



*Better Buildings Residential Network  
Peer Exchange Call Series*

*Successful Strategies for Better Insulating*

*October 10, 2024*

# Agenda and Ground Rules

- Moderator
  - **Jonathan Cohen**, Better Buildings Residential Network
- Agenda Review and Ground Rules
- Residential Network Overview and Upcoming Call Schedule
- Opening Poll
- Featured Speakers
  - **Edward Louie**, Pacific Northwest National Laboratory (PNNL)
  - **Charlie Haack**, North American Insulation Manufacturers Association (NAIMA)
  - **Emma Kirby**, Potential Energy Coalition
- Open 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.

*The views expressed by speakers are their own, and do not reflect those of the Dept. of Energy.*

# Better Buildings Residential Network

## Join the Network

### Member Benefits:

- Recognition in media, social media and publications
- Speaking opportunities
- Updates on latest trends
- Voluntary member initiatives
- One-on-One brainstorming conversations

### Commitment:

- Members only need to provide *one number*: their organization's number of residential energy upgrades per year, or equivalent.

### Upcoming Calls (2<sup>nd</sup> & 4<sup>th</sup> Thursdays):

- *10/24: Increasing Low-Income Upgrades and Decarbonization*
- *11/14: TBA*

Peer Exchange Call summaries are posted on the Better Buildings [website](#) a few weeks after the call



**Edward Louie**  
***PNNL***

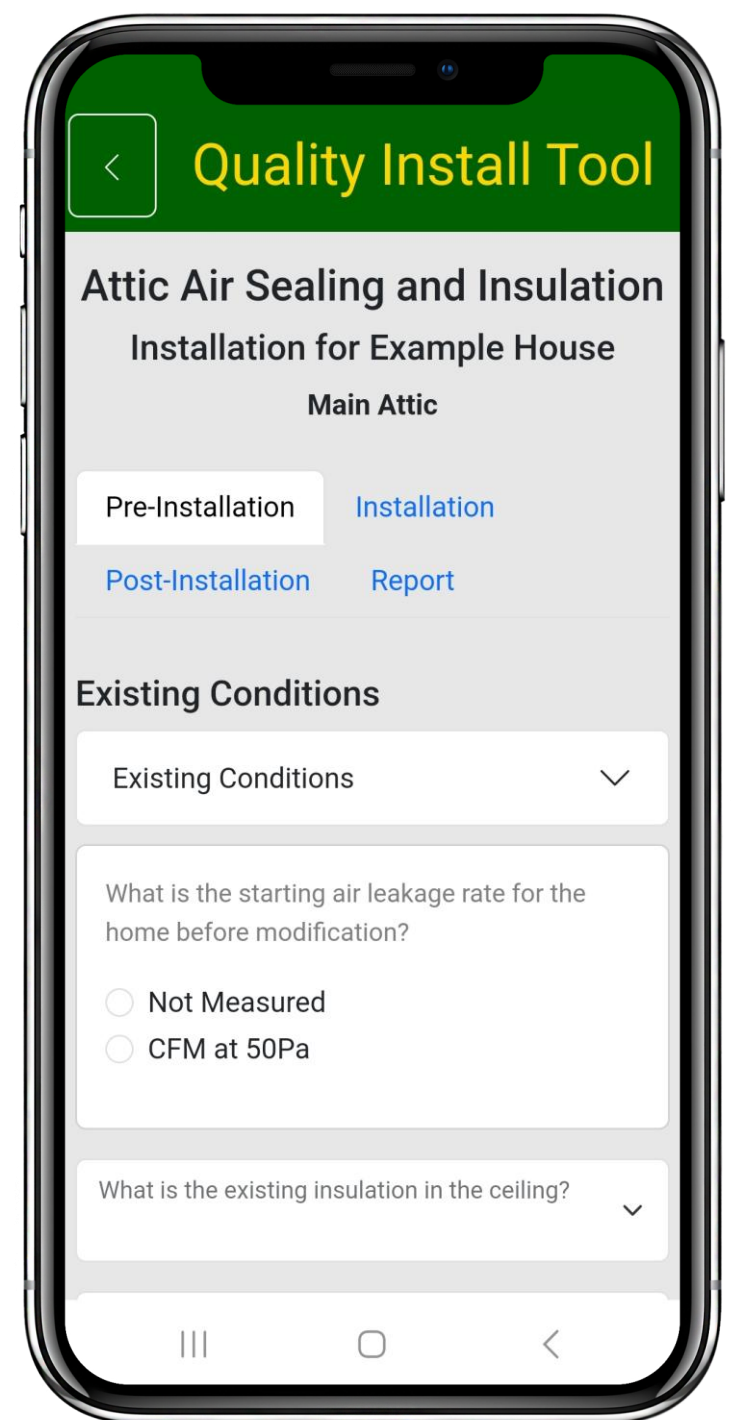
# Quality Install Tool

## A Strategy for Better Insulation

A free, easy-to-use, tool with workflows to document all commonly done residential retrofits

Presented at  
Better Buildings Residential Network  
Peer Exchange Call  
October 10, 2024

Tool developed by Pacific Northwest National Laboratory  
funded by the U.S. Department of Energy



# Problem

Residential energy efficiency measures are frequently installed incorrectly, leaving energy and money savings that are not realized

- 90+% of attic retrofits are “blow and go” jobs without first doing air sealing.
- In walls, insulating panels lose more than 36% of their performance if gaps represent only 0.5% of the insulation volume.
- A 5% area of attic missing insulation results in a 52% increase in heat loss compared to 100% coverage.
- “Whatever one calls it ... it is FRAUD. Cheating is prevalent throughout the United States. Every time government has investigated attic insulation, blatant and widespread violation of federal and state consumer Protection laws has been alleged and proven. This pattern of fraud has persisted since day one.” - Insulation Contractors Association of America, 1996

These problems have the greatest impact on low-income households, which count most on the anticipated savings.

# Quality Installations Needed to Achieve Decarbonization Goals

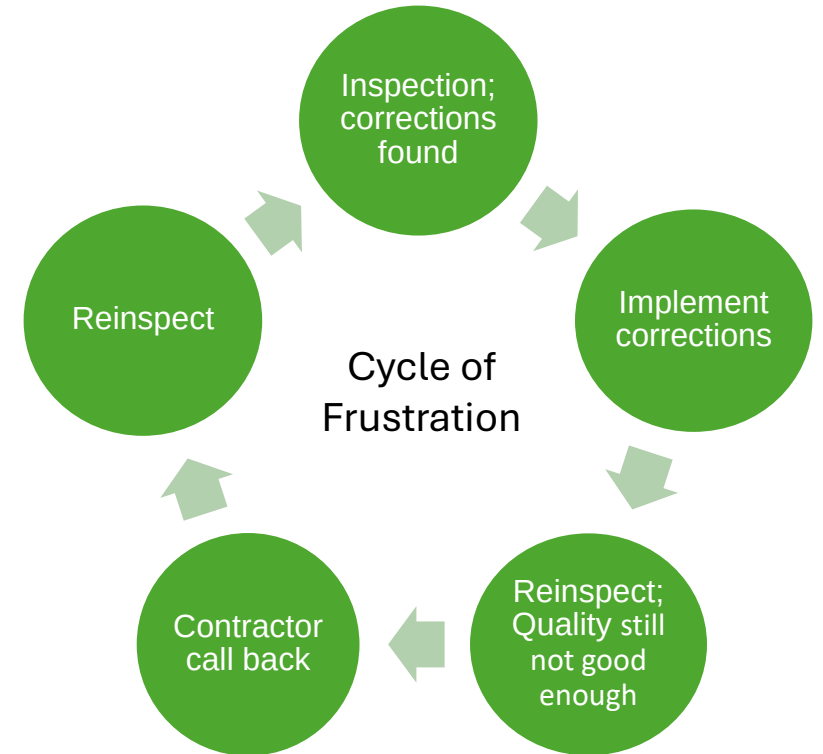
- By 2035, 3% annual efficient envelope retrofit rate for existing residential is achieved and maintained or exceeded thereafter. Reduce the market barriers of envelope retrofits
- Heat pumps for residential and small-to-medium commercial applications reach 75% of space heating sales by 2035 and >90% sales by 2050.
- By 2050, All primary electric resistance space and water heating is replaced by heat pumps.



Quality installation is assumed and required to reach these goals.

# Prevailing Quality Verification Approach

- Typically, only completed for 5% of projects
- On-site inspection results in tons of wasted emissions from travel
- 3<sup>rd</sup> party onsite validation is expensive—as such, all projects cannot be validated
- Some programs opt for installing contractor checklists in-lieu of on-site inspections
  - This provides no proof of proper installation
- Many elements are impossible or difficult to inspect/check afterwards

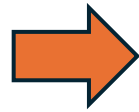


# Modern Approach

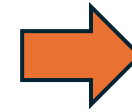
- The Quality Install Tool (QIT) works seamlessly to provide best-practice guidance to installers while documenting the quality installation for a wide range of stakeholders

## Typical Process Flow Using the QIT:

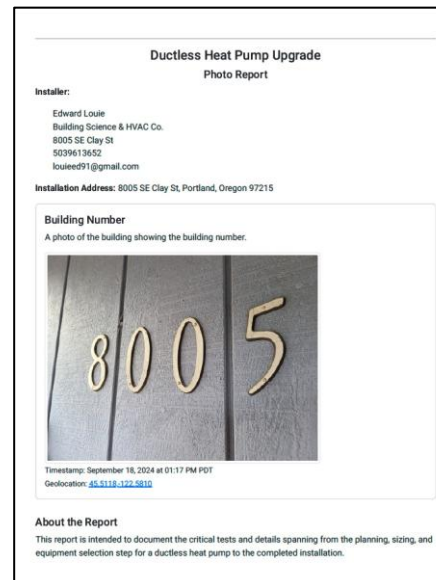
1) Contractor takes prompted pictures throughout the installation process



2) Tool converts picture series into PDF for sharing purposes (similar to a home inspection process)



3) PDF can be shared with many stakeholders for documentation of quality installation



Designed by FreePik

# Who Benefits?



Customer

Documents quality of the retrofit they have invested in



Contractor

Documents work completed and its quality at the time of completion; also serves as installation guide for trainees



3rd Party Verifiers

Supports review of work done without travel or logistical inconvenience



Utilities

Helps utilities have evidence that their program's incentives will realize full savings potential



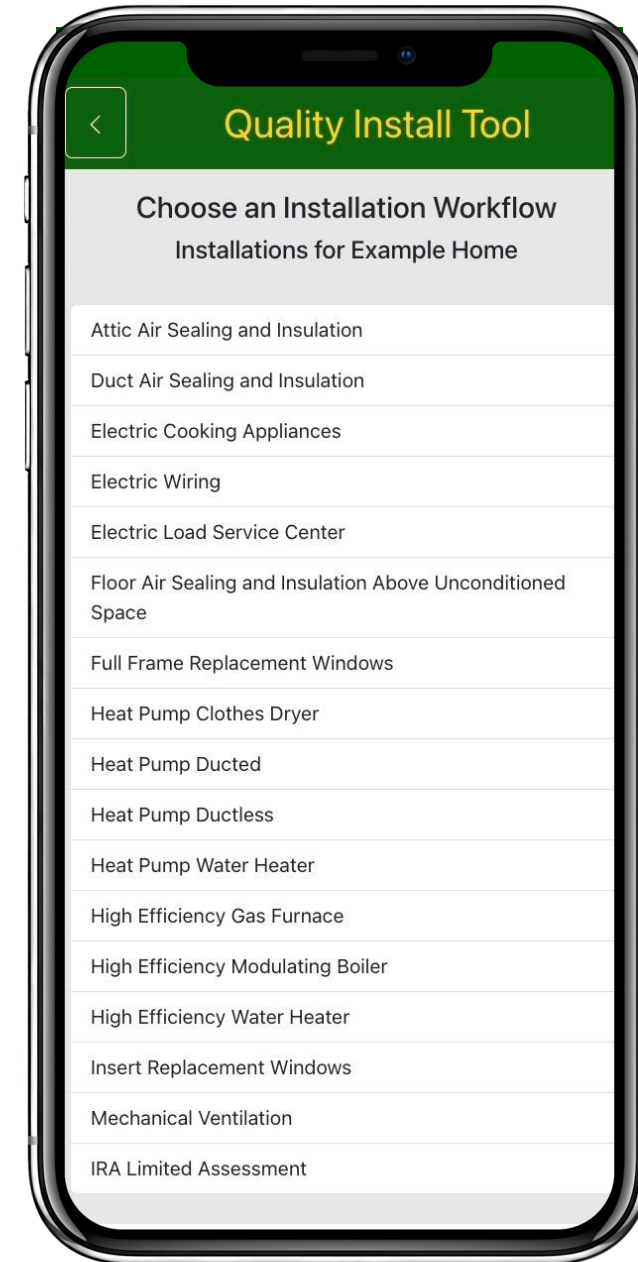
Insurance

Photo documentation of assets for accurate risk assessment

# Quality Install Tool

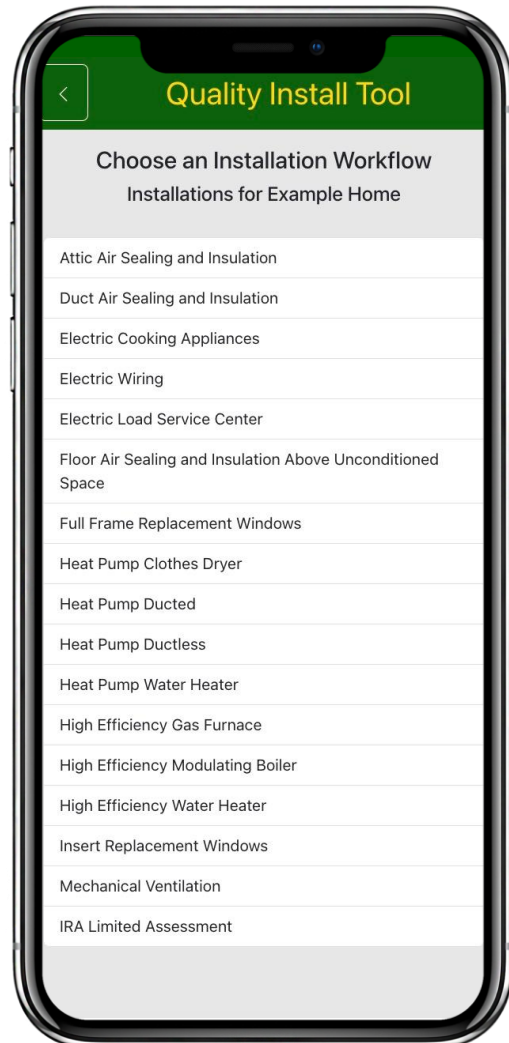
Features to support wide-scale adoption and market transformation

- No other tool easily and systematically documents critical details and test results
  - Streamlines quality install workflow for contractors
  - Points to other standards and tools where possible
  - Built-in geotagged and timestamped photos for proof of install at particular location
  - Automated PDF report generation – easy to share via email
- Free to use
- No download needed, “Web-app” works offline, saves offline, send PDF when back online
- Open-source code/adaptable – programs can use the code and change the requirements if desired (DOE version is best practice)



# Workflows

Currently available workflows



## HVAC Workflows

- Heat Pump Ducted
- Heat Pump Ductless
- High Efficiency Gas Furnace
- Duct Air Sealing and Insulation
- Mechanical Ventilation
- IRA Limited Assessment

## Plumbing Workflows

- Heat Pump Water Heater
- High Efficiency (Gas/Oil) Water Heater
- High Efficiency (Gas/Oil) Modulating Boiler

## Safety Workflows

- Combustion Safety Testing

## Envelope Workflows

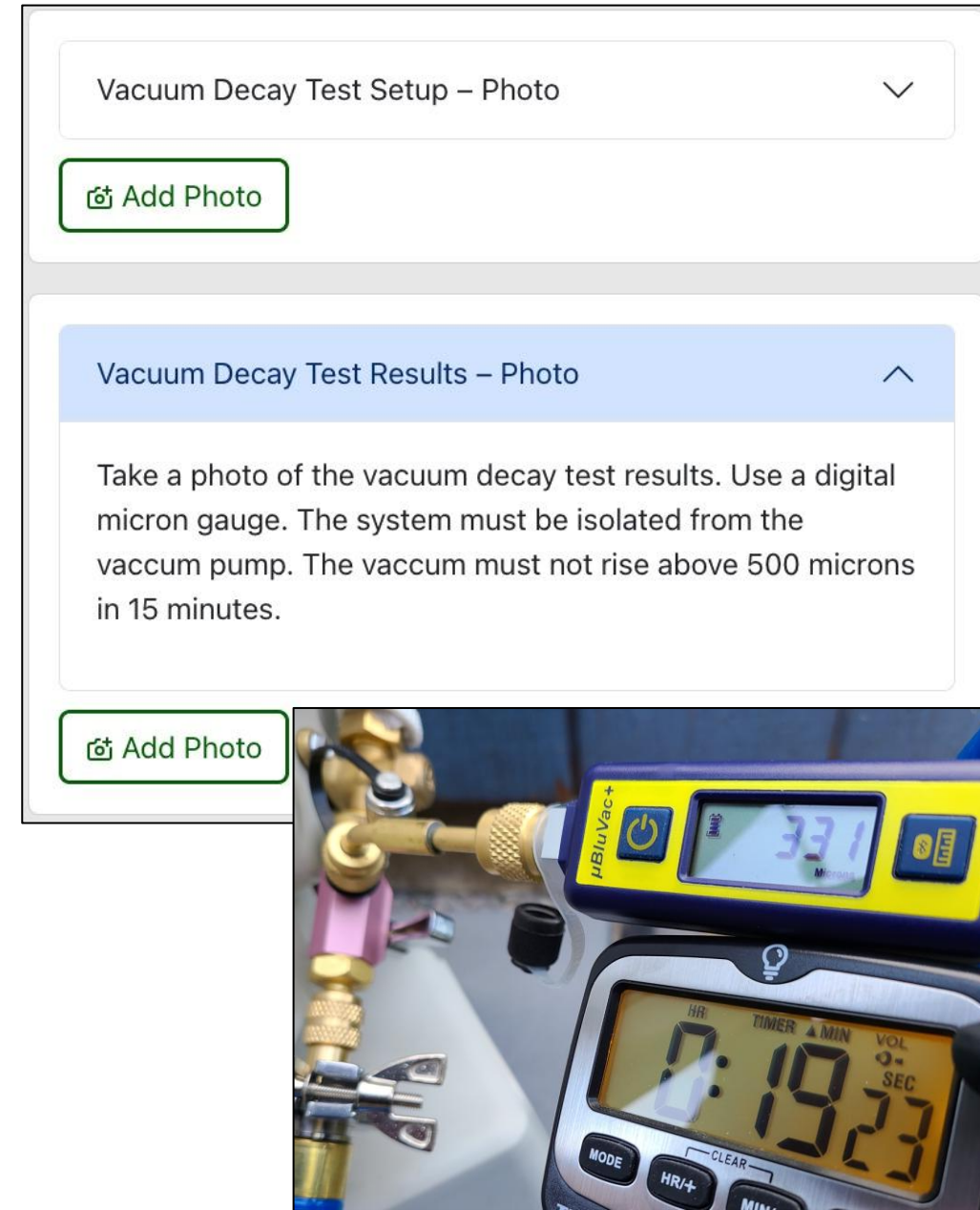
- Attic Air Sealing and Insulation
- Wall Air Sealing and Insulation
- Floor Air Sealing and Insulation Above Unconditioned Space
- Foundation Wall Air Sealing and Insulation
- Slab Foundation Air Sealing and Insulation
- Full Frame Replacement Windows
- Insert Replacement Windows

## Electrical & Appliance Workflows

- Electric Wiring
- Electric Load Service Center
- Heat Pump Clothes Dryer
- Electric Cooking Appliances

# Workforce Training Needed

- Blower door directed air sealing being developed in the 1980s by weatherization specialists supported by the Weatherization Assistance Program (WAP), however the skill is still not ubiquitous among the workforce.
- Air Conditioning Contractors of America (ACCA) released the first version of Quality Installation Specification in 2007 however the skill to do a proper vacuum decay and pressure decay test is not ubiquitous among the workforce.
- Quality Install Tool can also be used as part of training.



# Quality Install Tool - Introduction

First Time Use

Subsequent uses will  
start here

Each workflow  
“Installation” can be  
done more than once.  
Example DHP #1, DHP  
#2, DHP #3

## Quality Install Tool

Welcome to the Quality Install Tool

With this tool you will be able  
to easily take photos and document  
your entire installation project.

For your records  
For your clients  
For quality assurance reporting

Add a New Project

Click here to learn more about the [Quality Install Tool](#)

### Quality Install Tool

#### New Project Information

Project Name

#### Installer Information

The Installer information is optional, but we recommend filling in at least one field for reference in the final report.

Technician Name

Installation Company

Company Address

Company Phone

State

Zip Code

Building Number – Photo

Add Photo

Cancel Save Project

### Quality Install Tool

Add a New Project

**Example House**  
935 SE Test St,  
Portland, Oregon 97215

**GreenHome Institute**  
1451 Lake Drive SE,  
Grand Rapids, Michigan 49516

**Test**  
123 Test St,  
Portland, Oregon 97215

Click here to learn more about the [Quality Install Tool](#)

### Quality Install Tool

#### Choose an Installation Workflow

Installations for Example House  
935 SE Test St, Portland, Oregon 97215

- Attic Air Sealing and Insulation (1)
- Duct Air Sealing and Insulation
- Electric Cooking Appliances
- Electric Wiring
- Electric Load Service Center
- Floor Air Sealing and Insulation Above Unconditioned Space (1)
- Full Frame Replacement Windows
- Heat Pump Clothes Dryer
- Heat Pump Ducted (1)
- Heat Pump Ductless (3)
- Heat Pump Water Heater (1)
- High Efficiency Gas Furnace
- High Efficiency Modulating Boiler
- High Efficiency Water Heater
- Insert Replacement Windows

# Attic Air Sealing & Insulation Workflow

## Pre-Installation

[Pre-Installation](#) [Installation](#) [Post-Installation](#) [Report](#)

### Existing Conditions

Existing Conditions

What is the starting air leakage rate for the home before modification?

☐ Not Measured

☒ CFM at 50Pa

CFM at 50Pa

2523

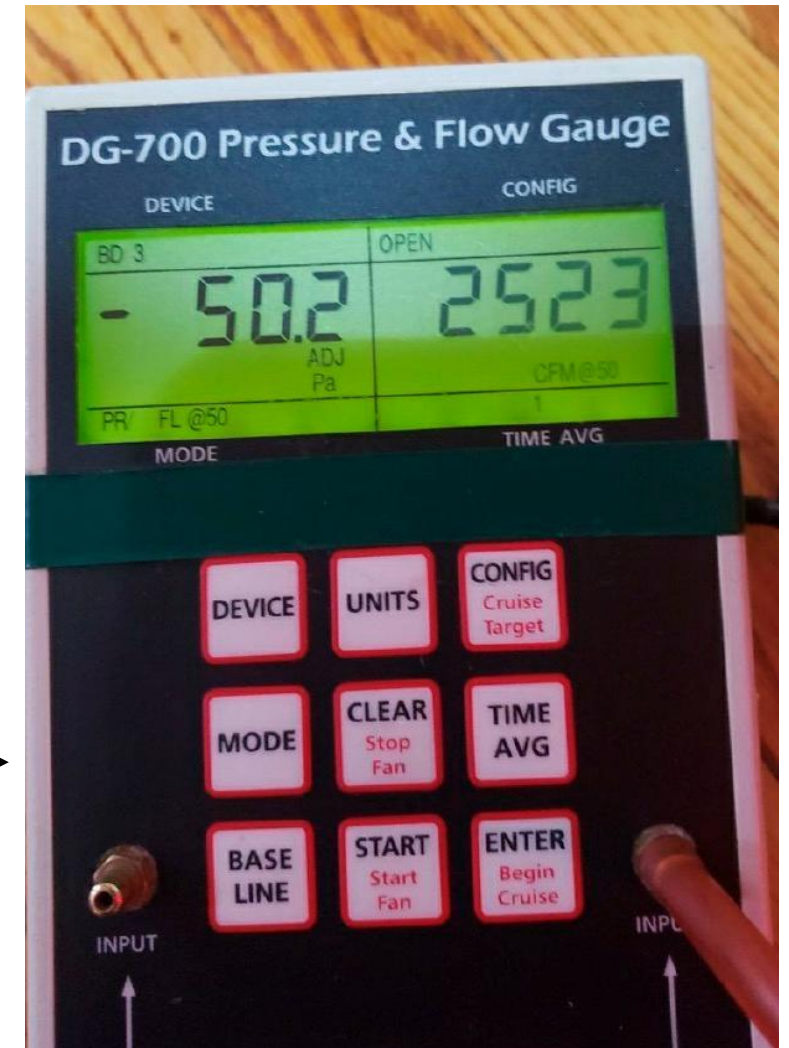
Starting blower door manometer showing the CFM50 value – Photo

Add Photo

What is the existing insulation in the ceiling?

Blown-in insulation

What is the existing insulation R-value in the ceiling?



# Attic Air Sealing & Insulation Workflow

## Pre-Installation

### General Safety

General Safety



Roof condition



What is the roof condition?

☐ Good

☒ Potential Issue

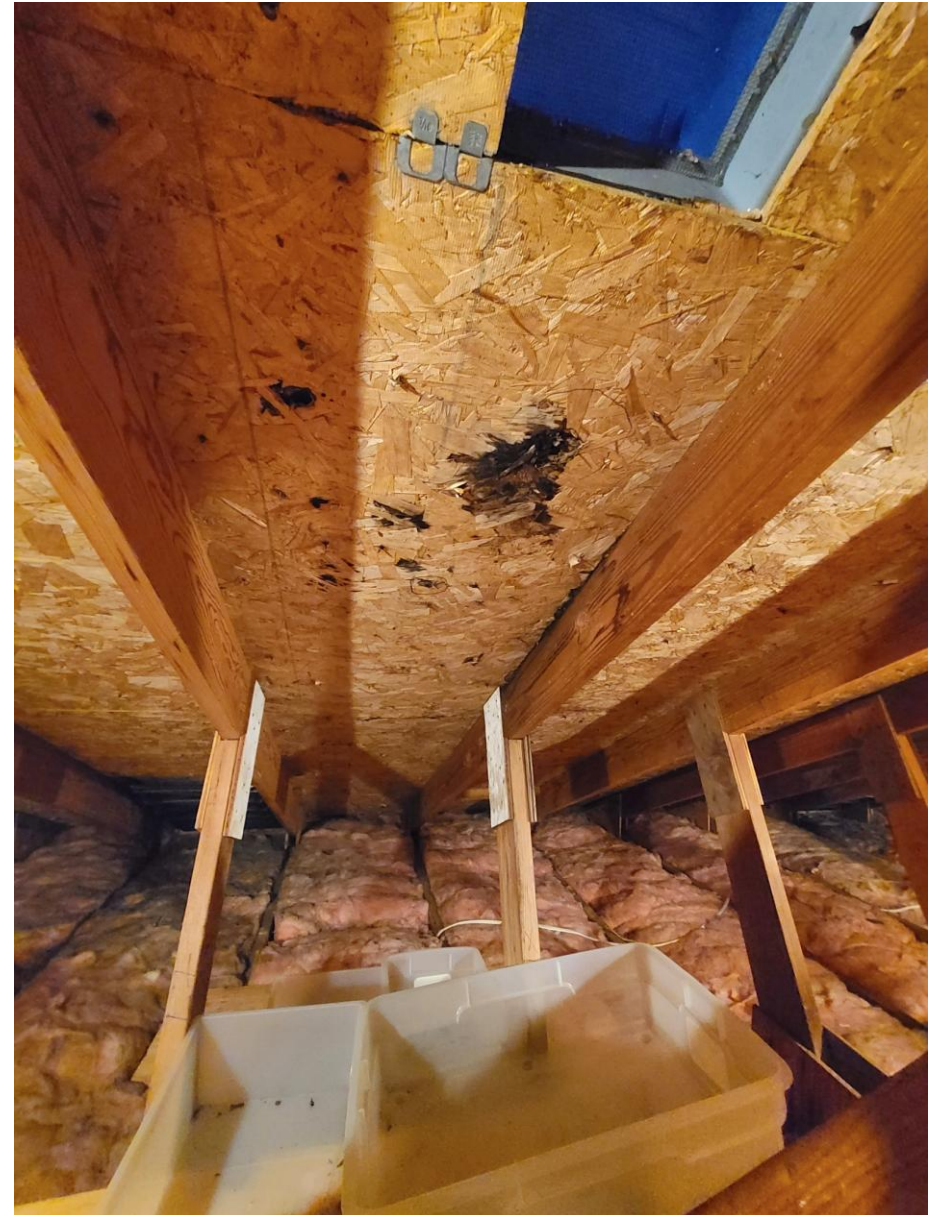
Mold or Moisture problems in the Attic



Are there signs of mold or moisture problems in the attic?

☒ Yes

☐ No



# Attic Air Sealing & Insulation Workflow

## Pre-Installation

Use your judgement.

A home with a very high starting air leakage rate is probably not going to get tight enough to where mechanical ventilation will be warranted.

But for homes that are decently tight to begin with but don't have MV, this is the time to calculate MV needs and pick an appropriate MV device.

### Pre-retrofit mechanical ventilation calculation

- The pre-retrofit ventilation calculation can help estimate whether mechanical ventilation will be needed post air sealing and insulation work.
- Consider using RED Calc ASHRAE 62.2 tools to do the mechanical ventilation calculation.  
<https://basc.pnnl.gov/redcalc>
  - Consider infiltration credits. A very leaky home may still be leaky enough after the scoped air sealing and insulation work is completed.
- The ASHRAE 62.2 standard does not require the installation of a system smaller than 15 CFM (7 L/s)

Has mechanical ventilation calculation been performed pre-retrofit?

☐ Yes

☒ No

Have the answers to these safety questions been disclosed to the homeowner?

☒ Yes

☐ No



RED

ASHRAE 62.2-2016 Ventilation

Reset Print

New or existing construction

Dwelling unit is

Use infiltration credit

Closest weather station

Weather and shielding factor [1/hr] = 0.52

Floor area

Number of occupants

Dwelling height

Measured leakage @ 50Pa

☐ Use Advanced Blower Door Inputs

☐ Use Local Ventilation Alternative Compliance

#### Dwelling-Unit Ventilation Results

Effective annual avg infiltration rate 

Total required ventilation rate,  $Q_{tot}$  

Infiltration credit,  $Q_{inf}$  

Required mechanical ventilation rate,  $Q_{fan}$  

NOTE: The ASHRAE 62.2-2016 standard does not require the installation of a system smaller than 15 CFM (7 L/s)

#### Dwelling-Unit Ventilation Run-Time Solver

Fan capacity

Fan run-time per hour

#### Dwelling-Unit Leakage Rate Solver

Target mechanical ventilation rate

Corresponding measured leakage @ 50Pa 

Version 2016-07-06\_01:30

# Attic Air Sealing & Insulation Workflow

## Installation – Air Sealing

[Pre-Installation](#) **Installation** [Post-Installation](#) [Report](#)

Provide a photo of each detail, skip if the feature is not present the home's attic.

[Installation - Air Sealing](#) [Installation - Insulation](#)

Drywall to Top Plate – Photo

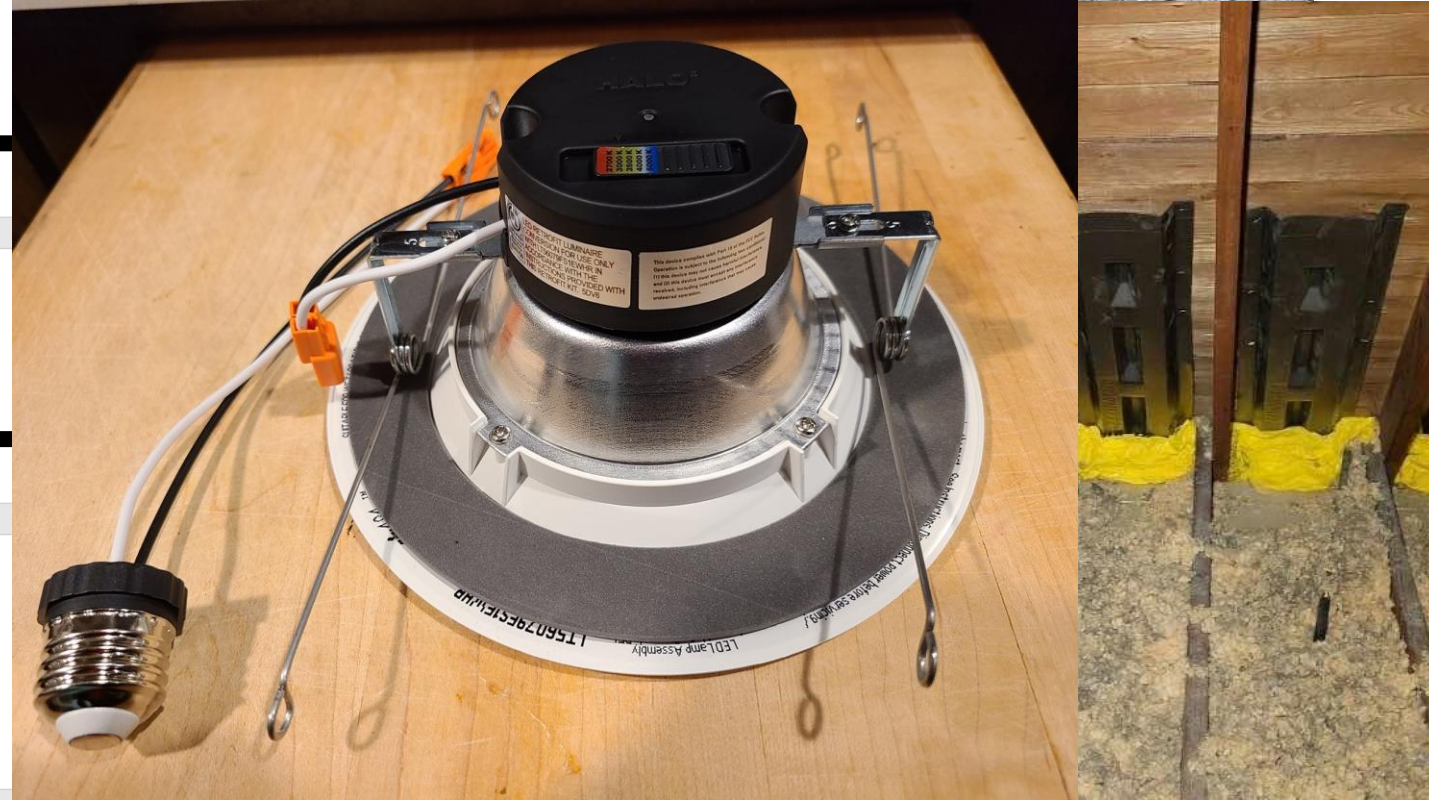
 Add Photo

Soffit Air Baffles – Photo

 Add Photo

Leaky Recessed Light – Photo

 Add Photo



# Attic Air Sealing & Insulation Workflow

## Installation – Air Sealing

Chimney Dam – Photo



 Add Photo

Hot Flue Pipe Dam – Photo



 Add Photo

Wire and Pipe Penetrations – Photo



 Add Photo

Attic electrical box:

  
Nope!!!



@wjthehomebuilder

Subscribe

Attic Air Sealing Detail

 Oh No (Instrumental) · Kreepa



# Attic Air Sealing & Insulation Workflow

## Installation – Air Sealing

Large Opening Sealed – Photo



 Add Photo



Duct Boot to Drywall – Photo



 Add Photo



Exhaust Fan Sealed to Drywall – Photo



 Add Photo



# Attic Air Sealing & Insulation Workflow

## Installation – Air Sealing

Knee Walls Sealed – Photo



 Add Photo

Knee Walls Enclosed – Photo

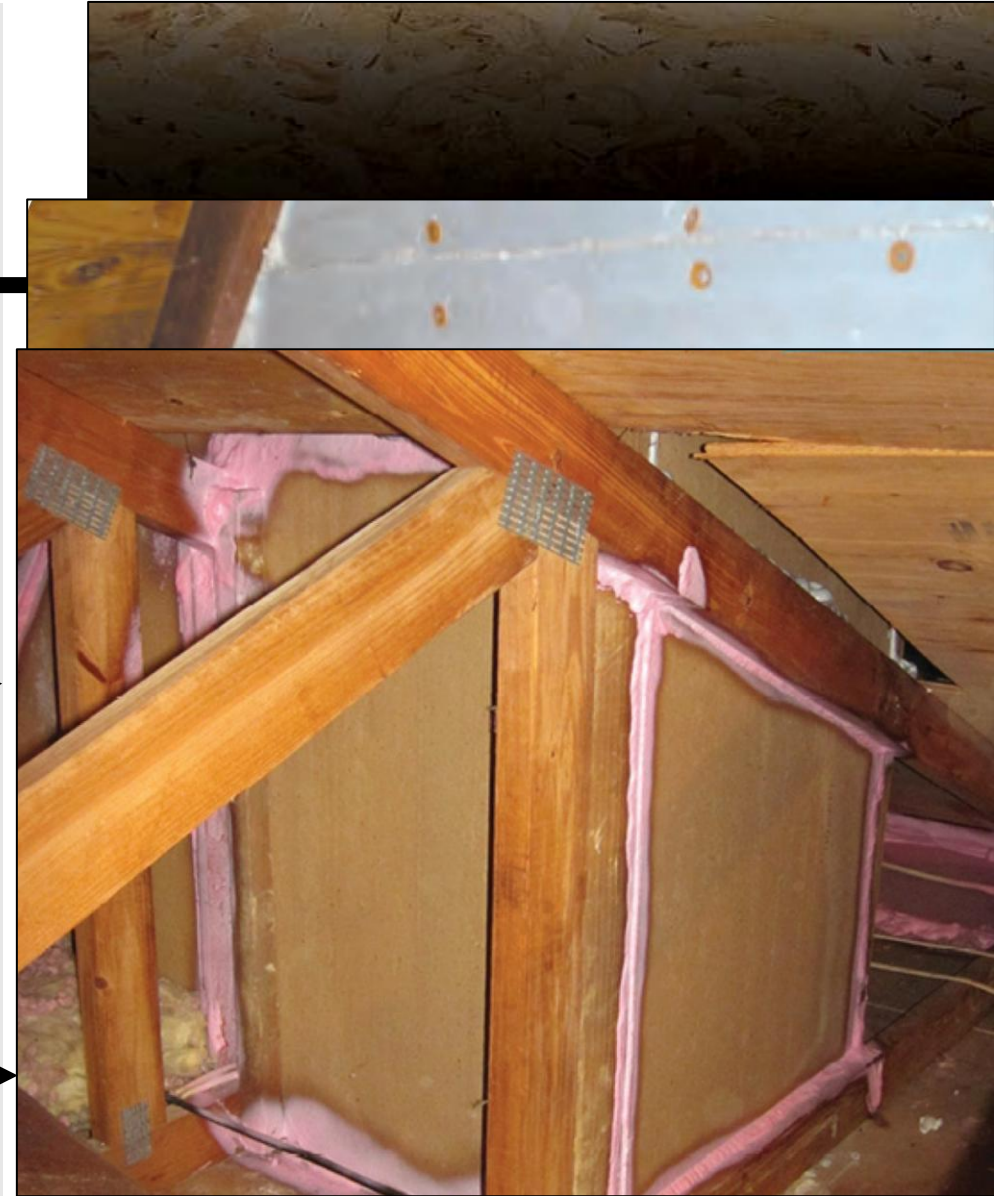


 Add Photo

Skylight Walls Sealed – Photo



 Add Photo



# Attic Air Sealing & Insulation Workflow

## Installation – Air Sealing

Skylight Walls Enclosed – Photo



 Add Photo



Balloon Walls Sealed – Photo



 Add Photo



Stairwell Wall Sealed – Photo



 Add Photo



# Attic Air Sealing & Insulation Workflow

## Installation – Air Sealing

T&G Ceiling Sealed – Photo



 Add Photo

Storage Platform Preparation – Photo



 Add Photo

Overview of Air Sealed Attic – Photo



 Add Photo



# Attic Air Sealing & Insulation Workflow

## Installation – Air Sealing

Attic Access Dam – Photo



 Add Photo



Attic Access Weatherstrip – Photo



 Add Photo



# Attic Air Sealing & Insulation Workflow

## Installation – Insulation

Installation - Air Sealing

Installation - Insulation

Insulation Measuring Rulers – Photo



Add Photo

R-value Per Inch – Photo



Add Photo

Skylight Shaft – Photo



Add Photo



# Attic Air Sealing & Insulation Workflow

## Installation – Insulation

Knee Wall – Photo



 Add Photo



Stairwell Wall – Photo



 Add Photo



Storage Platform – Photo



 Add Photo



# Attic Air Sealing & Insulation Workflow

Installation – Insulation

Wide Angle – Photo

▼

📷 Add Photo

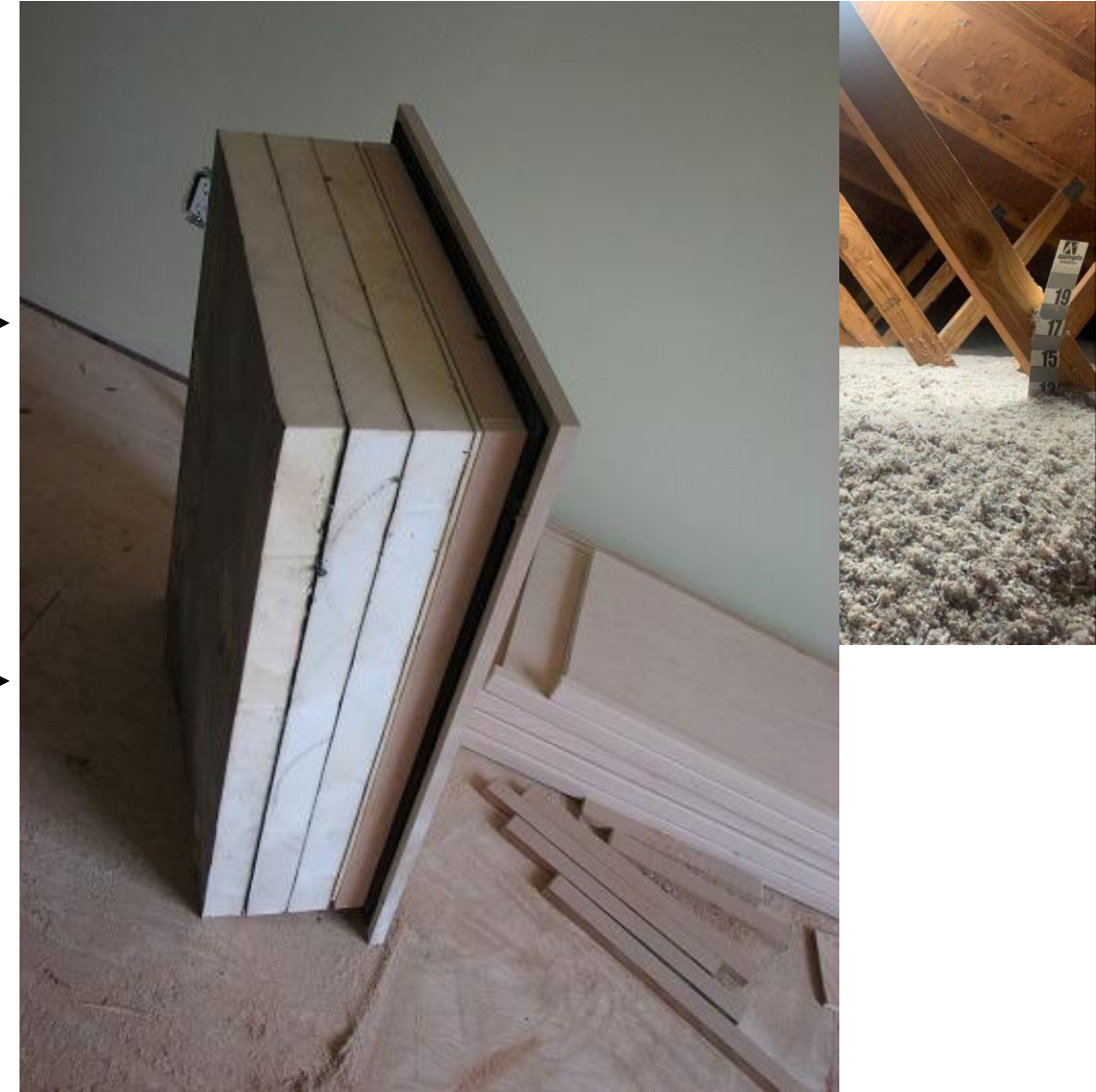
→

Attic Access - Photo

▼

📷 Add Photo

→



# Attic Air Sealing & Insulation Workflow

## Post-Installation

### Final Conditions

What is the air sealing level you have achieved?

- ☐ Not Measured
- ☒ CFM at 50Pa

CFM at 50Pa

1756

Final blower door manometer showing the CFM50 value – 

Photo

 Add Photo



# Attic Air Sealing & Insulation Workflow

## Report – Print Report

- The tool automatically generates a PDF report that can be saved to a phone. One can then use the phone's sharing capabilities to email a copy of the PDF and/or save it to a cloud storage location.
- The report has the photos rotated and sized to fit into pages and places them into text that describes the photo. If the photo is of a test, the text describes to the reader what numbers represents good results.

10/3/24, 4:22 PM

DOE - Quality Installation Report

Attic Air Sealing and Insulation Upgrade

Photo Report

Installer:

Greatest Tech Ever  
Best Home Performance Company Ever  
1234 Excellence Ave  
503-123-4567  
BestHPCE@gmail.com

Installation Address: 935 SE Test St, Portland, Oregon 97215

Building Number

A photo of the building showing the building number.



Timestamp: September 16, 2024 at 01:11 PM PDT

Geolocation: [45.5118 -122.5810](#)

Existing Conditions

What part of the home are you air sealing? Attic

What is the starting air leakage rate for the home before modification? 2523 CFM at 50Pa

Starting blower door manometer showing the CFM50 value – Photo

Photo of the manometer showing CFM50 of air leakage before air sealing and insulation work was performed



Timestamp: October 3, 2024 at 04:20 PM PDT

Geolocation: [45.5118 -122.5810](#)

[https://quality-install-tool.pnl.gov/app/dae453f6-389d-4a89-a423-73b87a32eb5b/doe\\_workflow\\_attic\\_air\\_sealing\\_and\\_insulation/31485f4a-e75c-41ac-ad5c-a364ca9...](https://quality-install-tool.pnl.gov/app/dae453f6-389d-4a89-a423-73b87a32eb5b/doe_workflow_attic_air_sealing_and_insulation/31485f4a-e75c-41ac-ad5c-a364ca9...)

10/3/24, 4:22 PM

DOE - Quality Installation Report

What is the existing insulation in the ceiling? Blown-In Insulation

What is the existing insulation R-value in the ceiling? 13

General Safety

What is the roof condition? Potential Issue

Are there signs of mold or moisture in the attic? Yes

Has an mechanical ventilation calculation been performed pre-retrofit? No

Have the answers to these safety questions been disclosed to the homeowner? Yes

Installation - Air Sealing Details

Drywall to Top Plate – Photo

Photo of drywall to top plate seam sealed



Timestamp: October 3, 2024 at 04:21 PM PDT

Geolocation: [45.5118 -122.5810](#)

Soffit Air Baffles – Photo

Photo of soffit air baffles installed blocked with batt insulation and/or air sealed with spray foam



Timestamp: October 3, 2024 at 04:22 PM PDT

Geolocation: [45.5118 -122.5810](#)

[https://quality-install-tool.pnl.gov/app/dae453f6-389d-4a89-a423-73b87a32eb5b/doe\\_workflow\\_attic\\_air\\_sealing\\_and\\_insulation/31485f4a-e75c-41ac-ad5c-a364ca9...](https://quality-install-tool.pnl.gov/app/dae453f6-389d-4a89-a423-73b87a32eb5b/doe_workflow_attic_air_sealing_and_insulation/31485f4a-e75c-41ac-ad5c-a364ca9...)



# Accurate Geolocation & Time Stamps

Instructions/Guide to accurate geolocation and time stamps when using the Quality Install Tool.

Enable location services on phone and allow the web browser and/or camera to use the device's location While Using the App if/when prompted.

Accurate Geolocation & Time Stamps to the job site:

- Photos taken using the Quality Install Tool using a smartphone
- Photos transferred from phone to desktop/laptop using a USB cable and uploaded to the Quality Install Tool using a desktop/laptop

Not Accurate Geolocation & Time Stamps to the job site:

- Photos uploaded to the Quality Install Tool from the phone's storage when off-site
  - Reason: iOS and Android security prevents the web browser from accessing a file's metadata. Thus, the quality Install Tool must instead record the geolocation and time of the phone's current location.
- Photos transferred from Android phones to desktop/laptop using email or Google Drive
  - Reason: Android security removes geolocation data when uploading files from the phone to email and cloud storage platforms.

# Checking The Geolocation

- In the report click on the geolocation link below an image to see the location on Google Maps
- In the QIT workflow click on the geolocation link below an image to see the location on Google Maps
- Check to see if this location matches the installation address in the report

## Quality Installation Report PDF

10/3/24, 4:22 PM DOE - Quality Installation Report

Attic Air Sealing and Insulation Upgrade  
Photo Report

Installer:  
Greatest Tech Ever  
Best Home Performance Company Ever  
1234 Excellence Ave  
503-123-4567  
BestHPCE@gmail.com

Installation Address: 935 SE Test St, Portland, Oregon 97215

Building Number  
A photo of the building showing the building number.



Timestamp: September 16, 2024 at 01:11 PM PDT  
Geolocation: [45.5118,-122.5810](#)

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Starting blower door manometer showing the CFM50 value - Photo  
Photo of the manometer showing CFM50 of air leakage before air sealing and insulation work was performed



Timestamp: October 3, 2024 at 04:20 PM PDT  
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[https://quality-install-tool.pnnl.gov/app/dce453f6-389d-4a89-a423-73b87a32eb5b/doi\\_workflow\\_attic\\_air\\_sealing\\_and\\_insulation/31485f4a-e75c-41ac-ad5c-a364ca9...](https://quality-install-tool.pnnl.gov/app/dce453f6-389d-4a89-a423-73b87a32eb5b/doi_workflow_attic_air_sealing_and_insulation/31485f4a-e75c-41ac-ad5c-a364ca9...) 1/4

## Quality Installation Tool Workflow

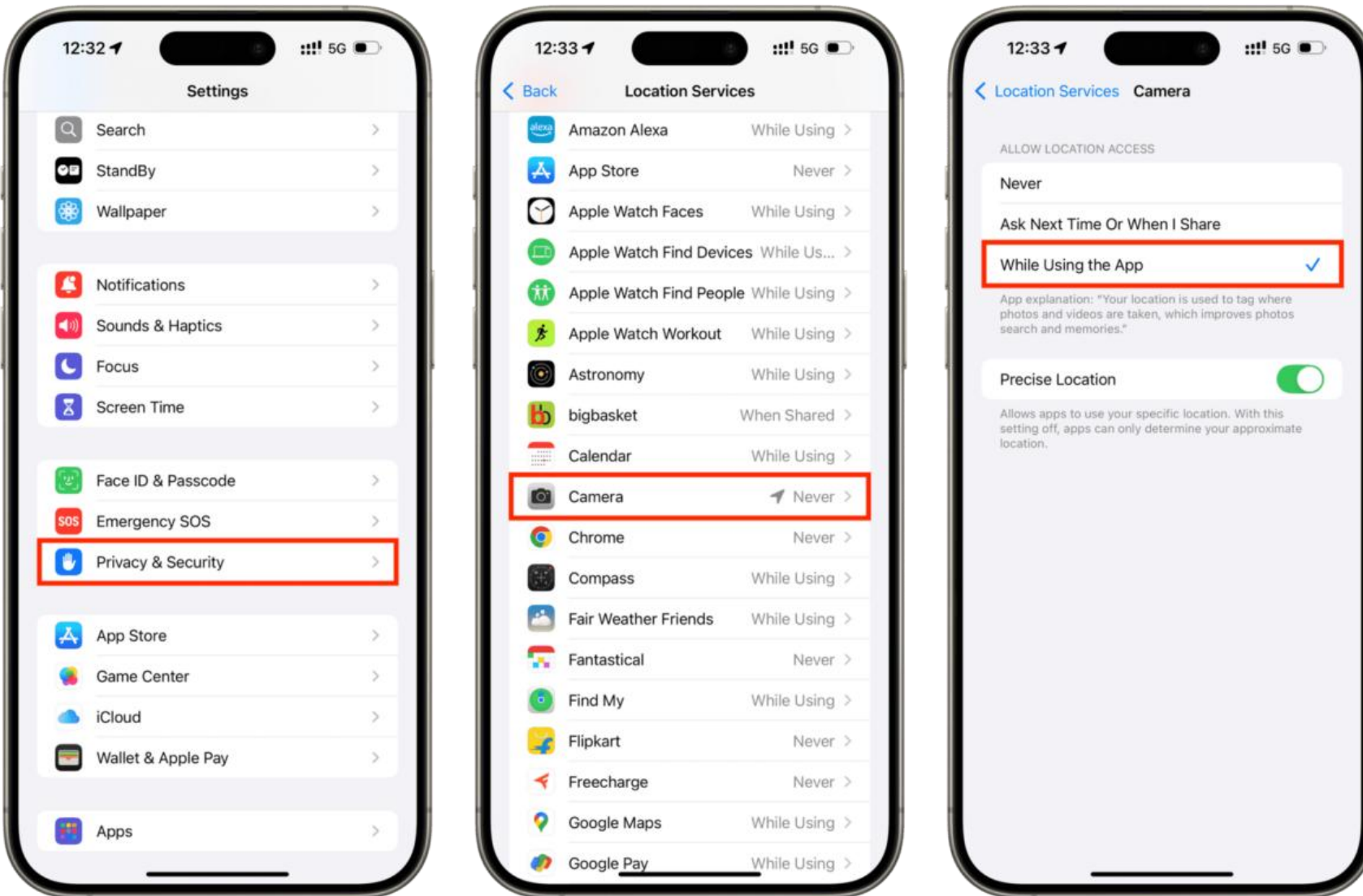
Starting blower door manometer showing the CFM50 value - Photo

Replace Photo

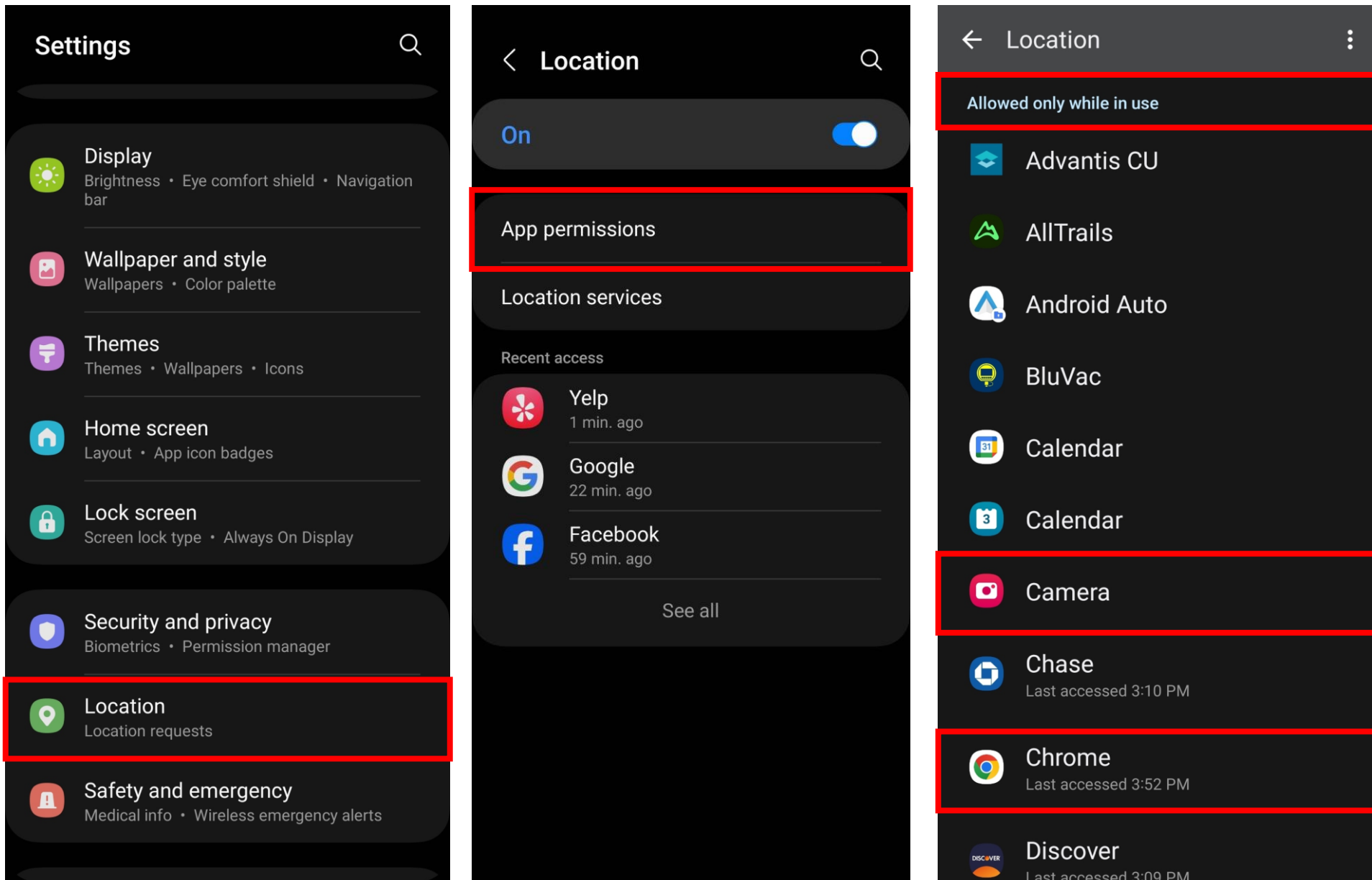


Timestamp: October 3, 2024 at 04:20 PM PDT  
Geolocation: [45.5118,-122.5810](#)

# Troubleshooting Location Permission Settings on iOS



# Troubleshooting Location Permission Settings on Android





**Charlie Haack**  
***NAIMA***

# ***Successful Strategies for Better Insulating***

**10 October 2024**

**Charlie Haack, NAIMA**



## NAIMA Background Before We Start

### What is NAIMA?

- ▶ The North American Insulation Manufacturers Association
- ▶ Brings together the North American manufacturers of fiber glass, rock wool, and slag wool insulation products
- ▶ Mission to promote energy efficiency and promote safe use of member products



Charlie Haack  
VP Technical Services at NAIMA

1

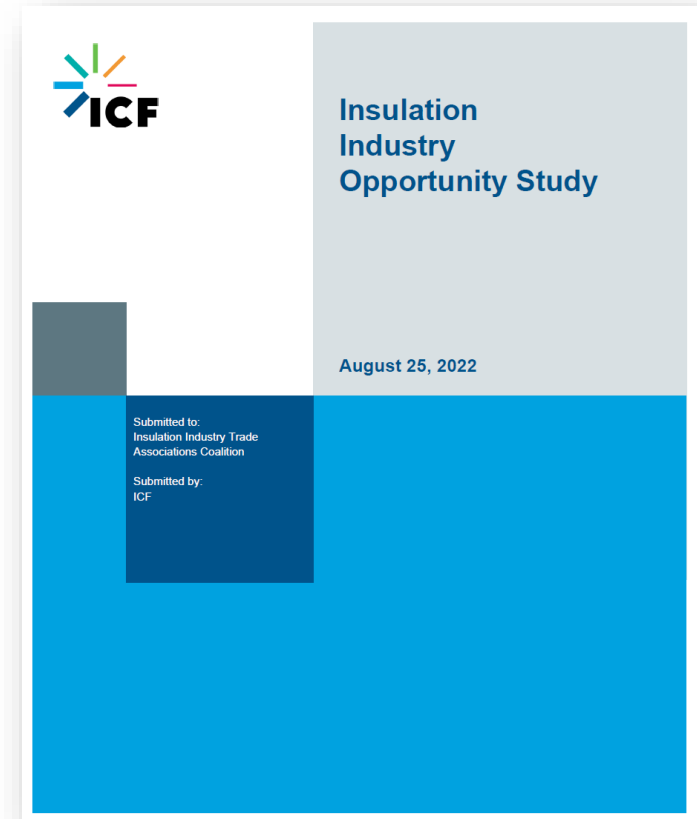
## Quantifying Benefits of Insulation



## Quantifying the Benefits of Insulation

### 1. Energy Cost Savings + Emissions Reductions: Enormous benefits across the building sector

ICF performed a nationwide analysis of potential energy & emission savings through insulating residential, commercial, and industrial buildings

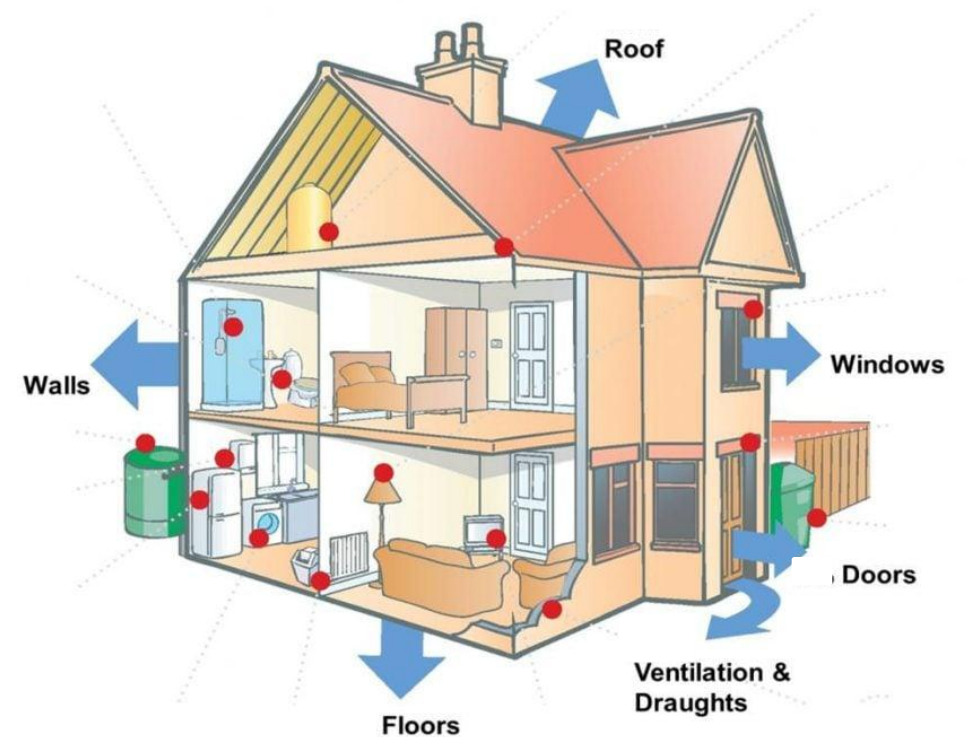




## Quantifying the Benefits of Insulation

### ■ Residential Analysis

- ▶ Step 1: Develop baseline conditions for existing homes
- ▶ Step 2: Develop upgrade conditions for existing homes
- ▶ Step 3: Assess technical potential savings from insulating all homes
- ▶ Step 4: Review cost-effectiveness





## Quantifying the Benefits of Insulation

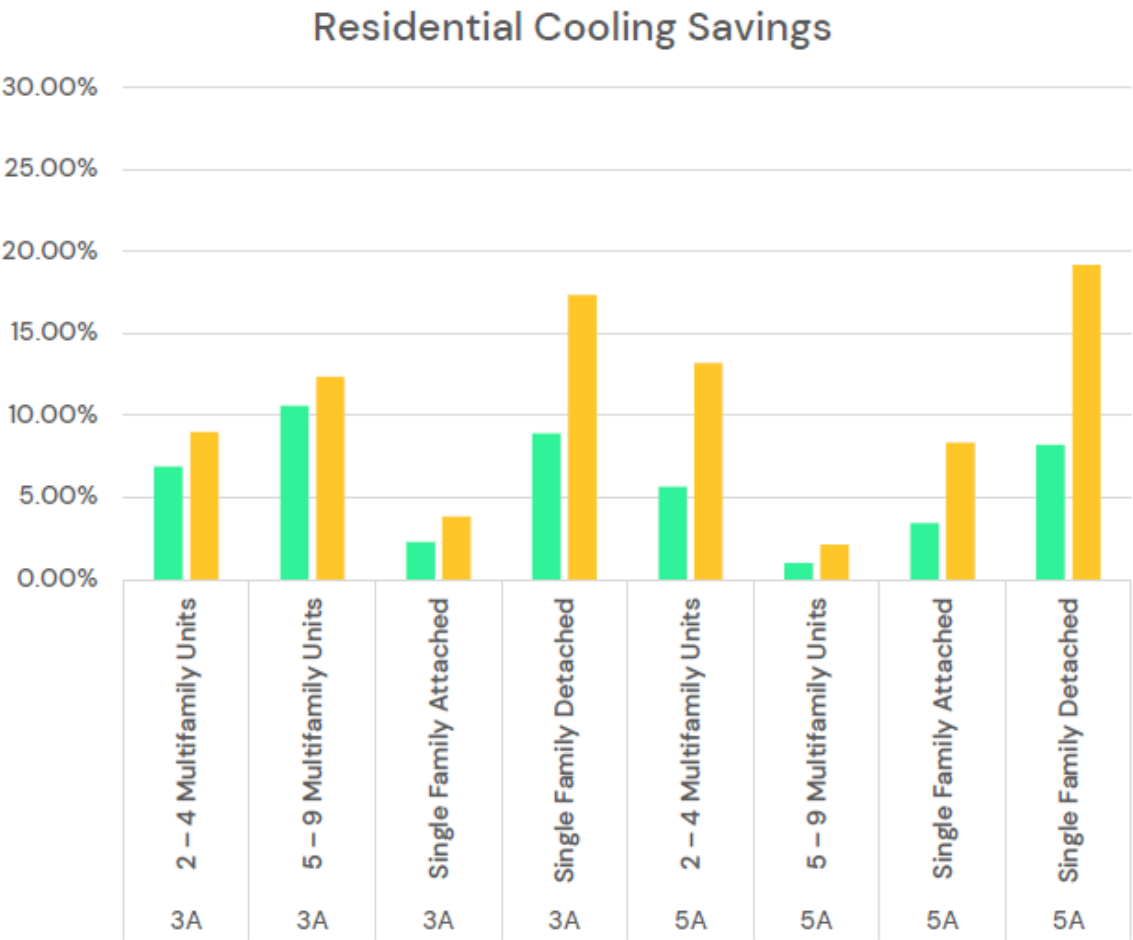
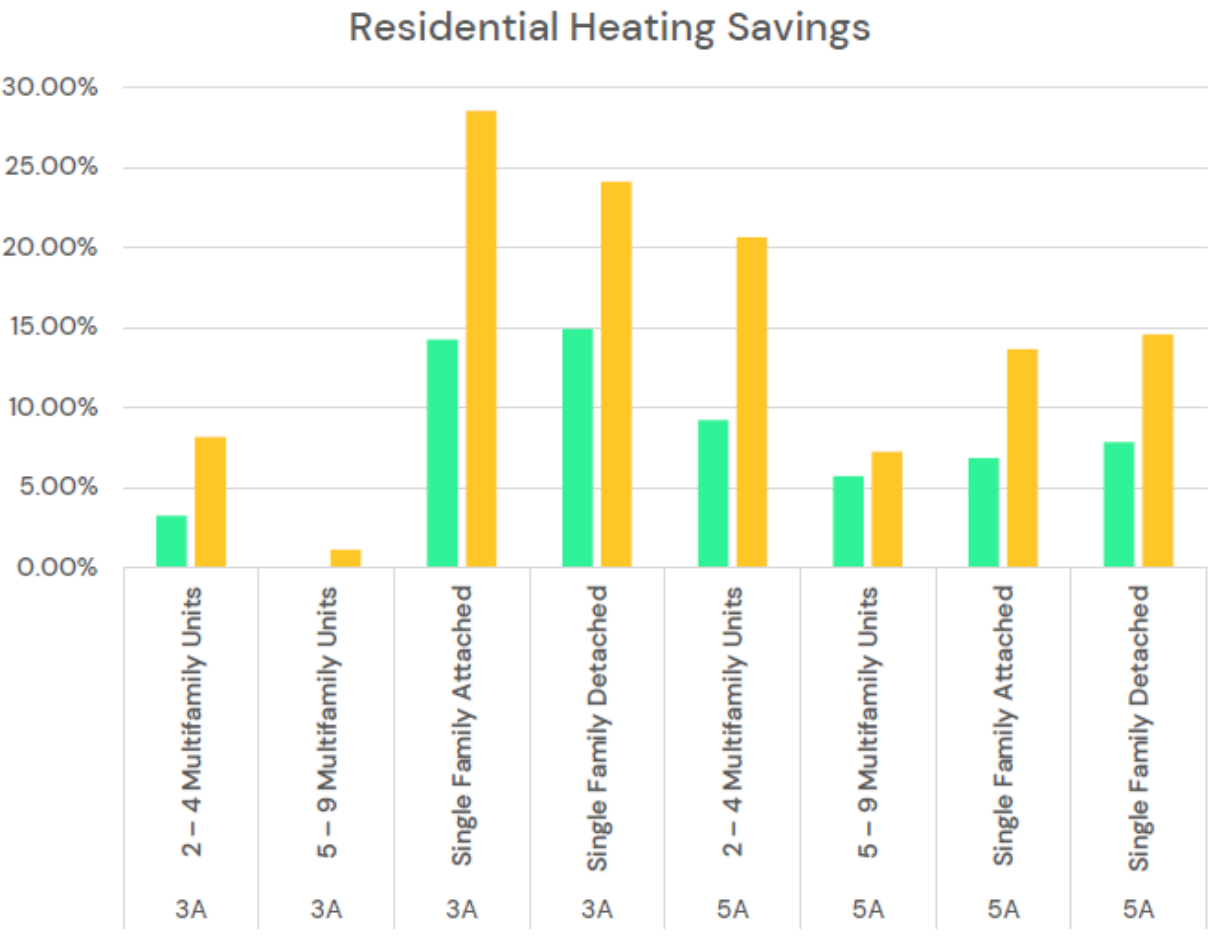




## Quantifying the Benefits of Insulation

2. **Predictable Peak Load Reductions: Improved envelope helps utilities manage peak load**
  - ▶ With focus on Grid-Interactive Efficient Buildings (GEBs) (e.g. HVAC controls, connected DHW, batteries + PV - wanted to ensure that insulation is still relevant when these GEB strategies are implemented
  - ▶ Result: Insulation plays a significant role in reducing peak heating and cooling electricity demand

# Residential Peak Period Usage Reduction



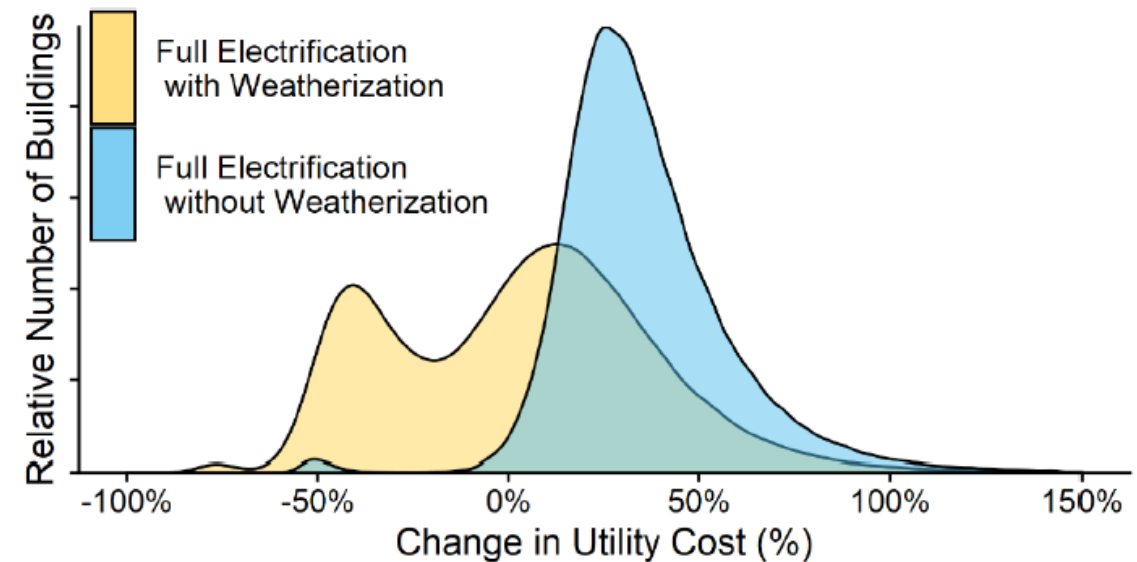
■ Upgrade 1: small scale retrofit ■ Upgrade 2: full retrofit to code levels



## Quantifying the Benefits of Insulation

### 3. Insulation Empowers Electrification: ACEEE Topic brief in 2023

- Literature review of insulation + electrification studies
- *“Weatherizing buildings is an excellent first step toward electrifying their heating and cooling systems...”*
- *“excluding weatherization from full electrification programs yields substantial bill increases for nearly all customers”*



# 2

## **Barriers to scaling insulation upgrades**



## Barriers to scaling insulation upgrades

1. **Lack of public awareness**  
Even if they've heard about them, homeowners don't know particulars about rebate incentives
2. **Complicated compared to new construction/commercial**  
Residential retrofit business as a whole is a complicated business
3. **Incentives can be hard to navigate for contractors.**  
Contractor base not in habit of marketing (federal) incentives



## Barriers to scaling insulation upgrades

### “25C Means Business” Contractor Campaign

- Free comprehensive 25C tax credit marketing program available to all insulation contractors
- Comprehensive collateral package
- Updated marketing communications
- Technical help available
- Suitable for company branding
- Partnerships with BPA, ICAA, Insulate America. NICE and national distributors

<https://www.25Cmeansbusiness.org/>



**25C** MEANS  
BUSINESS

### Homeowner Marketing Kit

*The tools contractors need to take full advantage of insulation tax credits and use them to grow their residential retrofit business*

Central to the 25C Means Business program is the **Homeowner Marketing Kit**, a library of **FREE** 25C homeowner tax credit resources that contractors can use to:



Update their websites



Publish social media posts



Run advertising campaigns



Incorporate into in-person sales processes

The Homeowner Marketing Kit will be updated with new resources on a regular basis. Here are examples of the types of 25C-related assets that contractors will have access to:



- Webpage copy
- Blog articles
- Infographics
- Short videos for websites & social media
- Social media posts
- Online advertising posts
- Email Campaigns



- Sample invoices showing a breakdown of 25C-eligible work
- Sample certificates for 25C-eligible jobs
- 25C Means Business program contractor badges and vehicle decals
- Physical leave-behind educational sheets
- Direct mail postcards

Sign up at [25Cmeansbusiness.org](https://www.25Cmeansbusiness.org/) Today!

Insulation Institute.  
AN IRVING-CLOUD COMPANY



## Barriers

### FREE Marketing Support for your Insulation Business!

The 25C homeowner tax credit is a national incentive available to EVERY household in the United States. The 25C Means Business program gives you the tools to take full advantage of insulation tax credits and use them to grow your residential retrofit business.

[ENROLL HERE](#)

### WHAT YOU GET WHEN YOU ENROLL

#### + Contractor Support: Sales & Marketing Training

-  From tax credit 101 information to advanced policy interpretations, all available via FAQs and PDF factsheets
-  Pre-recorded videos and webinars help you and your team market and sell the 25C homeowner tax credit the right way
-  Sample invoices and support documents make it easy for your staff to fit the 25C homeowner tax credit into your existing workflow

#### + Homeowner Marketing Kit

All contractors enrolled in the 25C Means Business program will have access to a wide variety of free marketing and sales materials designed to position you as a trusted expert in insulation tax credits.

-  Landing pages, blog articles, infographics, and videos about the 25C homeowner tax credit that can be easily added to your website
-  Copy and design templates for 25C homeowner tax credit email, paid search advertising, direct mail, and social media campaigns
-  Third-party-branded educational material like sales sheets and pamphlets to print out and bring to sales calls
-  Contractor badges & truck decals that show homeowners what sets you apart from competitors

<https://www.25Cmeansbusiness.org/>



# Examples of Customizable 25C Marketing Kit in Use

**Air Doctors Heating and Cooling, LLC.**  
August 29 at 8:05 AM · 🌐

💡 Make upgrading your home more affordable with insulation tax credits! 🏠 The less it costs to upgrade, the faster you'll recoup your investment through lower monthly energy bills. 🔥 Plus, you'll enjoy a more comfortable home. Talk to our team today about qualifying for up to \$1,200/year in insulation tax credits! 📞 #HomeUpgrades #TaxSavings #EnergyEfficiency #AirDoctors



**Claiming insulation tax credits makes upgrading your home more affordable**

The less it costs to upgrade, the faster you recoup your investment through lower monthly energy bills, all while living in a more comfortable home. *Talk to our team about qualifying for up to \$1,200 a year in insulation tax credits today.*

[Learn More](#)

**Evo Energy Solutions**

HOME ABOUT US SERVICES EMPLOYMENT OPPORTUNITIES CONTACT



**The Insulation Tax Credit**

The insulation tax credit, also called the Energy Efficient Home Improvement Credit, allows eligible homeowners to receive a federal tax credit of up to \$1,200 annually for upgrades like insulation and air sealing.

Evo Energy Solutions can help ensure that your work qualifies for this insulation tax credit. Reach out today to see how much you could save with the insulation tax credit and other available incentives and rebates.

**What Is a Tax Credit?**

**iFOAM** Southwest Kansas City, KS [change location](#) [FAQ](#) [Franchising](#) (913) 347-6697 [Top](#)

[Services](#) [About Us](#) [Resources](#) [Schedule a Free Consultation](#)

**YOUR "GO-TO" CONTRACTOR**

iFOAM of Southwest Kansas City, KS  
(913) 347-6697

[Schedule a Free Consultation](#)



**Welcome to iFOAM of Southwest Kansas City, KS**  
I'm here to help answer any questions you have.

**The Insulation Tax Credit**

The insulation tax credit, also called the Energy Efficient Home Improvement Credit, allows

[Connect](#) [Call](#) [Email](#) [Book](#) [Chat](#)

**LinkedIn** Search

Home My Network Jobs Messaging Notifications

**Air Doctors Heating and Cooling, LLC.**  
566 followers  
3w · 🌐

Save Big with Insulation Tax Credits.

Get up to \$1200 in tax incentives for upgrading your home's insulation!

<https://lnkd.in/e-tegxiT>



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1 repost

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Heating, Cooling, Refrigeration, Duct Cleaning

**VISIT OUR WEBSITE TO LEARN MORE**  
[AIRDOCTORSHVACSERVICE.COM](http://AIRDOCTORSHVACSERVICE.COM) 734-740-2961

**Save Big with Insulation Tax Credits V3**

Air Doctors Heating and Cooling, LLC. [Subscribe](#)

0 0 Share Download Save



## Q&A

# Q&A

Charlie Haack

VP Technical Services, NAIMA

[chaack@NAIMA.org](mailto:chaack@NAIMA.org)

# Appendix

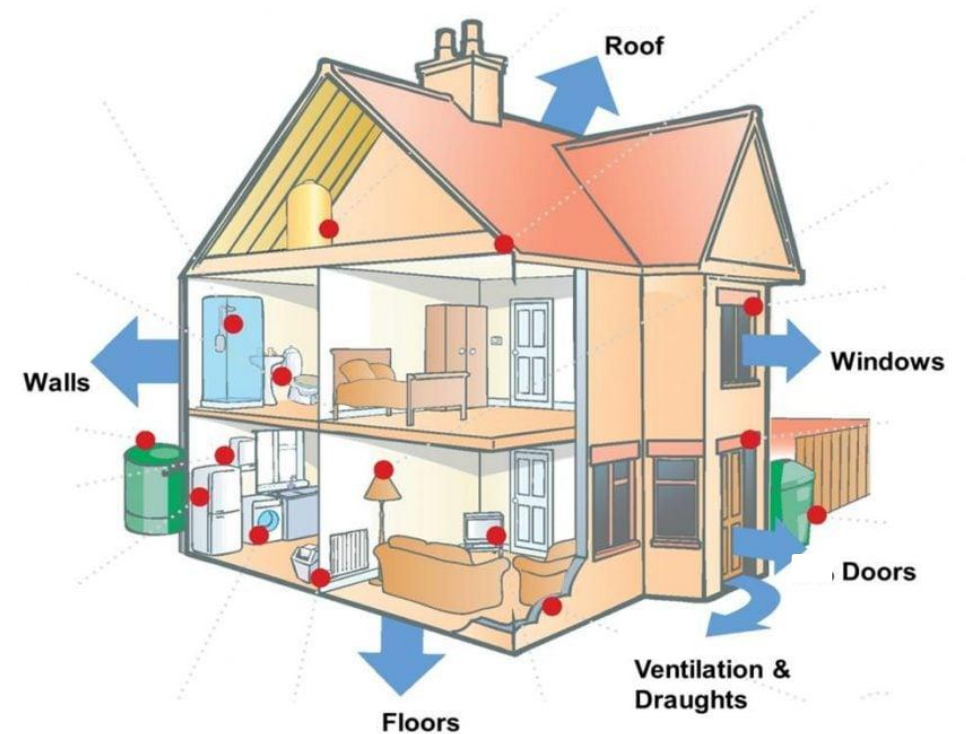
**Backup/additional detail  
slides**



# 1. Residential Opportunity

## ■ Residential Analysis

- ▶ Step 1: Develop baseline conditions for existing homes
- ▶ Step 2: Develop upgrade conditions for existing homes
- ▶ Step 3: Assess technical potential savings from insulating all homes
- ▶ Step 4: Review cost-effectiveness





# 1. Residential Opportunity

## ■ Residential Analysis

- ▶ Step 1: Develop baseline conditions for existing homes

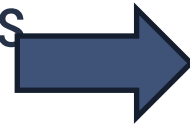


Table 1 – National Averages of Baseline Model Inputs

| Wood Frame Wall<br>Average R-value | Unfinished Attic<br>Average R-value | Average Infiltration<br>ACH50 | Unfinished Basement<br>Floor Average R-value |
|------------------------------------|-------------------------------------|-------------------------------|----------------------------------------------|
| 6                                  | 25.6                                | 17.4                          | 2.7                                          |

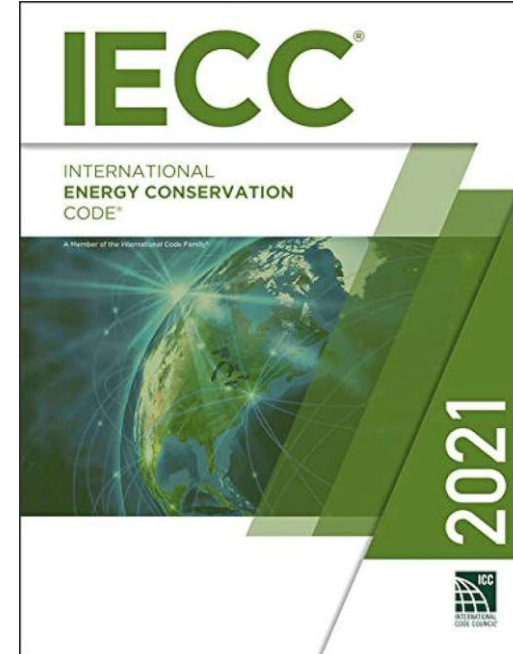
- ▶ Approximately 73 million single family detached homes



# 1. Residential Opportunity

## ■ Residential Analysis

- ▶ Step 2: Develop upgrade conditions for existing homes



\*Where Possible



## 1. Residential Opportunity

Table 2 – Code Compliant Upgrades Applied to Baseline Models

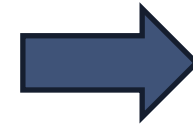
| Climate Zone    | Wood-Framed Wall Upgraded R-value <sup>9</sup>                                                   | Unfinished Attic Upgraded R-value | Upgraded Air Leakage Rate (ACH50) | Floor Upgraded R-value |
|-----------------|--------------------------------------------------------------------------------------------------|-----------------------------------|-----------------------------------|------------------------|
| 1               | All uninsulated walls were upgraded to R-13; percentages of building stock were upgraded further | 30                                | 5                                 | 13                     |
| 2               |                                                                                                  | 49                                | 5                                 | 13                     |
| 3               |                                                                                                  | 49                                | 3                                 | 19                     |
| 4               |                                                                                                  | 60                                | 3                                 | 19                     |
| 5               |                                                                                                  | 60                                | 3                                 | 30                     |
| 6               |                                                                                                  | 60                                | 3                                 | 30                     |
| 7 <sup>10</sup> |                                                                                                  | 60                                | 3                                 | 38                     |



# 1. Residential Opportunity

## ■ Residential Analysis

- ▶ Step 3: Assess technical potential savings from insulating all homes



OpenStudio





# 1. Residential Opportunity

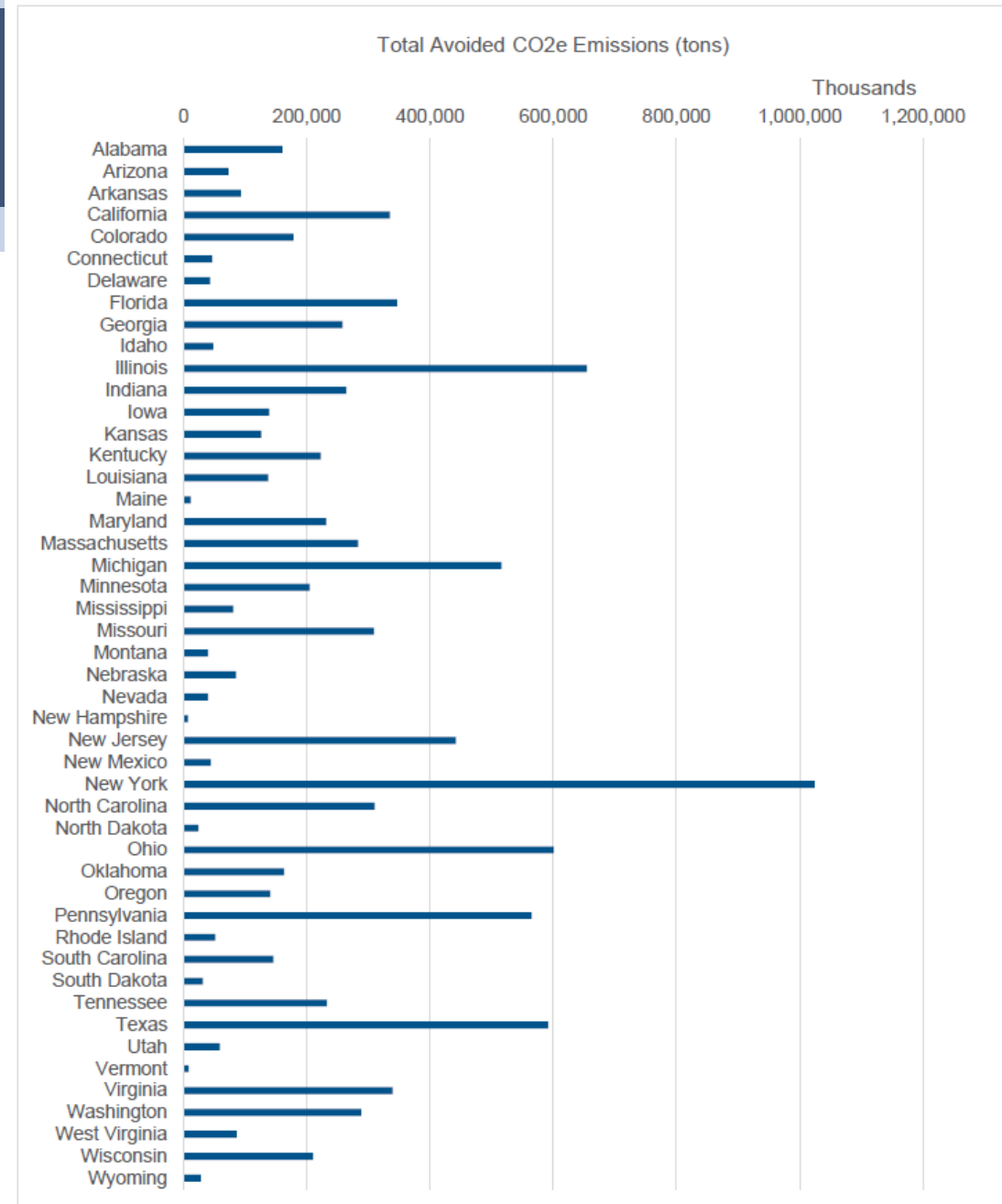




## 1. Residential Opportunity

- State-level potential emission reductions
  - State comparison shown (results dependent on quantity of homes + heating/cooling energy savings)

Figure 2 – Total Avoided CO2 Equivalent Emissions by State





# 1. Residential Opportunity

- State-level potential emission reductions
  - ▶ Projected over life of home
  - ▶ Broken out by fuel type

Table 39 – Residential Emissions Impacts

| State          | Annual CO2e Emissions (tons) |             | Cumulative CO2e Emissions (tons) |             |               |
|----------------|------------------------------|-------------|----------------------------------|-------------|---------------|
|                | Electricity                  | Natural Gas | Electricity                      | Natural Gas | Total         |
| Alabama        | 716,029                      | 2,486,866   | 35,801,475                       | 124,343,277 | 160,144,752   |
| Arizona        | 369,038                      | 1,078,250   | 18,451,904                       | 53,912,509  | 72,364,413    |
| Arkansas       | 866,897                      | 982,042     | 43,344,875                       | 49,102,095  | 92,446,970    |
| California     | 5,838,149                    | 850,860     | 291,907,436                      | 42,543,009  | 334,450,445   |
| Colorado       | 3,344,589                    | 215,527     | 167,229,453                      | 10,776,351  | 178,005,804   |
| Connecticut    | 690,619                      | 227,438     | 34,530,926                       | 11,371,910  | 45,902,836    |
| Delaware       | 540,927                      | 310,079     | 27,046,341                       | 15,503,934  | 42,550,275    |
| Florida        | 12,594                       | 6,911,390   | 629,705                          | 345,569,510 | 346,199,215   |
| Georgia        | 2,379,261                    | 2,776,958   | 118,963,053                      | 138,847,925 | 257,810,978   |
| Idaho          | 613,409                      | 338,136     | 30,670,454                       | 16,906,807  | 47,577,261    |
| Illinois       | 11,808,879                   | 1,281,758   | 590,443,941                      | 64,087,922  | 654,531,863   |
| Indiana        | 4,232,027                    | 1,043,992   | 211,601,353                      | 52,199,593  | 263,800,946   |
| Iowa           | 2,541,507                    | 241,390     | 127,075,333                      | 12,069,477  | 139,144,810   |
| Kansas         | 2,122,125                    | 398,449     | 106,106,262                      | 19,922,448  | 126,028,710   |
| Kentucky       | 1,750,288                    | 2,693,651   | 87,514,406                       | 134,682,551 | 222,196,957   |
| Louisiana      | 686,630                      | 2,050,822   | 34,331,512                       | 102,541,085 | 136,872,597   |
| Maine          | 144,585                      | 85,518      | 7,229,264                        | 4,275,920   | 11,505,184    |
| Maryland       | 2,999,740                    | 1,624,461   | 149,986,992                      | 81,223,064  | 231,210,056   |
| Massachusetts  | 5,137,079                    | 522,394     | 256,853,975                      | 26,119,723  | 282,973,698   |
| Michigan       | 9,690,213                    | 625,145     | 484,510,673                      | 31,257,265  | 515,767,937   |
| Minnesota      | 3,706,543                    | 382,075     | 185,327,159                      | 19,103,744  | 204,430,903   |
| Mississippi    | 344,559                      | 1,258,187   | 17,227,944                       | 62,909,347  | 80,137,291    |
| Missouri       | 3,768,394                    | 2,404,315   | 188,419,702                      | 120,215,749 | 308,635,451   |
| Montana        | 736,363                      | 51,859      | 36,818,152                       | 2,592,959   | 39,411,111    |
| Nebraska       | 1,469,321                    | 230,405     | 73,466,067                       | 11,520,228  | 84,986,295    |
| Nevada         | 524,502                      | 261,229     | 26,225,091                       | 13,061,460  | 39,286,552    |
| New Hampshire  | 56,544                       | 79,919      | 2,827,210                        | 3,995,926   | 6,823,135     |
| New Jersey     | 8,098,290                    | 736,585     | 404,914,520                      | 36,829,262  | 441,743,782   |
| New Mexico     | 741,613                      | 136,537     | 37,080,652                       | 6,826,833   | 43,907,485    |
| New York       | 18,340,922                   | 2,137,041   | 917,046,097                      | 106,852,047 | 1,023,898,145 |
| North Carolina | 1,197,258                    | 4,997,721   | 59,862,885                       | 249,886,062 | 309,748,947   |
| North Dakota   | 335,328                      | 141,809     | 16,766,411                       | 7,090,438   | 23,856,849    |
| Ohio           | 10,228,498                   | 1,778,984   | 511,424,914                      | 88,949,215  | 600,374,128   |
| Oklahoma       | 2,113,171                    | 1,147,295   | 105,658,558                      | 57,364,728  | 163,023,286   |
| Oregon         | 1,256,078                    | 1,557,733   | 62,803,876                       | 77,886,662  | 140,690,537   |



# 1. Residential Opportunity

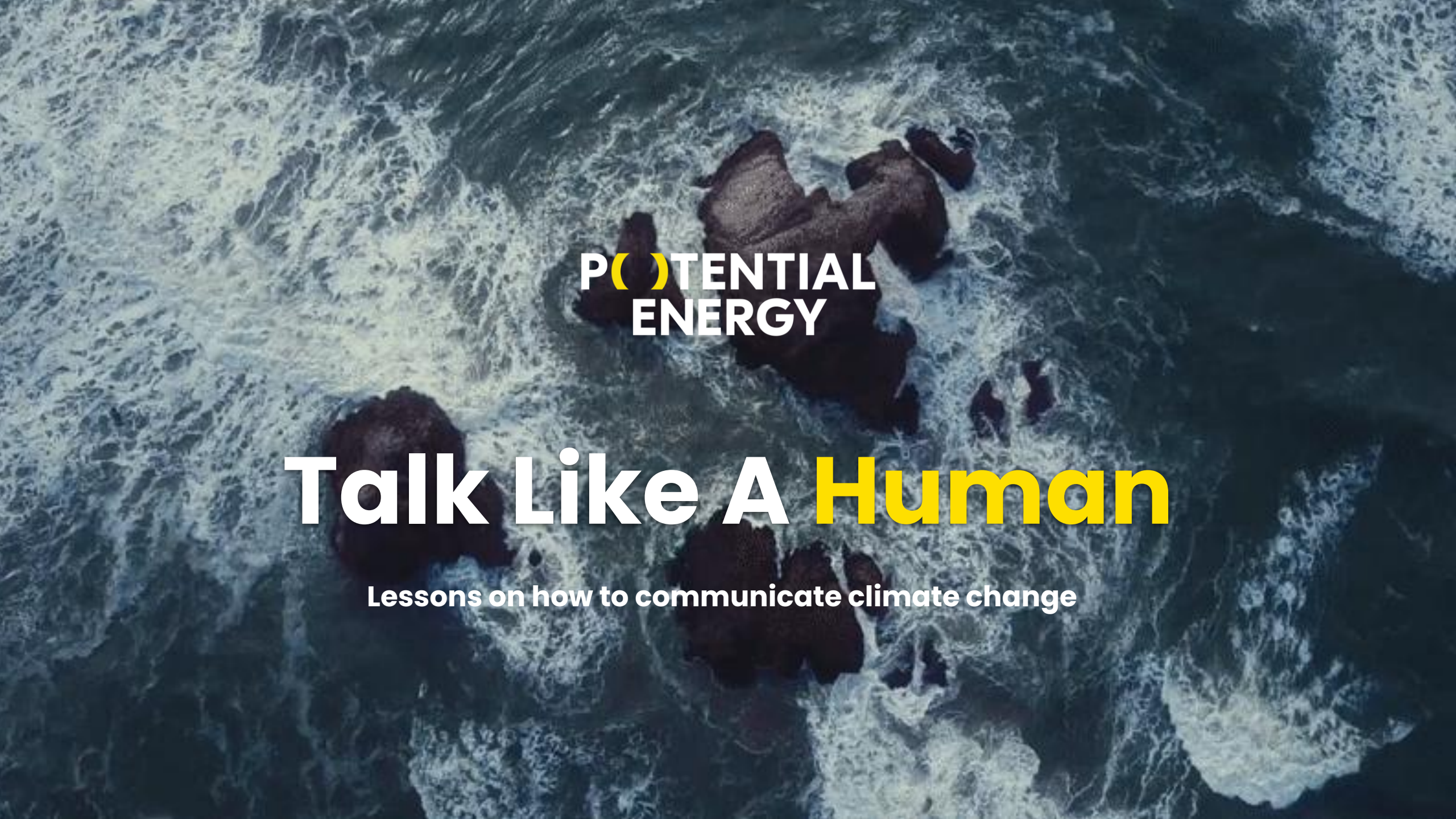
## ■ Residential Analysis

### ▷ Step 4: Cost-effectiveness

| Upgrade Type                   | Average BCR for Models Containing this Upgrade |
|--------------------------------|------------------------------------------------|
| Insulation Wall                | 2.10                                           |
| Insulation Unfinished Attic    | 1.73                                           |
| Insulation Crawlspace          | 2.04                                           |
| Insulation Unfinished Basement | 2.10                                           |
| Insulation Interzonal Floor    | 1.77                                           |
| Infiltration                   | 1.73                                           |



**Emma Kirby**  
*Potential Energy Coalition*



POTENTIAL  
ENERGY

# Talk Like A Human

Lessons on how to communicate climate change

# ( Our Mission )

Potential Energy is a global nonprofit marketing firm that uses the deep analytics and creative storytelling of private sector marketing to create public demand for climate solutions.

Our mission is to dramatically accelerate the energy transition around the world.

We take a **human centered, data driven approach** to marketing & communications

## Qualitative research

Deep listening with core human insights

- Focus groups
- 1:1 Interviews
- Online community forums

As a result, we **deeply understand:**

- Core values
- Attitudes
- Barriers
- Beliefs

## Quantitative research

Large scale audience testing

- Large-scale surveys
- Randomized Controlled Trials (RCTs)
- Competitive/oppositional framing
- Policy tests

## In-market deployment

Real world, in-population performance

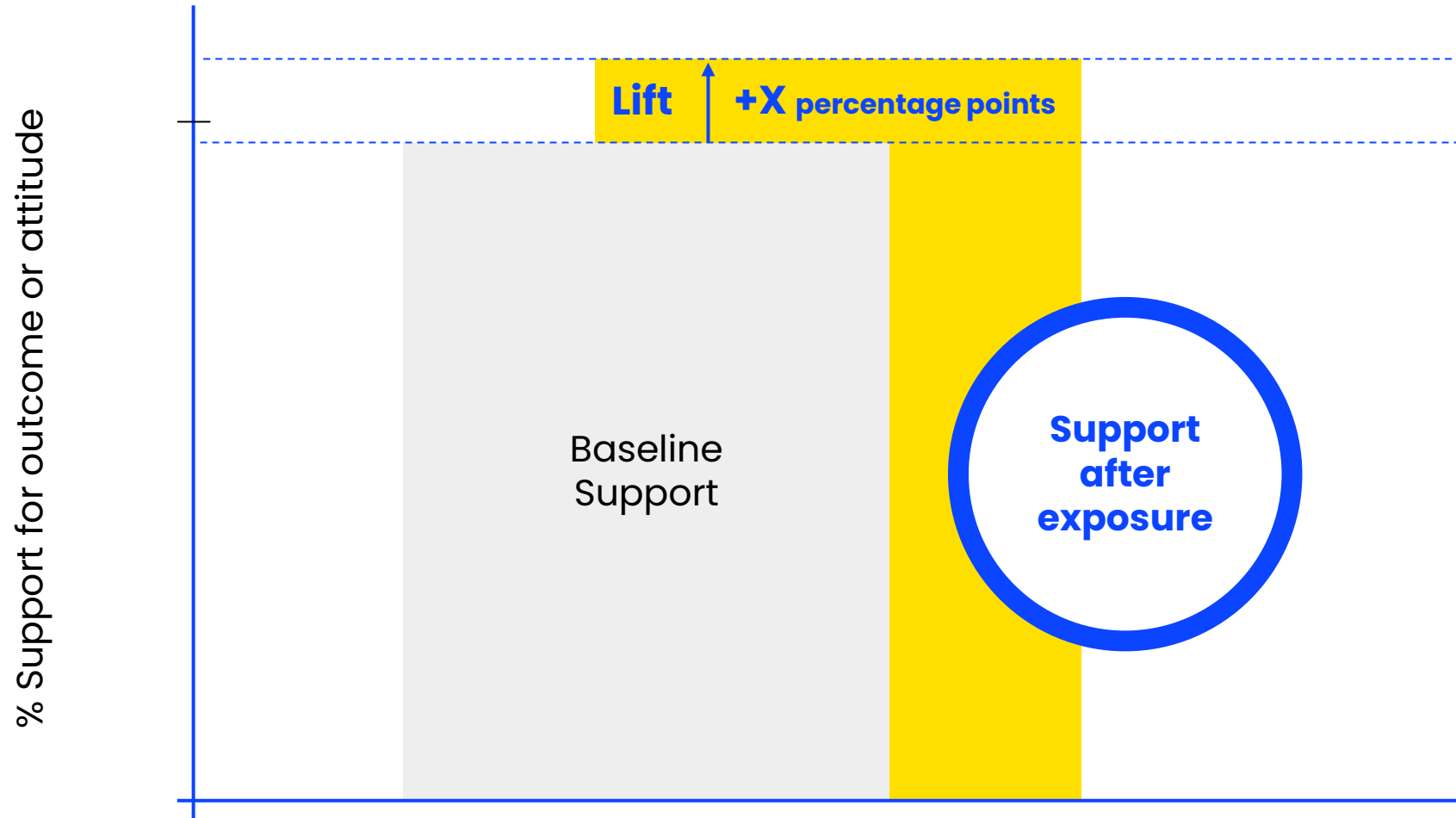
- Impact measurement
- Persuasive effectiveness
- Campaign economics

And are able to **deploy:**

- Effective messaging
- Moveable audiences
- Strong campaign economics



# What is **lift** and why do we use it?



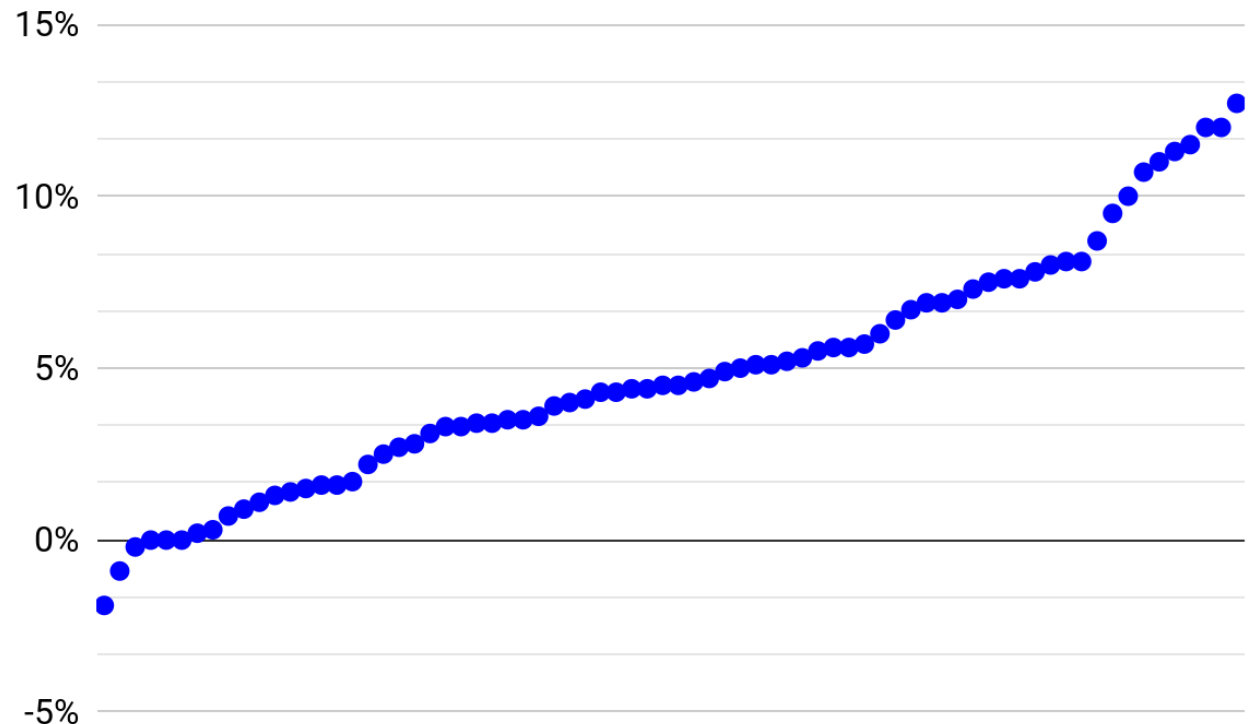
**Lift describes how much people move for or against something** (a policy, attitude, or belief) when we show them a message or ad.

We determine this using **large-scale, robust statistical analysis.**

# We have amassed a very significant body of data

- **3 billion**  
ads served and measured
- **730**  
messages, ads, and  
concepts tested for  
persuasive effect
- **2800+**  
hours of focus group input  
from citizens

## Growth in Support for Climate Action



# We conducted the largest ever global study

## A 23-country comprehensive survey

G20 countries (excl. Russia)  
+ Chile, Colombia, Kenya,  
Nigeria, Norway

## 58,000+ respondents

At least 2,000 per country  
Balanced on age & gender  
Fielded in local languages

**70%** Global Population

**80%** Global Emissions

**90%** Global GDP

# Agenda

- 1 Climate change has a communications problem.
- 2 The principles of climate change communications
- 3 How to win local support?
- 4 Key resources

( PART ONE )

**Climate change has a  
communications problem.**

The world does **not speak climate**

There's **limited understanding** of the issue, even among those who believe in climate change and support actions to address it

< **25%**

of people understand there is **complete scientific consensus**

< **20%**

believe **renewables have become less expensive**

**Recycling is the top climate solution proposed by everyday people** in both focus groups and surveys



There's a **human solution.**

# What is the “**why**” the world cares about?

“We need to tackle climate change because we need to”

**1x** To increase jobs & economic growth

**3x**  
Social justice

**5x**  
To reduce air and water pollution

**7x**  
To prevent extreme weather

**12x**  
To protect the future for the next generation

(PART TWO)

# The **principles** of climate communication

A photograph of a forest path with large trees and sunlight filtering through the canopy. Two people are walking away from the camera on the path.

**Simplicity  
Humanity  
Accountability**

( 01 )

# Simplicity

Regular people aren't policy wonks.  
Connect using language they understand.

# Merely communicating these two foundational messages has real impact on support for climate action

**Carbon pollution  
from fossil fuels**

stays in the  
atmosphere,  
**causing** the planet  
to dangerously  
overheat

There is **complete  
scientific consensus**  
on this fact

**+8 p.p.**

lift in strong support  
for immediate  
climate action

# The words we choose have a significant impact on how people understand and support action

1.5 degrees

Safety Zone

Emissions

Pollution

Natural gas

Methane

Gas car

Tailpipe pollution standards

We see as much as **2x the lift** in support for climate solutions from framing choices

We often accept the framing of scientists, corporations or even the fossil fuel industry

# Speak plainly and keep it local

## *Words to avoid:*

- Planetary
- Global North / South
- Anthropogenic

## *Words to use:*

- Our state
- Our town
- My neighbor
- Our kids

( 02 )

# Humanity

Skip the theoreticals. What works best: knowing that “people like me” are being affected.

# Real potential loss is a powerful message across the political spectrum

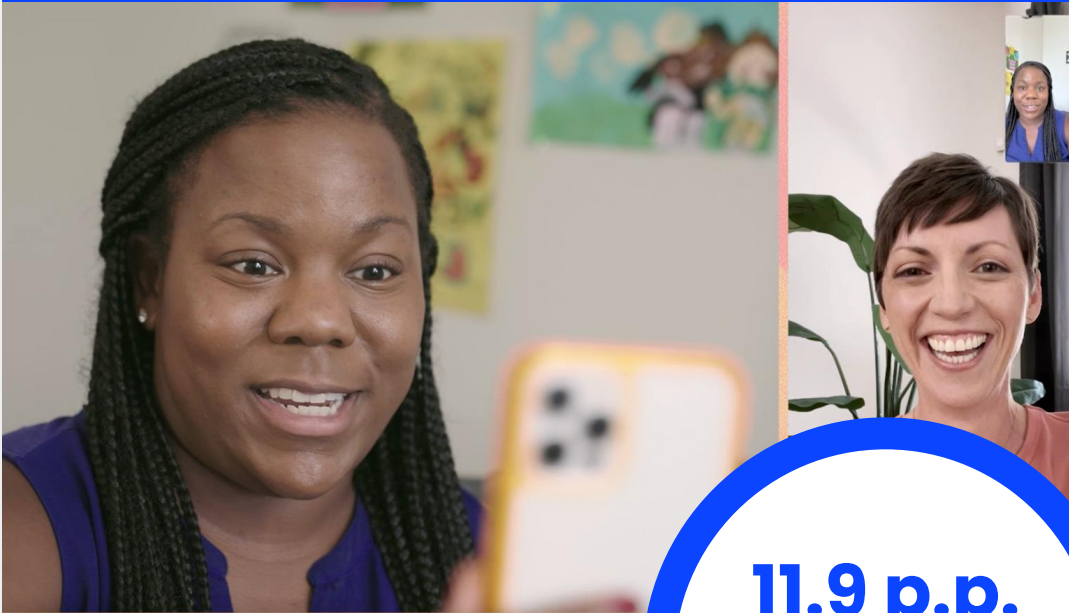


## Climate support lift vs control group

among target audience of suburban women



## A climate scientist talks to another mom



**11.9 p.p.**

lift in strong  
support for  
immediate  
climate action

## Story about the prosperity from solving climate change



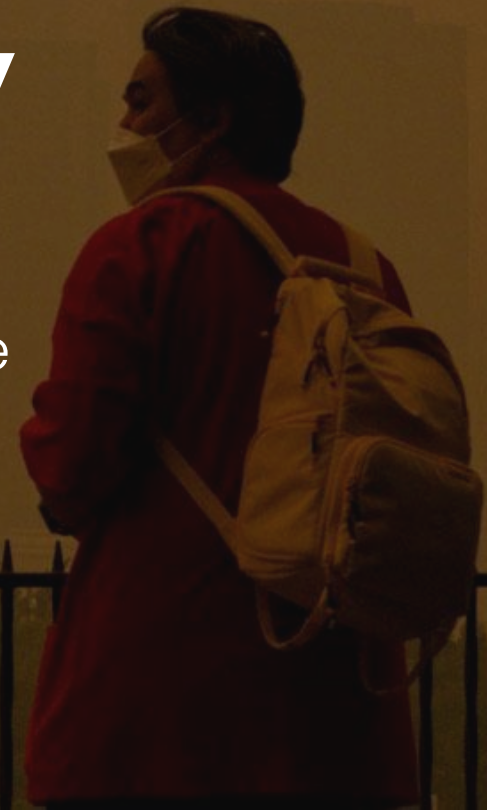
**1.5 p.p.**

lift in strong  
support for  
immediate  
climate action

( 03 )

# Accountability

Fight pollution not climate change



# Fight pollution, not climate change.

## *Framings that work well:*

- **Fairness**

It isn't right that we allow some bad actors to pollute in a way that costs us all.

- **End dependency**

Our dependency on dirty, expensive energy is costing us money and our health.

- **Extreme weather**

Heat trapping pollution is causing unnatural extreme weather patterns that threaten the people and places we love.

**We need to shift the conversation...**

**FROM...**

# Natural

**It's a natural cycle**

**About a distant future**

**About the weather**

**TO...**

# Unnatural

**A fossil fuel pollution problem**

**Hurting us right here, right now**

**About the people impacted**

# Bold language and imagery: the signs of climate change are here now



Climate support lift  
vs control group



**(PART THREE)**

# **How to win local support?**

# Small but vocal opposition to local clean energy projects



PUBLIC INTEREST

**'At what cost?' Michigan communities fight mega sites despite promise of jobs**



NEWS

**Controversy Swirls Around Michigan Megsites as Critics Ramp Up Opposition**



**Mundy Twp. residents voice opposition to potential megasite**



**RESIDENTS OPPOSE MEGASITE IN MUNDY TWP**



**NEW THIS MORNING  
RESIDENTS VOICE OPPOSITION TO MUNDY TWP. MEGASITE PROPOSAL**

# Deep listening and persuasion canvassing to **connect face-to-face** with people in townships

## Rural Michigan Action Alliance (RMAA)



- “On the ground” local knowledge and connections in Michigan.
- Hire program staff, community organizers and deep canvassers.
- Help administer canvassing.

## Neighbors United



- Experts in deep canvassing operations and training.
- Train canvassing staff and lead the canvassing operations.
- Lead on developing the canvassing scripts and data collection.



# Our research finds fears about protecting the things that matter the most to local residents

## Why they love their community

Tight-knit atmosphere \_\_\_\_\_

“Small town feel” \_\_\_\_\_

Open space \_\_\_\_\_

Sense of safety \_\_\_\_\_

Beautiful scenery \_\_\_\_\_

Local history \_\_\_\_\_



## How the project will destroy it

\_\_\_\_\_ Influx of new people

\_\_\_\_\_ Added traffic

\_\_\_\_\_ Enormous eyesore

\_\_\_\_\_ Unfamiliar changes

\_\_\_\_\_ Environmental damage

\_\_\_\_\_ Forgotten past

# To cultivate trust for new clean energy projects...

We use the opposition's tactics against them

...and lifted local citizen voices to **provide a counter narrative** to disinformation

### Mid-Michigan News

#### Great Lakes Weekly: The Truth about 'Grassroots Opposition'



Battery Plant Outside Lansing Hiring 1,700+ Workers

Great news! A new battery plant is coming to Delta Township near Lansing, and it's bringing lots of good jobs with it. The plant is called Ultium Cells, and they need to hire 1,700 people to work there.

### New Clean Factories in Michigan Start Hiring



Battery Plant Outside Lansing Hiring 1,700+ Workers

Great news! A new battery plant is coming to Delta Township near Lansing, and it's bringing lots of good jobs with it. The plant is called Ultium Cells, and they need to hire 1,700 people to work there.

Veronica Singer  
Kyle Krew who will own the factories? Are they American or Chinese owned? (I think this was the point of the post you responded to.)

1w Like Reply Hide 2

Author  
Great Lakes Weekly  
Veronica Singer, it depends on the company. Under the CHIPS law and Inflation Reduction Act law, they have to follow a number of US rules. And many Chinese companies do not qualify for incentives. Nearly 100% of jobs will be filled be American workers. Estimates are that pay will average approximately \$105,000 per year and starting technicians at many battery and semiconductor plants start at between \$60k and \$70k per year.

1w Like Reply

Jackie Adkins  
So they are trying to bring the China factories to genesee county now

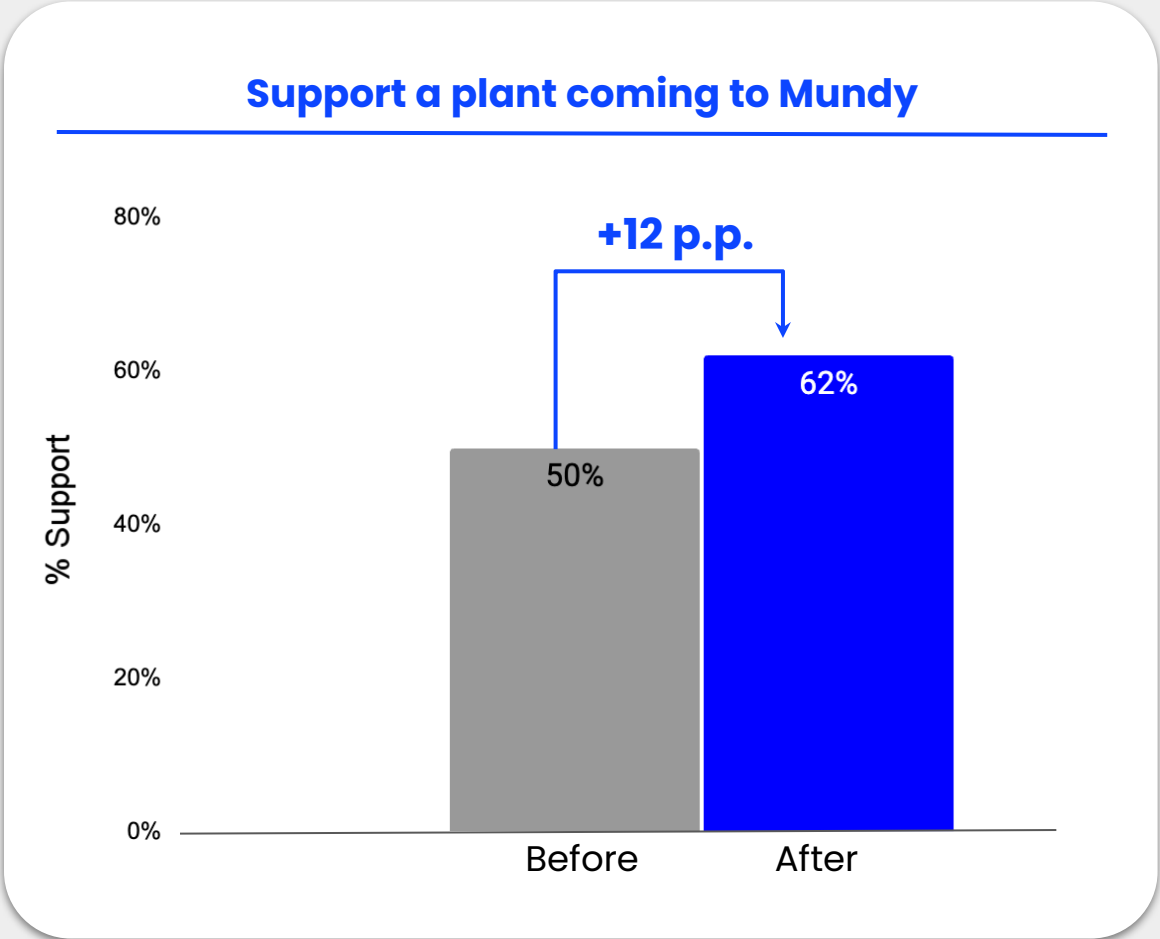
1w Like Reply Hide 4

Kyle Krew  
Jackie Adkins yes, these industries are trying to reduce and eliminate dependency on Chinese manufacturing to finish out semiconductors. 90% of semiconductors (computer chips) are manufactured in Taiwan and sent to China to be finished. (Huge cost hurdle, security, time, foreign dependency.) The manufacturing environments for semiconductors are sterile clean spaces absent even a spec of dust, costing hundreds of millions to construct, and a large impediment to why the US has been contracting chip manufacture overseas. These projects intend to and will reduce foreign dependency on semiconductor manufacture in the US, lower costs, add security and stability to technologies, and provide jobs and technical careers to the local populace.

1w Like Reply Hide 9

# Results

Since we began our campaign, **local support for a plant in Mundy Township is increasing**



## Resources

Download the full global report at  
<https://potentialenergycoalition.org/global-report/>

Search the global dataset by country <https://potentialenergycoalition.org/global-data-tool/>

Download our “Talk like a human” climate messaging guide at  
<https://potentialenergycoalition.org/wp-content/uploads/2024/01/Talk-Like-a-Human.pdf>

Check out our Unnatural Disasters Hub (soon available in Spanish)  
<https://potentialenergycoalition.org/unnatural-disasters/>

Subscribe to our newsletter “That’s Interesting” at <https://potentialenergycoalition.org/>

Get in touch at [partner@potentialenergycoalition.org](mailto:partner@potentialenergycoalition.org)

# Later is **too late!**



**Thank you**



APRIL 30  
- MAY 2  
2025

# Better Buildings, Better Plants SUMMIT

**LEARN MORE:** [betterbuildingsolutioncenter.energy.gov/summit](https://betterbuildingsolutioncenter.energy.gov/summit)

U.S. DEPARTMENT OF  
**ENERGY**

# Explore the Residential Program Guide

Resources to help improve your program and reach energy efficiency targets:

- [Handbooks](#) - explain *why* and *how* to implement specific stages of a program.
- [Quick Answers](#) - provide answers and resources for common questions.
- [Proven Practices](#) posts - include lessons learned, examples, and helpful tips from successful programs.
- [Technology Solutions](#) **NEW!** - present resources on advanced technologies, **HVAC & Heat Pump Water Heaters**, including installation guidance, marketing strategies, & potential savings.
- [Health + Home Performance Infographic](#) – spark homeowner conversations.



<https://rpssc.energy.gov>

# Health + Home Performance Infographic



DOE's Health + Home Performance Infographic reveals the link between efficiency and health – something everyone cares about. Efficiency programs and contractors can use the question-and-answer format to discover a homeowner's needs.

The infographic is ideal for the “kitchen table” conversations where people decide what to do – and who they want to do it. It also has links for homeowners to find a qualified contractor if they do not already have one.

[Download](#) this infographic from DOE's Better Buildings Residential Network.

Looking for photos to help tell your energy efficiency story? Visit our image libraries:  
<https://www.energy.gov/eere/better-buildings-residential-network/articles/image-libraries>

# Thank You!

Follow us to plug into the latest Better Buildings news and updates!



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[Office of Energy Efficiency and Renewable Energy  
Facebook](#)

Please send any follow-up questions  
or future call topic ideas to:  
[bbresidentialnetwork@ee.doe.gov](mailto:bbresidentialnetwork@ee.doe.gov)