



ComfortReady
HOME

Residential **FIELD GUIDE**

2025-2026

This Field Guide is a resource for weatherization, HVAC and water heating contractors and utility partners to assist with Bonneville Power Administration, or BPA, qualifying energy conservation projects. This document reflects BPA energy conservation incentives and minimum requirements in the current [Implementation Manual](#), effective **October 1, 2023**, through **May 31, 2026**. Incentives are assessed during this period and changes may be made after this date. Incentives may vary between utilities and additional terms and conditions may apply. Contact the local serving utility or a local Comfort Ready Home Field Specialist to confirm incentives and requirements.

See [page 6](#) for *Field Specialist information*.



Visit the BPA
[Implementation Manual](#)





PARTNERING To Create Thriving Communities.

Today, our homes are much more than where we live. They provide a place of stability and security. In some cases, they serve as our offices and our schools. More than ever, we want our homes to be comfortable, healthy and safe.

Your local utility and BPA rely on the contractor community to help residents improve their homes by making them more energy efficient, saving them money and providing a better and more comfortable place to live.

When you — the contractor — offer homeowners a full suite of services to help them weatherize their homes, your work provides invaluable customer satisfaction. Utility incentives and energy conservation improvements you make, such as high-quality insulation, air sealing, windows, doors, water heating and HVAC installations, create a positive impact that helps your community thrive and your business grow.

We developed Comfort Ready Home to give contractors the tools to build their business at no cost. As a member of the Comfort Ready Home Residential Contractor Network, you will receive training and ongoing technical support to be a leader in energy- efficient home upgrades. We can help take your work to the next level and connect you with customers who are ready to invest in energy conservation.

This Field Guide is just one of the tools available through the Comfort Ready Home program. In these pages, you'll find technical information, product guides to help your kitchen-table conversations with customers, checklists for quality installations and quick links to resources.

Additional free tools are available at ComfortReadyHome.com. There, you can access local utility incentive programs online, a variety of free training options and assistance from our Field Specialists. We will support you in building a stronger business and provide tools to help your customers make smart investments in their homes.

More than anything, we thank you for taking the time to join the Residential Contractor Network and helping homeowners in the Northwest save money and live more comfortably.

Sincerely,

David Murphy
BPA Program Manager
Energy Conservation
Bonneville Power Administration

Cyrus Collins
Implementation Program Manager

Jonathon Belmont
Residential Sector Lead
Energy Conservation
Bonneville Power Administration

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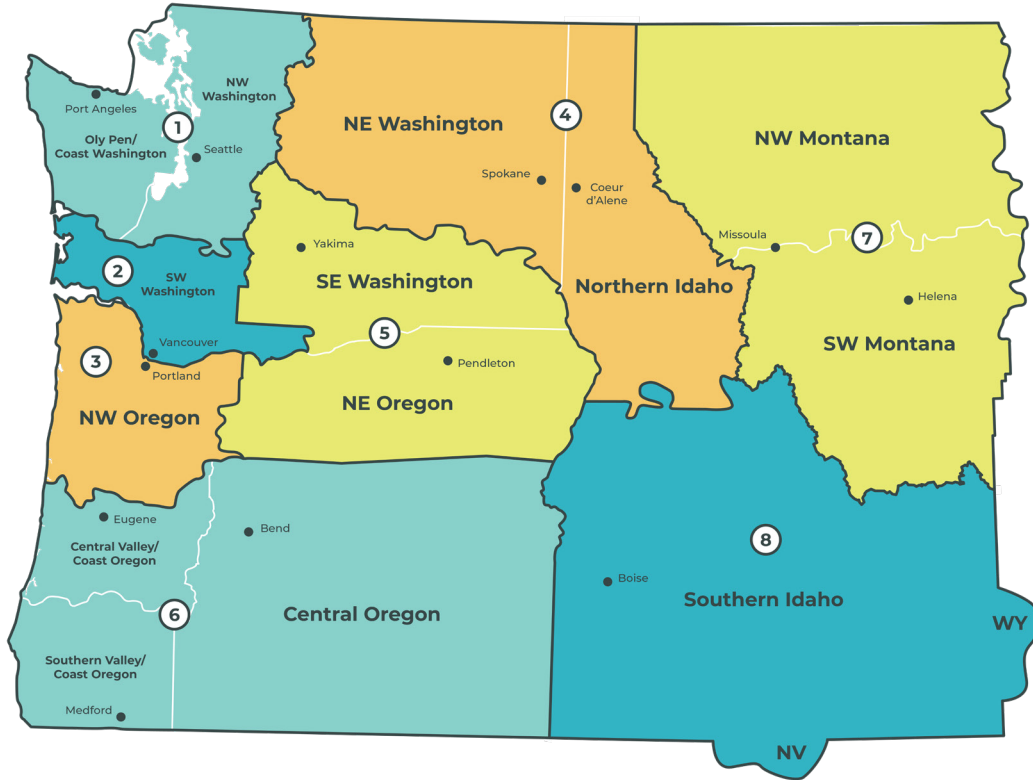
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Comfort Ready Home Program

MEET YOUR Support Team

YOUR Support Team



Comfort Ready Home Field Specialists help contractors make the most of energy conservation programs by:

- Providing one-on-one support for weatherization, HVAC and water heating installers
- Developing useful tools, guides and technical resources
- Delivering free customized hands-on workshops and trainings
- Sharing sales and marketing materials designed to increase leads and conversions
- Establishing mutually beneficial connections between contractors and local utilities



[Get in touch with your regional Field Specialist.](#)

Field Specialists



Miesha Yagle
NW Washington
Olympic Peninsula



Mike Stothers
Central Oregon
Central Valley/Coast Oregon
Southern Valley/Coast Oregon



Nick Phillips
SW Washington



Scott Mayfield
NW Montana
SW Montana



John DeLance
NW Oregon



Mike Hughes
Field Team Manager



Aaron Lazelle
NE Washington
Northern Idaho



Brian Bennet
Southern Idaho

CONNECT with Your Utility

Utilities work in partnership with BPA to offer unique incentive programs and packages that serve the needs of their customers. Working directly with your utility is the best way to make sure you have the most up-to-date information on what incentives are available for homeowners.

Connect with your [local utility representative](#) for details on their program offerings.





COMFORT READY HOME

The Comfort Ready Home program helps communities become more energy efficient, healthier and more comfortable through home weatherization, HVAC and water-heating upgrades. We make affordable energy conservation upgrades possible for every home by connecting electric utilities, contractors and homeowners with each other, and with the tools they need to make smart energy conservation decisions.

BPA and Northwest utilities have a shared goal of increasing our weatherization achievements by 10 times, and quadrupling our HVAC and water-heating projects to meet the growing energy demands in the region. In this guide, you will find helpful technical and program information for many of BPA's residential incentive offerings. This guide will continue to grow over time with expanded resources and information. Always contact your local utility program for specifics on current incentives and requirements. A list of Northwest utility contacts is available at comfortreadyhome.com/utility-search.

In addition, when you join the Comfort Ready Home Residential Contractor Network you will have access to new customers and utility incentives for your energy-efficient weatherization, HVAC and water-heating installations.

NO COST Program Resources

FIELD SPECIALISTS: Field Specialists provide program and technical support for contractors and utilities and are available to answer any questions you have about the program.

MARKETING TOOLKITS: Download templates and guides to help you drive participation in residential energy conservation programs.

FREE TRAININGS: On-demand eLearning and on-site workshops to help you gain skills and perform quality installations of energy-efficient home upgrades.

PRODUCT GUIDES: Tools for you to help homeowners choose the right energy-efficient products for their home.

CONTRACTOR SEARCH: A space for homeowners to find qualified local contractors (like you!) to help make smart, energy-efficient upgrades.



To become a Comfort Ready Home Contractor, complete an application online at ComfortReadyHome.com/join.

Not all services are available in every area, so check with your local utility or find your local Field Specialist at ComfortReadyHome.com/field-specialists.



HOW TO Participate

The Comfort Ready Home program provides contractors and utilities with a menu of tools, resources and services to enhance their residential weatherization, HVAC and water-heating offerings.

Contractors

Contractors can visit the online [Contractor InfoHub](#) to:

- **JOIN** the Comfort Ready Home Residential Contractor Network.
- **ACCESS** the Learning Center & sign up for trainings.
- **DOWNLOAD** the contractor-focused marketing toolkit.
- **CONNECT** with Comfort Ready Home Field Specialists.

Utilities

Utilities can visit the [Utility Center](#) to:

- **TAKE ADVANTAGE** of Comfort Ready Home training programs, marketing support and more.
- **GET STARTED** working with your local Field Specialist who can deliver a detailed plan to support your program.
- **USE ALL THE SERVICES** to capture long-term energy savings by augmenting your existing offers or establishing new programs.

BENEFITS

For Contractors

- Access to new customer inquiries through the Comfort Ready Home Residential Contractor Network.
- Free online sales and technical training courses available 24/7 in the Learning Center.
- A dedicated marketing toolkit with sales tools and customizable materials.
- Personalized support from a Comfort Ready Home Field Specialist in your area.

For Utilities

- Tools to meet your residential energy conservation program goals.
- Access to a network of trusted residential contractors or directly link your website to the contractor search results for your service area.
- A marketing toolkit developed specifically for utilities.
- Dedicated support from a Comfort Ready Home Field Specialist.

For Home Owners

- Easily search for qualified contractors.
- Access free shareable informational guides, videos, and an interactive webpage.



Comfort Ready Home Program

RESOURCES

to Support
Your Business



CONTRACTOR Marketing Toolkit

The Comfort Ready Home Contractor Marketing Toolkit contains easy-to-use templates, tools, guides and resources to help contractors enhance their communications, bring in more sales leads and increase customer engagement.

Toolkit items are available in English and Spanish, with more being added all the time.

Examples include:

PRODUCT GUIDES – Technology-specific product guides for contractors and homeowners.

SOCIAL MEDIA GUIDES – Social media content and best practices guides.

WEBSITE LANDING PAGE – An energy conservation landing page template and content.

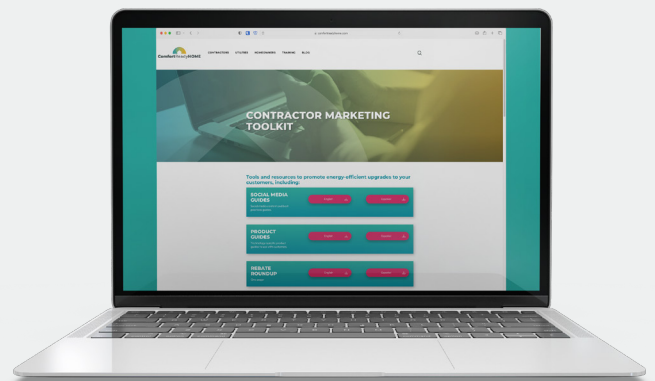
PROPOSAL TEMPLATE – A customizable template for customer proposals.

DENSE PACK INSULATION CALCULATOR – Online tool for determining correct insulation quantities.

SALES GUIDE – Sales and outreach tips and resources.

WINTERIZATION TIPS – Ways your customers can prepare their homes to stay comfortable through the winter while lowering utility bills.

POWER OUTAGE TIPS – Steps customers can take to prepare and make it through an outage safely.



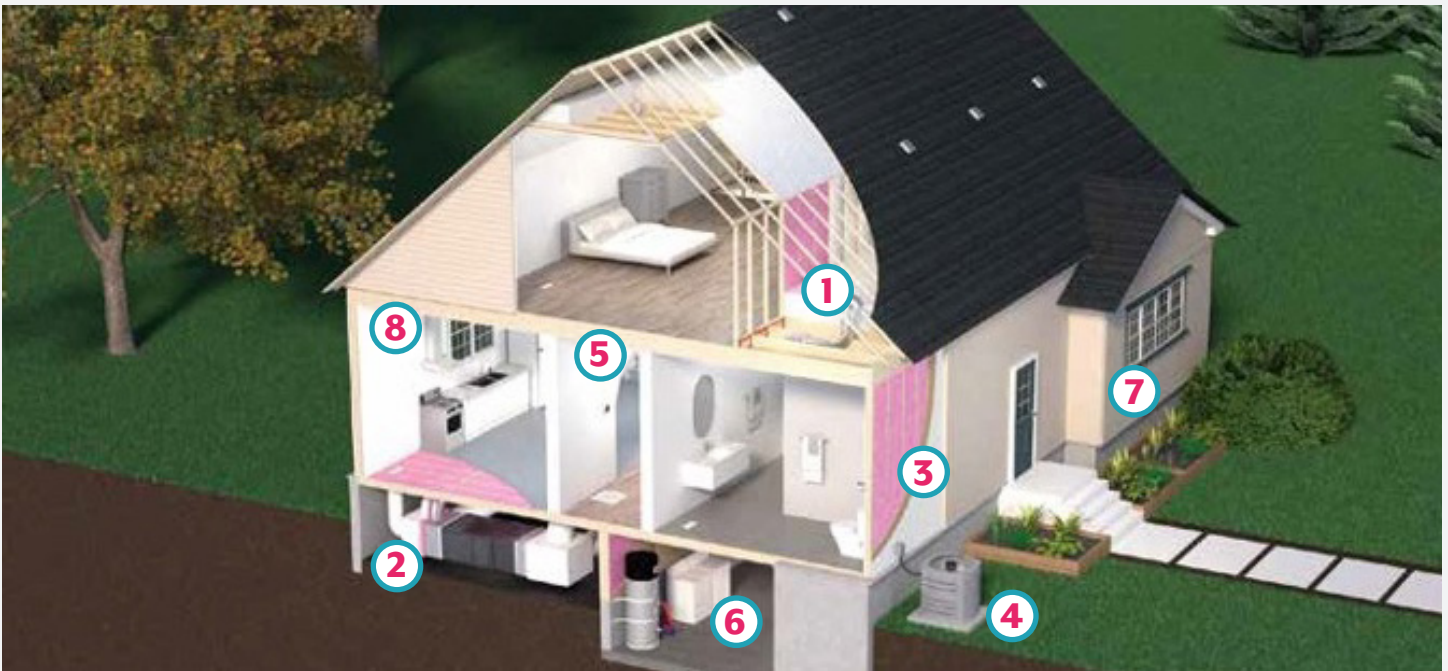
If you have questions, suggestions, or would like help using the toolkit, contact your Comfort Ready Home Field Specialist.



HOME COMFORT Upgrades

Energy conservation upgrades can make your home more comfortable while lowering your monthly utility bills. There are options for every home and budget, from simple projects to comprehensive whole-home solutions.

Check out some of the most effective energy conservation upgrades below, then visit [ComfortReadyHome.com/Homeowners](https://www.comfortreadyhome.com/homeowners) to learn more, find contractors near you and connect with your utility for incentives.



- 1 AIR SEALING** blocks uncontrolled air flow into and out of your home, leaving you with a quieter, healthier, and more comfortable home that wastes less energy.
- 2 DUCT SEALING** ensures conditioned air is optimally delivered throughout your house, with less wasted energy.
- 3 INSULATION** in your attic, walls and floors will make your home more energy efficient, quieter and more comfortable.
- 4 HEAT PUMPS** are an efficient and environmentally friendly way to heat and cool your home. Depending on your home type and budget, a ducted air source heat pump or ductless heat pump could work for you.
- 5 SMART THERMOSTATS** are an easy, affordable and convenient way to control your heating and cooling system and lower your costs, even remotely.
- 6 HEAT PUMP WATER HEATERS** use as little as one-third of the energy consumed by standard electric storage water heaters, while delivering the same supply of reliable hot water.
- 7 ENERGY EFFICIENT WINDOWS AND DOORS** offer energy savings and protection from water intrusion, drafts, and heat gain and loss.
- 8 AIR FILTRATION AND VENTILATION** keep your indoor air healthy by filtering and removing contaminants from your home.

Want to get the most value out of your home improvements? Many of these upgrades pair well together to provide optimal savings and comfort — see next page for details.

HOME COMFORT Upgrades

Many upgrades pair well and complement each other.

When investing in your home's energy conservation, it's worth considering which upgrades work well together to maximize comfort while delivering the best value. Ask your contractor about combining different upgrades and check with your utility for available incentives.



AIR SEALING

Pairs well with: Insulation; Duct sealing; Air source heat pumps; Ductless heat pumps; Windows and doors; Ventilation

Good for: Indoor air quality; Utility bills; Comfort; Environmental footprint; Noise reduction



DUCT SEALING

Pairs well with: Air sealing; Air source heat pumps

Good for: Indoor air quality; Utility bills; Comfort; Environmental footprint; Noise reduction



INSULATION

Pairs well with: Air sealing; Ventilation; Ductless heat pumps; Air source heat pumps; Windows and doors

Good for: Indoor air quality; Utility bills; Comfort; Environmental footprint; Noise reduction



HEAT PUMP

Pairs well with: Air sealing; Insulation; Duct sealing; Smart thermostats

Good for: Utility bills; Comfort; Environmental footprint



SMART THERMOSTAT

Pairs well with: Air source heat pumps

Good for: Utility bills; Comfort; Environmental footprint



WINDOWS AND DOORS

Pairs well with: Air sealing; Insulation

Good for: Indoor air quality; Utility bills; Comfort; Environmental footprint; Noise reduction



AIR FILTRATION AND VENTILATION

Pairs well with: Air sealing; Insulation

Good for: Indoor air quality



Visit [ComfortReadyHome.com/Homeowners](https://www.comfortreadyhome.com/homeowners) to learn more about these upgrades, find installers near you and connect with your utility for incentives.



FREE Customized Training

Become an Energy Conservation Expert with FREE customized training

Comfort Ready Home offers a variety of free trainings and workshops designed to familiarize contractors with energy-efficient weatherization, HVAC and water heating installation best practices and acquaint them with utility programs. These courses focus on enhancing skills and fostering beneficial partnerships.

In-Person Workshops

Comfort Ready Home Field Specialists are available to provide free on-site or in-office training for contractors. These can cover a range of topics, from introductory courses to in-depth technical training to whole-home evaluations. They are also offered in a range of formats including small-group sessions and large, hands-on workshops.

Reach out to a [Field Specialist](#) to schedule your training.

Online Learning Center

The Comfort Ready Home Learning Center offers free on-demand training courses to help you engage with customers and perform quality installations of energy-efficient home upgrades. The online learning platform is open to anyone and available 24/7. All courses are eligible for continuing education credits (CEUs) and other certifications.

[Enroll today.](#)

YouTube Training Playlists

The Comfort Ready Home YouTube channel features video playlists covering several weatherization and energy conservation topics. These include Evaluating the Home as a System, Selling Energy Conservation, All About Indoor Air Quality and more.

Bookmark our [YouTube channel](#).

Training Catalog

For a full list of Training offerings, visit ComfortReadyHome.com/training-center.





DELIVERING Exceptional Customer Service

Comfort Ready Home delivers exceptional customer service. All participants of Comfort Ready Home are encouraged to deliver the best customer service experience, while simultaneously endeavoring to make improvements wherever and whenever necessary.

Keeping the Residential Contractor Network, utility staff and homeowners safe and healthy is our number one priority.

Be Prepared

Have thoughtful and accurate answers prepared for these possible objections. Work through your answers to these questions and others before you receive them. How effective and prepared you are to handle objections will build trust in your product and services. Objections are opportunities to validate your client's concerns while strengthening relationships.

Customer Service: In the Home

CALL AHEAD: Even if you are going to be on time, it is important to connect with the customer on when you will be arriving.

ARRIVE ON TIME: On time is on time. Don't be early and don't be late. Many people organize their day very precisely and being early can be just as frustrating as being late.

BE PREPARED: Know why you are going to the home and don't get caught off guard. Organizing your notes the day before can make a day go smoother.

RESPECT THE PROPERTY: A person's house is their home. Treat their property with the utmost respect. Let them guide you through the home, ask permission before opening a closed door and use site protection if opening an attic or crawlspace.

PERSONALIZE THE EXPERIENCE: Use your method of working with customers to tailor the experience to their needs. Simply asking if there are specific considerations to get the job done will help reveal a customer's concerns and how they want the home to be treated.

BE CLEAR: Contracting is hard work. Don't sugarcoat the complexity of the job. Explaining clearly what is entailed and the possibility of potential unknown or unseen circumstances should be done before problems arise.

SCHEDULE A FOLLOW-UP MEETING: Proposals are hard work and just sending an email reduces the likelihood of a sale. A second meeting on the schedule creates cadence and helps eliminate having to chase down customers.

HOW TO HANDLE Customer Objections

See Objections as Opportunities

Receiving objections from a potential customer can send a contractor off track quickly. From simple questions to valid concerns, how a salesperson handles the situation can strengthen a relationship or end it. By viewing objections as engagement to find an agreement, navigating them well can put a project on the fast track to a sale.

The 5 C's on working through objections

- **CALM:** When entering a conversation that can potentially take the relationship a step back, it is important to continue without negative emotion. Maintain a calm attitude and systematically work toward a solution.
- **COLLECTED:** Don't get defensive. Most objections are not personal. Instead, gather your thoughts on how to best convey the information to get to a solution. Sometimes developing a simpler way to explain something is all that is needed.
- **CONFIDENT:** Be confident in what you are proposing or explaining. If you don't know the answer, say that and commit to getting back to them. It is more important that an amazing team backs you up rather than knowing everything.
- **CONCISE:** There is no rush to the conversation. Don't feel rushed to over explain in the moment.
- **CONCLUSION:** Come to a mutual agreement on understanding needs and next steps. Reflecting a customer's own words in the conversation can help both parties understand the solution. This helps build trust while managing expectations.



HOW TO HANDLE Customer Objections

How to Overcome 12 Common Objections

1 “I’m not interested, but you can send me information.”

Ask a few qualifying questions that will help you determine where they are in the buying process. By understanding their readiness to purchase you can be a subject matter expert and help them through early-stage research questions. This will allow you to be first to offer a bid when they move to purchase.

2 “Your price is too high.”

Help guide the conversation from “price” or “cost” to “value.” If your proposal is higher than other bids there is usually a reason. Explain why your proposed investment value matches the pricing. Longer warranties, higher quality, more efficient products, well-paid and trained technicians: all of these drive-up cost while reducing risk. Help your customer understand what they are paying for.

3 “I heard a different solution from your competitor.”

Every contractor is going to have a slightly different solution to meet their customer’s needs. Focus on the reasons behind your choices. Every project design should be based on expertise, resources, and your customer’s needs. If you worked through their “pain points” as you developed the proposal, mirror those in your reply. Your service should directly address the reasons they want to invest in the project.

“It’s good you’re looking at all your options. My goal is to meet the needs we spoke of and find the best solution for your home. That is why we tailor our solutions to homeowners like you. Here is what I suggest.”

4 “It’s not a good time.”

When someone says it’s not good timing, do not get discouraged. Use it as an opportunity. Ask qualifying questions to establish that there is a need. Your next goal is to find a good time to reconnect. One of the best ways to move up a timeline is by identifying value to the homeowner by having the cost-of-waiting conversation. Show them how waiting could cost them money or have other negative effects (cold/hot rooms during cold spikes or heat waves. They will be more likely to want to reconnect sooner. Giving them something to think about so when you talk again, they are more likely to move forward. You will also start to build trust and ultimately make it easier to close the deal.

5 “This seems like too big of a project.”

It is not uncommon to propose many improvements to a homeowner, which can be overwhelming. Homeowners may not fully understand how much they will like their home when you finish the project, so the improvements can be difficult for them to visualize. When the homeowner says it’s too much money or too much work, start with a small project. Once they have completed one project and are happy with the result, they are more likely to do another. Who are they going to call for the future upgrade? You, of course! You’re the one who worked with them and earned their trust.

6 “You do not offer this in your product.”

Many times, customers get caught up in a special feature of a competitor’s product. Although it may sound nice, it may not have much value to that specific customer in that location. Ask the customer why they like that feature and what they expect to get from it. Many times, you will find that your product can meet the same need without the added expense. You might also be able to show the customer the feature is not needed to get the value they want.

HOW TO HANDLE Customer Objections

7 “I need to get more quotes.”

It is very common for people to get other quotes. You're probably not going to change their minds, so turn it into an advantage. Explain to the owner that you will give them a price, but you also want to make sure that they are getting the right system installed in their home. Offer to write out product specs, must haves and things to look out for that other companies may not provide or leave out. Position yourself as an expert and a partner to build trust and present you and your company in the best possible light. Take the burden of the next step off your customer and set a follow-up appointment in the timeframe they need to do their research.

8 “I cannot afford it.”

Money is often a concern for customers, especially those in lower income brackets. Tailor your proposal to include rebates, incentives, and financing options and consider that higher incentives are available for moderate-to-low income residents. (Most customers don't know they qualify!) By breaking down the total into a monthly payment you can often help potential buyers afford the project. If your project has multiple parts to it, work with your client to break it into phases. Often doing part of a larger project within budget can showcase the good work your company does and retain repeat customers.

9 “It seems too complicated.”

Remember that what may be common and easy for you may seem overwhelming for the average consumer. That's why it's important they have a contractor they can trust. New technology, utility rebates, demo, construction, installation, financing, warranties, etc. can all add up to what appears to be an insurmountable task. Find ways to make it easy for the customer to understand and participate. Make sure your customers understand that you will be there supporting them every step of the way.

**Introduce customers to their
Comfort Ready Home Field Specialist
and let them know there are experts
ready and willing to walk them through
the process step-by-step.**

10 “I support the coal, oil and/or gas industry, not energy conservation.”

This objection may come in many forms. Some customers see energy conservation as an economic or political issue. It is best to focus on non-energy benefits for these customers. Try to keep the conversation directed at improved comfort, less maintenance and reduced energy costs. For instance, new windows will help keep a home cool in the summer, warm in the winter and significantly reduce outside noise pollution, in addition to saving energy.

11 “Where is the incentive money coming from?”

Often customers are concerned with how incentive programs receive funding. They may have concerns about increased taxes, wasteful utility spending or even a type of scam. You do not need to be an expert on this subject, but it is best to have an answer. Explain to the customer that a very small portion of every customer's utility bill gets set aside to fund these programs, and they must participate to receive rebates and incentives. Direct your customer to contact their utility or visit the utility's website to verify it is legitimate.

12 “Why is the utility going to give me money to use less energy?”

A perceptive customer will question why the utility wants to give them money to use less of the product they sell. Explain to the customer that it is actually in the utility's best interest. It is cheaper to use less energy than it is to build new power plants. Offering incentives for energy-efficient home upgrades help the utility save energy and keep rates lower for everyone.

INCREASE Your Sales Opportunities

Combining Complementary Conservation Upgrades

According to a study by the National Association of Home Builders, 9 out of 10 home buyers would choose a house with energy-efficient features over a cheaper, less efficient home.¹ Simply saying, “buyers don’t care” about energy conservation is no longer a viable excuse. The problem (or opportunity for contractors) is many homes still aren’t upgraded to be efficient. Home buyers are left having to do the work on their own and can often get confused as to where to start. Because of this, more homeowners are reaching out to full-service contractors who can take care of all their needs. Cross-selling multiple measures creates a simple process for buyers while creating a larger, more accurate impact on their comfort and savings.

Cross-Selling Conservation Upgrades

Unlike upselling, which is encouraging your customer to buy a higher priced piece of equipment or service over the current proposal, cross-selling is when you recommend a product or service that complements your customer’s existing energy-efficient upgrade. For example, insulating a home often requires a smaller sized heating and cooling system. They complement each other and will enhance the project that was first proposed or considered. Another example is when installing a smart thermostat, educate the homeowner or decision-maker on the benefits of air and duct sealing.



Check with your local Field Specialist who may be able to point you to reputable contractors in the Residential Contractor Network who offer complementary services.



1. Schwarz, R. (2019). The Misconception that Buyers “Don’t Care” About Home Performance. The Energy Logic. <https://theenergylogic.com/blog/the-misconception-that-buyers-dont-care-about-home-performance-2/>



Key Takeaway The goal is to always propose the best suite of solutions that address the customer’s pain points and exceed their project expectations. Second is to increase your sale’s project size. After all, happy customers drive referrals and project volume keeps your crews in the field. Who doesn’t want both of those benefits?



[Comfort Ready Home's Product Guides](#) provide customers an overview of weatherization and energy conservation upgrades that can save homeowners money while increasing comfort. Printed Guides are available to you upon request. Simply contact your [Comfort Ready Home Field Specialist](#).



AIR SEALING

Significant air leakage can weaken even the most high-performance insulation. Effective air sealing stops uncontrolled air from entering and escaping your home, leaving you with a quieter, healthier, and more comfortable home that wastes less energy.



DUCT SEALING

Duct sealing allows your home's heating and cooling system to perform to its highest standard by optimally delivering conditioned air to each room. This means less wasted energy and enhanced comfort throughout your house.



INSULATION

The largest contributor to high energy bills in the winter and summer months is the unwanted movement of heat into and out of your home. Properly insulating your attic, walls and floors is a solution for making your home more comfortable and energy efficient while reducing your utility bills.



HEAT PUMPS

Heat pumps are an efficient, economical, and environmentally friendly way to heat and cool your home. Depending on your home type, budget, and needs, a ducted air source heat pump or ductless heat pump might work best for you.



SMART THERMOSTATS

On average, heating and cooling systems account for more than half of the total energy usage in a home. Smart Thermostats can reduce electric use by 6-12%, compared to a standard thermostat, and they offer features such as scheduling and control from a remote location.



HEAT PUMP WATER HEATERS

Heat pump water heaters, also known as hybrid water heaters, use heat pump technology to transfer heat from the surrounding air to heat the water in the tank. These water heaters use as little as one-third of the energy consumed by standard electric water heaters while delivering the same supply of reliable hot water.



WINDOW AND DOOR REPLACEMENT

Professionally installed energy-efficient windows and doors offer energy savings as well as protection from water intrusion, drafts, and summer solar heat gain.



AIR FILTRATION & VENTILATION

All homes have a level of natural ventilation, which can lead to high concentrations of pollutants. Mechanically controlled ventilation systems help keep your indoor air healthy by supplying fresh air to the home while filtering and removing contaminants.



Comfort Ready Home Program

Energy Conservation
Income Qualified
CUSTOMERS



Energy Conservation **INCOME QUALIFIED** Programs

How to partner with and refer customers to non-profit energy conservation programs

Energy conservation installations can have high upfront costs, limiting access to upgrades for income-qualified residents.

Historically, lower-income residents often pay a much higher percentage of their household income on utility bills, resulting in a higher energy burden.

Fortunately, participating utilities, tribal partners, state agencies and community action agencies, or CAAs, can offer higher incentives to income-qualified homeowners and renters to encourage energy conservation projects and installations. This can greatly decrease utility bills, mitigate health and safety issues such as water damage and mold, make their homes more comfortable, and improve indoor air quality for current and future residents.

Much of the energy conservation work in the region is accomplished through incentives paid to both public utilities and their customers, so it is important that programs are structured to allow customers of all income levels to have access. For more than three decades, BPA, public utilities, CAAs, tribes and states have worked to address this issue, improving equitable access to energy conservation for all Northwest residents.

ONE MISSION, TWO PROGRAMS

As part of BPA's work to ensure energy conservation accessibility to rate payers of all income levels, BPA operates two Energy Conservation Income Qualified programs. Funding from both income qualified programs can be used in the same home, as long as they are not used on the same part of the installation.

One is managed by public utilities through their Energy Conservation Incentives. For incentive-funded projects, or measures, utilities can offer higher incentive amounts for low-income qualified homes to cover the cost of the installation. Some measures are fully reimbursed dollar-for-dollar and many are reimbursed dollar-for-dollar up to a cost cap that aims to match average market cost. Also, utilities can use additional funds to cover the cost of repairs necessary to maintain the effectiveness and durability of an installation.

The other Energy Conservation Income Qualified program is a grant program distributing BPA program funds to state and tribal partners. CAAs are typically involved in delivering those services.

Energy Conservation **INCOME QUALIFIED** Programs

Your customer may qualify for free upgrades

If your customer indicates they receive energy assistance or benefit from other income qualified programs, check with your customer's utility to ensure they offer higher incentives and to verify what type of income qualification guidelines they follow. This will help make sure your customer does not miss out on no-cost energy conservation opportunities and to help guide your conversations with customers. Include this in your bid and let your customer know that if they qualify, you can help with the free installation or connect them to the agency that will help.

All existing housing types (Single-family, manufactured and Multifamily) are eligible for low-income measures, although not all measures are applicable to each housing type. For additional details, connect with your local utility program to see what low-income measures they offer.

Income qualifications follow the U.S. Department of Energy Weatherization Assistance Program definition of 200% of the federal poverty-income level based on household size unless a statewide eligibility definition is provided. In the Northwest, state minimum income levels for participation are often higher than the federal level. Utilities may require detailed documentation or may accept a signed self-attestation of income to verify eligibility based on household gross income levels. For additional details see the [BPA Income Qualified Energy Conservation Incentive Program](#).

The table below represents one example of qualifying income levels only for the year 2026. The federal poverty-income level may be redefined every year and states may have their own income-qualification requirements. Click [here](#) to check guidelines and your state's definition for the most up to-date federal poverty-income level.

EXAMPLE

2026 Federal Poverty Income Level

Subject to change year-over-year.

HOUSEHOLD/FAMILY SIZE	200% OF THE FEDERAL POVERTY GUIDELINE
1 person	\$31,920
2 people	\$43,280
3 people	\$54,640
4 people	\$66,000
5 people	\$77,360
6 people	\$88,720
7 people	\$100,080
8 people	\$111,440
9 or more	Add \$11,360 each

Note: some states have higher income allowances for program participation. State-specific data can be found here: [Idaho](#) | [Montana](#) | [Oregon](#) | [Washington](#)

Energy Conservation **INCOME QUALIFIED** Programs

Connect with your local resources to understand the requirements

Connect with your [Comfort Ready Home Field Specialist](#) to help you better understand the requirements, incentives and rules for participating where you work for the homeowners you serve.

Northwest Resources

Follow these links to find specific utility programs and agencies that serve your area.

UTILITY LOW INCOME PROGRAMS

[Idaho](#)
[Montana](#)
[Oregon](#)
[Washington](#)

STATE CAA PROGRAMS

[Community Action Partnership of Idaho](#)
[Montana Energy Assistance Offices](#)
[Oregon Home Weatherization Services](#)
[Washington State Weatherization Programs](#)

UTILITY RESOURCES

Income-qualified programs are an essential part of a utility's service to their customers and provide many benefits beyond simple energy savings. If you are part of a utility wanting to launch a new income qualified program or improve an existing process, [this resource](#) will help you determine where to begin and what to expect.

[Plan and Manage a Program for Income Qualified Customers](#)

DEVELOPING A SUCCESSFUL PROGRAM FOR INCOME QUALIFIED CUSTOMERS

Here you will also find a customizable form to collect customer and project data and facilitate income verification.

[Income Qualified Project Information and Income Verification Form \(Optional\)](#)



 **Comfort Ready Home Program**

WEATHERIZATION



Air sealing decreases the amount of air moving into and out of a home, which improves thermal performance, comfort, indoor air quality, and increases the longevity of the building.

While air leaks may provide ventilation to exhaust pollutants and bring in fresh air, they can also introduce pollutants into the home. It is essential to consider the existing conditions and ventilation of the home when reducing airflow through air sealing to avoid indoor air quality problems. Proper combustion equipment design and ventilation must be balanced with air sealing to ensure a safe and efficient home.

Prior to starting an air sealing project, it is important to assess the home to identify any water leaks, instances of standing water, mold and mildew, as well the configuration and condition of existing mechanical and passive ventilation systems. Any standing water, leaks, or mold and mildew issues should be addressed before work begins.

Successful Air Sealing Projects

Common air sealing products include spray foam, rigid insulation, caulk and sheet metal. Air Sealing may be performed as a standalone measure, but also complements attic insulation and floor insulation.

Prescriptive Air Sealing is an incremental process that reduces air leaks in a home by finding and sealing all accessible air leaks. Prescriptive Air Sealing does not require a blower door test or a certified technician; however, some utilities may have additional requirements.

Prescriptive Air Sealing can be performed in an attic and/or crawlspace and may be eligible for an incentive for each space independently. The attic and crawlspace may be completed separately and at different times.

In contrast, Whole-Home Air Sealing requires a blower door test to obtain a measurement of building tightness before and after air sealing. Air leakage testing must be performed by a certified technician. Approved certifications include BPI, HERS, Weatherization Assistance Program, or PTCS. (Note: the PTCS program expired on September 30, 2023. New trainings will not be offered.) Requirements for performing this both Prescriptive and Whole House Air Sealing can be found in the [BPA Residential Weatherization Specifications and Best Practices Guide](#).

Objectives of Air Sealing

- Protect insulation's thermal resistance to save energy.
- Avoid moisture movement into and out of the house and house assemblies which can lead to air quality issues or damage to building components.
- Increase comfort.
- Improve indoor air quality.



SINGLE-FAMILY Prescriptive Air Sealing

Preparation

- Before air sealing attics and crawlspaces, ensure no leaks or water intrusion exists prior to installing insulation.
- Verify attic and crawlspace each meet local and state codes for ventilation, typically 1/150 or 1/300 if the vents are well distributed between high and low on the roof, or distributed evenly around the crawl perimeter.
- Ensure home is free of existing moisture, mold and relative humidity issues.
- Ensure home has at least one operational exhaust fan, ducted to the exterior, per the guide "Complementary Prep Work: Mechanical Ventilation Guide – Venting Bath Fans and Dryers" ([Page 33](#)).
- If combustion appliances are present, ensure the presence of or install a UL- or CUL-approved carbon monoxide detector.
- Confirm use of correct materials identified for air sealing structural leaks vs air leaks around high-temperature items such as flues, chimneys and recessed-can lights.
- Identify inaccessible locations.
 - Building structure, framing and mechanically fastened materials block access.
 - Opportunities immediately adjacent to eave line: top plates, balloon framed walls, soffits and can lights.
 - Penetrations beneath/behind 5 inches of insulation, i.e. blown in attic and batt in floor.

SPECIFICATION CHECKLIST

For details on all BPA requirements for this measure, please refer to the [BPA Residential Weatherization Specifications and Best Practices Guide](#).

- Attic hatch/door and pull-down stair covers: gasket or weather-stripping. Vertical and horizontal hatches, or pull-down stairs between conditioned space and attic or crawlspace. Must provide an effective air seal and be durably installed to the use-case of the hatch.
- Duct boots/penetrations: mastic, caulk, or other airtight seal installed around the perimeter of duct boots between the boot and the ceiling.
- Chases, soffits and floor joists under knee walls: blocked with rigid material and sealed with caulk or foam. Maintain clearance from combustible materials, typically 3 to 4 inches, but check local codes.
- Fire-rated materials used as appropriate near heat-producing devices.
- Recessed-cans/Non-IC rated fixtures: foam, caulk or another airtight seal installed between fixture and ceiling; or a drywall or another non-flammable air-sealed insulation box or hat installed over fixture. Shield extended 3 to 4 inches above new attic insulation. No insulation covers the top of the box or hat fixture.
- Recessed-cans/IC-rated fixtures: fixture sealed between interior finish and the fixture. Fixture is not covered with spray foam and openings in the fixture are not sealed. Attic insulation is installed over the fixture.
- Bath fans: foam, caulk, or other airtight seal installed around perimeter of bath fans. Fire-resistant caulk used for bath fans with a heat source. Gaps larger than 1 inch spanned with sheet metal.
- Top plates and electrical or plumbing penetrations, sill plates for basement wall rim joists: drywall-to-top-plate connections, wood-to-wood or concrete seams, penetrations through the plate sealed with foam or caulk.

SINGLE-FAMILY Prescriptive Air Sealing

Installation Examples



SEALED CHASE OR CAVITY

Courtesy of Oregon Housing and Community Services



OPEN/UNSEALED CHASE OR CAVITY

Courtesy of Oregon Housing and Community Services and Oregon Energy Coordinators Association



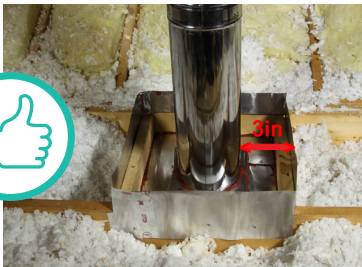
NON-IC FIXTURE WITH DRYWALL SHIELD (HAT)

Courtesy of Advanced Energy



UNSEALED NON-IC FIXTURE

Courtesy of Advanced Energy



SEALED PENETRATION (HEAT-PRODUCING)

- Surrounded by sheet metal.
- 3-inch clearance maintained.
- Fire-resistant sealant.

Courtesy of Advanced Energy



UNSEALED PENETRATION (HEAT-PRODUCING)

Courtesy of U.S. Department of Energy Weatherization Program Trainers' Consortium (DOE WAP TC)



FLOOR JOISTS UNDER KNEEWALL

(Blocked with rigid material and sealed with caulk).
Courtesy of U.S. Department of Energy



FLOOR JOISTS UNDER KNEEWALL

(Not blocked with rigid material and unsealed).
Courtesy of U.S. Department of Energy

MINIMUM REQUIRED DOCUMENTATION

Contact the serving [utility](#) for specifics on required documentation.

- Square footage of sealed area and age of home.
- Contractor invoice showing order or purchase date and cost.
- Documentation that the measure requirements have been met (e.g., manufacturer, model number, type, size and quantity of product installed or used).

PAIRS WELL WITH

- Home insulation.
- Prescriptive duct sealing.

INSULATION



Attic, wall and floor insulation can improve the thermal performance of a home, but may cause problems if not installed properly. Insulate to the maximum level possible and always consider effective air sealing when installing insulation.

Insulation products must be rated by material R-values to qualify. Products that potentially achieve an R-value based on assembled requirements, reflectivity and/or emissivity do not meet BPA's requirements for insulation and do not qualify for BPA reimbursement. Check with your local [utility](#) weatherization program for specific requirements for pre-existing and installed insulation levels.

Attic Insulation

Homes that have little-to-no insulation in attics, floors and walls will always benefit by adding as much insulation as possible in each assembly. To maximize savings and building durability, air sealing and passive ventilation should be paired with attic insulation. The attic often has the most space to add insulation and may offer at least twice that of other assemblies. Attics also tend to be the hottest places in the home during the summer and as cold as the outside during winter months. Attic insulation reduces conductive and radiant losses from the ceiling to an attic and can be the most effective improvement in the home. It should be prioritized ahead of insulating walls or floors.

Wall and Floor Insulation

Insulating floors has a unique benefit because homeowners are in direct contact with their floors for much of their time indoors. Keeping floors warmer

provides greater comfort. Homeowners can also benefit from wall insulation. Walls often consist of framed and drywalled portions, and windows and doors. Exterior walls typically make up the largest single surface area of the thermal boundary of a home.

This is similar for manufactured homes with a few key differences. Depending on the design, manufactured homes with a belly or rodent barrier beneath the floor and a flat or bowed roof may have as much or more room for floor insulation than the ceiling/roof area. This may mean that, for manufactured homes, you might prioritize floor insulation over the ceiling insulation in terms of the immediate benefits for the resident. Manufactured home walls typically do not present the same opportunities for adding insulation. It is more difficult to add insulation, the wall depth could be as thin as 3 inches and the structural integrity of the home may not support the weight of additional wall insulation.

The bottom line is that it is always worth examining the potential for adding new insulation, comparing it to the existing insulation, then estimating the incentives you may be able to provide to help lower the cost for the resident.

Successful Insulation Projects

- Always consider air sealing when adding insulation in a Single-family home attic, floor or crawlspace.
- For existing Single-family site-built and Multifamily buildings, evaluate attics first as the best opportunity to reduce energy bills and increase comfort.
- For manufactured homes, look closely at the options, but consider the belly/floor as the best opportunity to reduce energy bills and increase comfort for the homeowner.
- Roof/ceiling insulation for manufactured homes falls under program incentives for attic insulation.



SINGLE-FAMILY Attic Insulation

Preparation

- Ensure no existing roof leaks or failing roof flashing.
- Remove degradable and absorbent materials that might rot from in the attic.
- Baffles and shields should be rigid, non-combustible materials attached to framing, and extend a minimum 4 inches above new insulation, with 3 inches of clearance around non-IC fixtures, flues and chimneys.
- Vent baffle openings should be equal or greater than the soffit vents in the bays, should extend to the exterior side of the top plate and be attached to rafters.
- Install a dam around openings to maintain the insulation level to the edge of the opening.
- Install one depth ruler facing the attic entrance for every 300 square feet of attic area.
- If water pipes are not covered by at least 1 inch of attic insulation, wrap the pipes with at least one- inch-thick insulation.
- Each attic space must meet applicable local and state codes for ventilation.
- New and existing exhaust fans must be sealed and vent directly to the outdoors.
- Insulation in contact with active knob-and-tube wiring must be approved in writing by a licensed electrician.

SPECIFICATION CHECKLIST

For details on all BPA requirements for this measure, please refer to the [BPA Residential Weatherization Specifications and Best Practices Guide](#).

- Pack insulation against the eave baffle or roof deck to achieve the highest possible R-value in places where the full intended thickness of insulation won't fit.
- Install insulation to the surface between the conditioned space and attic with a uniform R-value/consistent depth. Level the insulation if necessary.
- Insulate vertical access doors to at least R-11 and horizontal access hatches to at least R-30.
- Permanently attach weatherstripping to the attic-access door or frame to create an effective air seal between the door frame and the door. Repair air leaks or replace the door prior to insulating.
- Pull-down stairs: Weatherstripped and insulated to a minimum of R-10. New assemblies include minimum R-5 and weatherstripping.
- Attic walls and knee walls: insulated to meet requirements, insulation covered with vapor permeable air barrier if attic is used for storage, access door insulated to minimum R-13 and weatherstripped. Block frame the opening between floors with an air barrier.
- All attic insulation shall meet manufacturer-specified density.



**Connect with the local
serving utility to confirm pre- and
post-condition requirements.**

PRE-CONDITION:

R-0 to R-30

POST-CONDITION:

R-38 to R-49

SINGLE-FAMILY Attic Insulation

Installation Examples



WEATHERSTRIPPED AND INSULATED HATCH

Courtesy of Advanced Energy and Oregon Energy



UNINSULATED, NOT WEATHERSTRIPPED

Coordinators Association



ATTIC INSULATED AND ALL PREP WORK COMPLETED

Courtesy of U.S. Department of Energy



ATTIC NOT PREPPED OR INSULATED

Courtesy of U.S. Department of Energy



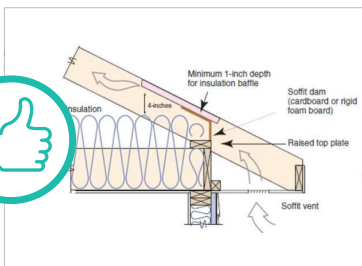
OPEN KNEE WALL INSULATED AND COVERED

Courtesy of Advanced Energy



OPEN KNEE WALL UNINSULATED

Courtesy of Advanced Energy



ROOF-TO-WALL HEEL INSULATED TO AT LEAST R-13

Courtesy of U.S. Department of Energy



ROOF-TO-WALL HEEL UNINSULATED

Courtesy of U.S. Department of Energy Weatherization Program Trainers' Consortium (DOE WAP TC)

MINIMUM REQUIRED DOCUMENTATION

Contact the serving [utility](#) for specifics on required documentation.

- Documentation that the measure requirements have been met (e.g., manufacturer, model number, type, size and quantity of equipment or product installed or used).
- Documentation of pre- and post-insulation R-values, and square footage of installed insulation.
- Primary heating system type.
- Invoice showing order or purchase date, cost, post-condition.

PAIRS WELL WITH

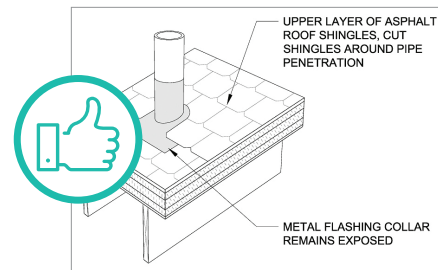
- Prescriptive air sealing.
- Prescriptive duct sealing.
- Floor insulation.
- Whole-house air sealing.

IDENTIFYING Roof Leaks

Completing complementary preparation steps, such as identifying roof leaks, ensure that your workspace is ready for air sealing, insulation, and duct improvements. Follow these recommendations to ensure a quality job, a satisfied customer and to meet utility incentive requirements for some weatherization measures:

- Based on interior, attic and exterior inspections, identify known and suspected roof leaks.
 - Moisture caused by air leaks is typically widely distributed under the roof deck and located above an obvious source such as can lights, bath exhaust fans, etc.
 - Moisture caused by roof leaks typically include visible staining and is concentrated in specific areas such as downslope from roof penetrations or under valleys.
- Remove all degradable and absorbent scrap materials from the attic that might eventually rot and damage the structure, especially wood and cardboard.
- Repair any water leaks and moisture damage prior to performing work.
- Assemble patching materials such as patches, nails and screws, putty tape, roof sealants and roof coatings/replacement materials.
- Address any ponding issues on flat Single-family or Multifamily roofs or bowed manufactured home roofs.
- Check for proper flashing and soft spots on the roof-decking materials.
- Downspouts should be securely fastened to the house. Elbows and straight sections should be fastened with pop rivets.

Installation Examples



WALL FLASHINGS AND PENETRATIONS INSPECTED FOR LEAKS

Courtesy of Advanced Energy and Oregon Energy



INTERIOR MOISTURE SOURCE NOT CORRECTED. THIS PROBLEM IS DUE TO AN UNVENTED FAN

Courtesy of Pennsylvania College of Technology



INSPECT ALL DOWNSPOUTS FOR PROPER CONNECTION



RUSTING, DISCONNECTED DOWNSPOUT

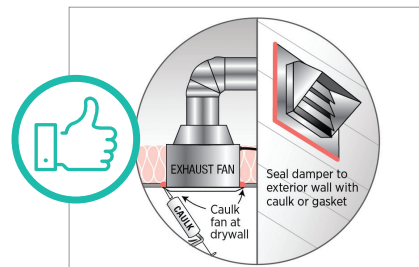
MECHANICAL VENTILATION-VENTING

Bath Fans and Dryers

Completing complementary preparation steps, such as ensuring properly vented bath fans and dryers, ensure that your workspace is ready for air sealing, insulation, or duct improvements. Follow these recommendations to ensure a quality job, a satisfied customer and meeting utility incentive requirements for some weatherization measures:

- Exhaust fan and dryer ducts must be sheet metal or HVAC flex-duct and insulated to a minimum of R-4 if in an unconditioned space. Vinyl coil ducts must be replaced.
- Any newly installed exhaust ducts must be sized correctly.
 - Up to 100 CFM can use 5-inch duct.
 - Up to 135 CFM can use 6-inch duct.
 - Up to 150 CFM can use 7-inch duct.
- All exhaust fans must vent to the outdoors. Ducts must be mechanically fastened using sheet metal screws or clamps and be substantially airtight. Mechanical fasteners must not interfere with dampers.
- Exhaust fan ducts should be adequately supported to prevent sagging, be as straight as possible to maximize effective airflow and have no more than two 90-degree turns, or equivalent. Dryer vents should be limited to 25 feet in length.

Installation Examples



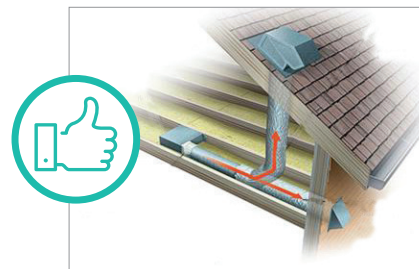
PROPERLY VENTED TO EXTERIOR

Courtesy of U.S. Department of Energy



NOT INSULATED, VENTED TO EXTERIOR OR PROPERLY SUPPORTED

Courtesy of U.S. Department of Energy



VENTED TO EXTERIOR

Courtesy of U.S. Department of Energy



POORLY DUCTED, VENTED TO ATTIC

Courtesy of U.S. Department of Energy

SINGLE-FAMILY Wall Insulation

Preparation

- Inspect walls for evidence of moisture damage. If condition of the siding, sheathing or interior wall finish indicates an existing moisture problem, no sidewall insulation should be installed until the moisture problem has been identified and corrected.
- Inspect indoor surfaces of exterior walls to ensure they are strong enough to withstand the force of blowing-in insulation. Add screws or other reinforcement to weak walls, if feasible.
- Inspect for interior openings from which insulation may escape such as balloon-framing openings in the attic or crawlspace, pocket doors, un-backed cabinets, interior soffits and closets. Seal openings as necessary to prevent insulation from escaping.
- Knob-and-tube wiring: active knob-and-tube wiring must be approved in writing by a licensed electrician if it will come into contact with insulation.
- Wall-mounted heaters: blocked to prevent contact with insulation. If blocking can't be installed, cavity isn't filled with insulation.

Recommended

- Holes that will be covered by siding must be plugged and must be completely covered by the siding. If a plug is partially exposed, for example, by falling between two pieces of shake siding, the plug must be covered by properly lapped building paper.
- Holes drilled through the siding must be plugged, sealed, weatherproofed and ready to paint. If the surface of the plug is below the surface of the siding, the hole must be filled with non-shrinking filler.
- If walls are balloon framed, blocking shall be installed at the top and bottom of the walls at each floor.

The Power of Retrofitting a Home

In this video, we dive into the transformative power of retrofitting a home for maximum energy efficiency! Discover how upgrading insulation, installing high-efficiency windows, and enhancing air sealing can work in harmony to create a more comfortable living environment while significantly reducing a home's energy needs.

<https://youtu.be/eY8zRnaleFk?si=EwcnZYmZIVPxBnu>

SPECIFICATION CHECKLIST

For details on all BPA requirements for this measure, please refer to the [BPA Residential Weatherization Specifications and Best Practices Guide](#).

- Insulate the wall to the highest practical R-value, at least R-11 for 4-inch walls, R-21 for 6-inch walls. Fill all cavities in all exterior walls, including small cavities above, below and on the sides of windows and doors.
- Blown-in cavity insulation shall be installed so it completely fills the cavity, with adequate density per the manufacturer's specifications to ensure no settling.
 - Fiberglass dense pack ~2 lb/ft³.
 - Cellulose dense pack ~4 lb/ft³.
- Tube-fill method is the preferred methodology for all wall blows, except for scenarios where framing, blocking or restrictions in the wall cavity prevent this method.
 - Block wall-mounted heaters to prevent contact with insulation. If you can't install blocking, don't fill the cavity with insulation.
- Open walls: insulated to at least R-11 for 4-inch walls, R-21 for 6-inch walls. Consider moisture when selecting insulation materials for below-grade walls.



Connect with the local serving utility to confirm pre- and post-condition requirements.

PRE-CONDITION:
R-0

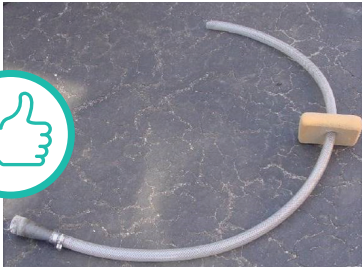
POST-CONDITION:
R-11 or Greater

[LMS for insulation and wall blown in insulation](#)

To find a qualified contractor, visit our [contractor finder](#).

SINGLE-FAMILY Wall Insulation

Installation Examples



HOSE HAS NO KINKS AND INCLUDES A SPONGE TO REDUCE LEAKAGE AT PENETRATION WHEN INSULATING
Courtesy of South Seattle Community College



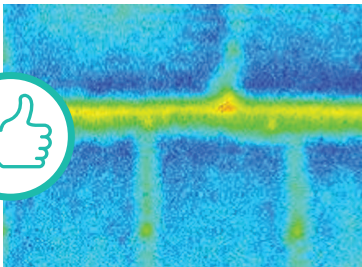
HOSE HAS MAJOR KINK
Courtesy of South Seattle Community College



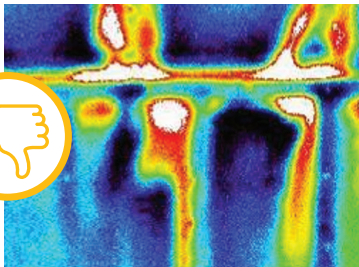
INSULATION ACCESS HOLES PLUGGED AND SEALED WITH SOLID PLUGS
Courtesy of U.S. Department of Energy



VENTED PLUGS FOR INSULATION ACCESS HOLES



INFRARED DENSE WALL PACK
Courtesy of Advanced Energy



INFRARED POORLY INSTALLED WALL INSULATION
Courtesy of Advanced Energy



INSULATING BRICK OR STUCCO WALL FROM INTERIOR
Courtesy of South Seattle Community College



BRICK WALL TO BE INSULATED FROM EXTERIOR

MINIMUM REQUIRED DOCUMENTATION

Contact the serving [utility](#) for specifics on required documentation.

- Documentation that the measure requirements have been met (e.g., manufacturer, model number, type, size and quantity of equipment or product installed or used).
- Documentation of pre-and post-insulation R-values, and square footage of installed insulation.
- Primary heating system type.
- Invoice showing order or purchase date and cost.

PAIRS WELL WITH

- Window and door replacement.
- Attic insulation.
- Underfloor insulation.
- Air Sealing.

SINGLE-FAMILY Floor Insulation

Preparation

- Evaluate crawlspace for ground moisture, crawlspace venting, plumbing leaks, presence of ground cover, and existing rodent infestations and debris.
- Remove all degradable and absorbent scrap materials from the crawlspace, especially wood and cardboard. Repair any water leaks and moisture damage prior to performing work.
- Bulk-water problems and plumbing leaks must be repaired, and standing water drained before insulating.
- Extend all exhaust ducts, such as those for down-flow kitchen ranges and dryers, to the outside of the crawlspace with a code-approved end cap.
- If necessary, install a new 6-mil ground-moisture barrier before installing underfloor insulation.
- The total net-free area of foundation vents must meet code requirements, typically not be less than one square foot for each 150 square feet of underfloor area as a default standard, or 1/300 when vents are evenly distributed around the perimeter.
- Ensure access hatches from the interior or exterior close completely and securely. Weatherstrip and insulate any hatches that connect to the conditioned area of the home.



**Connect with the local
serving utility to confirm pre- and
post-condition requirements.**

PRE-CONDITION:

R-0 to R-11
R-12 to R-19

POST-CONDITION:

R-19, R-25 or R-30
R-30

SPECIFICATION CHECKLIST

For details on all BPA requirements for this measure, please refer to the [BPA Residential Weatherization Specifications and Best Practices Guide](#).

- Size batts to fill the entire joist bay and cut to fit around obstructions so no gaps, voids or compressions exist.
- If the installed batt has a vapor-retarder facing, the facing must be installed against the floor sheathing or be removed.
- Support fiberglass batts so they remain in contact with the subfloor using the following materials, starting no more than 3 inches from the ends:
 - Wood lath needs to be a minimum of ¼ x 1 inch for spans up to 48 inches. Spans greater than 48 inches must use 1 x 2 lumber.
 - Twine must be non-stretching polypropylene or polyester.
 - Wire must be stainless steel, copper or an equivalent material of similar corrosion resistance, with a minimum diameter of 0.040-inch, size 18 AWG.
- Fasteners must be corrosion resistant screws, nails or power-actuated staples that can penetrate wood 5/8 inch. **DO NOT USE SELF-SUPPORTING HANGERS.**
- Spray-foam insulation typically needs no support. When installing fiberglass batts or blown fiberglass underneath foam, as additional floor insulation or as an ignition barrier, support the fiberglass insulation.
- Walls between conditioned space and underfloor spaces:
 - If the floor-joist cavities are open between the conditioned and unconditioned spaces, block with a rigid material and seal with caulk or foam.
 - Insulate the walls to a minimum of R-11 for a 2 x 4 cavity and R-21 for a 2 x 6 cavity.
- Protect underfloor insulation for un-skirted crawlspaces and cantilevered floors with an air barrier.

SINGLE-FAMILY Floor Insulation

Installation Examples



INSULATION FILLS CAVITY, PROPERLY SUPPORTED

Courtesy of U.S. Department of Energy



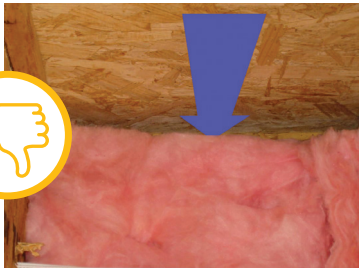
INSULATION DOES NOT FILL CAVITY AND NOT PROPERLY SUPPORTED

Courtesy of ENERGY STAR, U.S. Environmental Protection Agency



INSULATION IN FULL CONTACT WITH FLOOR

Courtesy of ENERGY STAR®, U.S. Environmental Protection Agency



AIR GAP BETWEEN FLOOR AND INSULATION

Courtesy of U.S. Department of Energy



CRAWL HATCH INSULATED AND WEATHERSTRIPPED

Courtesy of Dan Wildenhaus



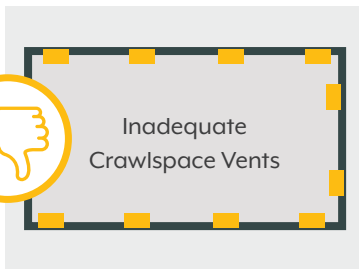
CRAWL HATCH NOT INSULATED

Courtesy of U.S. Department of Energy and Oregon Energy Coordinators Association



VENTED TO MINIMUM AMOUNT AND WELL DISTRIBUTED

Courtesy of Dan Wildenhaus



POORLY VENTED AND NOT EVENLY DISTRIBUTED

Courtesy of Dan Wildenhaus

MINIMUM REQUIRED DOCUMENTATION

Contact the serving [utility](#) for specifics on required documentation.

- Documentation that the measure requirements have been met (e.g., manufacturer, model number, type, size and quantity of equipment or product installed or used).
- Documentation of pre- and post-insulation R-values and square footage of installed insulation.
- Primary heating system type.
- Invoice showing order or purchase date, cost, post-condition.

PAIRS WELL WITH

- Prescriptive air sealing.

GROUND Barrier

Completing complementary preparation steps ensures that your workspace is ready for air sealing, insulation, or duct improvements. Verify that a ground-moisture barrier is present in the crawlspace or install a new ground-moisture barrier before installing underfloor insulation.

- Acceptable materials for a ground-moisture barrier include the following:
 - 6-mil black polyethylene.
 - UV-stabilized and opaque polyethylene.
 - Existing black 4-mil polyethylene may remain if it is in good condition.
- Overlap seams by 12 inches. Best practice is to seal seams.
- Treat unconditioned basements with exposed soil the way you would a vented crawlspace. Cover the exposed soil with a ground-moisture barrier.

Installation Examples



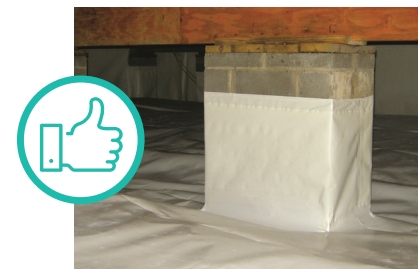
CLEAN, DRY AND COVERED

Courtesy of U.S. Department of Energy



STANDING WATER

Courtesy of U.S. Department of Energy



SEAMS OVERLAP, LAPS UP FOUNDATION

Courtesy of U.S. Department of Energy



MISSING GROUND COVER

Courtesy of U.S. Department of Energy

MANUFACTURED HOME Belly Insulation

Preparation

Manufactured-home floors should not be insulated if a plumbing leak cannot be repaired. Note: insulating manufactured home floors may help keep exterior moisture from moving up into the body.

Install a ground cover in the crawlspace. Six-mil black polyethylene UV-stabilized and opaque polyethylene, existing black 4-mil polyethylene may remain if it's in good condition.

- For non-ducted return systems (refer to 7.1 of BPA Residential Weatherization Specifications and Best Practices Guide). If the floor contains a non-ducted return system, seal the opening to the crawlspace and provide return air to a central location in the home.
- Extend all condensate and/or water drains to the outside of the crawlspace.
- Extend all types of appliance exhaust ducts to outside of the crawlspace. For duct types, refer to 7.1 of BPA Residential Weatherization Specifications and Best Practices Guide.
- Seal all plumbing penetrations and ductwork in the belly or through the floor before installing underfloor insulation.
 - Repair or replace damaged skirting by bringing it as close to the ground as possible to reduce intrusion from animals.



Connect with the local serving utility to confirm pre- and post-condition requirements.

PRE-CONDITION:

R-0 to R-7
R-8 to R-11

POST-CONDITION:

R-22 or maximum
R-22 or maximum possible

SPECIFICATION CHECKLIST

For details on all BPA requirements for this measure, please refer to the [BPA Residential Weatherization Specifications and Best Practices Guide](#).

- Materials used to patch the rodent barrier must be vapor-permeable, durable and capable of supporting the insulation.
- Repair all large holes in rodent barrier with stitch staples and approved materials.
- Determine if the belly is best insulated from the edge or underneath, depending on clearance and access.
- Blow only fiberglass insulation in the floor cavity of a manufactured home.
- Blow to a density, from either beneath through belly or through edge, to a density of 1.25 lbs/ft³ to 1.75 lbs/ft³.

RECOMMENDED

- Identify and flag any combustion-air vents for furnaces, water heaters or stoves/ fireplaces. Confirm they extend below the finished belly material.
- If a crossover duct is present, seal and insulate or replace.
- Replaced crossovers should be rigid sheet metal and insulated to R-11.
- Ensure crossover ducts are well supported and not in contact with the ground cover or ground.

MANUFACTURED HOME Belly Insulation

Installation Examples



CLEAN CRAWL, GOOD GROUND COVER

Courtesy of Oregon Housing and Community Services and Oregon Energy Coordinators Association



UNPREPPED CRAWL, DISCONNECTED DRYER VENT, POOR GROUND COVER

Courtesy of U.S. Department of Energy



REPAIRED AND SUPPORTED BELLY MATERIAL

Courtesy of Pennsylvania College of Technology



BELLY IS NOT WHOLE

Courtesy of Pennsylvania College of Technology



INSULATING BELLY FROM EDGE FILL METHOD

Courtesy of U.S. Department of Energy



UNINSULATED BELLY WITH DUCT LEAKAGE

Courtesy of Pennsylvania College of Technology



PROPERLY FIXING SKIRTING

Courtesy of Santa Fe Community College



NO SKIRTING AROUND HOME

Courtesy of Pennsylvania College of Technology

MINIMUM REQUIRED DOCUMENTATION

Contact the serving [utility](#) for specifics on required documentation.

- Documentation that the measure requirements have been met (e.g., manufacturer, model number, type, size and quantity of equipment or product installed or used).
- Documentation of pre-and post-insulation R-values, and square footage of installed insulation.
- Primary heating type.
- Invoice showing order or purchase date, cost, post-condition.

PAIRS WELL WITH

- Manufactured home roof insulation.
- Manufactured home heat pump installation.
- Heat pump water heater for manufactured homes.



Preparation

Effective methods for insulating manufactured home floors, walls and roof cavities have been developed over the past 25 years. Insulation should not be installed if moisture problems found in wall and roof cavities cannot be corrected. Blowing a closed mobile-home roof cavity is similar to blowing a closed wall cavity, only the insulation does not have to be as dense. Fiberglass blow-in insulation is preferred. Cellulose should not be used due to moisture absorption, density and weight. For high elevations, colder climates, or conditions where the existing roofing needs extensive repairs, rigid insulation on top of the bowed or flat roof deck is highly recommended.

- Inspect all ceiling and roof penetrations for leaks, water damage or physical damage. Repair as needed before insulating ceiling cavities.
 - Address any ponding/standing water issues on the roof.
- If the ceiling cavity contains a non-ducted return-air system, seal the opening to the attic and provide return air to a central location in the home.
- For vented roof cavities, comply with all applicable requirements for Single-family attic prep.
- Determine if edge fill, gable fill, interior fill or top fill with continuous insulation is most appropriate.



**Connect with the local
serving utility to confirm pre- and
post-condition requirements.**

PRE-CONDITION:	POST-CONDITION:
R-0 to R-17	R-22 or maximum possible R-30 or maximum possible

SPECIFICATION CHECKLIST

For details on all BPA requirements for this measure, please refer to the [BPA Residential Weatherization Specifications and Best Practices Guide](#).

- For flat or bowed roofs to include exterior insulation, insulate to at least R-7 with rigid insulation and cover the roof insulation with EPDM, TPO or new roofing product/membrane.
- Insulate attics under pitched roofs to at least R-22 and ventilate the attic to comply with Single-family attic insulation requirements.
- Confirm all roof materials, drains, gutters, penetrations and seams are reinstalled properly to avoid negative effects in the future.
- Insulate ceiling cavities under flat or crowned metal roofs by completely filling them with blown-in fiberglass insulation. Seal all existing attic ventilation except existing roof jacks.
 - Blown-in cavity insulation shall be installed so it completely fills the cavity, with adequate density per the manufacturer's specifications to ensure no settling.
 - Fiberglass blown fill ~0.8 to 1.6 lb/ft³.

RECOMMENDED

- If the manufactured home has a gas, propane or wood-burning space heater, fireplace, stove or other combustion device, install a hardwired carbon monoxide detector.
- Ensure any existing gutter and downspouts are returned to original or better condition.

MANUFACTURED HOME Roof Insulation

Installation Examples



ROOF PENETRATION PROPERLY SEALED

Courtesy of Oregon Housing & Community Services & Oregon Energy Coordinators Association



PENETRATIONS SHOULD BE SEALED FROM THE OUTSIDE

Courtesy of Pennsylvania College of Technology



INSULATED MANUFACTURED HOME ROOF THROUGH EDGE

Courtesy of Santa Fe Community College



UNINSULATED MANUFACTURED HOME ROOF

Courtesy of Santa Fe Community College



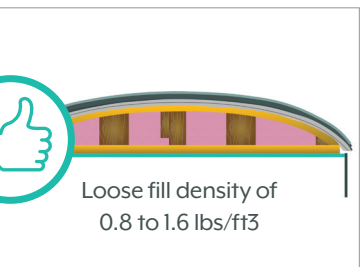
INSULATING BELLY FROM EDGE FILL METHOD

Courtesy of Santa Fe Community College



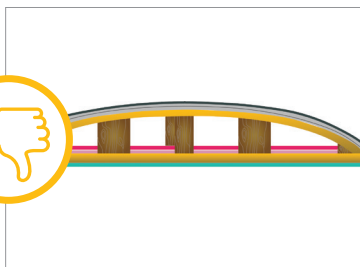
GUTTER NOT PROPERLY ATTACHED, POTENTIAL LEAKS AT ROOF EDGE

Courtesy of Santa Fe Community College



Loose fill density of 0.8 to 1.6 lbs/ft³

FULLY INSULATED BOWED ROOF TO CONSISTENT DENSITY



UNINSULATED ROOF CAVITY

MINIMUM REQUIRED DOCUMENTATION

Contact the serving [utility](#) for specifics on required documentation.

- Description of home (Single-family, Multifamily or manufactured).
- Number and square footage of windows or patio doors replaced.
- Pre-condition (frame type, i.e., wood, metal, single-or double-paned).
- Primary heating type.
- Invoice showing order or purchase date, cost, post-condition U-value (NFRC stickers or other verification).
- Documentation that the measure requirements have been met (e.g., manufacturer, model number, type, size and quantity of equipment or product installed or used).

PAIRS WELL WITH

- Window, floor, wall insulation.
- Whole-house air sealing.
- HVAC upgrades.



Old, leaky windows and doors are commonly identified as a major issue which can impact overall home durability and comfort. In some cases, older, well-used windows and doors create drafts because they do not close completely.

In homes built before 1990, it is common to find single-paned and aluminum-framed windows that offer minimal resistance to heat loss in the winter and can cause discomfort for occupants. Windows without Low-emissivity, or Low-E, glazing allow solar energy to overheat the house in summer.

Prime Window and Patio Door Replacement

Older windows and patio doors tend to be single-paned, uninsulated, and often have deteriorating or minimal weatherstripping. They can also have problems with window operation, noticeable leakage, damaged or decayed frame(s), or condensation. Installing newer, energy-efficient windows and patio doors can result in lower heating and cooling costs.

Low-E Storm Windows

Installing new, affordable, ENERGY STAR certified, Low-E storm windows is a great way to help reduce home heating and cooling energy costs. A window with Low-E coating reduces heat loss when it is cold and Low-E coatings with a low solar transmittance, or TSOL, can block excessive solar heat during summer months.

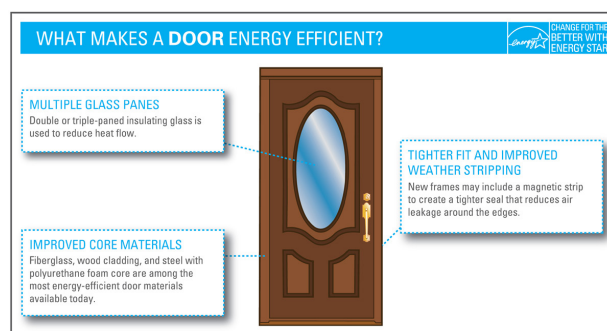
Exterior Insulated Doors

Installing a new exterior insulated door can increase the energy efficiency of a home and increase the home's comfort.

Replacing an uninsulated or damaged door with a new door is recommended when:

- Drafts are noticed.
- Light is visible between the door leaf and frame.
- Hinges are worn and noisy. The door does not operate properly or scrapes along floor.
- Insects are able to enter the home when the door is closed.

The door must either be ENERGY STAR certified or be NFRC-rated. If the door is not ENERGY STAR certified or NFRC-rated, or the ENERGY STAR list is not accessible, utilities may comply by documenting that the door meets [ENERGY STAR specifications](#).



PRIME Window and Patio Doors

Qualifications

May be eligible for Single-family, Multifamily, manufactured homes. Primary heating must be electrical. Pre-existing windows and patio doors must be: (1) single-paned with/without storms, any frame type (e.g., metal, wood, or vinyl) or (2) double-pane, metal frame only.

The replacement windows must have an NFRC minimum U-value of 0.30 or 0.22 for windows, and 0.35 or 0.30 for patio doors.

Window and patio door measures in Single-family and manufactured homes must be installed according to the [BPA Residential Weatherization Specifications and Best Practices Guide](#).



Connect with the local serving utility to confirm pre- and post-condition requirements.

PRE-CONDITION:

Single-paned with/without storms (metal, wood, or vinyl) or double-pane, metal frame only.

POST-CONDITION:

U-Values: Windows 0.30 - 0.22, Patio Doors 0.35 - 0.30

SPECIFICATION CHECKLIST

For details on all BPA requirements for this measure, please refer to the [BPA Residential Weatherization Specifications and Best Practices Guide](#).

- Confirm all windows and patio doors are installed with NFRC stickers attached.
- Support the bottom rail of a patio door within ½ inch of the exterior edge of the frame.
- Ensure replacement window and window opening have been properly incorporated into the home's water-resistive barrier using proper flashing techniques for each specific window type.
- Verify windows are caulked and sealed properly including structural frame, exterior wood, frame, sash, trim, stops and sills. Use of backer rod or non-expanding foam and caulk where gaps are greater than 3/8 inch.
- Confirm all hardware and fasteners are aluminum, stainless steel or another noncorrosive material.
- Verify that windows operate smoothly and safely.
- Ensure job site is left clean and orderly. Remove all scrap materials, tools and equipment.

PRIME Window and Patio Doors

Installation Examples



DOUBLE-PANED WINDOW, INSTALLED WITH PROPER FLASHING



UNINSULATED WINDOW WITH CONDENSATION



PROPER FLASHING WINDOW TO WEATHER BARRIER

Courtesy of U.S. Department of Energy



IMPROPERLY FLASHED WINDOW

Courtesy of U.S. Department of Energy



BACKER ROD FOR SEALING AROUND WINDOW

Courtesy of U.S. Department of Energy



HIGH-EXPANSION FOAM, NOT APPROPRIATE AROUND WINDOWS



BACKER ROD AND CAULK COMPLETE SEAL AROUND WINDOW FRAME

Courtesy of U.S. Department of Energy



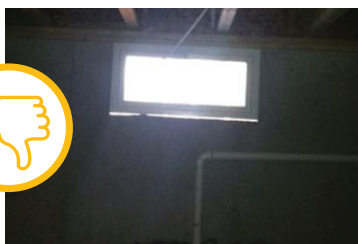
INCOMPLETE SEAL AROUND NEWLY INSTALLED WINDOW

Courtesy of U.S. Department of Energy



PROPER FIT WINDOW, LEVEL, AND SEALED

Courtesy of Santa Fe Community College



WINDOW INSTALL NOT SEALED, IMPROPERLY FIT

Courtesy of U.S. Department of Energy

MINIMUM REQUIRED DOCUMENTATION

Contact the serving [utility](#) for specifics on required documentation.

- Description of home (Single-family, Multifamily or manufactured).
- Number and square footage of windows or patio doors replaced.
- Pre-condition (frame type, i.e., wood, metal, single-or double-paned).
- Primary heating type.
- Invoice showing order or purchase date, cost, post-condition U-value (NFRC stickers or other verification).
- Documentation that the measure requirements have been met (e.g., manufacturer, model number, type, size and quantity of equipment or product installed or used).

PAIRS WELL WITH

- Attic, floor, wall insulation.
- Whole-house air sealing.
- HVAC upgrades.

LOW-E Storm Windows

Qualifications

- May be eligible for Single-family, Multifamily low-rise, manufactured homes (Multifamily mid- and high-rise buildings are not eligible).
- Existing window condition must be either (1) single-paned, any frame type (e.g., metal, wood, or vinyl) without existing storm windows; or (2) double-paned, metal frame only without existing storm windows.



Connect with the local serving utility to confirm pre- and post-condition requirements.

PRE-CONDITION:

Single-paned, any frame type (e.g., metal, wood, or vinyl) without existing storm windows or double-paned, metal frame only without existing storm window.

POST-CONDITION:

New ENERGY STAR certified Low-E storm window.

SPECIFICATION CHECKLIST

- When installed with an existing metal frame window, the storm window frame must not be in direct contact with the metal frame. Use framing lumber or furring strips to create space between window frames.
- Storm window must have the same opening type as existing window (i.e., double hung, slider, etc.) to facilitate summertime ventilation and egress.
- New Low-E storm windows must be installed per manufacturer's specifications.
- Storm windows must be permanently fastened with screws and not designed for seasonal removal.
- Install storm window so that the Low-E coating is facing the interior of the home.
- Make sure the gap around the perimeter of the window is even. A 1/16-inch gap is ideal.
- Caulk the sides and top of the window opening before you screw the window into place. Storm windows are designed to allow water or condensation to drain, so do not caulk the bottom.
- Verify that windows with openings operate smoothly and safely.
- Ensure the job site is left clean and orderly. All scrap material, tools and equipment have been removed.
- Confirm all hardware and fasteners are aluminum, stainless steel or another noncorrosive material.

LOW-E Storm Windows

Installation Examples



SINGLE-PANED ALUMINUM WINDOW WITH WELL-FIT STORM WINDOW

Courtesy of U.S. Department of Energy



SINGLE-PANED ALUMINUM WINDOW WITH NO STORM OR LOW-E PROTECTION

Courtesy of U.S. Department of Energy

MINIMUM REQUIRED DOCUMENTATION

Contact the serving [utility](#) for specifics on required documentation.

- Description of home (Single-family, Multifamily or manufactured).
- Number and square footage of windows replaced.
- Pre-condition (frame type, i.e., wood, metal, single- or double-paned).
- Primary heating type.
- A copy of the ENERGY STAR product list showing the product, or the product information insert or packaging that includes the ENERGY STAR logo.
- Invoice showing or purchase date and cost.
- Documentation that the measure requirements have been met (e.g., manufacturer, model number, type, size and quantity of equipment or product installed or used).

PAIRS WELL WITH

- Attic, floor, wall insulation.
- Whole-house air sealing.
- HVAC upgrades.

INSULATED Exterior Doors

Qualifications

- The new door must be a pre-hung, ENERGY STAR certified door and include replacement of the threshold, or be NFRC-rated.
- If the door is not ENERGY STAR certified or be NFRC-rated, or the ENERGY STAR list is not accessible, utilities may comply by documenting that the door meets ENERGY STAR specifications.
- New door glazing must meet or exceed the following U-factor ratings:
 - Opaque: less than or equal to 0.17
 - 1/2 lite: less than or equal to 0.25
 - Greater than 1/2 lite: less than or equal to 0.30
- Ensure the new door frame is square, has equal margins around the door and that the margins are insulated, sealed and caulked.
- Verify the jamb is not bowed and the door is not warped or twisted.
- Inspect and test door hardware, fasteners, strike plate and latch are flush, installed correctly, functioning and properly adjusted.
- Make sure weatherstripping is installed and sealing in the corners, corner pads are in place and that the threshold/sill is continuously bedded with caulk.



**Connect with the local
serving utility to confirm pre- and
post-condition requirements.**

PRE-CONDITION:

Substandard exterior door, such as one that does not contain an insulating material and/or one where the weatherstripping has degraded by at least 50%.

POST-CONDITION:

Pre-hung, ENERGY STAR certified door, with a new threshold

SPECIFICATION CHECKLIST

Please refer to the [ENERGY STAR specifications](#) for residential doors for more details.

- All replacement hardware/fasteners: stainless steel or another corrosion-resistant material.
- Older door: carefully remove, leave housing structure and door trim undamaged, and repair or replace framing structure if rotted.
- Door sub-sill: ensure area is solid and level before installation. Use acrylic caulk, a minimum of three beads 1-inch apart along the full width of sub-sill.
- Installation: shims must be installed approximately 8 inches from top and bottom corners, at the hinges, and above and below the strike plate. The door must be centered and plumb in opening with straight jambs. Screws, at least 3-inches long, should be installed through jamb, shims and into framing.
- Space between jamb and rough opening: must be filled with low-expanding foam or caulk. Backer rod should be installed in gaps larger than 3/8 inch.
- The door must be incorporated into the home's water-resistive barrier.
- Doors exposed to wind-driven rain or without overhang: Install riding-cap flashing overlapping sides of door frame.
- Doors with overhanging head flashing: new flashing must be tucked behind existing head flashing.
- Doors without overhanging metal head flashing: install new metal head flashing at top of door frame, behind existing siding and building paper.
- Metal head flashing: must be installed behind the exterior siding at least 1 inch, with a downward bending lip of at least ¼ inch on front and ends of metal head flashing.
- Exterior wood: must be caulked and primed. All filler and trim pieces must be thoroughly caulked, including brick molding, door frame, and trim on all sides and ends.
- Finished door, latch and lockset: ensure they operate smoothly. Closed door should evenly compress weatherstripping.
- Job site: must be kept clean and orderly; remove all scrap material, tools and equipment.

INSULATED Exterior Doors

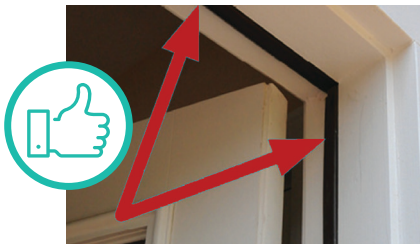
Installation Examples



NEW ENERGY STAR DOOR



INEFFICIENT DOOR NEEDS TO BE REPLACED



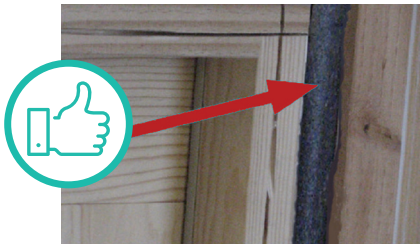
GOOD WEATHERSTRIPPING

Courtesy of U.S. Department of Energy



BAD AIR LEAKS AROUND DOOR. LIGHT IS VISIBLE IN THE CRACKS

Courtesy of U.S. Department of Energy



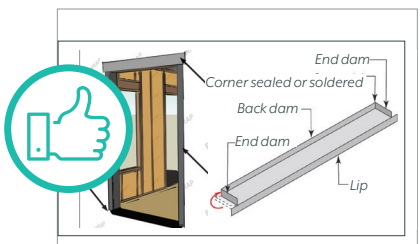
CLOSED-CELL FOAM SEALS THE GAP

Courtesy of U.S. Department of Energy



LOOSE-FILL INSULATION ALLOWS MOISTURE AND AIR INFILTRATION

Courtesy of U.S. Department of Energy



PROPERLY SEALED AND FLASHED DOORS PREVENT WATER DAMAGE

Courtesy of U.S. Department of Energy



IMPROPERLY FLASHED DOOR HAS STRUCTURAL DAMAGE DUE TO WATER PENETRATION

Courtesy of U.S. Department of Energy

MINIMUM REQUIRED DOCUMENTATION

Contact the serving [utility](#) for specifics on required documentation.

- Documentation that the measure requirements have been met (e.g., manufacturer, model number, type, size and quantity of equipment or product installed or used).
- Number of doors replaced.
- ENERGY STAR product list showing the product, or packaging that includes the ENERGY STAR logo or list the NFRC-rating.
- Documentation of the door's pre- and post-conditions.
- Invoice showing date and cost.
- Primary heating system type.

PAIRS WELL WITH

- Whole-house air sealing.
- Prescriptive air sealing.
- Attic, floor and wall insulation.
- Ductless or air-source heat pump.

PRESCRIPTIVE Duct Sealing

HVAC ducts located in unconditioned spaces may experience energy loss due to air leaks and heat transfer through the ducts' walls. This can lead to energy waste and can create discomfort if heated air doesn't reach all the rooms. Uninsulated ducts in exterior spaces and small gaps in the ductwork can result in significant energy loss and poor system performance.

Sealing gaps in ductwork, and repairing or reconnecting older duct connections, helps ensure conditioned air is directed to the intended areas and not wasted in attics or crawlspaces.

Prescriptive duct sealing is offered for existing Single-family and manufactured homes with ducts connected to electric heat. Become familiar with the [Prescriptive Duct Sealing Program Requirements for Technicians](#) as well as the [Prescriptive Duct Sealing Specifications](#).

For more information about prescriptive duct sealing, please contact ResEEprogram@bpa.gov.



PRESCRIPTIVE Duct Sealing

Qualifications

- This applies to repairing and sealing existing ductwork in Single-family homes and manufactured homes, heated with an electric forced air furnace and/or a heat pump.
- Prescriptive duct sealing shall be performed by a technician according to BPA Prescriptive Duct Sealing specifications and documented on the Prescriptive Duct Sealing form.
- At least 30% of the supply ducts must be in unconditioned space unless there is a high-pressure leak within 15 feet of an air handler in an unconditioned space.
- The presence of insulation alone shall not be considered a barrier to accessibility unless the contractor suspects asbestos may be present. In this case, the contractor shall stop work immediately and notify the homeowner that the site requires professional assessment, and possibly remediation prior to duct sealing.
- Resealing of ducts is allowed at utility discretion (i.e., a second duct sealing only) provided that all other program requirements are met.



**Connect with the local
serving utility to confirm pre- and
post-condition requirements.**

PRE-CONDITION:

Unsealed and
accessible ductwork

SPECIFICATION CHECKLIST

Your project may have unique requirements. See the [BPA Prescriptive Duct Sealing Specifications](#) for additional details.

- All accessible portions of the duct system shall be repaired and mechanically fastened where needed and properly supported.
 - Interior sections of ineffective or damaged ducts shall be repaired or replaced before duct sealing.
- All accessible portions of the duct which require sealing shall be exposed and sealed with approved materials. The following are examples of sealing opportunities: plenum; air-handler cabinet to plenum; plenum-to-takeoff connections; finger/dovetail joints; branch T's, Y's and L's; supply-and-return boots; duct-to-duct connections; gored adjustable elbows; end caps.
 - Large gaps in ducts should be repaired with sheet metal and sheet metal screws or mesh-reinforced tape and mastic.
 - All metal ducts shall be secured with at least three screws at each connection.
- All flexible ducts connections to rigid ducts shall be tightly fastened at both inner and outer lining using a compression (Panduit or equivalent) strap tightened with a manufacturer-approved tensioning tool.
- Loose tape shall be removed from rigid metal ducts prior to sealing. Secured tape that remains must be completely covered with mastic, which shall extend at least 1/2 inch beyond the tape edge on either side and be at least 1/8 inch thick.
- Cloth-backed duct tape shall not be used to seal, secure or fasten ducts.
- All rigid duct joints shall be sealed with UL-181 listed mastic, applied per manufacturer specifications.

PRESCRIPTIVE Duct Sealing

Installation Examples



DUCT PROPERLY SUPPORTED

Courtesy of Advanced Energy



DUCT IS NOT PROPERLY SUPPORTED

Courtesy of Advanced Energy



PLENUM SEALED WITH WATER BASED, FIBER EMBEDDED DUCT SEALING MASTIC

Courtesy of Advanced Energy



UNSEALED DUCT PLENUM

Courtesy of Advanced Energy



FLEX DUCT IS PROPERLY FASTENED TO METAL DUCT WITH MECHANICALLY TIGHTENED STRAP

Courtesy of Advanced Energy



FLEX DUCT IS NOT MECHANICALLY FASTENED TO METAL DUCT

Courtesy of Advanced Energy

MINIMUM REQUIRED DOCUMENTATION

Contact the serving [utility](#) for specifics on required documentation.

- Invoice showing order or purchase date and cost.
- [Prescriptive Duct Sealing Form](#)

PAIRS WELL WITH

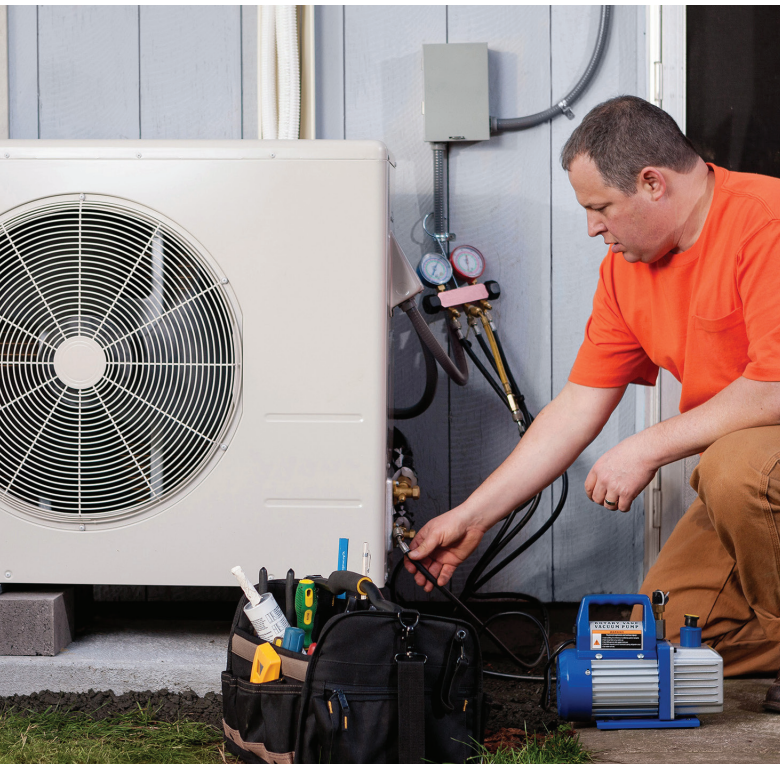
- Duct insulation.
- Home insulation.
- Prescriptive air sealing.
- Air source heat pump.



Comfort Ready Home Program

MECHANICAL

Measures



Mechanical systems play a large role in a building's energy use. Efficient, properly installed systems, along with programmable thermostats, can substantially reduce energy consumption.

Efficient heat pumps can reduce electric energy use up to 50%, compared to electric resistance heat.

Properly sized and selected heat pump equipment is important for system performance. Cold-Climate heat pumps (also known as 'Extended Capacity') extend the heating capacity down to -15° F providing year-round comfort in colder regions with less reliance on backup auxiliary heat. Properly designed, installed and commissioned heat pumps are 2.4 to 4 times more efficient than electrical resistance furnaces, cadets, and baseboard heaters and can provide comfort and value equivalent to gas and propane furnaces. An air-source heat pump is similar to an air conditioner, except for a reversing valve that allows refrigerant to follow two different paths: one for heating and one for cooling.

Some heat pumps come with auxiliary electric resistance heat, also called strip heat. The energy efficiency of a heat pump is largely determined by how much of the heating load can be handled by the heat pump's compressor without the aid of the strip heat.

The efficiency for new heat pumps is designated as Heating System Performance Factor 2, or HSPF2, for heating performance and Seasonal Energy Efficiency Rating 2, or SEER2, for cooling performance. Beginning January 2023, the Department of Energy (DOE) updated the national standard testing methodology and all newly manufactured heat pumps must meet the current federal minimum standards for HSPF2 and SEER2. HSPF2 and SEER2 ratings follow the same formula as the HSPF and SEER ratings but under more stringent test conditions. All air-source heat pumps incentivized by BPA need to meet the federal minimums for HSPF2 and SEER2. If a heat pump unit was manufactured before January 2023, it must meet the equivalent federal minimum efficiency standard for HSPF and SEER to qualify for an incentive.



Always check with the local utility for available incentives and minimum specifications in your area.

Your local utility may offer incentives for ductless heat pumps, air-source heat pumps, ground-source heat pumps, duct sealing and thermostats. For ducted air-source heat pumps, BPA offers incentives for standard heat pumps and variable-speed heat pumps.



DUCTLESS Heat Pumps

Applications

- Displacing the home's heating load with a single- or multiple-head system or replacing entire heating load with multiple systems. In smaller homes, a single multi-headed system may replace entire load.
- Existing homes where plug-in electric heaters are confirmed as the primary heating system in the home.
- Single-family residential additions where the primary electric or nonelectric system's duct work has not been extended to the addition and/or where the current heating source in the addition is electric zonal.
- Only one ductless heat pump, or DHP, may be claimed per home, regardless of the number of outdoor or indoor units installed and regardless of the home's square footage.



Connect with the local serving utility to confirm pre- and post-condition requirements.

PRE-CONDITION:

Electric forced air furnace or electric resistance zonal heat (baseboards, wall heaters, IR panels, ceiling cable heat) as the primary heating system.

SPECIFICATION CHECKLIST

- Heating Season Performance Factor: Ductless or ducted mini-split must be a split-system heat pump employing an inverter-driven outdoor compressor, with inverter-driven or variable-speed indoor blower, that meets the current federal minimum HSPF2.
- DHP or ducted mini-split must be certified by the Air-Conditioning, Heating, & Refrigeration Institute (AHRI) and a copy of the AHRI certificate is required. For cooler climates, it's highly recommended to search for products on the [Northeast Energy Efficiency Partnership](#) Cold Climate Air Source Heat Pump database.
- DHP must be installed on a dedicated electrical circuit, according to manufacturer's specifications and the [Best Practices for Installing Ductless Heat Pumps Guide](#).

Recommended

May be required by your local utility.

- Systems should be designed, sized and selected to offset at least 30% of the building's heating load at the winter designated temperature for the home's location.
- When installing refrigerant lines, create new flares using appropriate flaring tool and measurement gauge. **DO NOT USE** manufacturer-provided tubing flares and fitting.
- Set the outdoor unit on a stable, level surface or appropriate bracket and secure to the pad, risers and/or resting surface using bolts.
- Install outdoor unit in clear area that allows optimal airflow through fan.
- Insulation must cover entire line set length to avoid condensation and decreased efficiency, and protect the outdoor line set from insulation damage with rigid line hide and building-code approved line set protection.
- Condensate drains must slope downhill. They can be routed with the line set and run to a suitable termination point, away from crawlspaces and walkways.

DUCTLESS Heat Pumps

Installation Examples



DISPLACEMENT OF ELECTRIC-RESISTANCE HEAT IS INCENTIVIZED
Courtesy of NW Ductless Heat Pump Project



ONE INCENTIVE PER HOME, REGARDLESS OF THE NUMBER OF INDOOR HEADS
Courtesy of Better Built NW



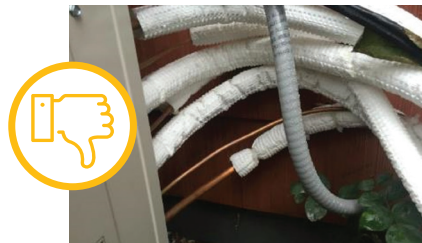
HSPF2 MEETS THE FEDERAL MINIMUM HSPF2 PER SPECIFICATION
Courtesy of ENERGY STAR, U.S. Environmental Protection Agency



HSPF2 DOES NOT MEET THE FEDERAL MINIMUM HSPF2 SPECIFICATION
Courtesy of ENERGY STAR, U.S. Environmental Protection Agency



ALL LINE SET/REFRIGERANT LINES PROPERLY INSULATED
Courtesy of PTCS



LINE SET/REFRIGERANT LINES NOT COMPLETELY INSULATED
Courtesy of NW Ductless Heat Pump Project



CONDENSATE DRAIN IS CONNECTED TO DOWNSPOUT
Courtesy of NW Ductless Heat Pump Project



CONDENSATE DIRECTLY LEAKS ONTO A WALKWAY

MINIMUM REQUIRED DOCUMENTATION

Contact the serving [utility](#) for specifics on required documentation.

- Manufacturer, model number, type, size and quantity of product installed.
- Invoice showing equipment ordered, or purchase date, cost.

QUALIFIED PRODUCT LIST AND GUIDES

[Best Practices for Installing Ductless Heat Pumps](#)

[NEEP list](#)

PAIRS WELL WITH

- Prescriptive air sealing.
- Insulation.
- Heat pump water heater.



Applications

- Homes heated with an electric forced-air furnace or non-variable speed centrally ducted air source heat pump or ground-source heat pump.
- Existing homes where the existing thermostat is non-qualifying.
- Single-family existing homes, low-rise Multifamily units and manufactured homes.
- One smart thermostat per qualifying system, with a limit of two per household.
- Note: Advanced thermostats are NOT recommended for variable-speed heat pumps or for DHPs.



Connect with the local serving utility to confirm pre- and post-condition requirements.

PRE-CONDITION:

Electric-resistance heat furnace, air-source heat pump or ground-source heat pump and existing non-qualifying thermostats.

SPECIFICATION CHECKLIST

- Thermostat must be on [BPA's Residential Smart Thermostat Qualified Product List \(QPL\)](#). To meet the standards of the QPL, thermostats must be ENERGY STAR certified or have an independent evaluation(s) demonstrating energy savings for the thermostat.
- Thermostat must have a built-in occupancy sensor with the function set to "on" or come packaged with an external occupancy sensor. The external occupancy sensor must be configured according to the manufacturer's settings.
- Thermostat must be set to the geographic location where it is located (home).
- Thermostat must be Wi-Fi enabled with remote access.
- Thermostat must be 7-day programmable or have learning- based scheduling.
- If the thermostat controls a heat pump, it must be programmed to control the heat pump and have heat pump auxiliary-heat control and optimization.

Recommended

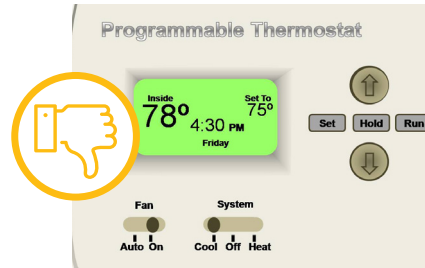
- Educate homeowner on thermostat operation and programming.

ADVANCED Smart Thermostats

Installation Examples



SMART THERMOSTAT WITH OCCUPANCY SENSOR



STANDARD PROGRAMMABLE THERMOSTAT

Courtesy of U.S. Department of Energy

MINIMUM REQUIRED DOCUMENTATION

Contact the serving [utility](#) for specifics on required documentation.

- Manufacturer, model number and serial number of each thermostat.
- Heating system controlled by the thermostat.

QUALIFIED PRODUCT LIST AND GUIDES

- [Residential Smart Thermostat Qualified Products List](#).

PAIRS WELL WITH

- Prescriptive air Sealing.
- Prescriptive duct sealing.
- Insulation.
- Non-variable speed air-source heat pump.

AIR-SOURCE Heat Pumps

Applications

- Air-source heat pump conversions are available to existing single-family and existing manufactured homes with whole-home centrally ducted electric forced-air furnaces.
- Variable-speed air-source heat pump conversions are available to existing single-family and existing manufactured homes with whole-home centrally ducted electric forced-air furnaces.
- Variable-speed air-source heat pump upgrades are available when: installing in an existing single-family or existing manufactured home without any previously existing primary heating system; adding to a nonelectric heating system (e.g., gas, oil, propane, or wood); upgrading from a zonal heating system (including zonal hydronic systems that do not utilize a duct system for distribution); or, replacing a ductless mini-split heat pump.
- Generally, homes with less than 4,500 square feet of heated floor area may qualify for only one heat pump rebate.



**Connect with the local
serving utility to confirm pre- and
post-condition requirements.**

PRE-CONDITION:

Electric forced
air furnace

Electric forced air
furnace, ducted
air-source heat
pump, ductless
mini-split heat pump,
electric resistance
zonal heat, wood,
oil, propane, gas, or
no existing primary
heating system.

POST-CONDITION:

Air-Source
Heat Pump

Variable-Speed Air-
Source Heat Pump

SPECIFICATION CHECKLIST

- The new air-source heat pump (ASHP) or variable-speed heat pump (VSHP) must have an HSPF2 and SEER2 efficiency rating that meets or exceeds the federal minimum efficiency standards as certified by the Air-Conditioning, Heating, and Refrigeration Institute (AHRI).
- HSPF2 and SEER2 apply to units manufactured after January 1, 2023, based on DOE's change to the national standard testing methodology. If a unit was manufactured before January 1, 2023, it must meet the current federal minimum efficiency standard for HSPF and SEER per the AHRI certificate.
- Variable-Speed Heat Pumps: Installation contractor must provide utility with manufacturer documentation that the outdoor compressor includes variable-speed or inverter-driven technology (e.g., specification sheet or brochure that documents the model has a variable-speed or inverter-driven compressor.)

Recommended

Below are some best practices to consider when installing the new air-source heat pump. For more installation best practices, please refer to the [BPA ASHP and VSHP Specifications and Installation Best Practices guide](#). Be sure to check with your local utility for specific program requirements.

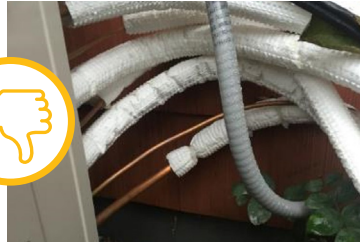
- System should be sized using a balance point based on equipment manufacturer's balance point worksheet.
- Follow industry best practices for vacuum decay test and refrigerant leak test.
- If the basement is part of the conditioned space (i.e. duct work provides conditioned air to a finished or unfinished basement), it should be included in the sizing calculations.
- Variable-Speed Heat Pumps: External Static Pressure should match the target airflow rate as per manufacturer's documentation.

AIR-SOURCE Heat Pumps

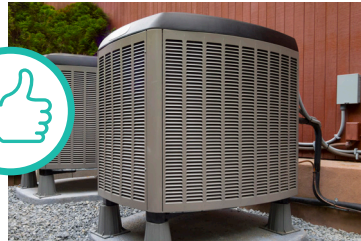
Installation Examples



ALL LINE SET/REFRIGERANT LINES PROPERLY INSULATED
 Courtesy of PTCS



LINE SET/REFRIGERANT LINES NOT COMPLETELY INSULATED
 Courtesy of NW Ductless Heat Pump Project



OUTDOOR UNIT SET ON A STABLE, LEVEL SURFACE AND SECURE TO THE PAD USING BOLTS



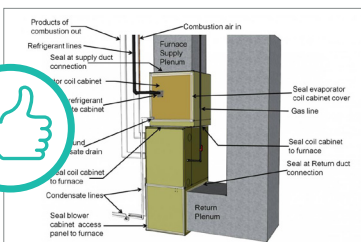
OUTDOOR UNIT SET DIRECTLY ON THE GROUND



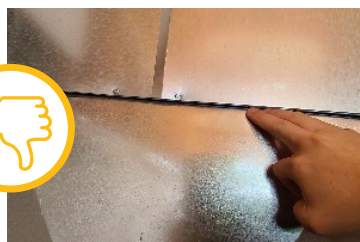
OUTDOOR UNIT INSTALLED IN CLEAR AREA THAT ALLOWS OPTIMAL AIRFLOW THROUGH FAN



OUTDOOR UNIT INSTALLED IN A CONSTRAINED AREA THAT LIMITS OPTIMAL AIRFLOW THROUGH FAN



OPENINGS IN THE UNIT CABINET SHOULD BE PROPERLY SEALED
 Courtesy of Building America Solutions Center



OPENINGS IN THE UNIT CABINET NOT PROPERLY SEALED
 Courtesy of Building America Solutions Center

MINIMUM REQUIRED DOCUMENTATION

Contact the serving [utility](#) for specifics on required documentation.

- Manufacturer, model number, type, size and quantity of product installed.
- Invoice showing order or purchase date, cost.
- [AHRI Certificate](#) documenting that the product meets Federal minimum HSPF2 and SEER2.
- If the unit has a variable-speed compressor, include manufacturer documentation that the outdoor compressor includes variable-speed or inverter driven technology.

QUALIFIED PRODUCT LIST AND GUIDES

[BPA ASHP Specifications and Best Practices](#)

[NEEP's Cold Climate Air-Source Heat Pump Specification and Product List](#)

[NEEP's Guide to Sizing & Selecting Air-Source Heat Pumps in Cold Climates](#)

PAIRS WELL WITH

- Prescriptive air sealing.
- Prescriptive duct sealing.
- Duct insulation.
- Insulation.
- Heat pump water heater.
- Smart thermostats.



Heat pump water heaters are a proven technology that improve water-heating energy efficiency. Water heating accounts for roughly 18% of home energy use and standard water heaters require a significant amount of energy to heat water. In contrast, heat pump water heaters use less than half the energy of a standard electric resistance water heater.

Unitary (drop-in) Heat Pump Water Heaters

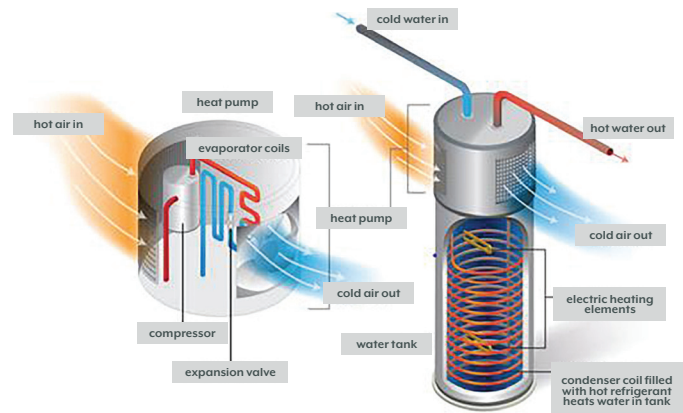
Heat pump water heaters with the air-to-refrigerant heat exchanger integrated onto the top of the tank are called unitary systems. Unitary systems are useful in several design scenarios by offering advantages, including:

- Straight forward replacement of standard electric resistance tank water heaters in many locations.
- Eligible units on the Qualified Products List are quiet and typically come with 10-year warranties.
- Unitary equipment provides the option of no venting, venting the exhaust, venting the incoming air, or venting both, depending on the location and surrounding conditions.

Split-System Heat Pump Water Heaters

Heat pump water heaters with the heat pump on the home's exterior, connected with piping to a separate tank on the home's interior or in a garage are called split systems. Split systems are useful in several design scenarios by offering advantages, including:

- Some split systems currently on the market use carbon dioxide as a refrigerant, which has an insignificant global warming potential, compared to conventional refrigerants like R-134a.
- The tank can be in a confined space without access to airflow.
- No cool air is created inside the house.
- The heat pump is outside the house, reducing indoor noise.



Installation Considerations

Installing a heat pump water heater is essentially the same as installing an electric resistance water heater, so no additional trades are needed onsite. Talk with your customer about where the new heat pump water heater tank will be located. Some locations will require additional venting, which may increase the cost but will also avoid a customer's potential dissatisfaction with additional cool air in the home. Note that it's a best practice to install a UL- or CUL-certified carbon monoxide detector when exhausting an interior heat pump water heater and the home contains a natural gas, propane, wood or oil appliance such as a stove or fireplace.

Check out HotWaterSolutionsNW.org for more resources or the [BetterBuilt NW Heat Pump Water Heater Technical Guide](#).

HEAT PUMP Water Heaters

Requirements

Unitary & split-system heat pump water heaters must be:

- Tier 3 or higher on BPA's Heat Pump Water Heater Qualified Products List.
- Installed according to manufacturer's specifications.
- A maximum of one heat pump water heater measure may be claimed per home. Accessory dwelling units with separate plumbing systems qualify, even if they are on the same electrical meter.
- Available for existing Multifamily housing, existing Single-family homes and manufactured homes.

Split-system heat pump water heaters must also meet the following qualifications:

- All water or refrigerant lines connecting the tank and outdoor units shall be insulated with minimum R-4.
- If domestic hot water pipes outdoors are freeze-protected with heat cable, the cable shall be installed per manufacturer's instructions, underneath the insulation and shall be thermostatically controlled to prevent the tape from operating above 38 degrees Fahrenheit.
- No resistance heating is allowed, except heat tape for freeze protection.
- System plumbed with a thermal mixing valve and equipped with internal check valves on the hot and cold-water lines connecting to it.



Connect with the local serving utility to confirm pre- and post-condition requirements.

SPECIFICATION CHECKLIST

- Follow manufacturer specifications regarding water heater clearance, intake and exhaust configurations, and seismic strapping.
- Position the unit so the control panel is facing outward and easily accessible to the homeowner. Make sure all data connection ports are accessible.
- Aim the exhaust air away from the center of the room so it does not inadvertently blow on anyone walking past. Direct exhaust away from any thermostats.
- If installing in a conditioned space (inside the heated portion of the home), consider ducting either the exhaust, or both the exhaust and intake to reduce cool air being added into the home.
- Ensure the intake air path is clear of obstruction, and the filter can be removed for cleaning and maintenance. For some installations, a ducted inlet and/or exhaust may be appropriate.
- Ensure that the positioning allows for easy access to inspect the water heater and controls, change the air filter and drain the tank.
- Provide condensate drainage as required by local code. Ensure the water heater is level so condensate properly collects into, and drains from, the condensate collection pan if used.
- Provide minimum R-10 foam pad under the heat pump water heater to minimize unnecessary heat loss through the bottom of water heater.
- Insulate the hot water piping to at least the minimum requirements in accordance with your local codes.
- If installing on a floor susceptible to water damage, install a drain pan to guard against any problems from future leaks.
- Wiring is grounded and proper wire gauge is used. Note: Most heat pump water heaters still have full-size resistance elements, so wiring requirements are identical to standard electric-resistance water heaters.
- Mode of operation is set at a minimum, to hybrid, and preferably heat-pump only.
- Job site is left clean and orderly. All scrap material, tools and equipment have been removed.

HEAT PUMP Water Heaters

Installation Examples



MEETS MINIMUM EFFICIENCY AND FOUND ON QPL

Courtesy of Northwest Energy Efficiency Alliance



DOES NOT MEET MINIMUM EFFICIENCY

Courtesy of Santa Fe Community College



INSULATE WATER PIPES TO PREVENT HEAT LOSS

Courtesy of NW Ductless Heat Pump Project



UNINSULATED HOT WATER PIPE FROM WATER HEATER

Courtesy of ENERGY STAR, U.S. Environmental Protection Agency



WHEN INSULATION IS NOT ENOUGH, USE HEAT TAPE TO PREVENT FREEZING



FROZEN PIPE DEVELOPS LEAK



DRAIN PANS CAN HELP PREVENT MESSSES AND WATER DAMAGE



NO DRAIN PAN OR LEAK DETECTION

MINIMUM REQUIRED DOCUMENTATION

Contact the serving [utility](#) for specifics on required documentation.

QUALIFIED PRODUCT LIST AND GUIDES

- [Heat Pump Water Heaters Qualified Product List.](#)
- [Better Built NW Heat Pump Water Heater Technical Guide.](#)

PAIRS WELL WITH

- Ductless or air-source heat pump.
- Whole-house air sealing.
- Attic, floor and wall insulation.
- Appliance measures.

Comfort Ready Home Program

ADDITIONAL Measures

ADDITIONAL MEASURES

Check with your local serving utility for available incentives on these additional BPA-qualifying measures.



Programmable Line Voltage Thermostats

Programmable line voltage thermostats are typically used to control baseboard, ceiling and wall heaters. The thermostat saves energy by controlling set schedules and enabling the heater to be turned on or off when the room temperature is not within a set range. Improved thermostat accuracy also helps save energy and can help reduce heating and cooling costs.

Benefits:

- Turns your HVAC system on or off when the thermostat detects the room temperature is not within a certain set range. Includes a temperature- sensing device.
- Allows flexible programming to suit any type of schedule.



Electric Vehicle Chargers

Efficient Electric Vehicle Chargers, or EV Chargers, help reduce the energy used to charge electric vehicles by reducing standby losses, or energy consumption when the vehicle is fully charged. BPA offers a measure for efficient chargers that meet the ENERGY STAR standard for Level 2 EV Chargers. More information is available on the [ENERGY STAR](#) website.

For quick access to guides and best practices, forms, specifications, marketing materials and other resources, visit [BPA Residential Appliances & Consumer Products Essentials](#).

ADDITIONAL MEASURES



Clothes Washers

According to energystar.gov, the average American family washes about 300 loads of laundry a year. An ENERGY STAR certified clothes washer can reduce energy costs by about 33% and water costs by more than 50%.

Benefits:

- Efficient motors spin clothes faster during the spin cycle to extract more water.
- More thorough rinsing and gentler operation.
- High-quality features for improved performance.

Door Sweeps

Installing a strip of flexible material at the bottom of an exterior door reduces air infiltration, saving energy by reducing heating and cooling losses by air sealing the gap under the door. More detailed information is available on the [RTF website](#).

Clothes Dryers

Similarly, energystar.gov explains that ENERGY STAR certified dryers use up to 20% less energy, most often using moisture sensors that can shut the unit off when the desired dryness level is reached. Additional savings can be obtained through the inclusion of heat pump technology.

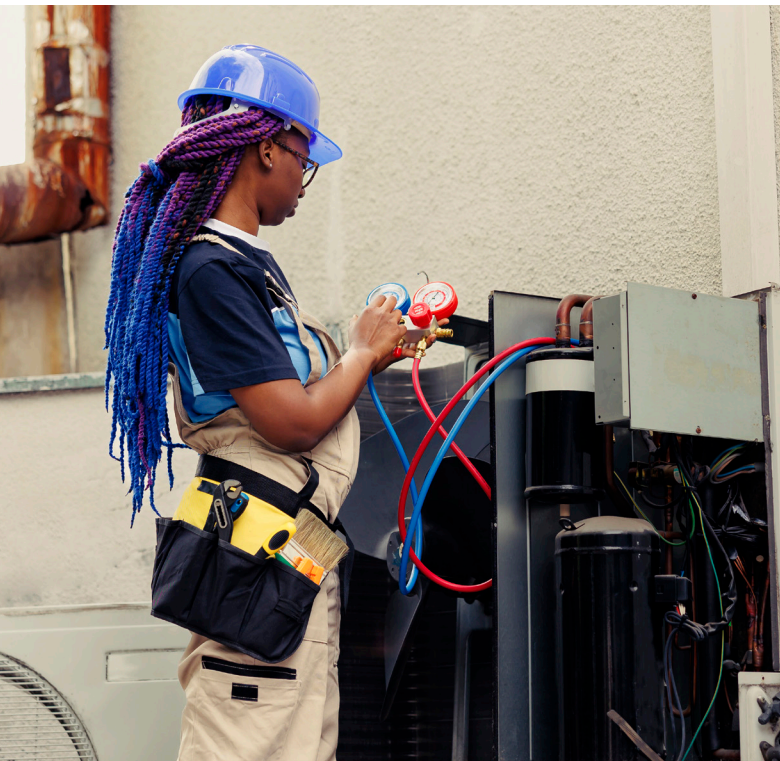
BPA supports utility-run appliance programs by providing access to qualified product lists for eligible clothes washers and dryers. Links to the ENERGY STAR certified product lists can be found on the [Appliances and Consumer Products Essentials page](#). ENERGY STAR evaluates products for reliability, operation and energy efficiency. Products with the ENERGY STAR label are certified as meeting strict energy efficiency and reliability standards.

BPA also partners with the Northwest Energy Efficiency Alliance (NEEA) on the Super-Efficient Dryer Initiative, which offers tiered incentives for the highest performing models available. A [qualified products list](#) is also posted to the webpage, and is updated when new products have been tested and become available.



Comfort Ready Home Program

Consumer
and Worker
SAFETY



Construction can be a safe occupation when workers are aware of the hazards and employers implement an effective Safety and Health Program. It is important to be aware of the potential hazards that a contractor may encounter while on a job site. The primary causes of construction site injuries are electrical incidents, falls, trenching and excavation, and falling debris.

According to the Department of Labor's Occupational Safety and Health Administration, or OSHA, one out of every five workplace fatalities is a construction worker. Workplace safety is of paramount importance to the Comfort Ready Home program and is expected to be a priority of all Program contractors. Program contractors are strongly encouraged to develop a Safety and Health program that addresses the specific workplace hazards associated with the work they perform.

Comfort Ready Home strives to encourage the highest standards of safety for contractors and Field Specialists. All Program contractors and Field Specialists will be required to adhere to OSHA guidelines and protocols for workplace safety pertaining to the scope of work being performed. Contractors and Field Specialists are encouraged to acquire OSHA training and certification cards. More information about obtaining an OSHA 10 or OSHA 30 Certification Card can be found [here](#).

Comfort Ready Home will focus on the care and safety that contractors need to be aware of while implementing residential home weatherization, HVAC and water-heating measures. These include but are not limited to:

General Site Safety

- Every Residential Contractor Network contractor is encouraged to appoint a safety representative that will be onsite each day and act as a champion for safety.
- Maintain a supply of emergency supplies including a first aid kit, eye wash, blood-borne-pathogen kit and fire extinguisher.
- Provide emergency information in vehicles and at job sites including emergency contact lists, MSDS sheets, OSHA posters, copy of company safety and health program, training records and toolbox/tailboard safety meeting records.
- Ensure facility security and public safety precautions by including a site perimeter fence, warning signs, travel and access ways, adequate lighting for site and public, necessary detours and canopies for sidewalks, traffic control plan, marked covers and barricades for holes, guardrails and visitor controls.
- Promote good housekeeping with well-maintained exits and access ways, trash receptacles, materials storage, remove projecting nails and puncture hazards, organize and/or remove material trash piles and provide proper toilet facilities.



Electrical Safety

- Have a lockout/tagout program in place.
- Make sure all power tools are in good condition and removed from service when found to be defective.
- Use heavy-duty, three-prong, flexible extension cords, with no splices or taps. Make sure your heavy-duty cords can handle the amperage of your power tools.
- Make sure all temporary lighting has adequate bulb covers and is suited for the location, has no empty sockets and is not used as a power drop.
- Identify the location of all underground and overhead power lines prior to digging, drilling or use of overhead equipment.
- Cover all live electrical parts and knockouts.

Fall Protection

- Develop a residential fall protection plan and provide training and certification to employees.
- Install guardrails wherever necessary including a 42-inch top, 21-inch mid, 4-inch toe with 200# capacity and 3-inch rail deflection.
- Barricade or cover holes and openings clearly marked HOLE or COVER with a capacity of 2x the intended load.
- Provide, inspect and maintain personal fall arrest systems including full body harness, shock-absorbing lanyard, double locking snap hooks and 5,000 lb.-capacity anchorage point.
- Include falling object protection as part of the fall protection plan with the use of hard hats, canopies and debris nets.

Fire Safety

- Have a fire prevention and evacuation plan in place.
- Inspect fire extinguishers for correct type, size, adequate number and date of expiration.
- Ensure proper storage of all flammable gases and liquids.
- Obtain hot-work permits and assign a fire watch when necessary.
- Implement a job site smoking policy.
- Identify fire hydrant location(s).

Hand and Power Tools

- Train and require employees to use power tools properly.
- Inspect power tools frequently, at a minimum before each use. Tag and remove damaged tools from service.
- Confirm that tools are equipped with the required guards, cutoffs, kill switches and anti-restart functioning.
- Inspect air hoses frequently for deterioration and damage. Make sure all whipchecks and safety pins are in place.
- Only use tools that are effectively grounded or double insulated.
- Know what the proper personal protective equipment, or PPE, is for the tool and wear it.
- Properly store all power tools when not in use.

Personal Protective Equipment

- Provide and require the use of PPE, including hard hats, safety glasses and goggles, hand protection, foot protection, hearing protection, protective coveralls and/or aprons, and traffic/high-visibility vests.

Scaffolding

- Designate a competent person to oversee erection, use and dismantling of all scaffoldings.
- Ensure all scaffolding is cross-braced, level and secure, properly anchored to structure, has proper ladders and access points, all coupling pins are in place, and use adequate base plates and mud sills.
- Install guardrails and overhead protection wherever necessary.
- Use proper fall protection and procedures when erecting and dismantling.
- Provide employee training.



Stairways and Ladders

- Have a lockout/tagout program in place.
- Make sure all power tools are in good condition and removed from service when found to be defective.
- Use heavy-duty, three-prong, flexible extension cords, with no splices or taps. Make sure your heavy-duty cords can handle the amperage of your power tools.
- Make sure all temporary lighting has adequate bulb covers and is suited for the location, has no empty sockets and is not used as a power drop.
- Identify the location of all underground and overhead power lines prior to digging, drilling or use of overhead equipment.
- Cover all live electrical parts and knockouts.

Hazardous Substances

- Have an abatement plan in place and keep a file onsite.
- Provide employee training and certification. Keep copies of certification records onsite.
- Provide and maintain hazmat-containment systems.
- Properly store and dispose of all hazardous substances.
- Keep MSDS sheets onsite for all substances that will be used or stored onsite.

Reduce/Replace Products Containing Volatile Organic Compounds

Encourage installation contractors to reduce the use of building materials that contain high levels of Volatile Organic Compounds whenever possible or when reasonable alternative products are available.

Residential Home Air-Quality Concerns and Protocols

Ensure participating contractors are hypersensitive when considering how to maintain and improve air quality of the home projects they are working on, as the air quality of homes is a critical factor to consider when installing weatherization measures. Some key considerations to address when improving the energy efficiency of a home include:

- Ensure proper venting is in place and/or added as needed to maintain air quality and avoid moisture from condensation. Venting considerations include, but are not limited to, attic ventilation in soffits and gable ends. Verify that roof baffles are not covered or collapsed. Crawlspace also need to be adequately vented and/or venting added as part of the scope of work to maintain a dry and healthy environment.
- Require the correct use of vapor barriers. This includes vapor barriers in attics and crawlspaces. Always adhere the vapor barrier to the conditioned space adding insulation on the unconditioned side. Additionally, vapor barriers such as plastic sheathing on the ground in crawlspaces, will be required to prevent moisture and air-quality issues.
- Do not create an air-quality issue. Technicians must be properly trained NOT to create air-quality issues in the home.
- Practice proper moisture protection and water diversion. Window and door installers cannot allow moisture to penetrate the building envelope where it can cause mold, mildew and structural damage.

Combustion Appliance Zones

Pay special attention to Combustion Appliance Zone(s) in the home. Areas of concern include the space the water heater, furnace, wall/floor heater, and/or boiler is located, and the location of gas or wood fireplace, gas stove, gas oven, gas broiler, and gas dryer are located. Some energy-saving projects, especially whole-home and prescriptive air sealing, can affect these zones. Be aware, test and install carbon monoxide detectors to reduce the risk from combustion appliances.

RESOURCES AND REFERENCES



Comfort Ready Home

[Contractor InfoHub](#)

[Find your Field Specialist](#)

[Utility Finder](#)

[Contractor Search](#)

[Training Center](#)

Bonneville Power Administration

[BPA Implementation Manual](#)

[BPA Implementation Manual \(IM\) Document Library](#)

[BPA Residential Weatherization Specifications and Best Practices Guide](#)

[HVAC Essentials Page](#)

[Weatherization Essentials Page](#)

[Water Heating Essentials Page](#)

[Appliances and Consumer Products Essentials Page](#)

[Low-Income Energy Efficiency Page](#)

Regional Partners

[Hot Water Solutions](#)

[Northeast Energy Efficiency Partnership](#)

[AHRI Directory](#)

[BetterBuilt NW](#)

[ENERGY STAR Certified Homes Thermal Enclosure System](#)

[Rater Checklist](#)

[Energy Out West Weatherization Field Guide](#)