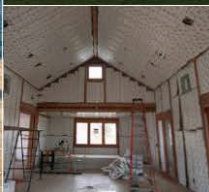


Building America Research Dissemination



Pacific Northwest National Laboratory

Michael Baechler, Senior Program Manager (Chrissi Antonopoulos, Presenter)

Michael.Baechler@pnnl.gov; Chrissi.Antonopoulos@pnnl.gov

Project Summary

Timeline:

Start date: October 2011

Planned end date: Ongoing

Key Milestones

1. Launch supporting Energy Star, January 2013
2. Zero Energy Ready Home launch, June 2014
3. Climate Packages launched, December 2014
4. Sales Tool launched, March 2015
5. Research Tracker launched, September 2017
6. Existing Homes tool launched, October 2017

Budget:

Total Project \$ to Date: (FY 13-17)

- DOE: \$3,347k

Total Project \$: (Through FY 20)

- DOE: \$5,297k

Key Partners:

Building America Management and Communication Team
DOE National Laboratories: NREL, LBNL, ORNL, PNNL
Building America Teams
EPA ENERGY STAR Certified Homes
EPA Indoor airPLUS
EPA WaterSense
DOE Standard Work Specifications

Project Outcome:

Disseminate Building America (BA) research results to government, academic, and industry researchers; Gather intelligence on research at other agencies to assist DOE in planning; and translate BA research into actionable best practices to assist industry—and programs that reach out to industry.

Team

PNNL Team:



Michael Baechler,
Senior Program
Manager



Chrissi Antonopoulos,
Operations Manager



Theresa Gilbride,
Content Manager



Cheryn Metzger,
Research Tracker
Lead



Pam Cole, Code
Compliance Briefs
Lead

Sponsor and Key Partners:



Challenge

Problem Definition: Before the Building America Solution Center (BASC), research, innovations, and best practices were often inaccessible to users and underutilized. Stakeholders did not know how to use the wealth of DOE-funded research that was available but seemingly invisible, making it difficult for the industry to assess the latest information.

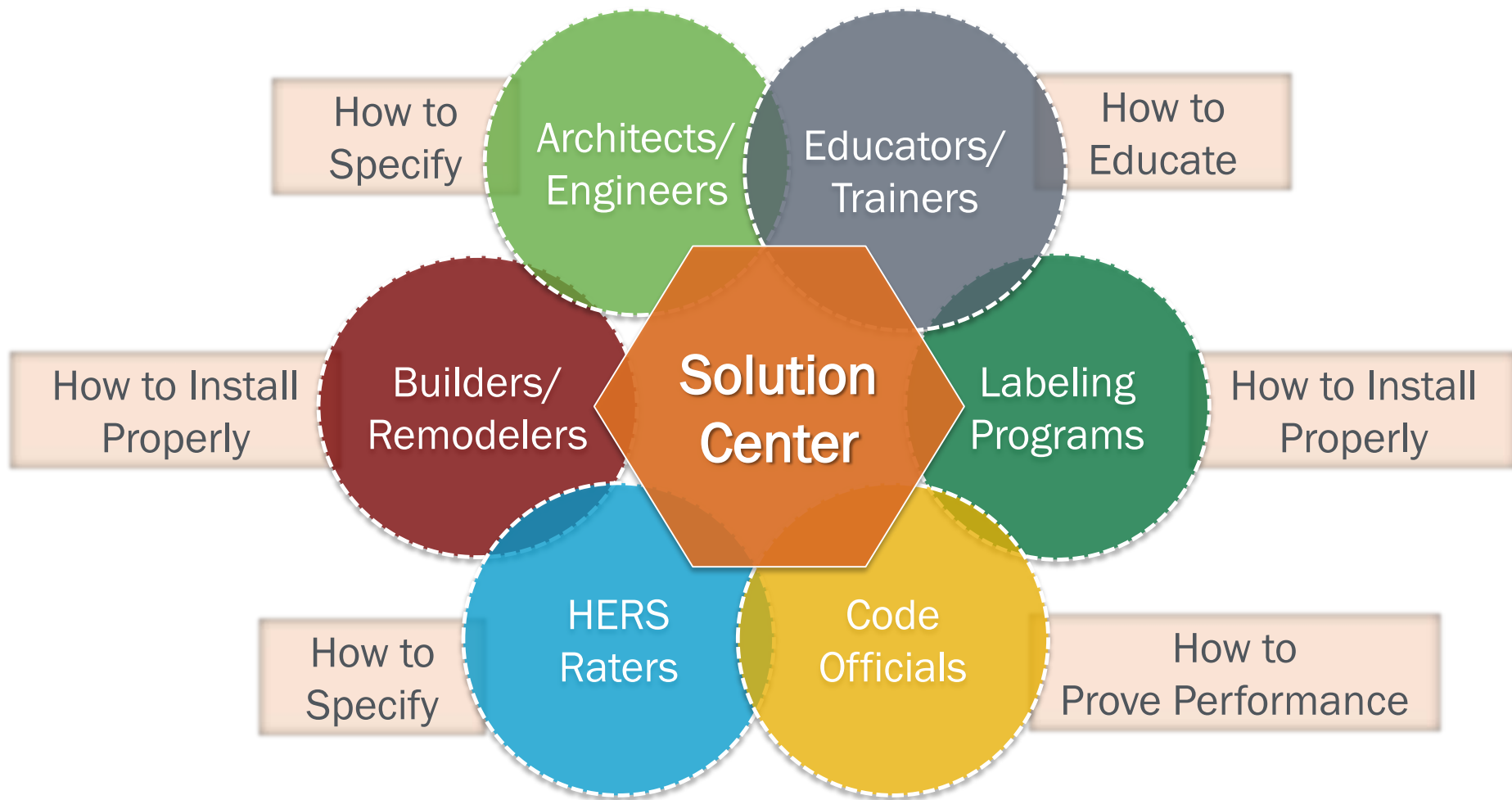
- Industry adoption of Building America Best Practices is essential for BTO to meet its aggressive 2025 goal to reduce energy for space conditioning and water heating in single-family homes
- The BASC is a key aspect of Building America's technology-to-market strategy
- Lack of shared knowledge among research organizations as they plan their programs may lead to stove-piping and the potential for duplication and lost opportunities for collaboration

Approach

The BASC is a web-based tool by which RBI disseminates research results. The BASC includes technology and best practice information related to both new and existing homes. This project includes the development of tools and features, ongoing maintenance of the BASC platform, and the incorporation of new Building America results as they are produced.

- New Research Tracker helps make RBI and other organizations' planning in residential building science research more collaborative and cost effective
- BASC guiding principles include the following:
 - Streamlined dissemination of peer reviewed research results
 - Continuous, responsive content improvement
 - A tailored technical foundation for partnering programs
 - Internal DOE technical and messaging coordination with related teams

Approach: Actionable Content



Approach: Simple Interface

Access to:

- 244 Guides
- 1,680+ Images
- 330+ Proven performance case studies
- 130+ CAD drawings
- 975+ Building Science references & resources
- 30+ Code compliance briefs
- 100+ Videos
- 40+ Sales briefs

Building Components

Guides A-Z

Library

Sales Tool

Climate Packages

Program Checklists

Existing Homes

Code Briefs

Website Widget

Mobile Apps

Recently Added Content

[Advanced Framing vs Traditional Framing](#)
Video Posted: March, 2018

[Condensing HVAC has Corrosion-Resistant Condensate Drain Pan Guide](#)
Guide Posted: March, 2018

[Let's Concentrate on Condensate](#)
Reference Posted: March, 2018

[Front view of vertical air handler condensate disposal and controls](#)
CAD File Posted: March, 2018

[Front view of horizontal air handler showing condensate drain pans, pipes, and controls](#)
CAD File Posted: March, 2018



As a community driven tool, we welcome your [comments](#) on how to continuously improve the Solution Center. If you are interested in submitting content, please become a [registered user](#) and see the [criteria for submissions](#).

Approach: Provide Customization Tools

San Francisco Zero Energy Ready Home Project #1

Guides



[Cantilevered Floor](#)

Guide describing how to air seal and insulate a cantilevered floor.



[Step and Kick-Out Flashing at Roof-Wall Intersections](#)

Guide describing how to install step and kick-out flashing on roofs.



[Double Walls](#)

This guide describes air barrier and insulation installation, along with air sealing for double walls - how to design as an architectural feature that provides a more dimensional appearance.



[Roof Deck Valleys and Penetrations Sealed](#)

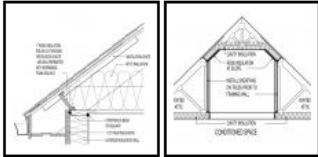
Guide describing how to apply heavy membranes at valley/roof deck penetrations in wet climates to prevent leaks in roofing.



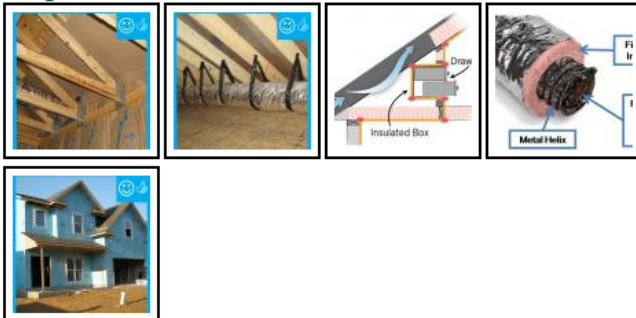
[Bathroom Fan Ratings](#)

Guide describing the bathroom exhaust fan ENERGY STAR rating requirements.

CAD Files



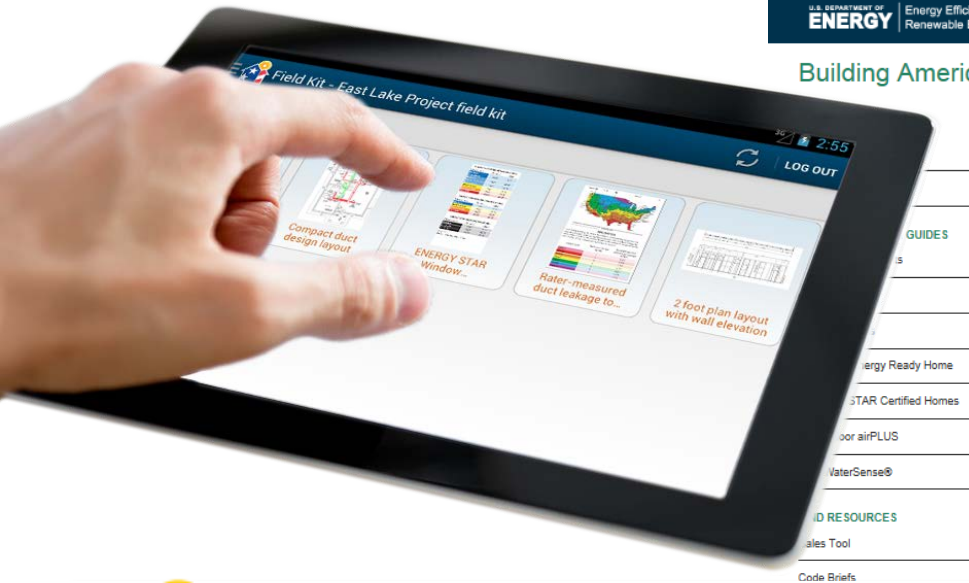
Images



Create Field Kits to save content. Add any type of BASC content:

- CAD files
- Images
- Guides
- Information Guides
- Videos
- Case Studies
- Sales Messages

Approach: Mobile Access Anywhere



Building America Solution Center

Enter your keywords

Welcome to our new homepage! The Building America Solution Center provides access to expert information on hundreds of high-performance construction topics, including air sealing and insulation, HVAC components, windows, indoor air quality, and much more. Click on the links below to explore the Solution Center.

Recently Added Content

- Termite shield with exterior rigid foam above and below
CAD File Posted: November, 2017
- Spray foam on concrete foundation wall with framed interior wall
CAD File Posted: November, 2017
- Foundation wall interior rigid insulation with furring strips
CAD File Posted: November, 2017



“Solutions” mobile app for iOS through the Apple store and Android via:

<https://basc.energy.gov/solutions>

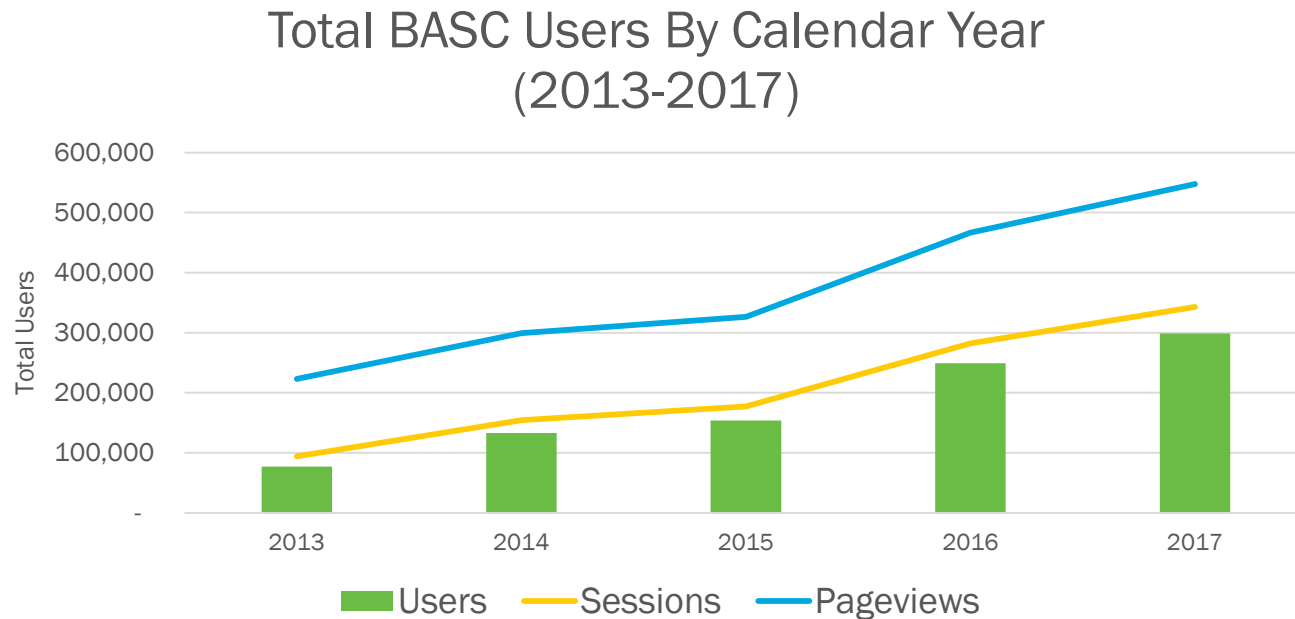
Field kits can also be accessed from computers



As a community driven tool, we welcome your [comments](#) on how to continuously improve the Solution Center. If you are interested in submitting content, please become a [registered user](#) and see the [criteria for submissions](#).

Impact

The BASC is key to Building America's technology-to-market strategy



“The Building America Solution Center is full of best practices. Every guide in there is based on the right way to do things.”

C.R. Herro

V-P of Environmental Affairs, Meritage Homes

“We built our business on the shoulders of giants, including the Building America Solution Center.”

Gene Myers

CEO, Thrive Home Builders

(Professional Builder Magazine Builder of the Year)

Impact

Since its launch in 2013, the BASC has welcomed:

- 1.7 million pageviews
- 847,000 users
- 965,000 sessions

All four federal home labeling programs use the BASC and Building America research as the basis for technical support to partnering builders.



We have maintained an aggressive schedule for content and feature development to keep the site current and user-friendly.

Future plans include extending best practices to include disaster resistance and resilience in collaboration with the Insurance Institute for Business and Home Safety.

Progress

- BASC launched, January 2013
 - Beta tests, Content fully populated soon after, EPA source of technical support, media push
- Content update version 3, revision 7, August 2013
- Field kit and mobile enhancements (August 2013 – March 2014)
 - Multiple field kits
 - Auto PDF and print feature
 - Adaptive screens
 - Android app
 - iOS app (Apple)
- Building Science Publications feature fully populated, December 2013
- ZERH navigation structure completed, January 2014

2011 Concept

- Sam's vision and structure
- Building America review

2012 Design

- Web tool platform built using Drupal
- Taxonomy created
- Navigation tools
- Demonstrations and beta tests

2013 Launch

- ENERGY STAR V3 Rev 6 and Rev 7
- Preliminary structure for ZERH and existing homes
- Upgrades: Mobile access, multiple field kits, revisions
- Better Buildings Clone

2014 Enhance

- Android (Nov.) & iOS (spring) Apps
- Populate ZERH
- Begin to populate Existing Home
- Incorporate 30% proven performance

Progress

- Indoor airPLUS and WaterSense checklists released
 - Worked with EPA teams to update/add content
- ENERGY STAR Rev 08 updates went live in 2016
- New interfaces released
 - Code Compliance Briefs
 - BA Library
 - Research Tracker
- 2017 Launch of Existing Homes tool
 - Worked with SWS team to incorporate links between tools
 - Worked with DOE HI-CAT team to ensure consistent terminology
 - Populated tool with new guides, and developed retrofit tabs for existing BASC content

2015
Enhance

- Optimized Climate Solutions released
- Indoor airPLUS Checklist released
- Sales Tool released
- BASC Outreach activities

2016
Enhance

- 30+ measure guide additions
- ENERGY STAR Rev 8 updates
- 2015 IECC updates
- Code Compliance Briefs released

2017
Enhance

- WaterSense Checklist released
- Existing Homes tool released
- Widget released
- Building America Library updates
- Research Tracker launched

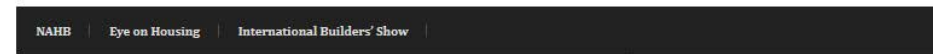
2018
Enhance

- Populate Existing Home tool
- Redesigned homepage
- Refined interfaces
- Incorporate new content and update existing content

Stakeholder Engagement

Project integration and collaboration efforts:

- Partnered with National Association of Home Builders (NAHB) to promote BASC on NAHBNOW blog (11-2017).
- Continue work with NAHB to support Home Builder Associations promoting National Green Building Standard.
- Working closely with the SWS team to ensure BASC and SWS link to one another where appropriate.
- Coordinating with other DOE teams working in existing homes.
- Use Research Tracker to help engage and coordinate DOE with other research.



DOE's Solution Center: A Builder's Best Friend

Filed in Codes and Regulations, Environmental on November 7, 2017 • 0 Comments



When members of the NAHB Construction, Codes and Standards staff attended the recent Energy & Environmental Building Alliance Summit in Atlanta, they met a number of energy experts and building science professionals interested in advancing the practice of voluntary high-performance building: the best way to bring green practices into the mainstream.

Among them: Chrissi Antonopoulos, an energy research scientist at the Pacific Northwest National Laboratory in Portland, Ore. Codes staff invited Antonopoulos to tell NAHBNow readers about the programs it offers, in particular, the Building America Solutions Center.

Like adding a building scientist to your staff, the Building America Solution Center gives you easy-to-access best practices for new and existing home construction. The Solution Center is a free online tool sponsored by the Department of Energy's (DOE) Building America program with information on hundreds of topics ranging from air sealing and insulation to HVAC, windows, indoor air quality and much more.

Bring it all Together

The BASC has nearly 250 best practice guides. Each one is packed with all the information you need for construction, training and sales. The guides are based on DOE-funded research by some of the brightest minds in building science. If you are involved in home construction, renovation, or sales, the Building America Solution Center is a necessary part of your everyday tool set. There are multiple navigation tools to help you quickly search, sort and, most importantly, find the information you need for both new construction and existing home improvements.



BASC Guides provide comprehensive construction guidance.

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Stakeholder Engagement: SWS Linkage

Whole House Ventilation Strategies for Existing Homes

[Feedback](#)

Scope Description Success Climate Training CAD Compliance More

Scope

To assess and upgrade the ventilation system in an existing home, do the following:

- Preliminary Planning
 - Determine project goals with respect to ventilation.
 - Determine what code or program requirements must be met.
 - Assess existing ventilation systems (including local ventilation for kitchen and bathrooms).
 - Assess existing heating and cooling systems - especially if new ventilation may be integrated with existing HVAC systems.
- Determine the most appropriate type of ventilation.
- Install and commission ventilation system.



This HRV, installed in a c provides balanced ventil home

For an overview of whole-building ventilation systems, see the Building America Solution Center guide [Whole-Building Delivered Ventilation](#). For information on assessing the performance of existing ventilation systems, see the [Pre-Retrofit Assessment of Ventilation Systems](#).

The U.S. Department of Energy's Standard Work Specifications have additional information on [ventilation systems](#).

Last Updated: 03/06/2018

NREL
NATIONAL RENEWABLE ENERGY LABORATORY

Standard Work Specifications Tool

Home | About | Help | Contact Us | My Account | Sign In

Search All Topics

Health & Safety | Air Sealing | Insulation | Heating & Cooling | Ventilation | Baseload

Keyword

Housing Type

- Single-Family Homes (34)
- Manufactured Housing (28)
- Multifamily Homes (55)

Section

- 2 Health & Safety (12)
- 3 Air Sealing (8)
- 4 Insulation (18)
- 5 Heating & Cooling (17)
- 6 Ventilation (39)
- 7 Baseload (5)

Search Results

Results 1 - 10 of 99

6.6204.1 [Commissioning Ventilation Systems](#)
Topic: Whole Building Ventilation
Subtopic: System Evaluation
Desired Outcome: Verify proper operation of existing system, installed system air flow meets required standard and provides continuous ventilation for background pollutant sources
Available In: [Single-Family Homes](#), [Manufactured Housing](#)

6.6102.1 [Outside Air Ventilation Supply Ducts](#)
Topic: Supply
Subtopic: Components
Desired Outcome: Ventilation supply ducts effectively move the required amount of air and prevent condensation
Available In: [Single-Family Homes](#)

3.1602.15 [Ventilation Existing Duct Sealing \(All Building Types\)](#)
Topic: Ducts
Subtopic: Duct Sealing
Desired Outcome: Improved effectiveness and efficiency of ventilation distribution

Remaining Project Work

Current FY Project Work Plan

- Complete populating the Existing Homes tool (80% populated as of April 2018)
- Integrate DOE's Home Improvement Checklists
- Update Research Tracker content and submissions
- Update Indoor airPLUS checklist to new revision
- BASC outreach: webinars and conferences

Future Work Plan

- Create a new checklist and content supporting disaster resistance (FY19)
- Integrate an interface and content for multifamily buildings (FY20)

Thank You

BASC.energy.gov

Pacific Northwest National Laboratory
Michael Baechler, Senior Program Manager

Michael.Baechler@pnnl.gov

REFERENCE SLIDES

Project Budget

Project Budget: Total DOE \$ to date: \$3,347k

Variances: Annual milestones are established with DOE guidance and collaboration and typically with go/no-go set points. To date all milestones have been met as planned or before scheduled due dates.

Cost to Date: The total FY 18 budget is yet to be determined. The existing budget including carryover and FY18 funds committed is approximately \$470K. 63% of this budget has been expended.

Additional Funding: None

Budget History

2013– FY 2017 (past)		FY 2018 (current)		FY 2019 – 2020 (planned)	
DOE	Cost-share	DOE	Cost-share	DOE	Cost-share
\$3,347k		\$700k*		\$1,400k*	

*Anticipated

Project Plan and Schedule

Project Schedule												
Project Start: FY 2013	Completed Work											
Projected End: Ongoing	Active Task (in progress work)											
	◆ Milestone/Deliverable (Originally Planned)											
	◆ Milestone/Deliverable (Actual)											
	FY 2017				FY2018				FY 2019			
Task	Q1 (Oct-Dec)	Q2 (Jan-Mar)	Q3 (Apr-Jun)	Q4 (Jul-Sep)	Q1 (Oct-Dec)	Q2 (Jan-Mar)	Q3 (Apr-Jun)	Q4 (Jul-Sep)	Q1 (Oct-Dec)	Q2 (Jan-Mar)	Q3 (Apr-Jun)	Q4 (Jul-Sep)
Past Work												
Q2-17 Launch Library Enhancements - 3 webinars			◆									
Q3-17 Existing Home structure				◆								
Q4-17 Launched WaterSense					◆							
Q1-18 Launched Existing Home tool						◆						
Q2 -18 Go/no go on Existing Home Content							◆					
Current/Future Work												
Q3 Home Improvement Structure Design*								◆				
Q4 Home Improvement Launch*									◆			
Q4-FY 19* Disaster Resistance Launch												◆