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2024

NASCSP

WINTER TRAINING CONFERENCE

Turning Possibilities into Reality

Elevating Efficiency: Insights from NREL & State-Level Badge Training Initiatives

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Elevating Efficiency: Insights from NREL and State-Level Badge Training

2024 NASCSP Winter Conference

Jal Desai, Cory Chovanec, Leslie Baulding

NREL Learning Objectives

By the end of this session, you will:

- ✓ Discuss recent updates and improvements to the U.S. Department of Energy's (DOE) Installer Badges Toolkit
- ✓ Identify key steps to using the toolkit and lessons learned from other implementers.

Installer Badges Background

- A credentialed workforce is in high demand.
- Staff entering the Weatherization Assistance Program (WAP) and home performance industry must navigate a wide range of certifications.
- Getting started can be an intimidating and daunting task.
  - Prerequisites, written/field exams, travel, etc.
- Imagine a more flexible option . . .
  - Welcome to the Installer Badges Toolkit!

NREL Weatherization Support

- **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

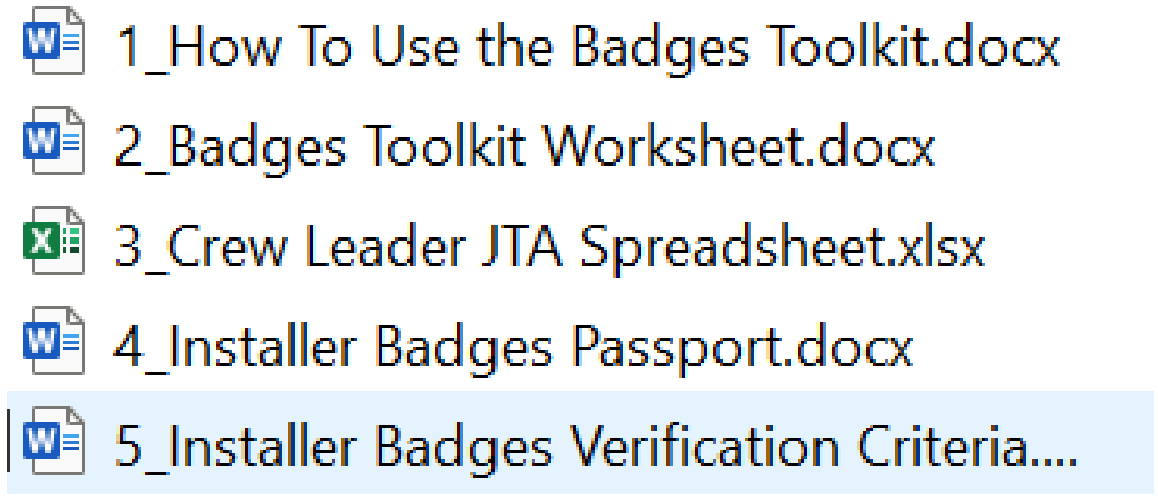
- Continuous Improvement Workshops
- Online programmatic trainings
- Stakeholder coordination
- Workforce development
- Innovation technical assistance
- Justice40 implementation.

Installer Badges Background

- Fiscal Year (FY) 2018: the Retrofit Installer Technician (RIT) Job Task Analysis merged with the Crew Leader Job Task Analysis.
- 2019: the RIT Badges were created as a voluntary resource.
  - 2020: Badge Toolkit updated, added licensing and copyright
  - 2022: Visualization added
    - Job aids and single-family 3D house
  - 2023:
    - Job aids translated to Spanish
    - Manufactured housing 3D house
  - 2024: Coming soon
    - Developing a series of diagnostic testing badges
    - Piloting a centralized platform for Installer Badging.

Overview—Badges Toolkit

- The Badges Toolkit is aligned with updated SWS and other relevant standards.



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

- Retrofit Installer tasks (25 Badges)
- Examples:
  - Work Lead-Safe
  - Air Seal Attic Floor
  - Seal and Dam High-Temperature Heat Sources in Attic
  - Prep Attic Floor for Insulation
  - Treat Attic Hatch.

https://sws.nrel.gov/installerbadges

Badge Toolkit Passport

- Pages for each Badge
- Supervisor or trainer record # of times a task is successfully completed
- Includes sample inspection checklists for each Badge.

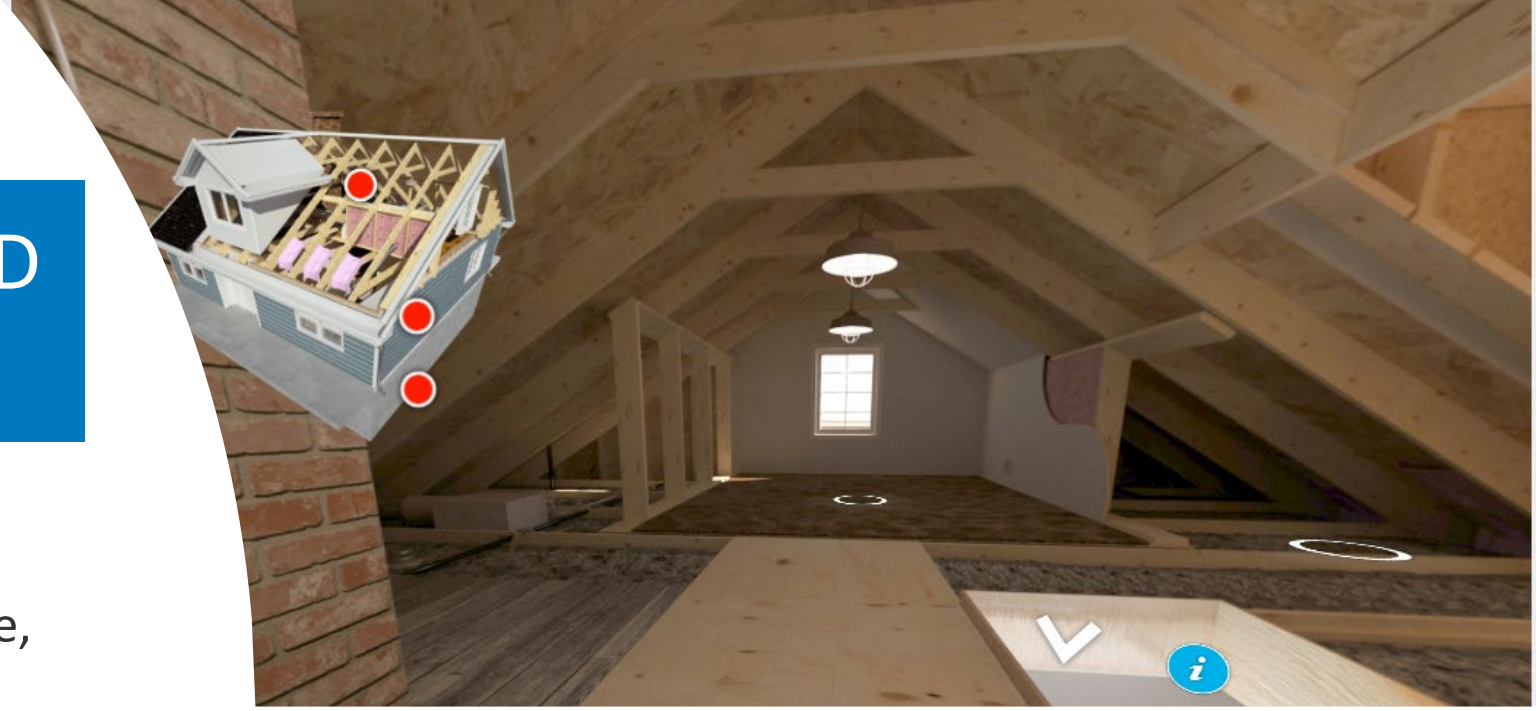
Treat Attic Hatch

Desired outcome: Attic access door or hatches properly sealed and insulated to minimize heat loss or gain and prevent insulation from falling out of attic when accessed.[7]

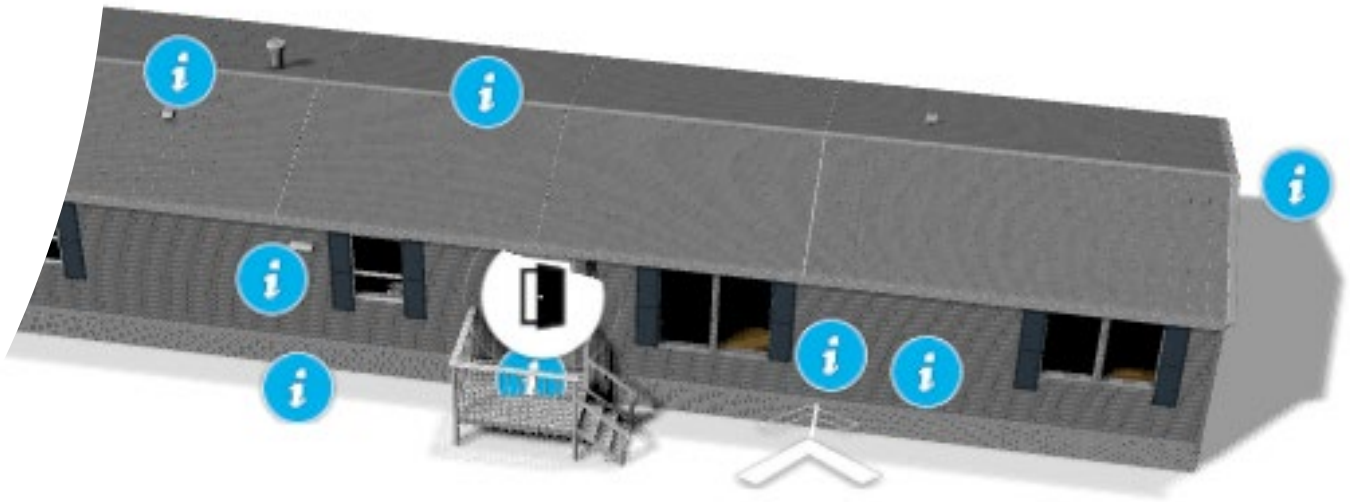
- Rigid,[8] durable attic hatch blocking/dam is installed in a permanent way;
- Dam will remain 2" taller than final attic insulation depth;
- Hatch is insulated to proper R-value (the maximum R-value structurally allowable, up to the final insulation level of surrounding attic);
- Insulation is durably attached to hatch;
- Access is weather-stripped or otherwise treated to prevent air movement when hatch is closed;
- Access closes with a "friction fit" or latch;
- Trim is air sealed with appropriate material; and
- Airtightness of hatch when closed has been verified with blower door and smoke (or infrared (IR), if temperatures permit).

JOB #	DATE	TECH SIGNOFF	INSPECTOR SIGNOFF

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.
- Visit the webpage: https://www.energy.gov/scep/wap/weatherization-installer-job-aids-and-interactive-3d-houses.



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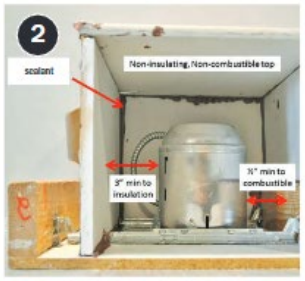
3-2

Seal and Dam Around Non-Insulation Contact-Rated (Non-IC) Recessed Lights

Job Aid for Seal and Dam High-Temperature Heat Sources in Attic Badge

Aligns with Standard Work Specifications 3.0102.1

Clear any debris and insulation from around non-IC rated can light.



Enclosure has 3 inches of clearance from lamp to insulation on all sides.

Premade boxes can make installation easier when installation site is clear of framing members.

Seal box on all sides and edges to make continuous barrier from attic.

Top of box must be R-1 or less and left free of insulation. Flag enclosure for added visibility.

When boxed with appropriate clearances and fire-rated materials, fire risk is mitigated and air leakage is reduced.

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CHECKLIST

Seal and dam high-temp heat sources in attic

DESIRED OUTCOME

Ensure safety from fire and prevent air leakage[1]

Non-Insulation Contact (IC) Recessed Lights

- ☐ Where non-IC recessed lights will be left in place enclosures completely surround each fixture.
- ☐ Enclosures:
  - ☐ Are constructed of fire-rated materials (e.g., 5/8" gypsum wallboard).
  - ☐ Maintain 3" clearance between fixture (including wiring, box, and ballast) and insulation.
  - ☐ Are free of insulation on top.
  - ☐ Are flagged to visually identify the location of the enclosure.
- ☐ All edges, gaps, and cracks of the enclosure, and between the enclosure and attic floor, are sealed with caulk, mastic, foam, or other approved material.

1. Relevant Standards: 3.0102.1

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For more information, visit: energy.gov/eere/wap

DOE/EE-2591 · May 2022

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5-2

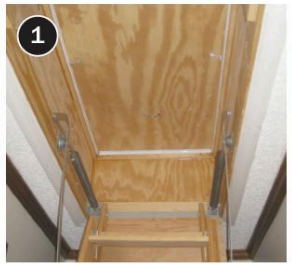
Contención, sellado y aislamiento de escalera de ático abatible

Guía de trabajo para insignia de tratamiento de escotilla de ático

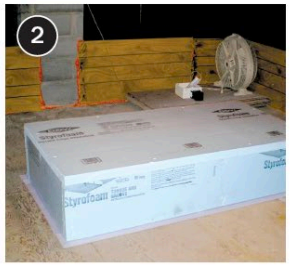
Cumple con las especificaciones normalizadas de trabajo 3.0103.1

ANTES

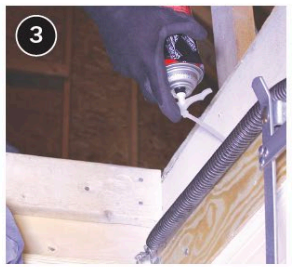
Las escaleras desplegables pueden ser un punto débil en las barreras térmicas/de presión, y también pueden permitir que el aislamiento caiga dentro de la casa si no se represan apropiadamente.



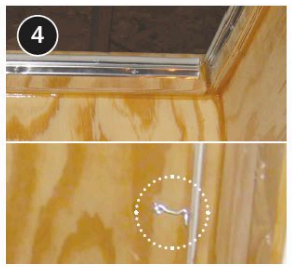
Construya una cubierta por encima y alrededor de la escalera desplegable, más alta que la altura final del aislamiento.



Aísle la parte superior y los lados de la cubierta de la represa, de acuerdo con el valor R correspondiente. Utilice materiales que cumplan con los requisitos del código de seguridad contra incendios aplicable (p. ej., barreras térmicas o de ignición).



Selle contra fugas de aire los espacios en el armazón y los bordes de la moldura según sea necesario.



Selle contra fugas de aire con cinta de espuma de celda cerrada o burletes. Instale los pestillos necesarios para garantizar que la puerta de acceso se cierre herméticamente contra el burlete.

DESPUÉS

Las escaleras desplegables del ático deben estar selladas y aisladas de forma segura y duradera para evitar el movimiento del aire y reducir la transferencia de calor.

Badges Icon Library

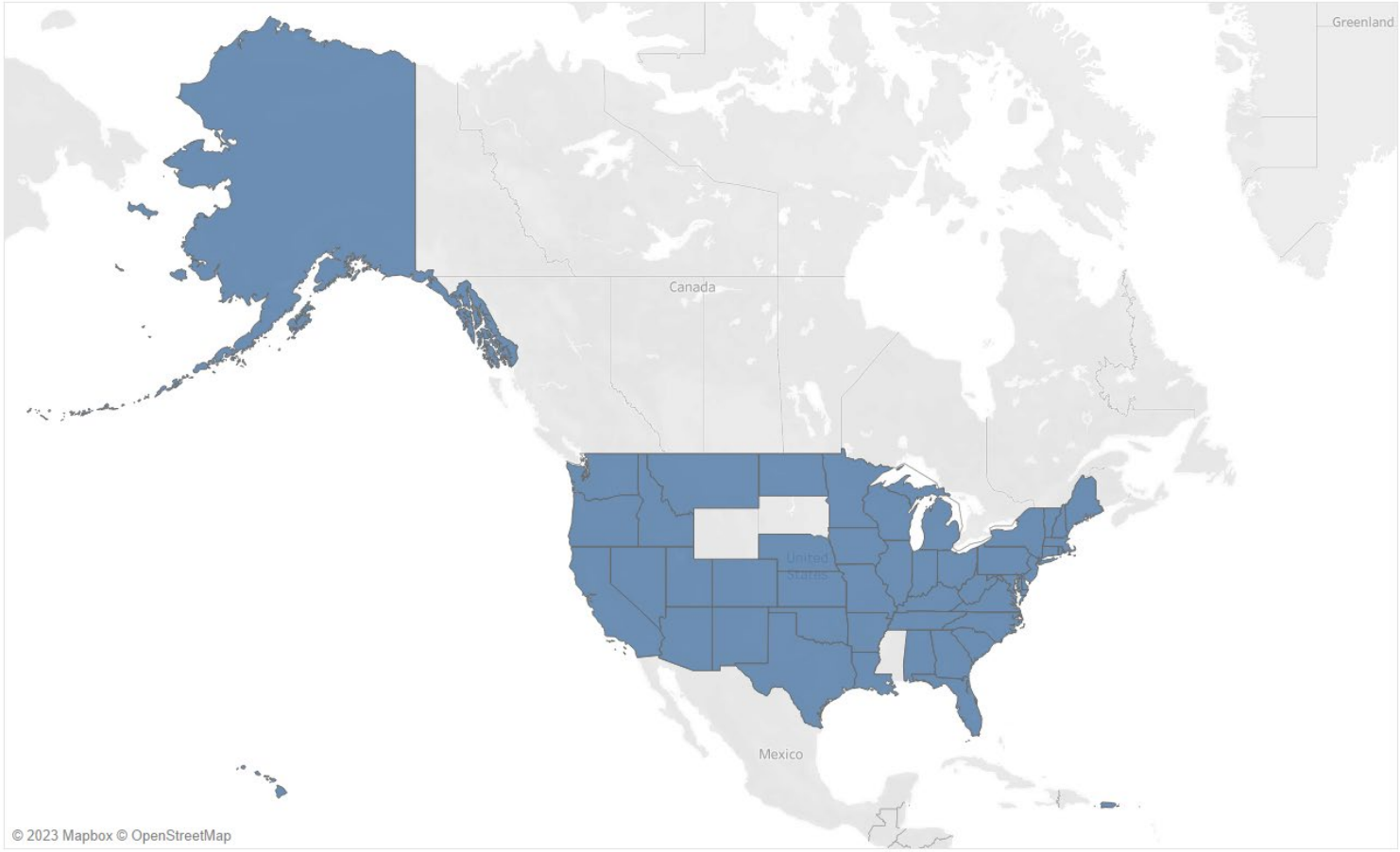
Work Lead-Safe	Air Seal Attic Floor	Seal and Dam High-Temperature Heat Sources in Attic	Prep Attic Floor for Insulation	Treat Attic Hatch
				
Insulate Attic Floor and Pass Inspection First Time	Insulate the Ceiling of a Manufactured Home	Seal and Insulate Knee Walls	Install Dense-Pack Sidewall Insulation	Insulate the Walls of a Manufactured Home
				
Install Weather Stripping and Sweep Set on Exterior Door	Air Seal and Insulate Walls of a Conditioned Subspace	Air Seal Floor Above Unconditioned Subspace	Insulate the Floor Above an Unconditioned Subspace	Insulate the Belly of a Manufactured Home
				
Install or Repair Vapor Retarder in a Subspace	Vent Clothes Dryer to the Exterior	Install Ducting for Bath or Kitchen Range Fan	Air Seal Ducted Distribution System	Insulate Ducted Distribution System
				
Install Window or Exterior Door	Repair/Replace Cracked or Broken Glass	Insulate a Water Heater Tank and First Six Feet of Pipes	Install Low-Flow Faucet Aerators or Showerhead	Install Exterior Roof Penetration
				

Installer Badges Toolkit Feedback Overview From the Network

- NREL recently collected feedback from Badges Toolkit users.

- Questionnaires, interviews, best practices, identified barriers, and stakeholder-driven recommendations for improvement of the Badges Toolkit were collected from a variety of organizations:
  - Grantee
  - Subgrantee
  - Training center
  - Nonprofit organization
  - Private industry.

Background

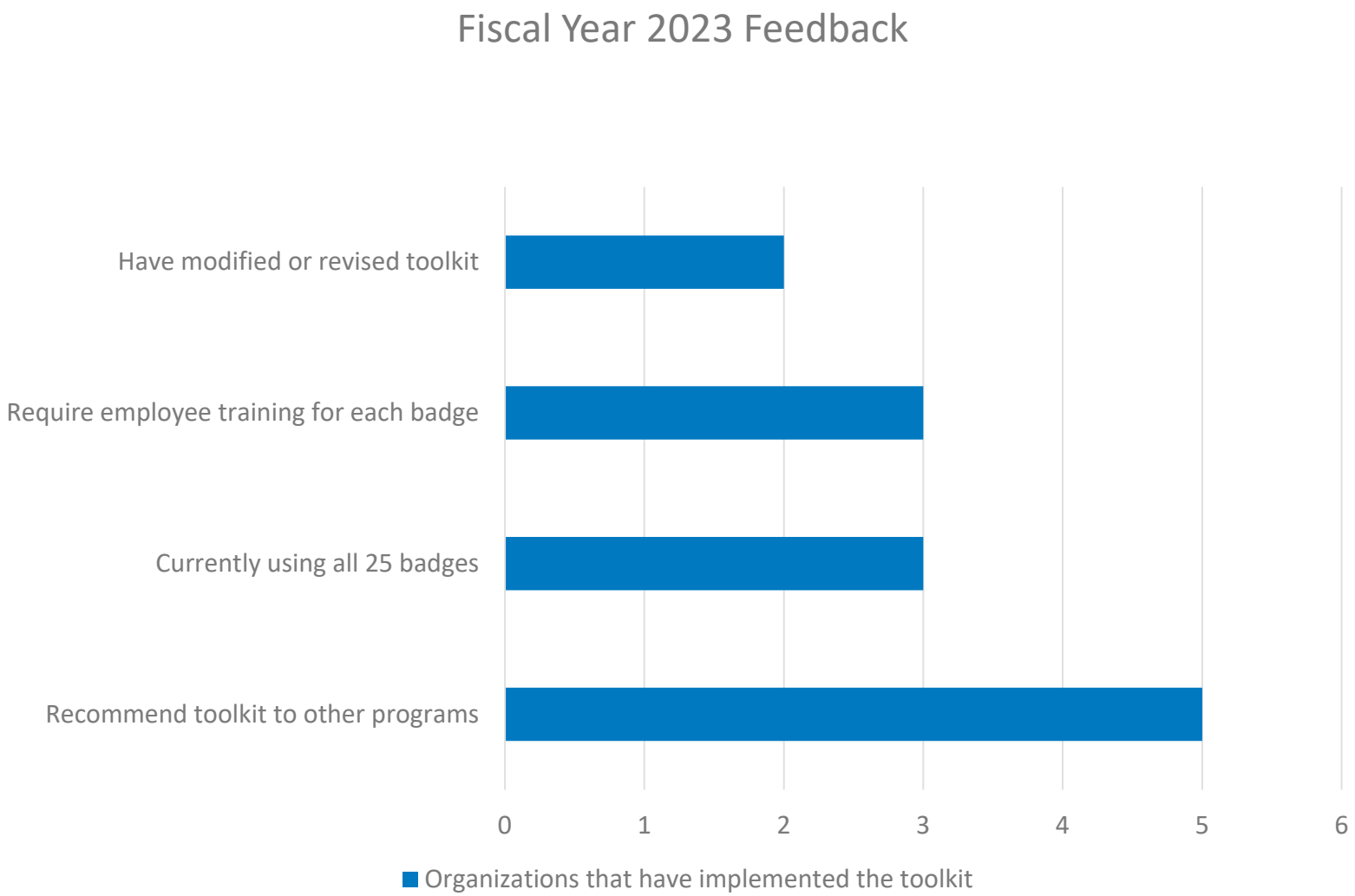


- As of October 1, 2023, 590 users had downloaded the toolkit through the SWS website since it launched in 2020.
- The map (highlighted in blue) shows the states where these users/ organizations are located.*

Three international downloads:
- Canada
- Argentina
- South Korea.

* There are a few users/organizations who did not provide their locations.

General Network Feedback (14 Respondents)



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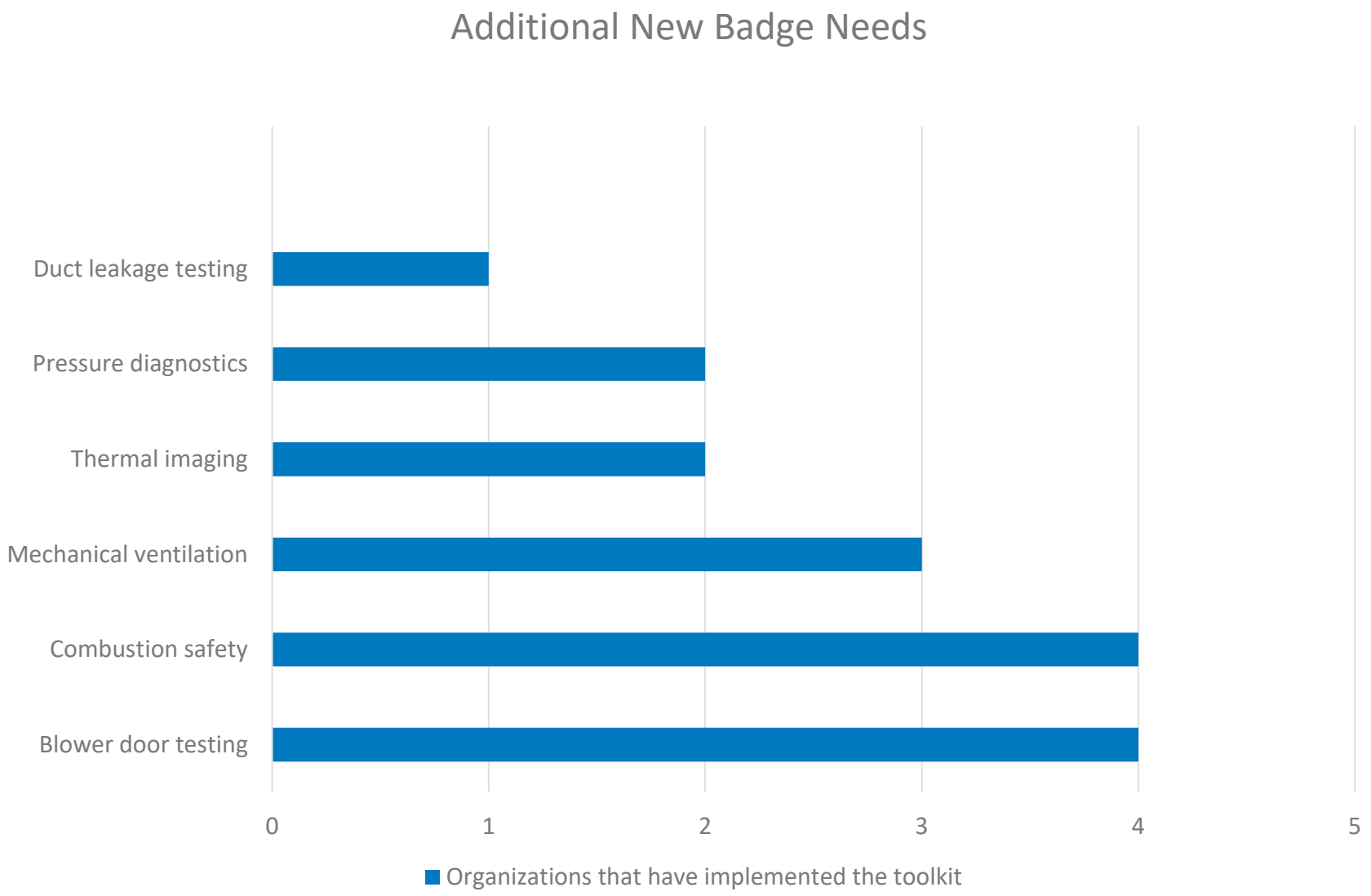
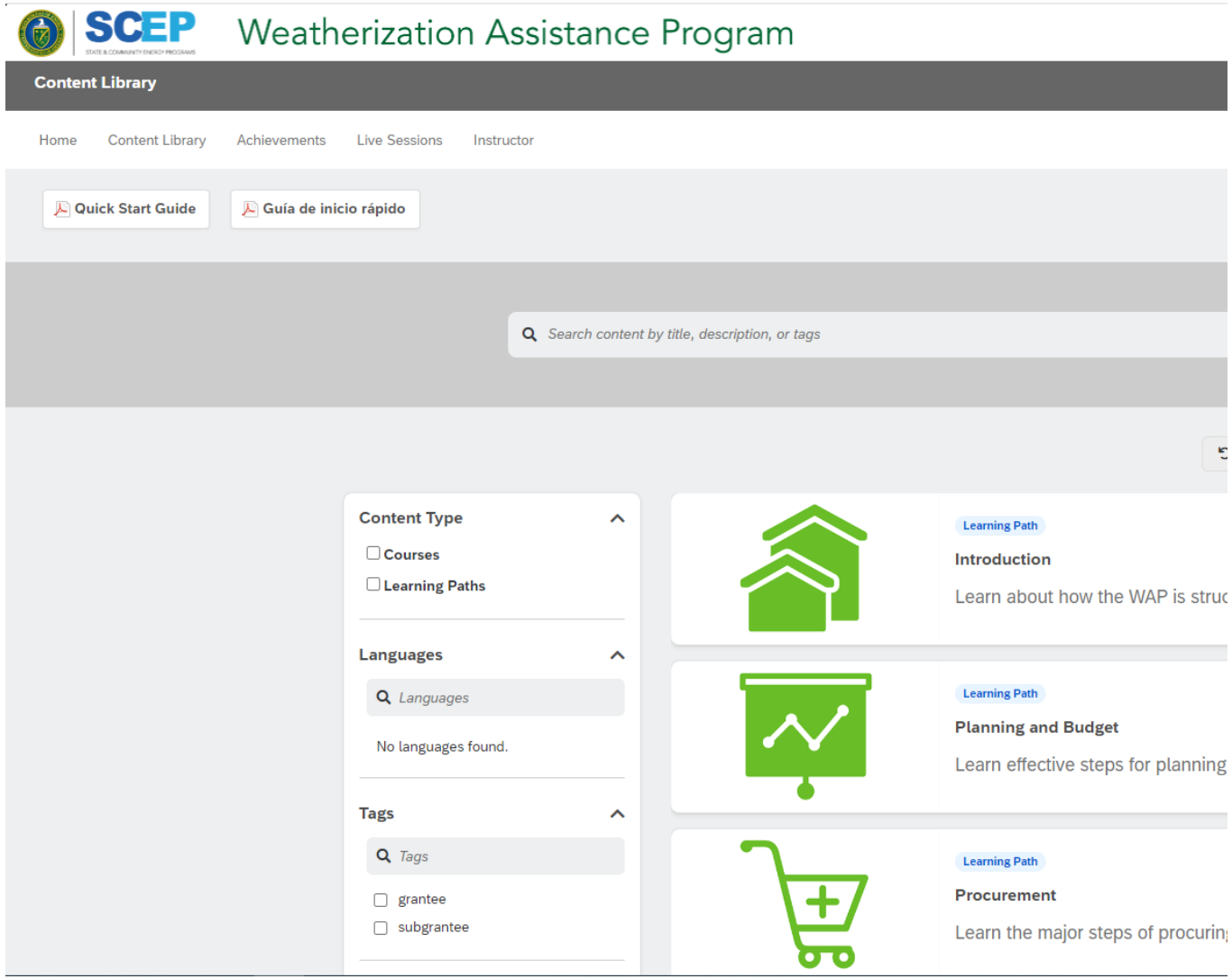
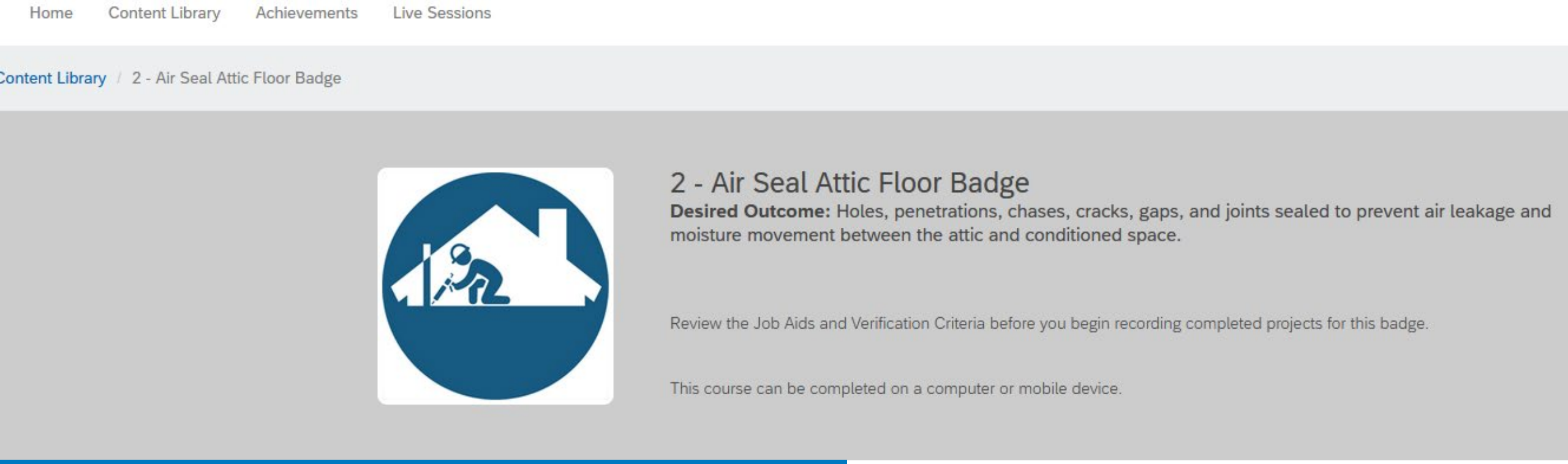


WAP Online Learning Management System

- Free online trainings
- Learning paths for:
  - Grantee administrative staff
  - Subgrantee administrative staff
  - Instructional systems design
- Continuing education units for EAs and QCIs
- In development:
  - Leveraging Funding training series
  - Client Interactions in the Home (for field staff)
  - Project Management for WAP Crew Leaders
  - Spanish translation of Subgrantee trainings.

https://wap.litmos.com/





Installer Badges Platform

Due to network demand, NREL is building out the retrofit Installer Badges in the WAP learning management system: https://wap.litmos.com.

- Available for pilot testers.

Questions and Open Discussion

www.nrel.gov

Weatherization Training

Can Micro-Badges Improve Training for Field Crews?

everblue®

Description

Discover NREL's latest advancements in training, highlighting efficient methods and new resources for the WAP badge toolkit. This transformative training approach offers standardized and verifiable recognition for home energy professionals. Additionally, learn about the success of the badge training initiative, with insights from Everblue and the Minnesota WAP implementation. This session offers a comprehensive guide to ensuring the success of such training initiatives. It aims to provide the needed guidance on implementation, including a strategic plan and a framework for evaluating its success.

Learning Objectives

- Enhance Work Efficiency with New Tools and Insights
- Master Badge Training for Industry Excellence
- Optimizing Learning and Engagement

Badges History

2018. Retrofit Installer Technician eliminated & tasks inserted into Crew Leader.

2020. DOE updated its badges toolkit; 25 badges total aligned with Crew

Leader. 2022. MN Dept of Commerce and Everblue created online badges

training and **tracking** system.

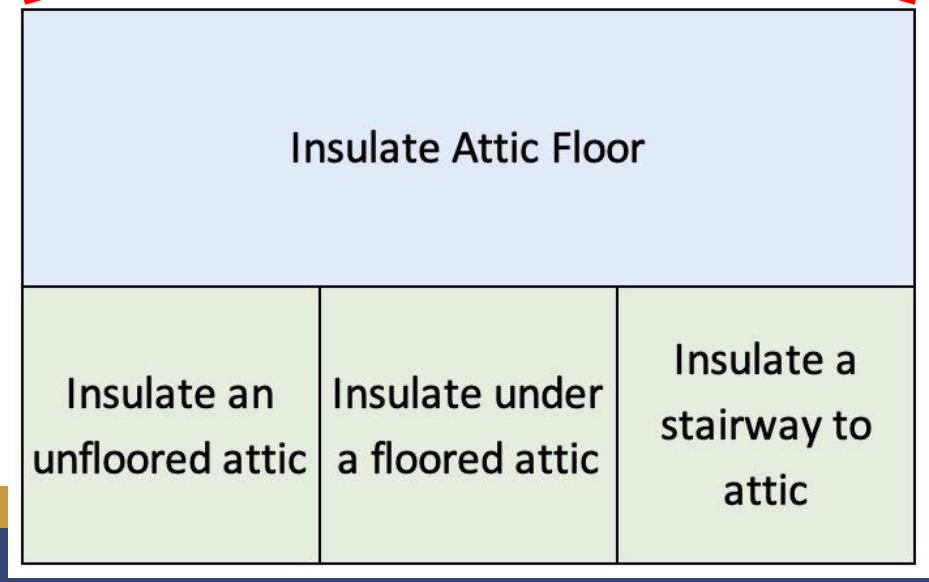
2024. NREL placing badges in WAP LMS. Other states beyond MN adopting badges training to scale workforce & meet demands of IRA.

Traditional WAP Training Challenges

- Contracting process for the State
- Common values in adult learning content creation
- Limited internal resources for learning management software
- High crew member turnover
- Costs and time for travel to training facility
  - Minnesota is over 400 miles from North to South
  - Lost production for Service Providers
  - Trainers for in-person training often travel to MN from out of the state
  - Adds GO/NO-GO decisions to the State based on reasonableness

What is a Micro-Badge?

- Bigger credentials are aligned with a "Job Task Analysis" (JTA)
- 1 Micro-badge = 1 slice of the JTA
- 25 Micro-badges = The full credential (for now)



Traditional Training

Badges Training

- ❌ Off the job training
- ❌ Days missing from a crew
- ❌ Travel (often) required
- ❌ Training only happens once
- ❌ All or nothing

- ✅ On the job training
- ✅ Each badge <30 minutes
- ✅ No travel required
- ✅ Training easily repeatable
- ✅ Earn only relevant badges

Badges vs Badges Training

Seal and Dam High-Temperature Heat Sources in Attic

Desired outcome: Ensure safety from fire and prevent air leakage.[5]

Combustion vents/chimneys/flues:

- Worker can identify difference between high-temperature flues and other vents (e.g., bath ventilation);
- Chases around high-temperature flues are air sealed with approved materials;
- A durable fixed dam of approved materials is constructed around high-temperature flues that:
  - Allows minimum 3" clearance.
  - Stands at least 2" taller than final insulation levels.

Non-IC recessed lights:

- Where non-IC recessed lights will be left in place, enclosures completely surround each fixture.
- Enclosures:
  - Are constructed of fire-rated materials (e.g., 5/8" gypsum wallboard)
  - Maintain 3" clearance between fixture (including wiring, box and ballast) and insulation
  - Are free of insulation on top.
- All edges, gaps, and cracks of enclosure, and between enclosure and floor, are sealed with caulk, mastic, foam, or other approved material.

JOB #	DATE	TECH SIGNOFF	INSPECTOR SIGNOFF

What's Next?

- Expand training to match any new NREL badges released
- Continue to blur the line between "in person" and "online training"
  - What if a trainer came to your job sites?
- Train-the-trainer or Train-the-QCI model?
  - Making library full library of online content available in the field

Questions?

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