Better Buildings Residential Network
Peer Exchange Call Series:
Making the Grade: Innovative Approaches to Improving Quality
August 3, 2017
Call Slides and Discussion Summary
Agenda and Ground Rules

- Agenda Review and Ground Rules
- Opening Polls
- Residential Network Overview and Upcoming Call Schedule
- Featured Speakers
  - Rebecca Filbey, Residential Energy Efficiency Program Manager & Rob Busby, Home Performance with ENERGY STAR (HPwES) Program Manager, Consumers Energy
  - Jason Elton, Quality Systems Manager, Enhabit
- Discussion
- Closing Poll and Announcements

**Ground Rules:**

1. Sales of services and commercial messages are not appropriate during Peer Exchange Calls.
2. Calls are a safe place for discussion; please do not attribute information to individuals on the call.
Join the Network

**Member Benefits:**
- Recognition in media and publications
- Speaking opportunities
- Updates on latest trends
- Voluntary member initiatives
- Solution Center guided tours

**Commitment:**
- Members only need to provide *one number*: their organization’s number of residential energy upgrades per year.

Upcoming calls:
- August 10: [Doing More with Less: Low Cost Program Strategies](#)
- August 17: [Back to School: Engaging Students in Energy Efficiency at Home and in the Classroom](#)
- August 24: [Making the Leap to the Multifamily Market](#)
- September 14: [Keeping Up with the Jones’: Key Strategies for Behavior Change](#)

Peer Exchange Call summaries are posted on the Better Buildings website a few weeks after the call: [https://energy.gov/eere/better-buildings-residential-network/peer-exchange-call-summaries](https://energy.gov/eere/better-buildings-residential-network/peer-exchange-call-summaries)

*For more information or to join, for no cost, email bbresidentialnetwork@ee.doe.gov, or go to energy.gov/eere/bbrn & click Join*
Ely Jacobsohn, Program Manager, Home Performance with Energy Star
Quality Assurance
Past, Present and Future
Topics Addressed

• Where we have come from
• Where are we now
• Where are we going
The Past

• Quality = Inspection
  ➢ Costly and often not quantified
  ➢ Root cause often ignored
  ➢ Tendency to use inspectors as “owners” for quality
  ➢ Potential for lengthy periods between installations and inspections and subsequent corrections
The Present

• HPwES offers two approaches for QA
  ➢ Inspection with feedback
  ➢ Quality Management Systems

• Goals
  ➢ Address root causes creating quality issues – feedback loop
  ➢ Reduce legal and financial risk
  ➢ Maintain or improve business reputation

• Results
  ➢ Mixed due to many issues
  ➢ Annual report summary follows
  ➢ Innovative approaches exist
2016 Average Field Inspection Cost by Region (N=38)

- **West** (N=7): $510
- **Central** (N=4): $330
- **Midwest** (N=8): $560
- **Southeast** (N=5): $400
- **Mid-Atlantic** (N=8): $300
- **Northeast** (N=6): $250
### Annual Report Summary Slide on Field Inspection Costs

#### Assuming 1000 Projects/Year

<table>
<thead>
<tr>
<th>Region</th>
<th>5% Inspection</th>
<th>10% Inspection</th>
<th>35% Inspection</th>
<th>100% Inspection</th>
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<tbody>
<tr>
<td>National</td>
<td>$20,000</td>
<td>$40,000</td>
<td>$140,000</td>
<td>$400,000</td>
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<tr>
<td>$400/insp.</td>
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<td></td>
<td></td>
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<tr>
<td>High</td>
<td>$30,000</td>
<td>$60,000</td>
<td>$210,000</td>
<td>$600,000</td>
</tr>
<tr>
<td>$600/insp.</td>
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<td></td>
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<tr>
<td>Low</td>
<td>$12,500</td>
<td>$25,000</td>
<td>$87,500</td>
<td>$250,000</td>
</tr>
<tr>
<td>$250/insp.</td>
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</tbody>
</table>
Implementation Challenges: Cost (N=23)

Sponsors Identifying Each Program Element as Their Most Costly

<table>
<thead>
<tr>
<th>Program Element</th>
<th>Number of Sponsors</th>
</tr>
</thead>
<tbody>
<tr>
<td>QA/Verification</td>
<td>7</td>
</tr>
<tr>
<td>Marketing</td>
<td>5</td>
</tr>
<tr>
<td>Incentives</td>
<td>5</td>
</tr>
<tr>
<td>Administration</td>
<td>4</td>
</tr>
<tr>
<td>Contractor Training</td>
<td>2</td>
</tr>
</tbody>
</table>
The Future

• QA monitoring to be more remote from job site
  ➢ Images instead of inspectors
  ➢ Connected devices and smart meters

• Data to drive analysis
  ➢ Big Data and trend analysis
  ➢ More specific and timely contractor feedback

• M&V 2.0 (Advanced M&V)
  ➢ Relies on automated data collection and analysis
  ➢ Internal team focused rather than external evaluator
  ➢ Continuous model evolution improves real-time adaptability to uncertain business environment
  ➢ More continuous, granular, and instantaneous information
Resources/References

The Status and Promise of Advanced M&V

Northeast Energy Efficiency Partnerships
EM&V 2.0
http://www.neep.org/tags/emv-20

ENERGYSAVY Case Study: PSEG Long Island
http://assets.cdnma.com/7083/assets/EnergySavvy_Case_Study_PSEG_LI_M%26V2.0_FINAL.pdf

California methods for calculating site-based, weather-normalized, metered energy savings
www.caltrack.org
Past Quality Assurance (QA) has relied mainly on field inspections. 
  
**Issue**: Inspection often fails to recognize the rework costs and tends to transfer real ownership for correct installations from contractors to inspectors.

Current HPwES QA approaches (traditional inspection & Quality Management Systems) have shown mixed results due to regional differences:

- **Inspection objectives**: Upgrade evaluations or customer re-engagement.
- **Rural vs Urban**: Driving distances affect mileage and time. Rural areas tend to cost more.
- **Extensiveness and volume of inspections**: More volume tends to reduce cost per inspection.

The sooner programs catch the energy upgrade errors, the less costly it will be to fix them: Average field inspection cost is $400 across the U.S.

Moving forward, QA/QC will rely more on big data and trend analysis:

- **Evaluation, Measurement and Verification (EM&V) 2.0** will enable more granular data collection and help programs be more adaptable and respond better to market needs.
Best Practices: Consumers Energy
Rebecca Filbey, Residential Energy Efficiency Program Manager &
Rob Busby, Home Performance with ENERGY STAR (HPwES) Program Manager
Using Feedback to Improve Trade Ally Engagement

Rebecca Filbey (Consumers Energy) / Rob Busby (ICF)

Aug. 3, 2017
About Consumers Energy

1886 Company was Founded

- 6.7 million Michiganders count on us for service
- 1,039 miles of electrical distribution lines
- Workforce consisting of employees and contractors 15,000

- More than 27,000 miles of natural gas distribution pipeline
- 5,885 megawatts of generating capacity
About Consumers Energy HPwES

• Launched current portfolio of residential energy efficiency programs in 2009
• Home Performance with ENERGY STAR® sponsor since 2010
• 900 – 1,300 jobs completed annually
• 35 – 50 Trade Allies
Goals

- Improve quality of work delivered by Trade Allies
- Increase contractor participation
- Develop better working relationship with Trade Allies
- Build a robust Contractor Value Plan
Engaging our Trade Allies in our metrics

- Energy Savings Achieved (KWH, MCF)
- Rebates Provided to Customers
- Customer Satisfaction
Contractor Participation Reports

- Monthly distribution by email
- High-level summary of activity, detailed monthly charts
- Account Managers can generate at any time for current period
Sample Report – Summary Section

• Rolling 13 months of data (allow for seasonality)
• Stats at a glance
Sample Report – Participation Section

- See past participation trends – use to forecast
- Application quality vs. program benchmark
- Tie periods of high flaw rate to specific events?
Driving to improve quality

• Sharing verbatim comments from customer satisfaction surveys
  • Targeted feedback – kudos and room for improvement

• Providing access to online learning center
  • Sales, technical, program administrative info

• Breaking down barriers to participation
  • Helping source energy auditor staff
  • Offering equipment rental to new/expanding Trade Allies
Sample - Online Learning Center
Building foundation for Contractor Value Plan

• Once we have data, we can compare contractors to each other

• Once we can compare contractors to each other, we can start to identify top performers

• Once we identify top performers, we can customize our special offerings
  • limited availability promotions, co-op advertising opportunities, leads...
What’s Next

• Incorporate Trade Ally Feedback
• Formal launch: Contractor Ranking System
• Improved Contractor Participation Reports
  • Up/down arrows for at-a-glance summary
  • Quarterly data presentment and email distribution
  • Includes ranking as well as position within rank
Feedback loop from consumer to contractor helps identify opportunities for improvement.
- Customer satisfaction surveys allow Consumers Energy to share direct customer feedback with contractors and identify trends in their progress.

Analyzing contractors’ performance allows Consumers Energy to identify the top performers and incentivize them accordingly.
- In developing their Contractor Participation Report, Consumers Energy found that contractors are not reticent in receiving benchmarking data, as it gives them a starting point to address barriers.

Breaking barriers to participation:
- Free online training allows Consumers Energy to work with their contractors’ network that is based on multiple locations.
- Equipment loans help contractors with limited resources.

Consumers Energy is currently working on a system ranking contractors in silver-gold tiers:
- This will help inform consumers, but also contractors’ account managers in addressing any gaps.
Best Practices: Enhabit
Jason Elton, Quality Systems Manager
Enhabit Quality Systems

➔ Why update our QA approach?
➔ What is a Remote Quality Review?
➔ What systems are used?
➔ How to track progress?
➔ What are the results?
➔ What are some important considerations?
Historical QA Process

2009 through mid 2015

• 100% Onsite Quality Reviews
• 2.5 hours and $200 per onsite QR (higher in rural areas)
• Highest percentage of Advisor time on QR
• Average Pass Rate 70 - 75%
• Contractors attend onsite QR with Advisor
• Contractors waiting to identify issues
• Results tracked in Excel spreadsheets and later in online project management system.
Remote Quality Review

➔ BPI-certified Home Advisor reviews data uploaded by contractor
➔ Review final documentation (Invoices, permits, etc.)
➔ Review contractor upgrade photos
➔ Contact client to discuss issues or concerns
➔ Talk with client about project experience and whether they would recommend contractor or Enhabit to others
Quality Review Changes

- 2015: Introduced small % of Remote QR as trial, Contractors no longer required to attend appointment with Advisor.
- Update Quality Systems
- 2016: Decrease Onsite QR to 45% (Reduced staffing, reduced funding)
- 2017: Decrease Onsite QR to 25%.
Quality Review

Changes

80% Onsite QR in Q1 of 2016
25% Onsite QR in Q2 of 2017
Quality Systems

- Enhabit uses a proprietary system (Threshold)
- Ability for contractors and advisors to enter and review project data
- Test In, Bidding and Test Out Data
- Documents and Upgrade Photos
- Integrated QR Form
- Sales force reporting
**Final Test Out Data**

- Contractor enters project data
- Final data reviewed by Advisor
- Data also used for utility incentive processing
- Data can be used to create Energy Scores (EPS)
- Contractors upload photos
### Project Documents

- Contractor uploads Project documentation
- Bids, Invoices, equipment info, permits, etc.

<table>
<thead>
<tr>
<th>File Name</th>
<th>Description</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>100 Point Performance Check Enhabit 100836.pdf</td>
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<td>Download</td>
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<tr>
<td>example bid.pdf</td>
<td>Signed Bid</td>
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<td>Delete</td>
</tr>
<tr>
<td>Enhabit LVF-100836.pdf</td>
<td>Other</td>
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<td>Delete</td>
</tr>
<tr>
<td>Enhabit Invoice 100836.pdf</td>
<td>Signed Invoice</td>
<td>Download</td>
<td>Delete</td>
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<tr>
<td>PortlandMapa_2017-190424-000-00-RS.pdf</td>
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<tr>
<td>20753 Windows Docs.pdf</td>
<td>Other Supporting Document</td>
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<tr>
<td>PooP-Solar Inspection approval.pdf</td>
<td>Utility Solar Verification</td>
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<td>Delete</td>
</tr>
</tbody>
</table>
Enhabit Upgrade Photos

- Photos of upgrades are required on every project.
- Uploaded by contractors to Threshold
- Photo checklist provided to contractors
- Contractors typically take good photos of work and check over installs prior to final submittal
- Advisors occasionally need to request additional photos or information
QR Form

- Used by Advisors on every project
- Indicate QR Type and Result
- Advisor fills out check lists
- Notes Fields
- Upload photos when Onsite QR
- Identify needed corrections
- Results available to Contractors
### QR Form Checklist

- Conforms to Utility specs and program standards
- QR form made available to contractors
- Identifies specific corrections
- Results logged in Salesforce record

### Building Envelope

<table>
<thead>
<tr>
<th>Air Sealing</th>
<th>Action</th>
<th>Reference</th>
<th>Correction Needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>✔</td>
<td>Approved Air Leakage Reduction which meets utility and/or Enhabit rebate requirements.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>✔</td>
<td>Address all accessible air sealing opportunities: attic, garage, crawlspace, exterior walls, basement walls.</td>
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<td></td>
</tr>
<tr>
<td>✔</td>
<td>CO Monitor installed on every floor with bedroom.</td>
<td></td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attic</th>
<th>Action</th>
<th>Reference</th>
<th>Correction Needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>✔</td>
<td>Determines if storage or human contact areas are present. 1.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>✔</td>
<td>Install baffles at eave vents, heat-producing fixtures, flues and chimneys. AT 1.3 and AT 1.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>✔</td>
<td>Dams shall be installed at interior accesses and where insulation is at different levels to keep loose fill from falling out of attic.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>✔</td>
<td>Interior ceiling accesses shall be insulated to a minimum of R-30 and knee wall access doors shall be insulated to a minimum of R-15. Interior accesses shall have permanent weatherstripping, AT 1.10 and AT 2.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>✔</td>
<td>Verify all exhaust fans are vented completely to the exterior with no gaps. AT 1.6–1.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>✔</td>
<td>Washington customers shall insulate all exhaust fan ducts in unconditioned spaces to a minimum of R-4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>✔</td>
<td>Insulate water lines in attic space: AT 1.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>✔</td>
<td>Insulate and weatherstrip access panel or pull-down stairs. AT 1.10–1.12</td>
<td></td>
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</tr>
<tr>
<td>✔</td>
<td>Insulate vertical walls, including skylights to R15 and cover with air barrier. Install blocking in floor under knee wall. AT 2.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>✔</td>
<td>Verify R-Value and condition of installation of insulation. Appendix B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>✔</td>
<td>All vapor barriers shall face the living area. AT 2.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>✔</td>
<td>Vertical walls separating attics from indoors shall be insulated. AT 1.13 and AT 2.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>✔</td>
<td>Air penetrations between attic and conditioned space have been sealed</td>
<td></td>
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</tr>
</tbody>
</table>
Quality Assurance Reporting

- Critical data entered in Threshold is recorded in Salesforce Database
- Data can be queried and used to create customized up to date reports
- Ability to review reports weekly, monthly, quarter, and year
- Results by contractor, region, product, etc.
Year 1 QR Results

➔ QR results post system change (Q3 2016 – Q2 2017)
➔ 94% Pass Rate Overall
➔ 80% Pass Rate Onsite QR
➔ 97% Pass Rate Remote QR
Quality Results

- After quality updates implemented there was an increase in the overall pass rate
- Onsite vs Remote results
- Important to track results by product and contractor
- Work closely with new contractor staff
- Follow up on issues
Considerations

➔ Important to provide lifeline for homeowners (Phone, email, etc.)
➔ Develop a case system to track complaints and issues.
➔ Invest in strong contractor relationships and communication
➔ Know your project managers and consultants working in homes
➔ There is risk in missing a correction when not going to every site.
➔ Provide Training and QA tools for contractors
➔ Develop good quality reporting systems
➔ Survey customer satisfaction
➔ Develop a quality plan and customer experience plan
Presentation Highlights: Enhabit

• **Transitioning from field inspections to remote quality reviews can bring wins all around**: Enhabit’s adoption of a web-based tool to perform remote inspections resulted in:
  • **Higher pass rate** of 94% overall
  • **Streamlined work and burden reduction** (e.g. fewer time spend on applications due to prepopulated fields in the web app)
  • **Time savings** for both contractors and Enhabit staff (fewer field inspections, less lag time between identifying and fixing issues)
  • **Better progress tracking** and identification of opportunities for improvement.

• **Pictures are essential in remote reviews to illustrate the work being done**: Enhabit’s web app requires contractors to upload detailed pictures of upgrades performed.

• **Tracking complaints and providing feedback back to contractors ensures work flaws are being addressed.**

• **Contractors can make or break a project**: Communication with contractors is key to ensure they are aligned with the program’s goals.
Upcoming Seasonal Messaging Opportunities

Now is the time to start planning energy efficiency messaging!

October: **Energy Action Month**

5th
**National Energy Efficiency Day**

Welcome October By Celebrating National Energy Awareness Month

Alliance to Save Energy

Article

31st
**Halloween**

Oktoberfest

Energy Vibe
Posters

Arlington County
Post
Addenda: Attendee Information and Poll Results
Call Attendee Locations
Call Attendees: Network Members

- Advanced Energy
- AppleBlossom Energy Inc.
- Arlington County Government
- Building Performance Institute (BPI)
- Center for Sustainable Energy
- City of Kansas City
- Civic Works
- CLEAResult
- Earth Advantage Institute

- Energy Smart Home Performance
- Enhabit
- Michigan Saves
- Midwest Energy Efficiency Alliance (MEEA)
- Mountain Association for Community Economic Development
- The Insulation Man, LLC
- TRC Energy Services
Call Attendees: Non-Members (1 of 2)

- ABCD, Inc.
- Alliant Energy
- AmeriCorps
- Association for Energy Affordability
- BC Building Info
- Cadmus Group
- Columbia Water and Light Department (MO)
- Community Action Agency of Butte County, Inc. (CAABCI)
- Consortium for Energy Efficiency (CEE)

- Consumers Energy
- CORE
- County of San Diego
- EnergyWorks
- Eversource
- Florida Department of Agriculture and Consumer Services
- Franklin Energy Services, LLC
- Hawaii Energy
- Holy Cross Energy
- Horizon Residential Energy Services
Call Attendees: Non-Members (2 of 2)

- ICF
- Johnson Controls
- Leidos
- Local Government Commission
- Lockheed Martin Energy
- Louisville Gas & Electric
- Montana Department of Public Health & Human Services
- NANA Regional Corporation, Inc.
- National Fuel Gas
- Navarro
- New York City Mayor's Office of Sustainability
- Open Energy Efficiency
- Oregon Institute of Technology
- Proctor Engineering Group
- Renew Financial
- Rhode Island Housing
- Snohomish County
- Tempo Partners
- The Energy Control Company (ECC)
- XLR8SUN Electric Car
Which of the following best describes your organization’s experience with innovative approaches to improving quality?

- Some experience/familiarity – 50%
- Limited experience/familiarity – 31%
- Very experienced/familiar – 15%
- No experience/familiarity – 2%
- Not applicable – 2%
Closing Poll

After today's call, what will you do?

- Consider implementing one or more of the ideas discussed – 9%
- Seek out additional information on one or more of the ideas – 83%
- Make no changes to your current approach – 8%
- Other (please explain) – 0%