



Weatherization Workforce Updates from NREL

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NASCS Winter Training Conference
March 13, 2024

NREL Weatherization Support

The National Renewable Energy Laboratory (NREL) provides technical assistance and research to support high-quality work and highly qualified workers in the weatherization and home performance industry.



Technical

- Standard Work Specifications (SWS)
- Energy Auditor (EA) and Quality Control Inspector (QCI) credentials
- Retrofit Installer Badges and 3D houses
- Weatherization Assistant model
- Regional priority lists
- Impact assessment.



Programmatic

- Continuous Improvement Workshops
- Online programmatic trainings
- Stakeholder coordination
- Workforce development
- Innovation technical assistance
- Justice40 implementation.

Workforce Credential Updates

EA and QCI Scheme Updates

- The EA/QCI Scheme Committee of subject matter experts completed revisions to the certification schemes in 2022 (next slide).
- Updated Job Task Analysis (JTA) reports were recently published.
 - [EA Job Task Analysis](#)
 - [QCI Job Task Analysis](#).
- The Building Performance Institute (BPI) has started the process to update EA/QCI exams.
- NREL, BPI, and the National Community Action Partnership are working to improve processes in response to network feedback (e.g., diversity, equity, and inclusion).

Multifamily Scheme Updates

- Since January 2024, NREL is convening a Multifamily Scheme Committee to review and consolidate multiple JTAs, resulting in updated multifamily EA and QCI JTAs.
 - Expected completion: October 2024
- NREL will offer technical assistance related to multifamily energy audits and processes.
 - What are the most important technical or programmatic multifamily assistance needs for you or your Subgrantees?

Technical Workforce Resources

Standard Work Specification Maintenance

- We are in year 4 of the current 5-year SWS maintenance cycle.
- Redline version and draft new specifications are live:
 - Integrated LED Retrofit Kit
 - Wood or Pellet Stove
 - Aerosolized Envelope Sealant
 - Extruded Polystyrene Retrofit Wall System
 - Roof Interconnected PV.
- Submit comments by September 30, 2024.

Maintenance Cycle Status



Stakeholders are encouraged to [provide comments on the Redline version](#).

Deadline: Sept. 30, 2024

Learn More:

[How SWS are maintained](#)

<https://sws.nrel.gov/maintenance>

Weatherization Image Gallery

- New Weatherization Image Gallery
 - Structured to align with SWS sections
 - Easily searchable
 - Includes brief description
 - Free to download and use images with proper credit
 - Gallery can be used for:
 - Marketing
 - Field guides
 - Presentations, etc.
- Contribute additional photos.
- <https://sws.nrel.gov/image-search>.

Section, Topic, Sub-Topic

- Air Sealing (40)
- Baseload (10)
- Health and Safety (10)
- Heating and Cooling (1)
- Insulation (23)
- Miscellaneous (2)
- Ventilation (35)

Image Gallery

Use the image gallery to find weatherization photos, equipment, and materials that comply with standards.

These images support a variety of visualization needs and marketing materials.

Contact

If you have any questions or feedback about the image gallery, please contact workforce.guidelines@nrel.gov.

How the Image Gallery Works

[\(+\)](#) Contribute Images

[\(+\)](#) Browse and Download Images



Attic Air Sealing

A weatherization technician inspects and air seals an attic penetration.

[Air Sealing](#) > [General Pressure Boundary](#) > [General Air Sealing](#)

By clicking this box, you are agreeing to the [terms of use](#) with respect to your use of this material.

[Download](#)

Credit: Dennis Schroeder, NREL 29481

EA Resources

The new resource repository conveniently compiles resources to help EAs.

- Topics include:
 - Insulation and building components
 - Appliance and baseload
 - Diagnostic testing
 - Health and safety.

<https://sws.nrel.gov/residential-energy-auditor-resource-repository>

The screenshot shows the 'Insulation De-Rate Calculator' interface. At the top left is the 'Better Buildings' logo with the U.S. Department of Energy tagline. To the right is the 'Home Energy Score' logo. A red-bordered box contains the text: 'You may need to click "Enable Editing" (above) in order for the Calculator to function properly.' Below the logos is the title 'Insulation De-Rate Calculator' in green. A table with a grid interface shows the following values: 'Choose Insulation' is 'Fiberglass', 'Choose Type' is 'Batt', 'Installation Quality' is 'Fair', and 'Enter Depth (Inches)' is '8'. The 'Calculated R-value' is '15'. A yellow box with a black border contains instructions: '<=> click cells to choose values' and 'Click "Enter" or "Tab" after entering or changing the Depth (inches) value. Cells that change to red are irrelevant and will be ignored during the calculation.' Below the table is a large text box with instructions: 'Select or enter a value in the green cells, above. If the cell is red, skip that cell. Always start at the top. The colors may change as you change preceding cell values. Red cell values are ignored during the calculation. Use the diagrams below to help determine the installation quality. If there are multiple insulation depths (e.g., the blown insulation was not evenly applied or there are multiple spaces with different amounts) use the "R-Value - Weighted Average" Averaging Calculator on the preceding tab to determine R-value. If you cannot inspect the insulation to determine installation quality (e.g., cathedral ceiling cavities), derate the R-value assuming a fair quality installation. If you cannot inspect the wall cavity insulation, please go to the next calculator tab, "Wall Insulation Defaults", and select your region to determine the wall insulation default R-value based on the age and region of the construction.' At the bottom is a navigation bar with buttons for 'Averaging Calculators', 'Insulation De-rate Calculator', 'Wall Insulation Defaults', 'Equipment Efficiency', and 'Areas Calculator'.

Choose Insulation	Fiberglass
Choose Type	Batt
Installation Quality	Fair
Enter Depth (Inches)	8
Calculated R-value	15

Select or enter a value in the green cells, above. If the cell is red, skip that cell. Always start at the top. The colors may change as you change preceding cell values. Red cell values are ignored during the calculation. Use the diagrams below to help determine the installation quality. If there are multiple insulation depths (e.g., the blown insulation was not evenly applied or there are multiple spaces with different amounts) use the "R-Value - Weighted Average" Averaging Calculator on the preceding tab to determine R-value. If you cannot inspect the insulation to determine installation quality (e.g., cathedral ceiling cavities), derate the R-value assuming a fair quality installation. If you cannot inspect the wall cavity insulation, please go to the next calculator tab, "Wall Insulation Defaults", and select your region to determine the wall insulation default R-value based on the age and region of the construction.

<https://betterbuildingsolutioncenter.energy.gov/home-energy-score/become-assessor>

Retrofit Installer Badges

- Each Badge defines desired outcome, criteria to verify, applicable material requirements, and reference to SWS/standards.
- NREL is working to develop four new diagnostic testing Badges:
 - Blower Door Testing
 - Combustion Safety Testing
 - Thermal Imaging
 - Pressure Diagnostics.

<https://sws.nrel.gov/installerbadges>



Installer Badges Toolkit

The Installer Badges Toolkit provides a flexible, customizable model for a competency-based apprenticeship approach to training and skills recognition across the home energy retrofit industry.

The National Renewable Energy Lab (NREL) and the U.S. Department of Energy (DOE) Weatherization Assistance Program (WAP) are collaborating with the home energy retrofit industry to support the development of skilled workers. The Installer Badges Toolkit provides a flexible, customizable, and voluntary approach to training and skills recognition for WAP implementers, utility programs, private sector workers, and contractors. It can be the basis of a competency-based Registered Apprenticeship, which offers greater flexibility and options for addressing talent development needs through apprenticeship, detailed here: <https://www.apprenticeship.gov/>.

A Flexible, Customizable Skills Verification Toolkit

The Installer Badges Toolkit consists of 25 Badges, each representing different energy efficiency tasks that an installer could perform on a home. Each Badge defines the desired outcome, criteria to verify, applicable material requirements, and references to SWS or other relevant standards. Workers earn Badges by completing each task and receiving approval from a qualified supervisor. To track progress, trainers or sponsors can provide workers with a physical Badges Passport or a digital badging platform.

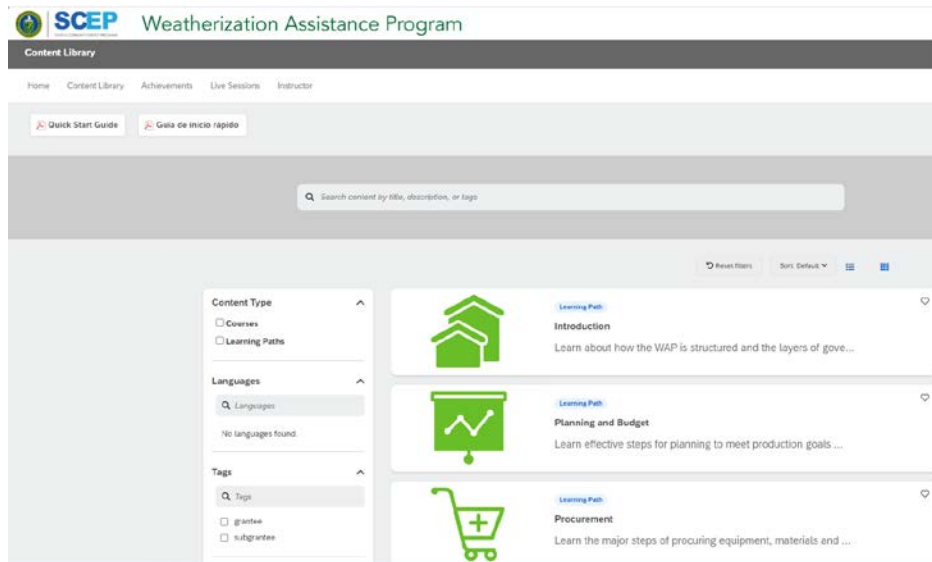
The Badges provide a consistent approach to training by ensuring that installers in different regions are learning the same skills nationwide. Organizations can also customize the Toolkit by choosing only those Badges that are relevant to their program.

Whether workers earn Badges on the job with supervisor approval or at a training center, the work quality requirements are consistent. This allows workers to transfer applicable

Installer Badges Platform

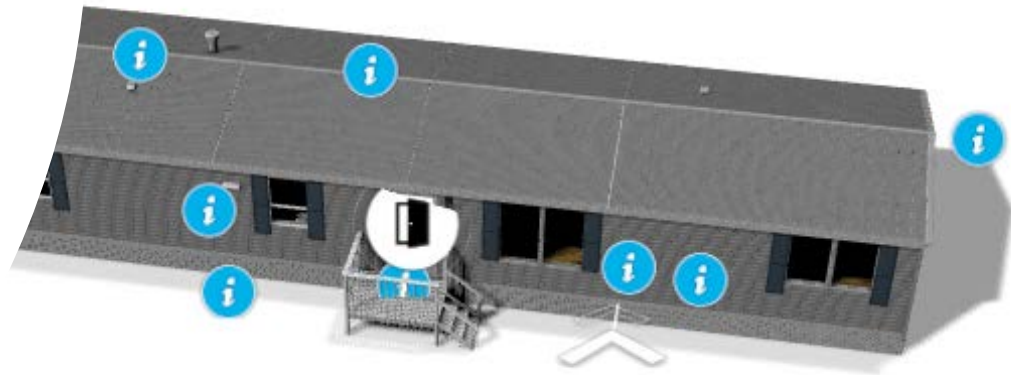
NREL is building out the Retrofit Installer Badges into the WAP learning management system:
<https://wap.litmos.com>.

❑ Available for pilot testers



Visualization Resources: 3D House Tools

- The 3D houses provide an interactive learning environment and support safe, durable, and effective home energy efficiency upgrades.
- Users navigate through a single-family or manufactured virtual house to locate job aids where common upgrade measures occur.
- For more information, visit <https://www.energy.gov/scep/wap/weatherization-installer-job-aids-and-interactive-3d-houses>.



Other Workforce Updates

Subcontractor Recruitment Template Slides


Recommended for:

- Presentations to local contractor and business associations
- Orientation for onboarding new contractors to your program.

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WAP Contractor Qualifications

- Registered Contractor in your jurisdiction
- Must meet minimum insurance requirements (Liability, Workman's Comp, ...)
- Payment and/or Performance Bonds
- Required Certifications, dependent on your trade (OSHA, BPI, ...)
- Lead-Safe Certified Firm (and individual Lead Renovator Certificates for installers and crew leaders)
- Able to meet work performance guidelines
- Able to supply all tools and equipment necessary to perform the work
- Able to work with low-income and minority households in a professional manner



Add local agency requirements here (if additional or different from described above)

Photo: Tom Wills - image gallery (2012)

Slide 27 of 30

Next slide

Invoicing & Payment

- Many WAP programs use an average price per measure (updated annually) for commonly installed measures.
- Agency: Include timeline for payment (ex: payment within 30 days of invoice receipt and satisfactory QCI)

Speaker Notes:

What you'll need may include references and testimonials; proof that you have a registered business; the right licenses, insurance, and certifications; a brief company description; and evidence that you have the necessary equipment and tools. You'll also need to fill out an application form, or a bid package, and complete required program or contract documentation. Being well-prepared and keeping everything organized during this phase will help you get up and running quickly as a weatherization contractor.

All WAP contractors must be registered and licensed

- Customizable slide decks with speaker notes for contractor outreach, recruitment, and onboarding
- Align with the Interstate Renewable Energy Council's Contractor Guide to Success
 - <https://greenworkforceconnect.org/a-guide-to-success-for-contractors-new-to-the-weatherization-assistance-program/>
- Available for download in March

Weatherization Success and Solutions Center

- NREL helped DOE build the Weatherization Success and Solutions Center, which provides a centralized and searchable hub for successful solutions (big and small) that are helping WAP organizations improve processes or outcomes for staff and clients. Topic areas include:
 - Client Success
 - Program Administration
 - Technical/Field Solutions
 - Workforce Development.
- ☐ To contribute a success story, email Allison Moe (Allison.moe@nrel.gov), <https://www.energy.gov/scep/wap/successes-solutions-center>.

Workforce Development Technical Assistance

- NREL is coordinating workforce development technical assistance for the WAP network with the Interstate Renewable Energy Council and the National Association for State Community Services Programs (NASCSPP).
- Technical assistance will provide one-on-one expert support to Subgrantees, training centers, and Grantees.
- Webinars, trainings, and other new tools and resources developed through this technical assistance will be available to the broader WAP network through the GreenWorkforceConnect.org website.

Retrofit Installer Technician

Retrofit installer technicians perform home energy-saving upgrades.



- Experience with tools
- Basic building science & math
- Computer and phone skills
- Customer service skills
- Positive attitude

NREL

Thermal Imaging Demonstrations

This document describes low-cost and simple activities that can be used by home energy and weatherization professionals and educators to help illustrate basic building science principles in an engaging way for students who are new to these concepts.



Introduction:
Thermal imaging, more commonly referred to as infrared scanning, is widely used in the residential and home performance industry to evaluate a variety of scenarios including, but not limited to:

- Verifying insulation coverage
- Finding air or duct leaks
- Locating water leaks

Infrared cameras are not for residential homes. Infrared cameras can detect air heat leaking openings when surface temperature differences are present within the camera's field of view. These temperature differences reveal the paths of the infrared detectors are converted.

Use to:

- Teach students basic building science principles using thermography.

Materials:

- Plastic garbage bag
- Water bucket
- Scrap piece of insulation

Image from <https://nascsp.org/workforce-resources-and-tools/>

WAP Emerging Leaders Program With NCAP

- NREL is collaborating with the National Community Action Partnership (NCAP) on a new leadership training program for emerging leaders in WAP.
- **The goal is to enhance the organizational management and leadership skills of WAP staff and to support retention, growth, and advancement within WAP Subgrantee organizations.**
- Applications will be announced in spring 2024.

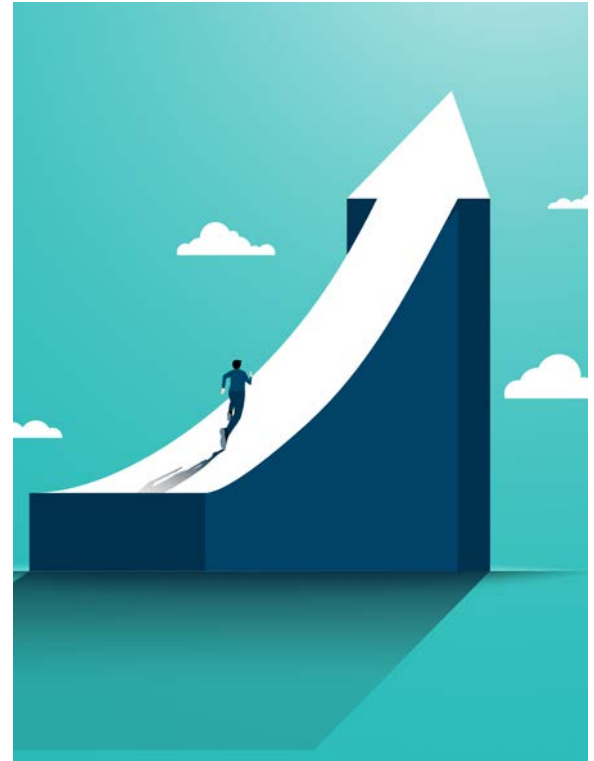


Illustration from PowerPoint Stock Images

Upcoming NREL Efforts in 2024

- Continuous Improvement Workshops
 - Recruiting and Retaining EAs and QCIs (virtual, May)
 - Communicating Weatherization Effectively to Diverse Audiences (virtual, July)
 - Optimizing Training and Technical Assistance Funds To Address Workforce Needs (in-person, October)
- Regional priority list updates (summer)
- Support to NASCSP in updating WAP wage survey analysis
- Development of a Wage Sensitivity Calculator.

Thank you!

www.nrel.gov

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NREL/PR-6A20-88913

This work was authored by the National Renewable Energy Laboratory, operated by Alliance for Sustainable Energy, LLC, for the U.S. Department of Energy (DOE) under Contract No. DE-AC36-08GO28308. Funding provided by U.S. Department of Energy Office of State and Community Energy Programs. The views expressed in the article do not necessarily represent the views of the DOE or the U.S. Government. The U.S. Government retains and the publisher, by accepting the article for publication, acknowledges that the U.S. Government retains a nonexclusive, paid-up, irrevocable, worldwide license to publish or reproduce the published form of this work, or allow others to do so, for U.S. Government purposes.

