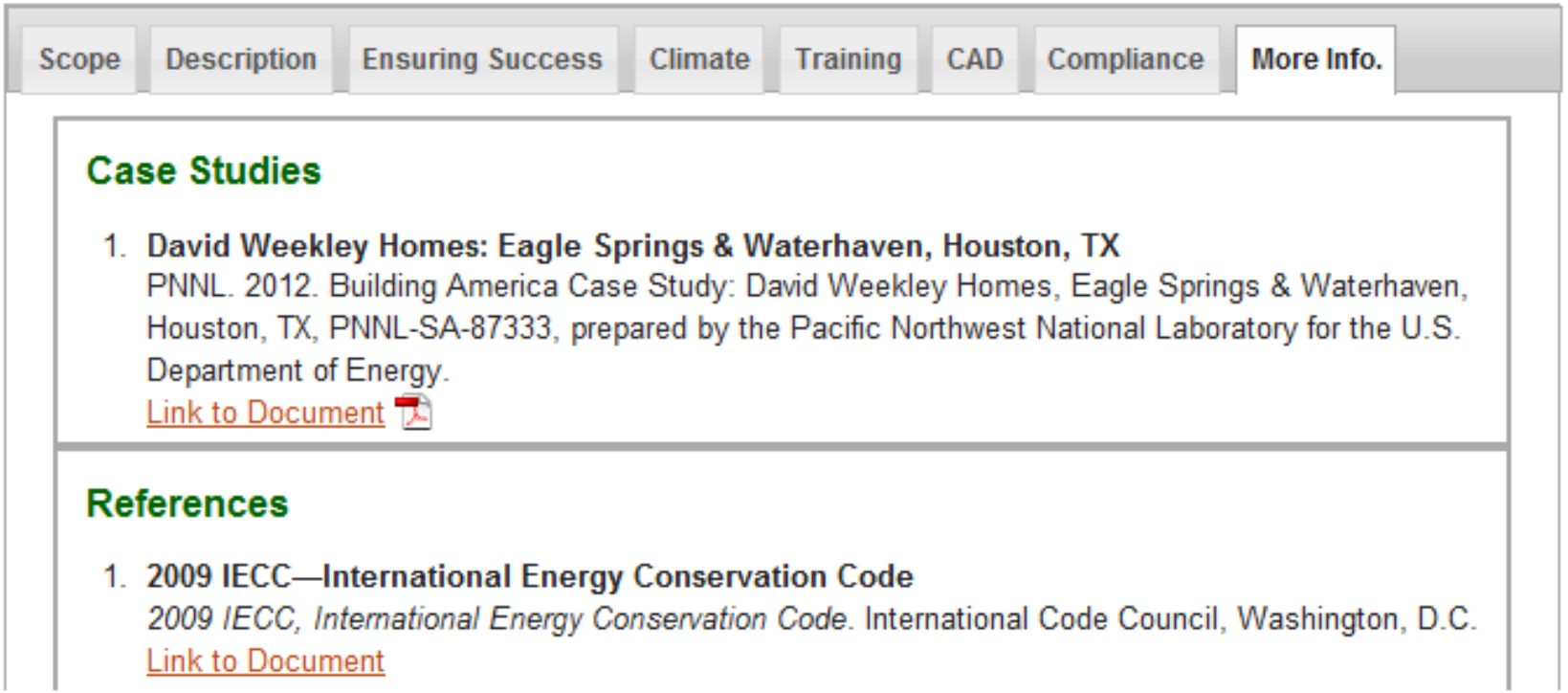
CAD: Includes Architectural CAD files of the building topic in DWG and PDF forms.

Guides (cont.)



Compliance: Provides specific compliance references from applicable codes and standards.

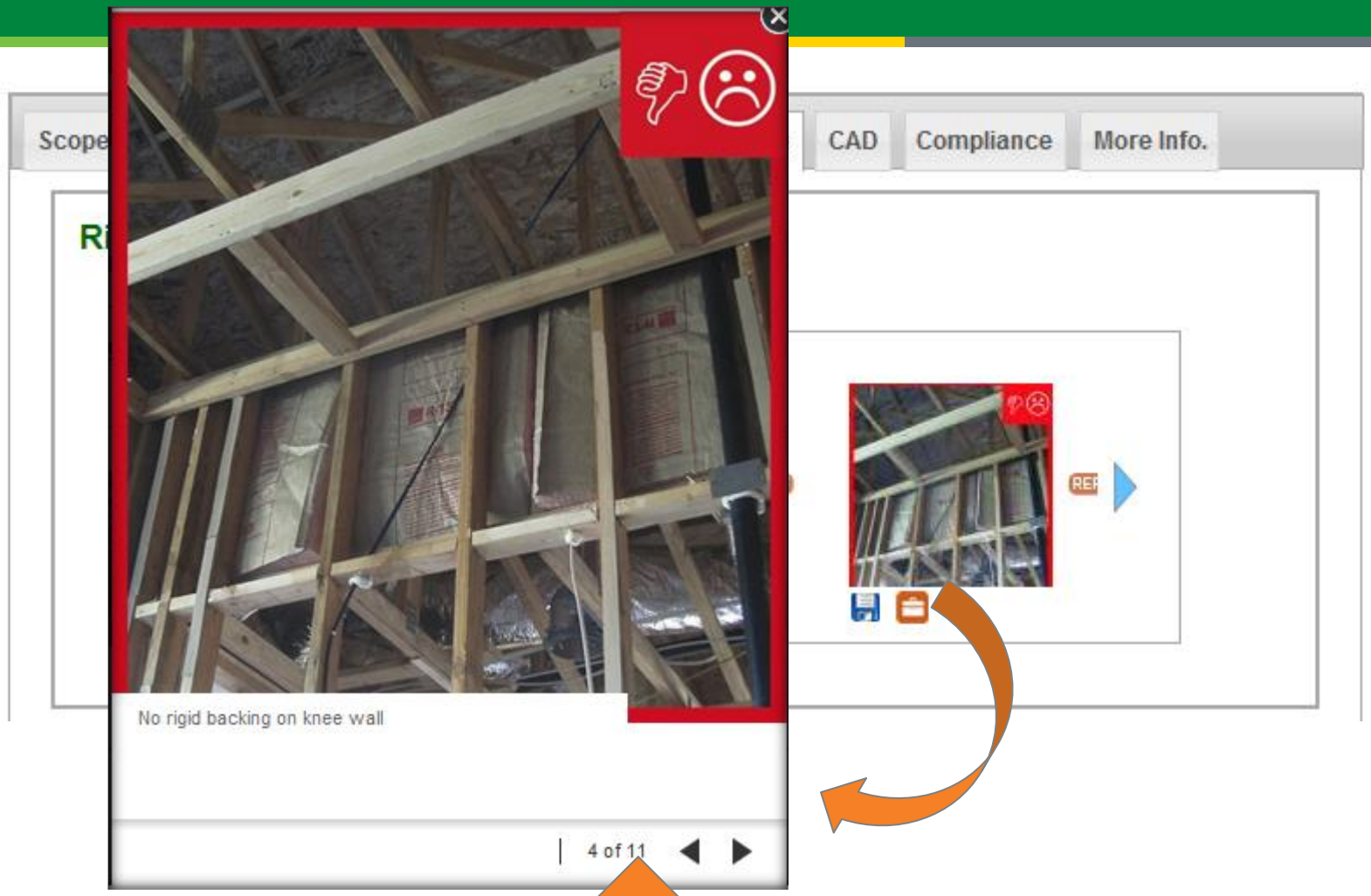
Guides (cont.)



More Info:

- References - Full citations with links for content.
- Case Studies - Summaries of Building America teams and builders who have applied best practices.
- Resources - Relevant information not previously cited as references.
- COMING: Innovations

Guides (cont.)

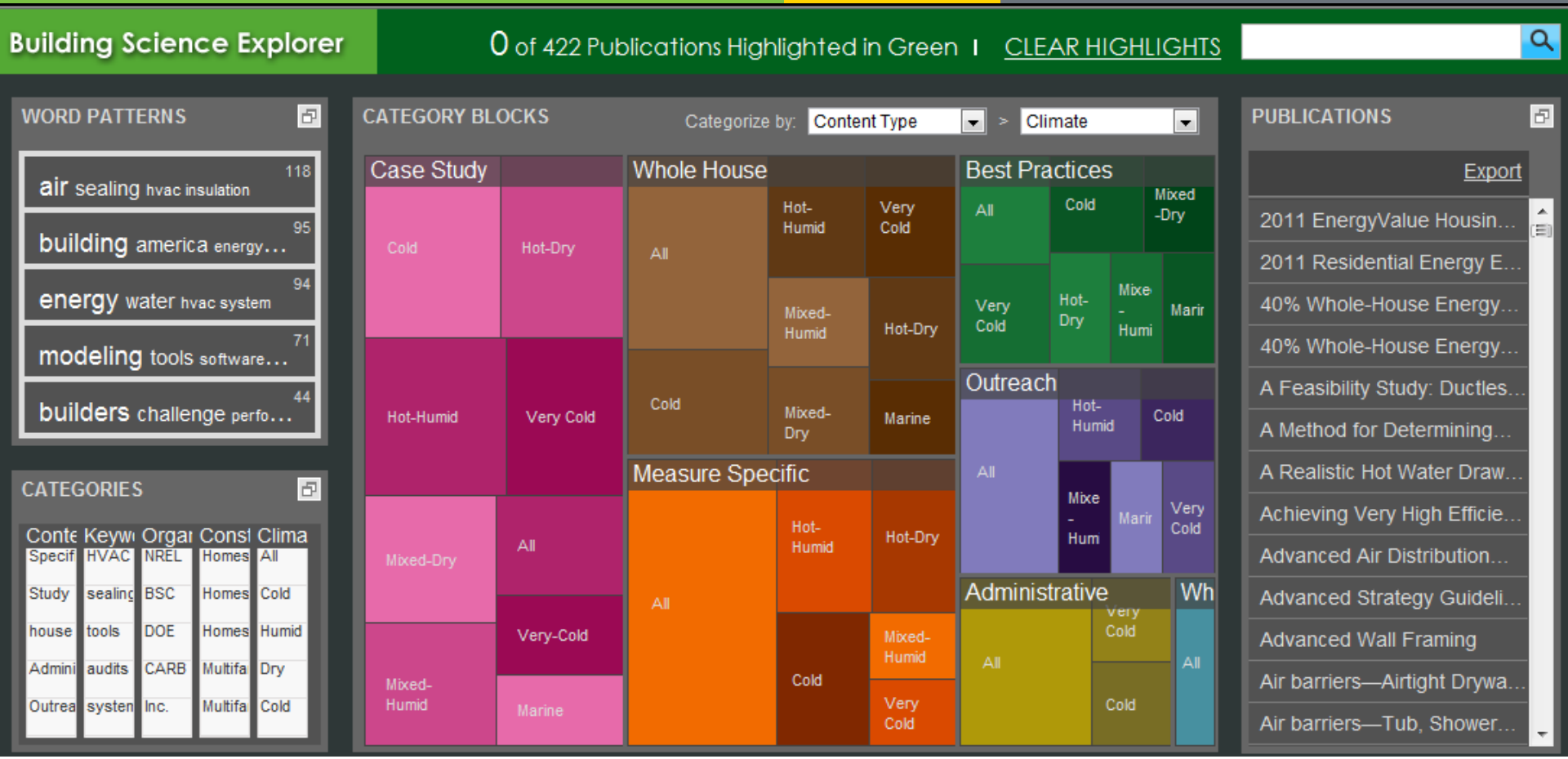


Click on any image within the Guide to enlarge it in a sliding window.

Scroll through all images in the Guide.

Building Science Explorer

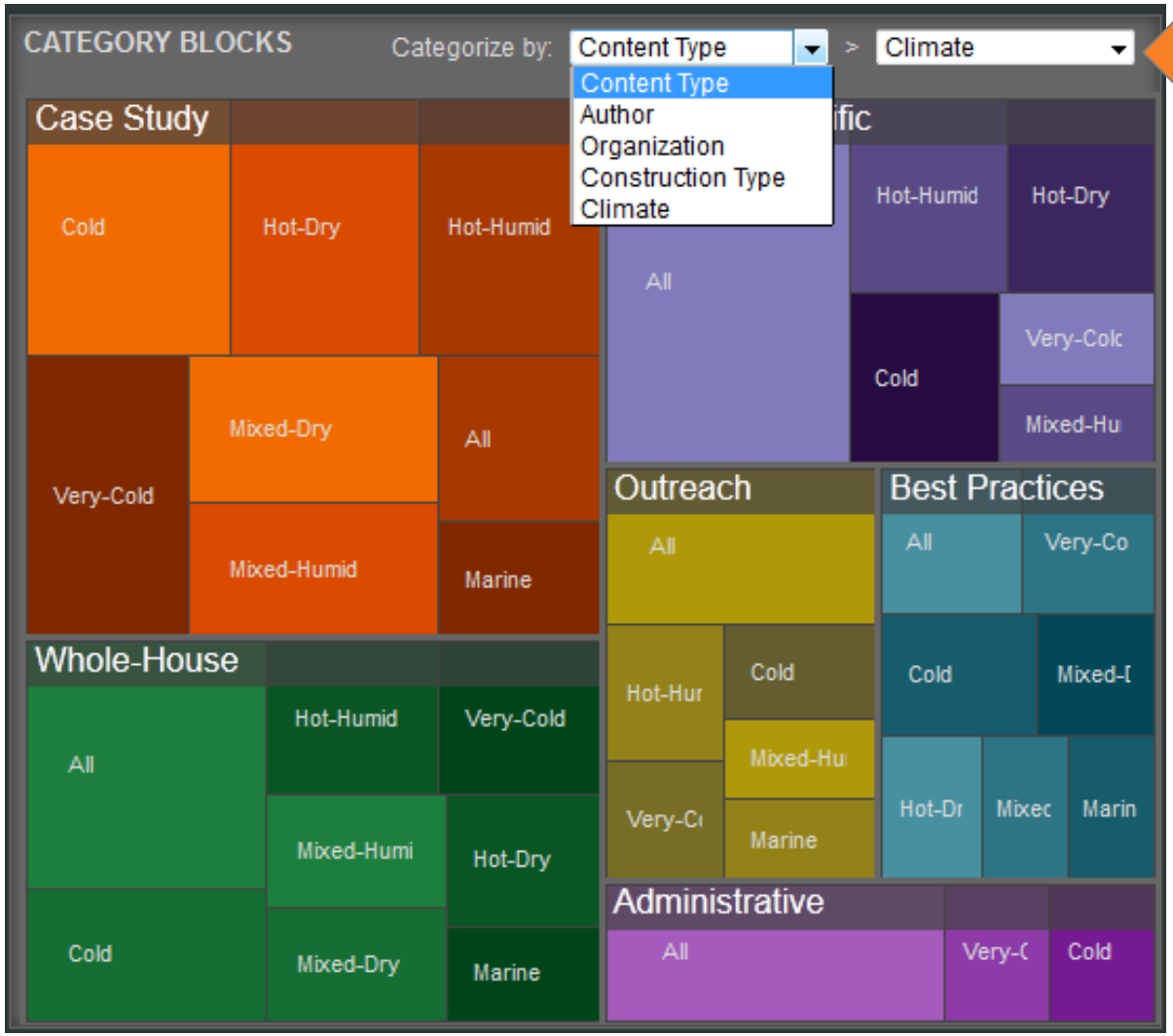
U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy



Building Science Explorer visualizes Building America and reference publications. It allows a user to explore the classification of content, and to drill down to specific Publications.

Building Science Explorer: CATEGORY BLOCKS

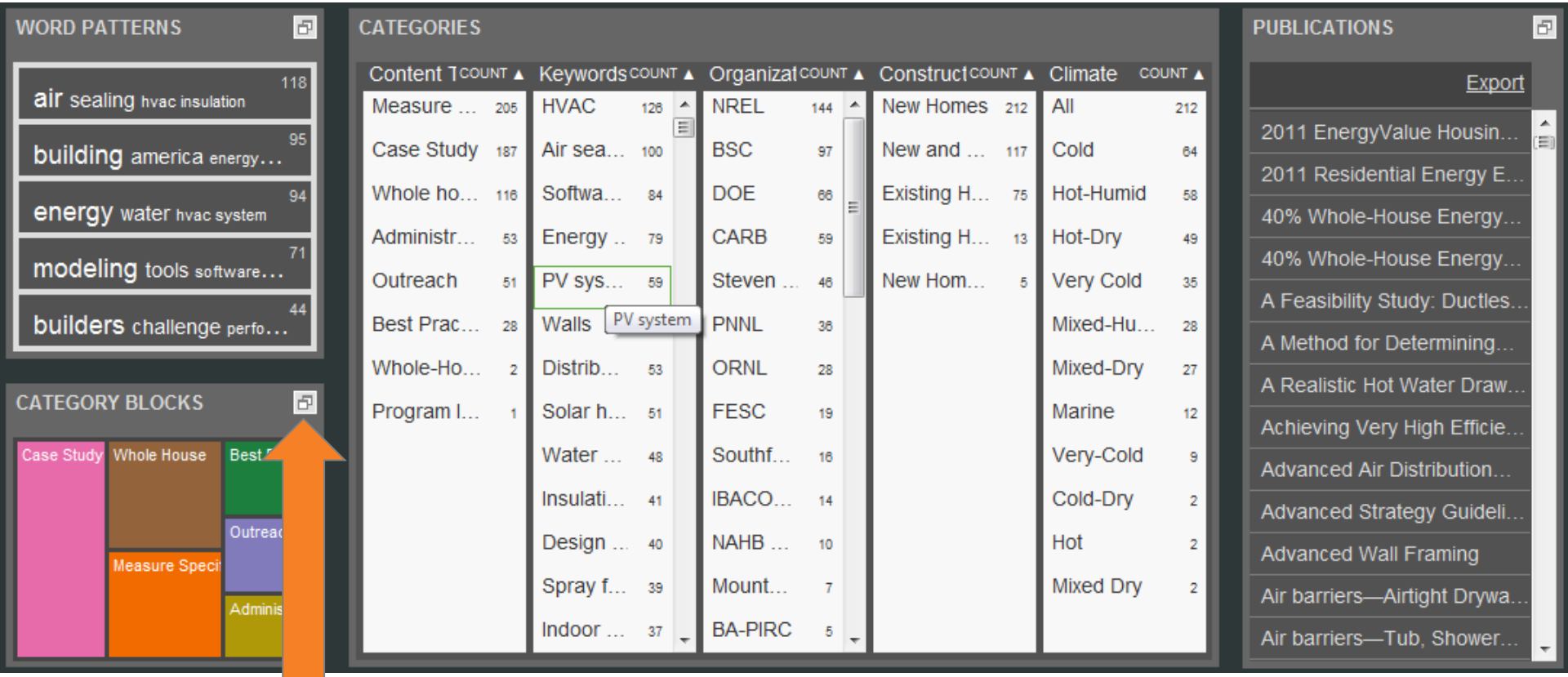
U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy



Change content categorizations

Building Science Explorer

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



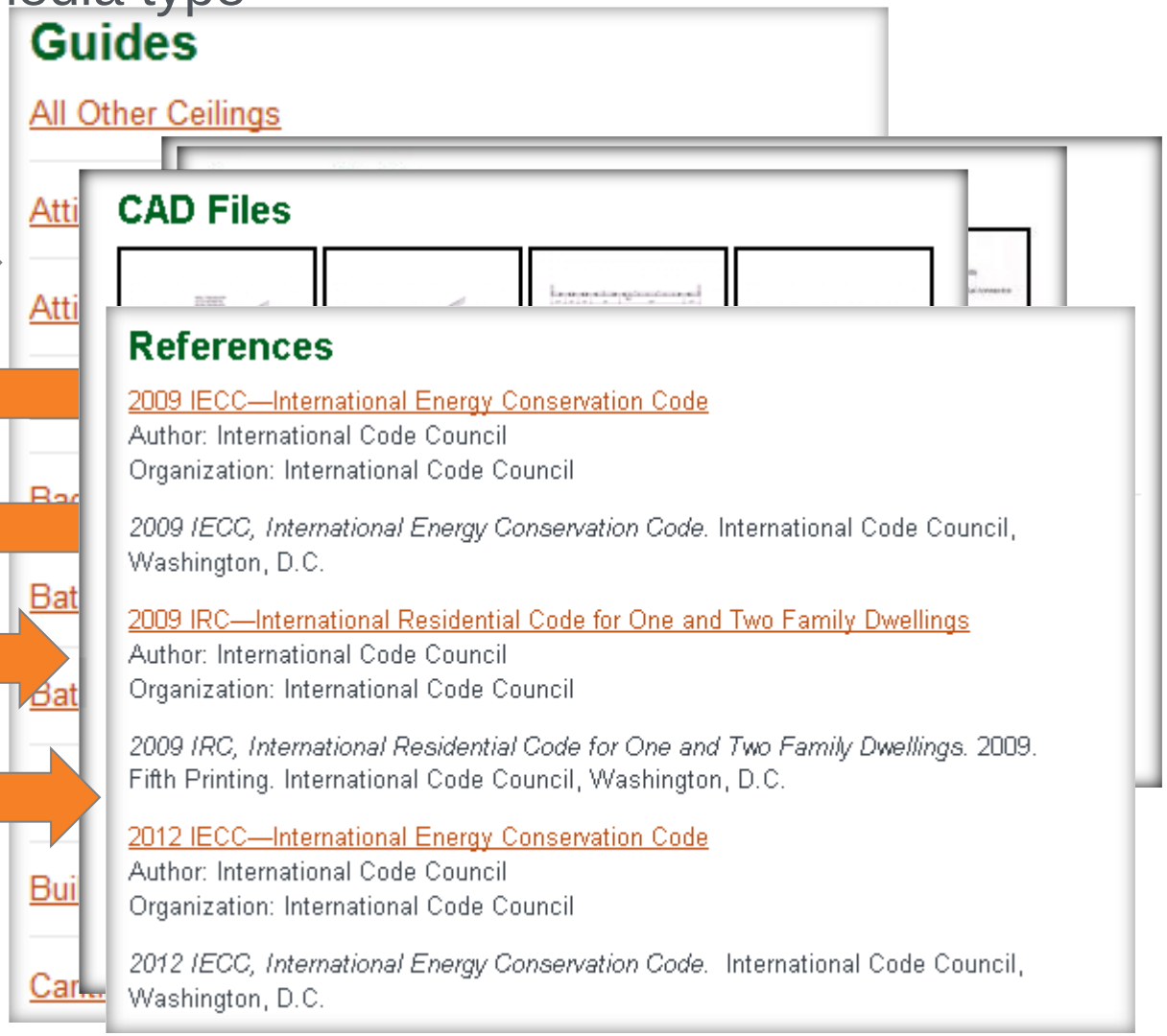
Select maximize icons to switch views.

Browser

Browse content by media type

Browser

- Guides
- Case Studies
- Image Gallery
- CAD Files
- References



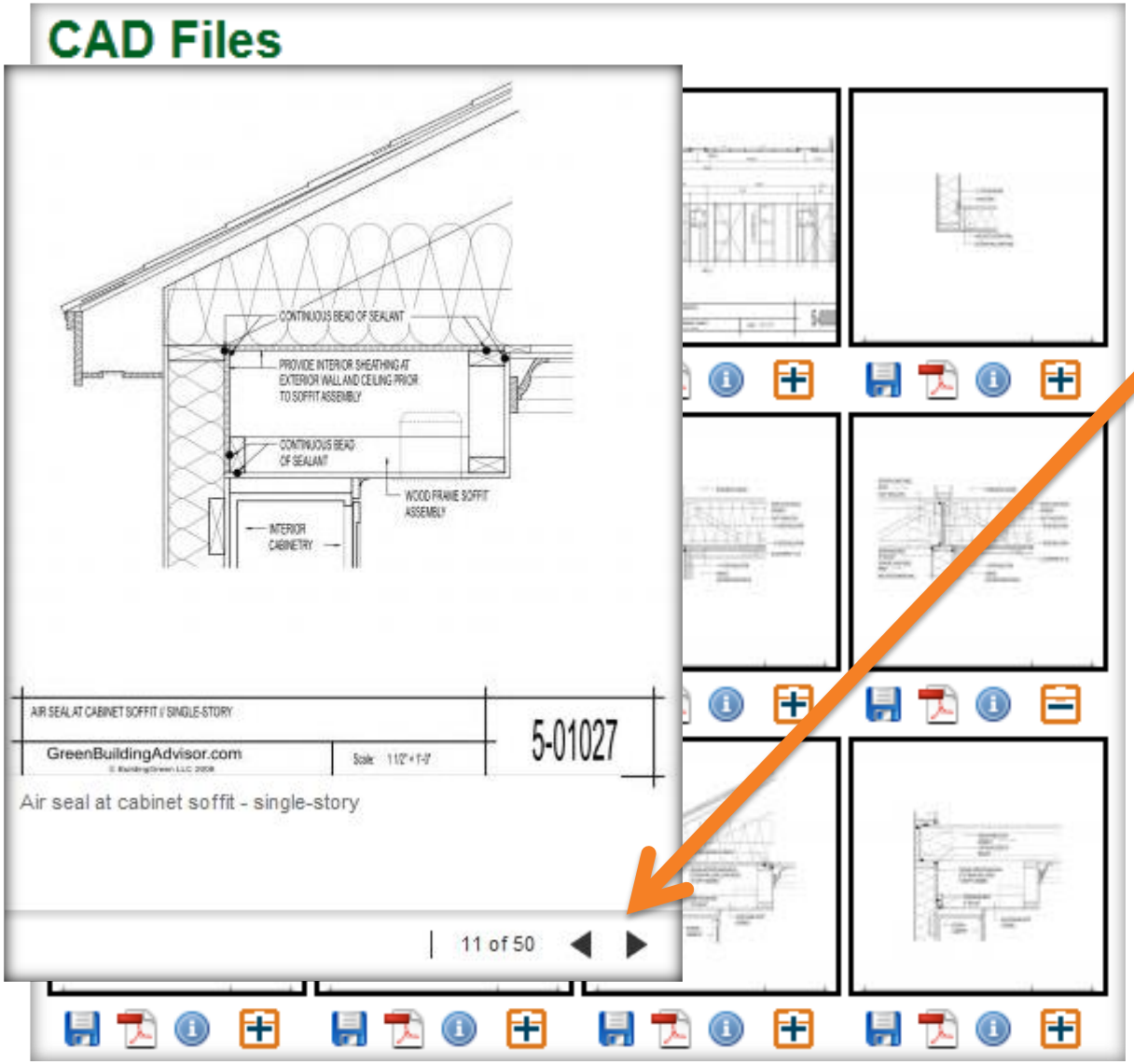
Browser: Image Gallery

- Click an image to enlarge in a sliding window.

Browser: Image Gallery

- Images can be displayed full size. Use Save As to save to file.
- COMING: Images will be saved in native original format
- Use the “REF” icon to locate the source of the image
- Select the Field Kit icon to add to your Field Kit

Browser: CAD Files



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

Browser: CAD Files

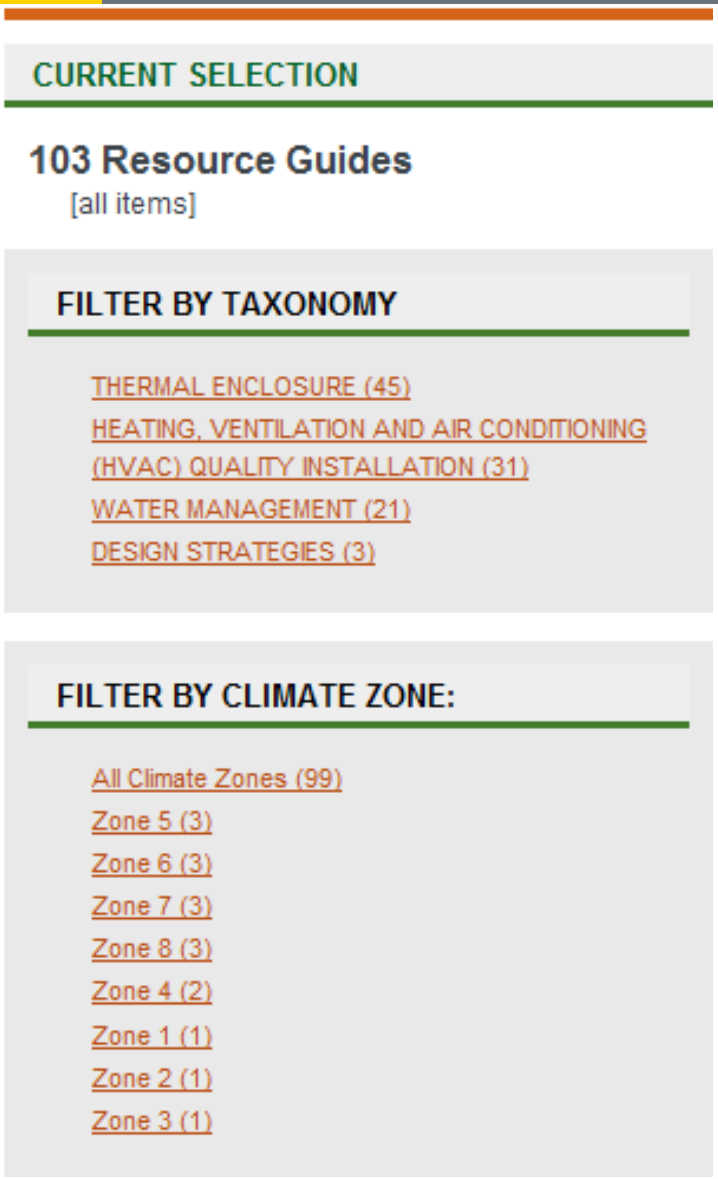
- CAD files can be saved in .dwg format
- CAD files can be converted to pdf
- Use the “REF” icon to locate the source of the CAD file
- Save CAD files directly to your Field Kit

Faceted Search

All Browser media can be searched using faceted search or simply browsed.

Search filters include:

- Taxonomy
- Component Subcategory
- Climate Zone
- Keywords
- Author
- Organization

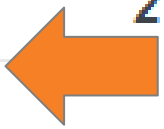


Faceted Search (cont.)

Guides

IECC Code Level Insulation

Insulation Installation (RESNET Grade 1)



CURRENT SELECTION

2 Resource Guides

[all items]

(-) THERMAL ENCLOSURE

(-) High-Performance Insulation

FILTER BY TAXONOMY

(-) THERMAL ENCLOSURE

(-) High-Performance Insulation

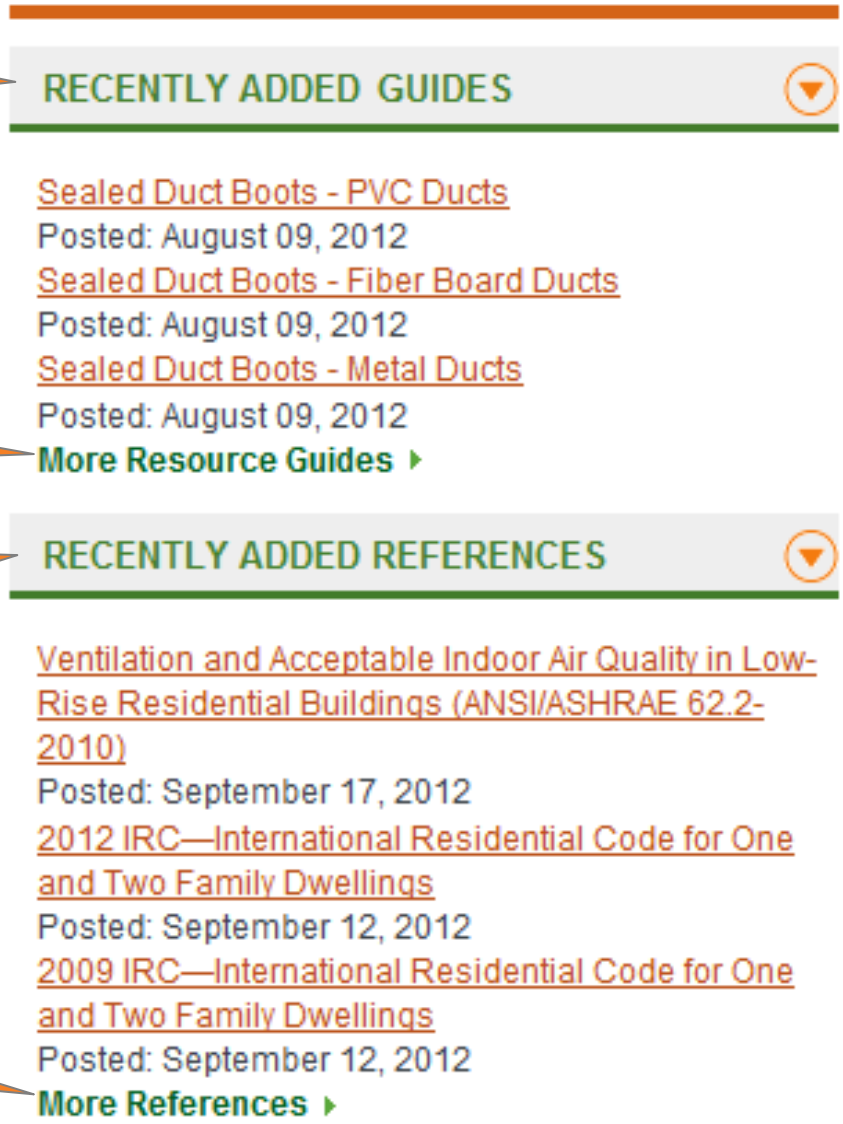
Recent Content

Recently added Guides automatically show up on the home page.

All Guides can be quickly accessed as a list.

Recently added References automatically show up on the home page.

All References can be quickly accessed as a list.



Building America Solution Center

Wrap-Up

Summary

- At its core, the Solution Center is web-accessible, structured data base of Building America best practices.
- The user interface consists of a number of tools to find focused content and to support partnering programs.
- Registered users are emphasized to give them more relevant information.
- The first priority has been developing tools and content to support ENERGY STAR Version 3.
- Initial content has been based on legacy information. New content will flow from Building America research.
- The Solution Center is a living database that will be continually populated and updated.

Important Dates

- Review comments submitted: 1 December 2012
- Public launch: January 2013
- DOE Challenge Home upgrade: October 2013
- Existing home renovation: 2014
- Content will be continuously populated and updated

Three Mechanisms for Comments for Registered Users

- Submit specific comments on each guide using the “FEEDBACK” links within the guides.
- A general comments and content submission feature will be added by Monday, 15 October.
- Email comments to:

basc@pnnl.gov

Access the Building America Solution Center at:

http://basc.energy.gov

Also accessible through the Building America Website at:

http://www.buildingamerica.gov

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