

Building America Teams Technical Quality Management

2015 Building Technologies Office Peer Review



U.S. DEPARTMENT OF
ENERGY

Energy Efficiency &
Renewable Energy

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Project Summary

Timeline:

Start date: October 1, 2009 (FY10)

Planned end date: September 30, 2014

Key Milestones

1. FY2014 Annual Report; 9/30/2014
2. Monthly Status Reporting; 15th of the month

Budget:

Total DOE \$ in FY15: \$1,200,000

Total DOE \$ from FY10-FY14: \$6,440,000

Total future DOE \$: \$7,685,000 for 3 years (proposed)

Target Market/Audience:

Residential building industry stakeholders - developers, builders, trade partners, architects, whole house contractors, utilities and other program developers with focus on “above code” market actors.

Key Partners:

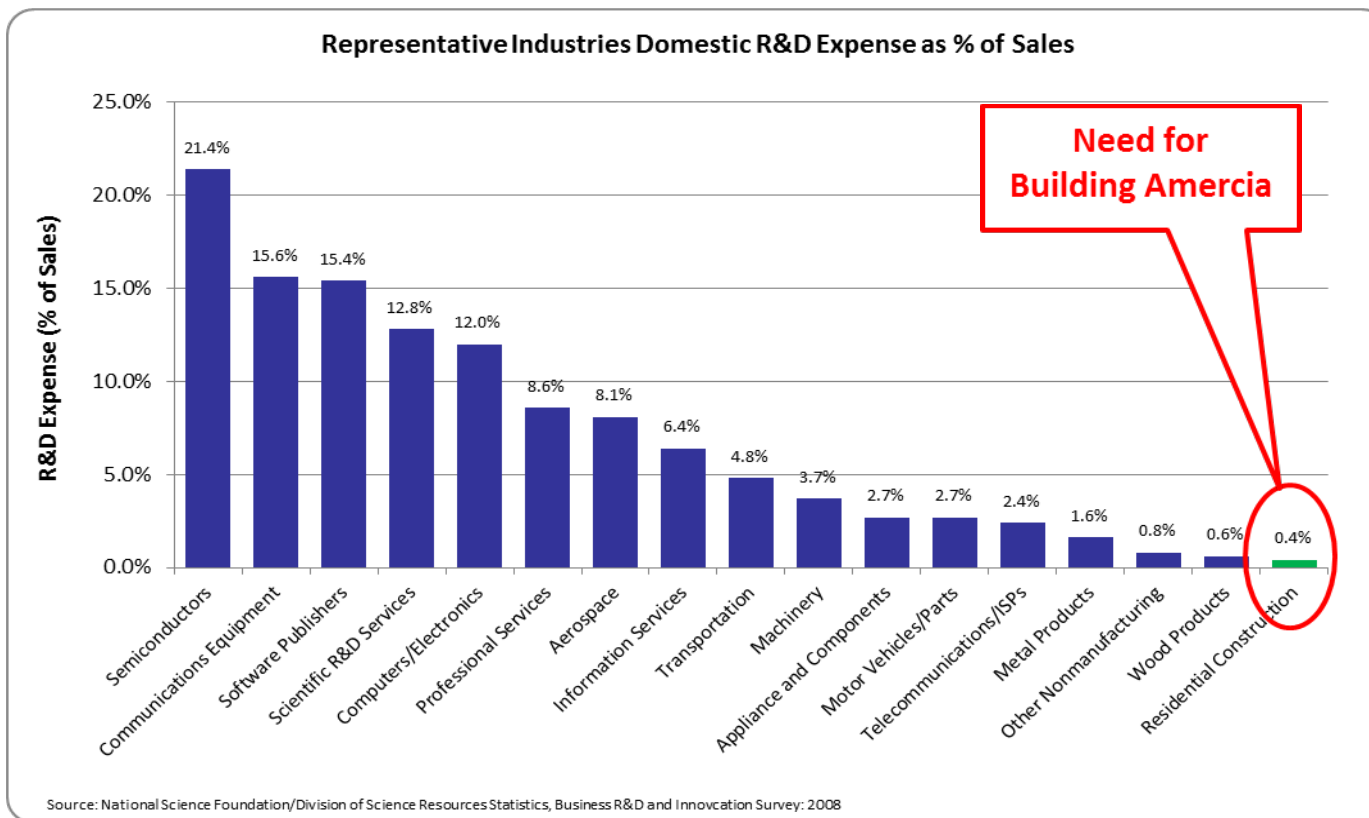
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|---|
| Building America Research Teams (10-15) |
| Lawrence Berkley National Laboratory |
| Pacific Northwest National Laboratory |
| Oak Ridge National Laboratory |

Project Goal:

Ensure high-quality, impactful results from Building America (BA) team research that demonstrates market-relevant strategies to enable 50% energy savings in new homes and 40% energy savings in existing homes.

Purpose and Objectives

Problem Statement: The lack of private-sector R&D investment in residential construction is a high-impact problem that EERE is uniquely suited to address. EERE-funded research informs DOE codes and standards programs and provides guidance to the highly fragmented, risk-averse residential construction industry.



Purpose and Objectives

Target Market and Audience: Residential building industry stakeholders - developers, builders, trade partners, architects, whole house contractors, utilities and other program developers with focus on “above code” market actors.

Impact of Project: Residential buildings consume more than ***one fifth of the nation’s energy***, but the housing industry invests far less into R&D and innovations than any other comparably sized industry. NREL ensures the delivery of high-quality, impactful results from the BA teams by leading the technical planning and management and coordinating with other related RBI research. Project objectives are successfully demonstrated via credible BA team outcomes that result in the ***voluntary change of practices*** (business, homebuilding) among the nation’s leading builders, ultimately resulting in ***broad market adoption of BA innovations***.

The Building America program conducts applied R&D and demonstration projects led by expert building science teams in partnership with leading industry partners to solve both technical and market barriers to achieving 50% savings. By conducting research in homes and communities with strategic early adopters, Building America is able to address the needs of the three BTO Ecosystem strategies simultaneously



Approach: Ensure technical quality and program success through creditable research and development (R&D) and market adoption through strategic outreach initiatives. Specific tasks include:

1. Oversight of BA team research planning and execution
2. BA program field test support
3. Technical peer review and publication of research results
4. Funding Opportunity Announcement (FOA) support
5. BA communication coordination and outreach
6. DOE Race to Zero Student Design Competition

Key Issues: Creating voluntary market transformation in a fragmented, risk-adverse market.

Distinctive Characteristics: Research in direct partnership with industry.

Approach

1. BA Team Technical Quality Management.

Apply active project management principles to review and track BA team projects, facilitate cross coordination between BA teams and national laboratory work, and support program strategy development to align BA work with BTO goals and objectives.

| Project | Start | End | Status | Category | Phase | Task |
|-----------|------------|------------|-----------|---------------------|--------------------|--------------------|
| Project 1 | 2013-01-01 | 2013-03-31 | Completed | Final Project Close | Final Report | Final Report |
| Project 2 | 2013-01-01 | 2013-03-31 | Completed | Final Project Close | Final Review | Final Review |
| Project 3 | 2013-01-01 | 2013-03-31 | Completed | Final Project Close | Final Presentation | Final Presentation |

2. BA Field Test Support.

Provide a technical review of all BA team test plans. Provide hardware support for enhanced field test operations, analysis support, and data analytics. Manage and maintain Field Test Best Practices Web resource.



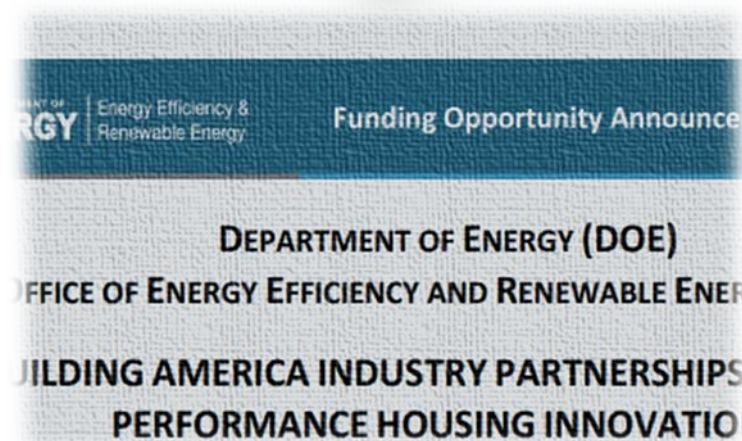
3. Peer Review and Publication Services.

Ensure credible results and highest quality publications. Administer technical peer review of all BA team publications. Provide template management and editorial services. Publish final reports in OSTI-based BA Publications Library.

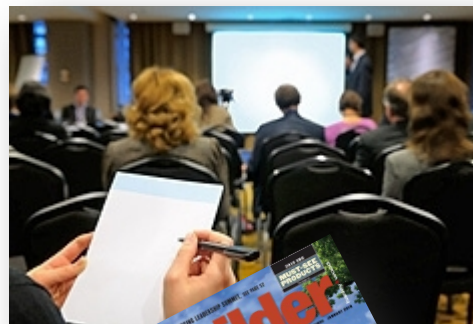


4. FOA Support.

Provide technical review of FOA documents for release and of solicitation responses to support the review team.



5. **BA Communication and Outreach.** Coordinate BA program technical communications, BA webinar series, BA Update e-newsletter, program website management, and other outreach supporting innovation deployment.

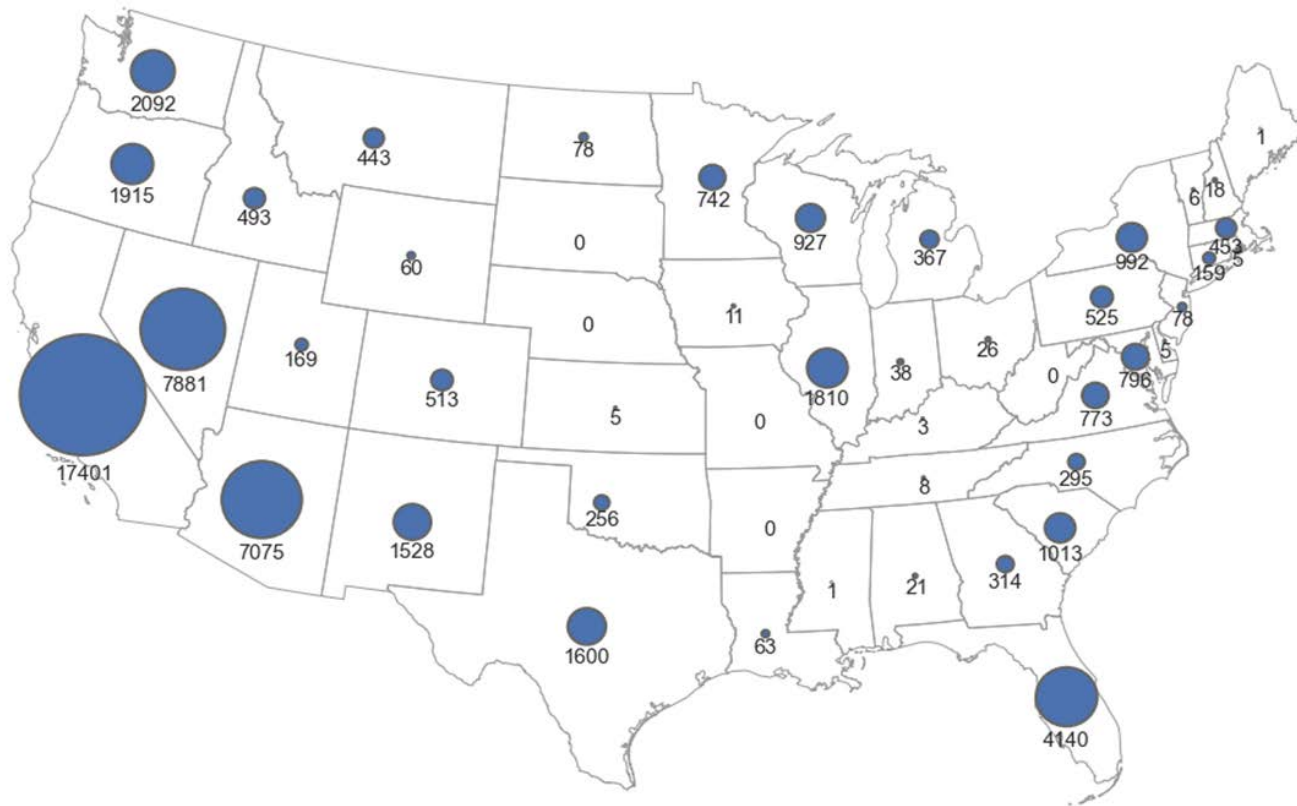


6. **DOE Race to Zero Student Design Competition.** Provide comprehensive leadership and implementation of student design competition. Task includes: develop competition guidelines; provide outreach to teams, industry, and the public; and host event at NREL Golden, Colorado, campus.



Progress and Accomplishments

Through its industry partners, Building America has studied over 55,000 homes in the United States. Partners and projects are strategically pursued and selected to address regions and market sectors with the greatest needs and potential for savings.



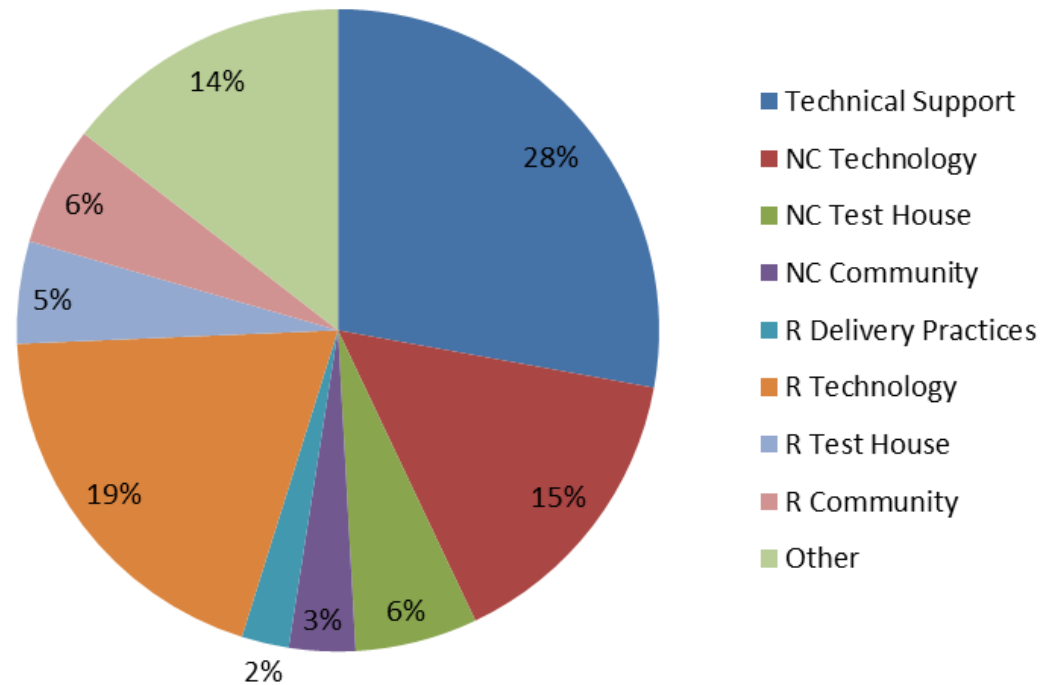
Houses Studied by Building America (2000-present)

Progress and Accomplishments

Building America research has a broad portfolio which includes the study of new construction (NC), retrofits (R), specific technology, whole-house solutions and community-scale applications. Building America teams also provide support to deployment efforts through technical support and the study of delivery practices.

Investment Summary

- 33% Retrofits
- 25% New Construction
- 34% Individual Technology Research
- 11% Whole House
- 9% Community Scale
- 28% Technical Support



BA Research Portfolio Funding Distribution

Progress and Accomplishments

Building America teams provide technical and collaborative support to many deployment programs and efforts.

- DOE Zero Energy Ready Homes (ZERH)
- EPA ENERGY STAR
- DOE Better Buildings (BB) Residential Program
 - Home Performance with ENERGY STAR (HPwES)
 - Home Energy Score
 - Better Buildings Residential Network
- DOE Weatherization Assistance Program (WAP)
- U.S. Department of Housing and Urban Development (HUD)
- U.S. Department of Defense (DoD)
- Joint Committee for Excellence in Building Science
- Development of 150 pieces of Building America Solution Center (BASC) content by Building America teams.
- DOE Codes and Standards program

FY14 Collaboration Highlights

- ZERH – 40 BA Projects
- BB – 15 BA Projects
- HPwES – 25 BA Projects
- WAP – 17 BA Projects
- BA Teams presented in more than 50 conferences

FY14 BA Team Code Changes

- Rim header provision adopted in 2015 ICC International Residential Code (IRC)
- Rigid insulation under wood floors provision adopted in 2015 ICC IRC
- Plastic duct system IRC code change proposal
- Plastic duct system IRC code change proposal
- BA Teams eight ASHRAE, ACCA, and RESNET standards committees

Project Integration and Collaboration



Habitat Cost Effective Energy Retrofit Program

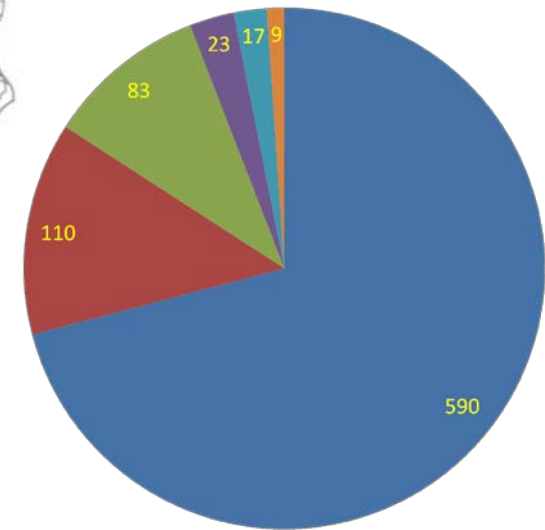
Building Energy Efficient Homes for America (BeeHa)

Project Integration and Collaboration



- ★ Team Leads
- Team Members
- Partners

BA Industry Partners Distribution (2009 to present)



- Builders
- Manufacturers
- Consultants
- Govt. Agencies
- Researchers
- Utilities

BA Industry Partners Market Sectors (1994 to 2009)

More than 1,200 industry stakeholders have been directly engaged in Building America research since the program's inception in 1994 to present.

Outreach Efforts

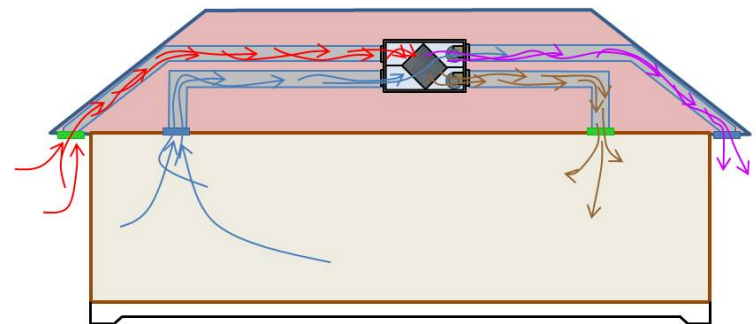
- Production of 110 market-ready publications authored by Building America teams
- Building America website migration and enhancement
- Monthly program newsletter: *Building America Update*
- Ongoing efforts to increase GovDelivery subscriber base
- Hosting public webinars with presentations by Building America team experts
- Focused promotion of Top Innovations
- Hosting the 'Race to Zero' Student Design Competition



Next Steps and Future Plans

Next Steps and Future Plans: In the next 3 to 5 years, Building America will focus on solving three core technical challenges to enable 50% energy savings in residential buildings and accelerate market transformation in the housing sector by 2030:

1. High Performance Thermal Enclosure Assemblies
2. Optimal Comfort Systems for Low-Load Houses
3. High Performance Ventilation Systems and Indoor Air Quality Strategies



REFERENCE SLIDES

Project Budget

Project Budget: TQM budget is proportional to BA Team funding amounts.

Variiances: FY15 budget is currently under negotiation to increase scope per RBI request.

Cost to Date: FY15 spending to date is \$600,000.











Additional Funding: none

Budget History

| FY2010– FY2014 (past) | | FY2015 (current) | | FY2016 – FY2018 (planned) | |
|--------------------------|------------|---------------------|------------|------------------------------|------------|
| DOE | Cost-share | DOE | Cost-share | DOE | Cost-share |
| \$6,440,000 | - | \$1,200,000 | - | \$7,685,000 | - |

Project Plan and Schedule

The TQM project is an annual reoccurring activity to support the Building America Industry Team. Deliverables include quarterly progress reporting and an annual summary report documenting the outcomes of the BA team research and BA program support activities. Annual go/no-go decisions are dependent on BA team funding allocations and award of BA team subcontracts/cooperative agreements.

| |  Milestone/Deliverable (Originally Planned) | | | | | | | | | | | |
|------------------------------|--|--------------|--------------|--------------|---|---|---|---|---|---|---|--------------|
| |  Milestone/Deliverable (Actual) | | | | | | | | | | | |
| | FY2013 | | | | FY2014 | | | | FY2015 | | | |
| 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 | | | | | | | | | | | | |
| FY2014 Monthly Updates | | | | |  |  |  |  | | | | |
| FY2014 Annual Report | | | | | | | | |  | | | |
| Current/Future Work | | | | | | | | | | | | |
| FY2015 FOA Support Activites | | | | | | | | |  | | | |
| FY2015 Quarterly Updates | | | | | | | | | |  |  | |
| FY2015 Annual Report | | | | | | | | | | | | |