

# Weatherization Plus Health Regional Conference: Columbus, Ohio

U.S. DEPARTMENT OF  
**ENERGY** | Energy Efficiency & Renewable Energy



**Julie Hughes**  
Senior Policy Advisor  
Office of Energy Efficiency and Renewable Energy

October 4-6, 2011  
Federal Update

# Recovery Act: By the Numbers

\$ 80 Billion in Clean Energy

- \$12 Billion in Energy Efficiency
- \$8 Billion in Building Retrofits
- \$5 Billion to the WAP

EE Programs	Total ARRA Funding (\$B)	Funding for Retrofits (\$B)
Low-Income Weatherization	5.2	5.2 (100%)
State Energy Programs (SEP)	3	1.5 (50%)
Grants to Local Governments (EECBG)	2.8	1.1 (39%)
BetterBuildings	0.5	0.5 (100%)
<b>Total*</b>	<b>11.5</b>	<b>8.3 (71%)</b>

\*Includes funds for Training and Technical Assistance

## The Weatherization Assistance Program

On target to Weatherize more than 700,000 homes by the end of the Recovery Act

Created 15,400 new jobs

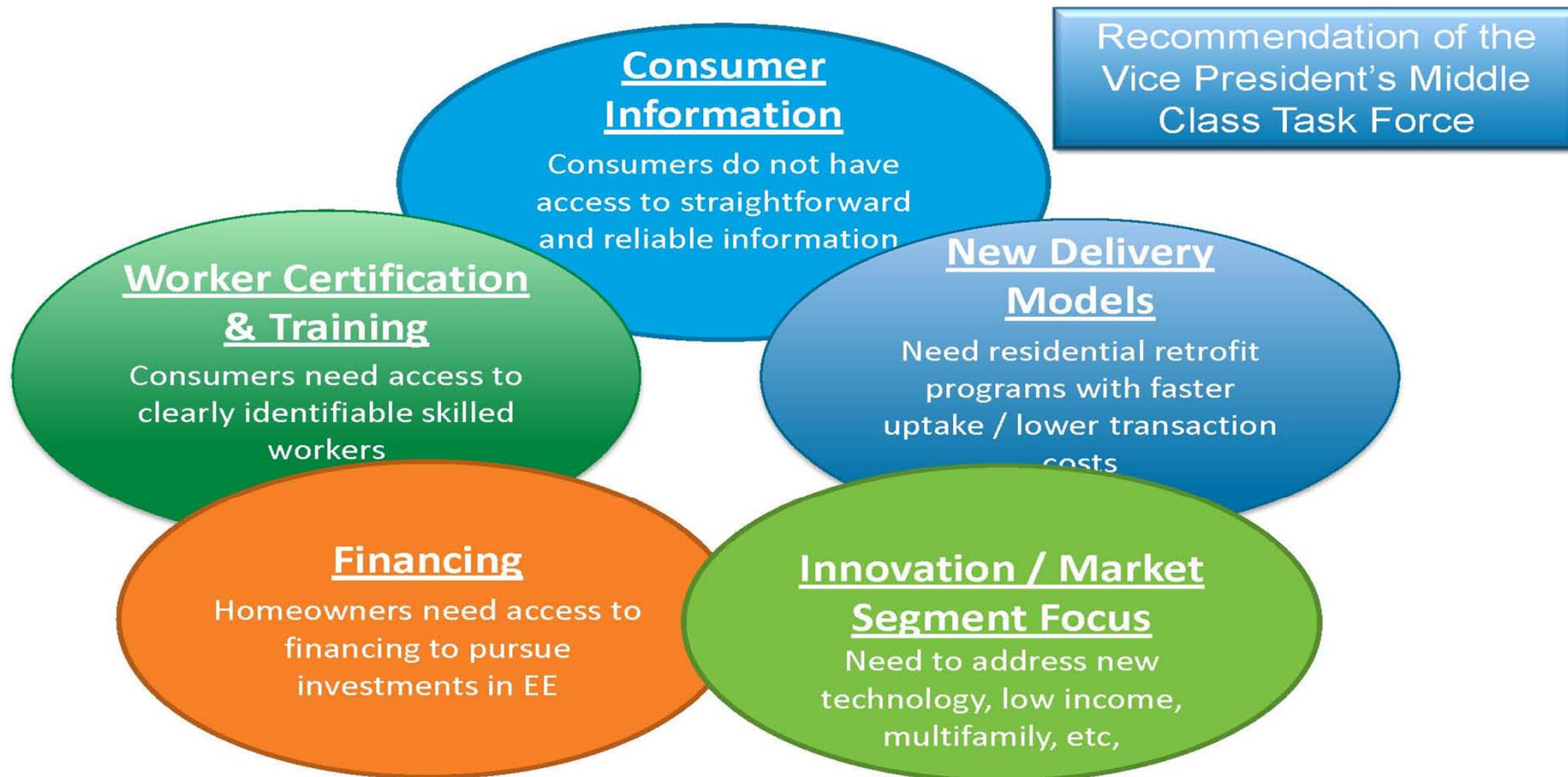
Cumulative Number of WAP Weatherized Homes (Starting 2009)



- Residential energy savings are a key component of DOE's long term strategy
- Low-Income weatherization represents a significant portion of those savings
- The WAP program must produce measurable results to be considered an effective component of DOE's larger goals
- The WAP is the national standard bearer for home energy retrofit knowledge. The program must leverage that expertise
- The WAP National Training and Technical Assistance Plan was developed to assist the WAP in producing quality work and training a qualified workforce

# Whole Home Retrofits: Untapped Opportunity

**Need Suite of Efforts to Overcome Market Barriers: Make home retrofits routine**



## Weatherization Assistance Program

### National Weatherization Training & Technical Assistance Plan



December 2009



Prepared by the U.S. Department of Energy, Office of Weatherization & Intergovernmental Program  
for the Weatherization Assistance Program

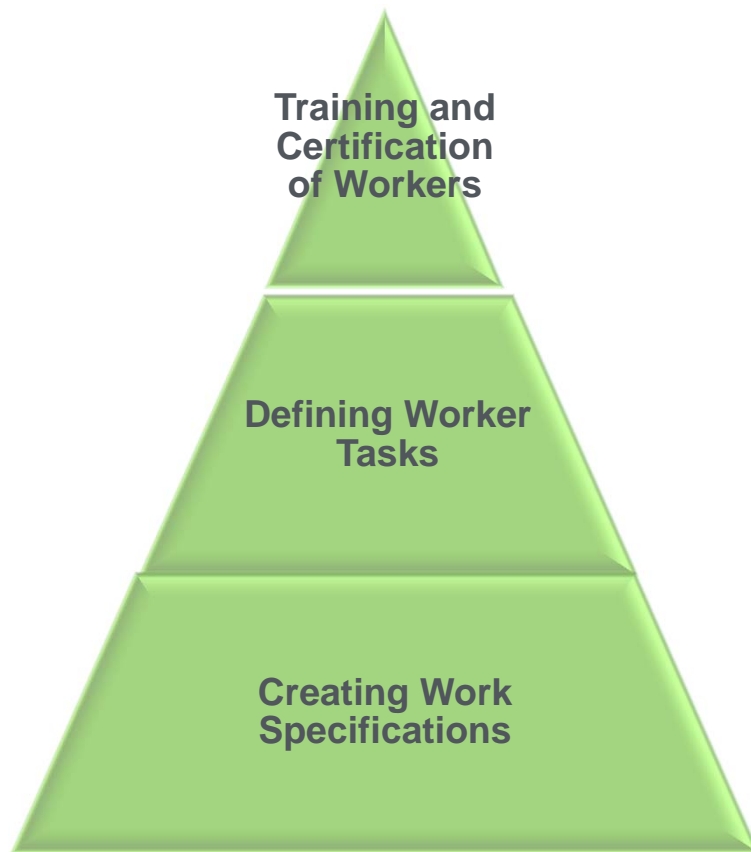
- ARRA increased T&TA funds from 10% to 20%
- \$1 Billion/ \$5 Billion T&TA
- The Weatherization Assistance Program National Weatherization Training and Technical Assistance Plan is the plan for \$138.5 M

## Quality Work = Sustainability

The T&TA Plan is building tools and resources to ensure that the WAP is able to produce high quality work and demonstrate that quality to stakeholders.

As ARRA comes to an end, a framework for quality will allow workers to transition to other markets and allow the WAP program to make the case for its ongoing operation and expansion.

## Professional Workers/ Quality Work



### Market Expansion

- Multifamily
  - Energy Audit Tool
  - Standard Work Specifications
  - Weatherization Innovation Pilot Program
- Private Market Integration
  - Better Buildings
  - Building America
  - Energy Star
- Healthy Homes
  - Wx Plus Health
- Regulatory Changes
  - Grant to Loan
  - Appendix A
- National Evaluation
  - Non Energy Benefits Study

- Guidelines for Home Energy Upgrade Professionals
  - Standard Work Specifications
  - Job Task Analysis
- Training Program Accreditation
- Worker Certification
- Training Resources and Tools
  - WAP Standardized Curriculum
  - National Weatherization Training Platform
  - WAP Training Centers



## Voluntary national guidelines to support *quality work* and a *skilled workforce* in the Weatherization Assistance Program and private residential energy efficiency upgrade industry

- Developed by industry, facilitated by NREL and EERE
- Second Round Public Comment Fall 2011

# Single Family SWS & Certification Timeline

**September 2010**

1st draft  
Standard Work  
Specifications &  
JTAs

**Winter 2010-  
Winter 2011**  
Technical and  
Industry  
Reviews

**Revision**

**Winter 2011**  
OMB and  
Federal  
Agency  
Review

**Revision**

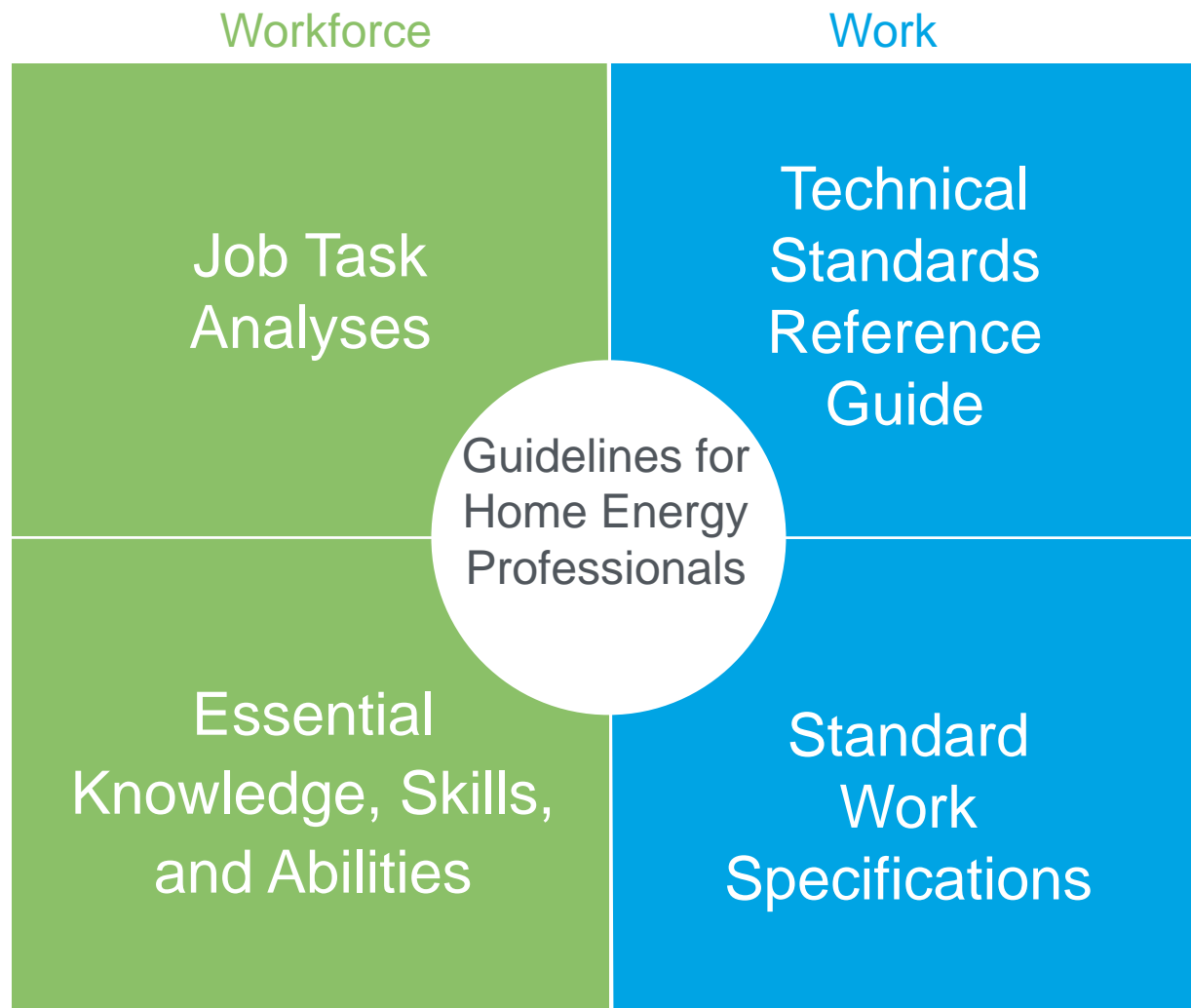
**Spring 2012**  
Single  
Family Final  
On-line

**Format  
Revision**

**Winter 2012**  
Certification  
Pilot Testing

**Summer 2012**  
Certifications  
Available  
Nationally  
&  
Issue  
Single Family  
SWSs  
**Printed**

# Four Components



- Define the minimum requirements for high-quality work and the conditions necessary to achieve the desired outcomes of a given energy efficiency retrofit measure
- Standard Work Specifications are outcome driven, but not prescriptive
- When applicable, SWS are based on existing technical standards
- Fill a critical niche in the “standards landscape”
- Work specifications = setting the bar for quality work

- Define the safety, materials, installation, and application standards, codes, and regulations applicable to residential energy efficiency retrofits
- Developed by government, industry, or third-party standards development organizations
- Examples
  - ASHRAE 62.2 (Ventilation for Acceptable Indoor Air Quality)
  - ASTM E1186 – 03 (Standard Practices for Air Leakage Site Detection)
  - OSHA 1926.28 (Safety and Health Regulations for Construction; Personal Protective Equipment)
- Workforce Guidelines for Home Energy Upgrades will contain a Technical Standards Reference Guide for industry

# Draft SWS: Attic Insulation Prep Detail—Knee Wall

**Topic: Attic**  
**Subtopic: Knee Walls**

12) Detail Name: Preparation for Batt Insulation

Desired Outcome:

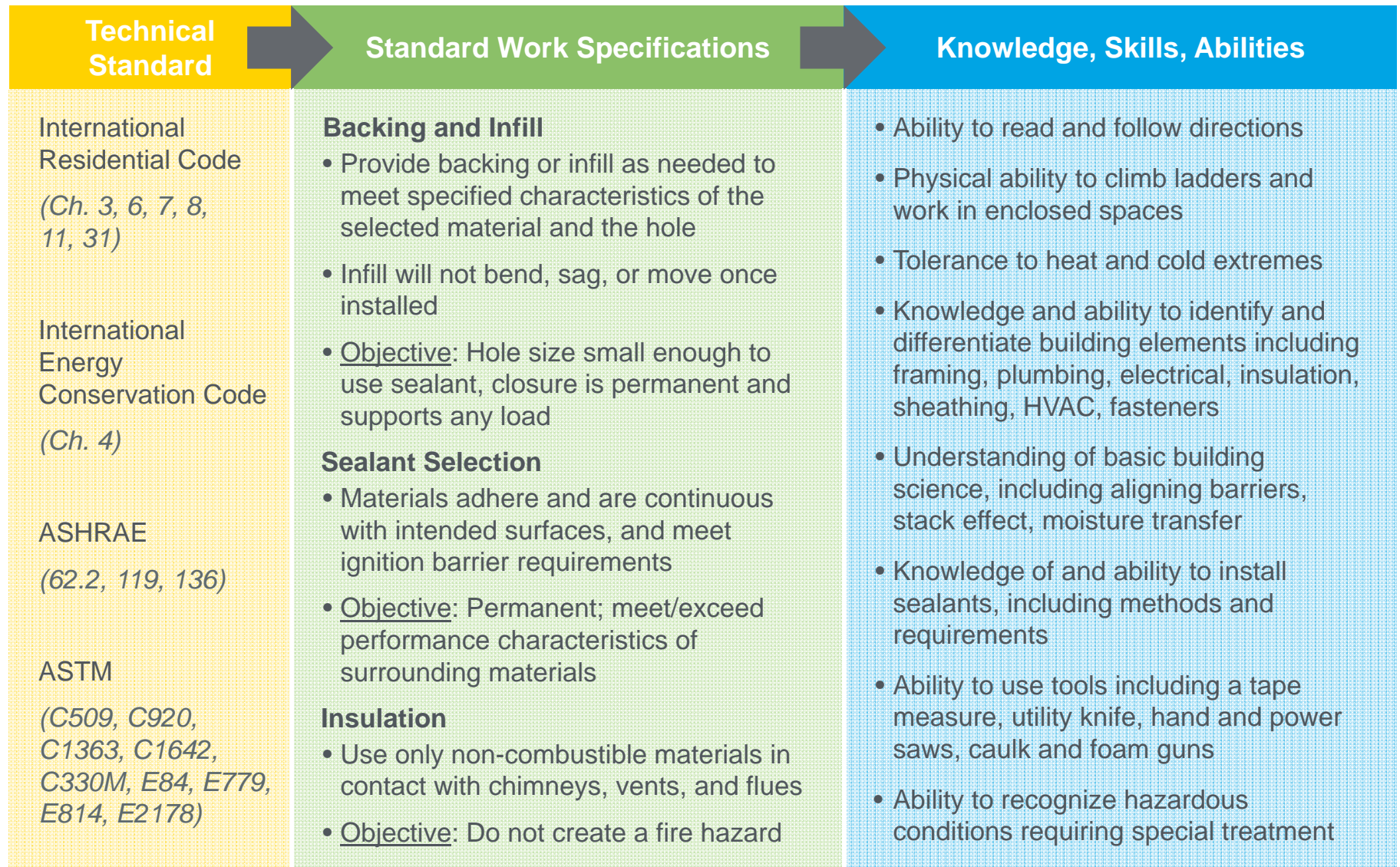
- Airtight cavity and properly insulated knee wall

Row	Title	Specification(s)	Objective(s)
1	Knee wall prep for batts	All knee walls will have a top and bottom plate or blockers installed using a rigid material  All joints, cracks and penetrations will be sealed in finished material including interior surface to framing connections	Eliminate bending or movement that may result in air leakage  Prevent air leakage through the top or bottom of the knee wall <sup>33</sup>
2	Installation	Insulation will be installed using one of the following methods:  New batts will be installed  All existing batted insulation will be adjusted to ensure it is in full contact with the interior cladding and top and bottom plates	Eliminate misalignment of existing insulation
3	Backing knee wall	If rigid material is used, material will be installed to cover 100% of the surface of the knee wall  If foam sheathing is used, sheathing will be listed for uncovered use in an attic, or covered with a fire barrier	Prevent insulation settling or movement

<sup>33</sup> ASTM E1186 - 03(2009)

Specification(s)	Objective(s)
All knee walls will have a top and bottom plate or blockers installed using a rigid material	Eliminate bending, sagging or movement that may result in air leakage
All joints, cracks and penetrations will be sealed in finished material including interior surface to framing connections	Prevent air leakage through the top or bottom of the knee wall <sup>33</sup>
Insulation will be installed using one of the following	Create an air barrier

# Attic Air Sealing: Penetrations



- Markets are driven by consumer confidence
- WAP's long history and extensive expertise support the development of consumer confidence
- Market rate programs can rely on the technical expertise within the WAP program to set standards for work quality and quality assurance
- WAP has a skilled workforce ready and able to transition into the middle-income market
- Common standards and certifications across markets and programs will ensure that the workforce is able to deliver a consistent product that consumers can trust
- WAP has spent 30+ years developing quality standards - a resource that can be utilized by all energy efficiency programs
- Standard Work Specifications (SWS) are outcome driven, but not prescriptive (*not protocols or best practices*)

**Standard Work Specifications = setting the bar for quality work**



## National Workforce Certification Training Program Accreditation

## Accreditation



- Is given to the **Training Program**
  - (Weatherization Training Center or other qualified program)
- Verifies that the Training Program meets a standard in both its operations as well as facilities



## Certification



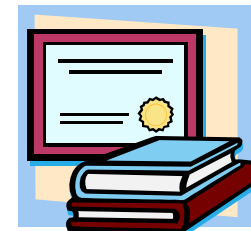
- Is given to individuals (**worker**)
- Certifies that an individual has the knowledge, skills, and abilities to perform a certain job.
- Is issued by an independent third party



## Credential (generic term)



- Careful! - Can be a “Certificate for Completion” or License, or degree, or full Certificate



DOE is building toward full Wx worker certification

# Credentialing Single Family: Key Challenges

1. Lots of different credentials
  - Certifications and certificates galore
  - Credentials are not always transferable across programs and geographies (impedes mobility)
  - What's a worker or a consumer to do?
2. Competencies (Job Tasks and KSAs) upon which certifications are built are all different and in need of strengthening
3. Certification exams need to better assess field capabilities
4. Many credentials are too expensive and are not always available in all locations

Proliferation of training and certificate programs for WAP and the Home Performance workforce

– industry, labor, government, educational institutions, NGOs

1. Major infusion of Federal and State training dollars with no standards
2. No objective measure (3<sup>rd</sup> party assessment) of training program effectiveness
3. No uniform way for workers seeking training to assess the quality of the program or provider



- Voluntary, third-party assessment of training provider quality
- Interstate Renewable Energy Council (IREC)
  - Currently accredits solar training programs
- ISPQ International Standard 01022
- IREC will use the *DOE Job Task Analysis and Knowledge, Skills, and Abilities* as the foundational document for accreditation

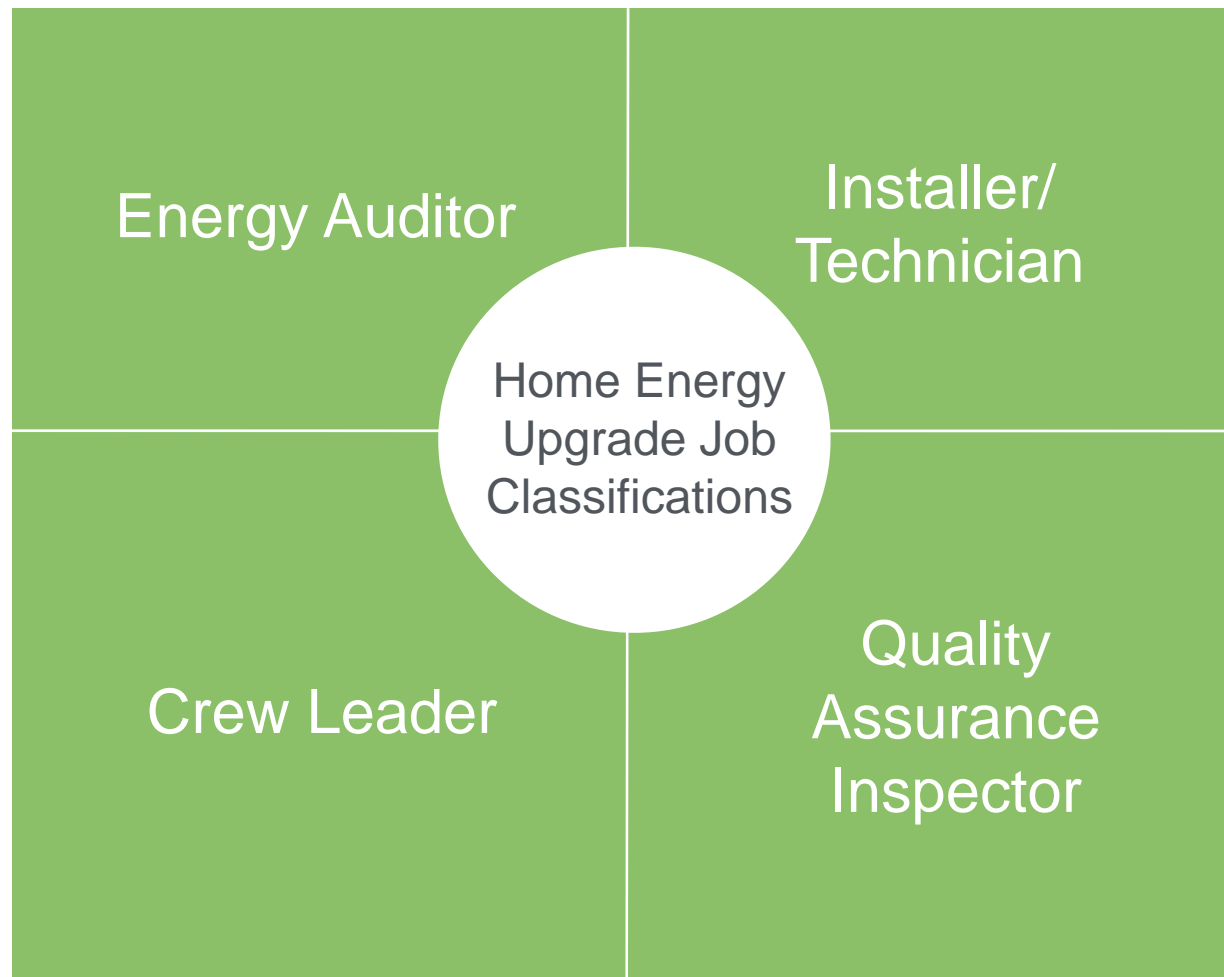
## Job Task Analysis

- Identifies and inventories a job's critical tasks.
- A formal process for determining and cataloguing *what a worker does*.
- Tasks are classified as either *cognitive* (mental) or *psychomotor* (physical) skills, and as *critical*, *very important*, and *important* for job performance.
- **Example:** An Auditor needs to be able to:
  - set up blower door
  - run test in accordance with ASTM E779,
  - record results of blower door test in diagnostic software, etc.



The Job Task Analysis is a part of the  
*Guidelines for Home Energy Professionals*

# Four Home Energy Upgrade Job Classifications



# Update: Training Program Accreditation

- IREC has been accepting applications for accreditation since May
- ORISE is currently working with training programs to assist them in moving through the accreditation process
- NRCERT - Christiansburg, Virginia is acting as a pilot program working with ORISE to develop a robust package of tools to assist future programs in becoming accredited
- IREC has given numerous webinars outlining the accreditation process
- ORISE and SMS are developing a needs assessment tool and a curriculum crosswalk tool to assist training programs in meeting accreditation requirements



# Expanding The Market

# Guidelines for Home Energy Professionals: Update SWS for Multifamily Buildings

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# Developing the Standard Work Specifications: Multifamily

- Collaboration between industry, labor and the building trades, and the DOE, HUD, USDA, and EPA
  - Continue collaboration with EPA on Protocols
- National Renewable Energy Lab, Advanced Energy, Association for Energy Affordability, Weatherization Assistance Program, Industry
- Will follow a process similar to the Single Family SWS development
- Multifamily is unique in that individual trade workers often play a larger role
- Overall Goal: Industry acceptance and market transformation!

- Build on the work and experience of the Guidelines for Home Energy Upgrade Professionals: Single Family
- Define Multi-Family building types
- Assess existing standard and resources for inclusion and reference in the SWS
- Fill gaps in existing materials through collaboration of market players
- Define professional job positions that will utilize the SWS

- Identified Need
  - Multifamily Energy Auditor
  - Multifamily Project Manager
  - Multifamily Building Operator
- Existing/New Resources in Development: Examples
  - BTP/NREL: Commercial Building Energy Auditor
  - BTP/NREL: Commercial Operating Engineer/Building Technician
  - BPI: Multifamily Building Analyst/Energy Auditor
    - Multifamily Energy Audit Standard
- Additional research is needed
- In order for MF to become an ISO 17024 certification will need to create JTA

- Outreach for Review of Multifamily SWS
  - Ensure all stakeholders are appropriately aware and/or engaged in development and review of standard work specifications
- Review Process:
  - Technical review, includes healthy homes and worker safety
  - Two industry reviews
  - Federal review
  - Two public comment periods
- Outreach Methods:
  - Email blasts
  - Webinars
  - Conferences and meetings
  - “Ambassadors”

# Standard Work Specifications for Multifamily Buildings

## The Timeline

Timeline for Industry  
Participation in the Guidelines  
for Multifamily Energy Upgrades

**June 14–15, 2011** *(completed)*

*Standard Work Specifications for  
Multifamily Energy Upgrades Market  
Lead Event*

Raleigh, North Carolina

**July 25–29, 2011** *(completed)*

*Standard Work Specifications for  
Multifamily Energy Upgrades  
Development Event*

Raleigh, North Carolina

If you would like to participate in  
developing the Standard Work  
Specifications for multifamily energy  
upgrades, please email us at  
[workforce.guidelines@nrel.gov](mailto:workforce.guidelines@nrel.gov).

**Future Timeline:**

**Webinars for Specific Audiences:**

**August, September, October 2011**

**Webinars for General Audiences:**

**September, 2011**

**Industry Review:**

**Start date: October 10<sup>th</sup>**

**Guidelines Completion:**

**Winter 2012- 2013**

# Multi-Family SWS Timeline

**July 2011**

1<sup>st</sup> draft  
Standard Work  
Specifications  
(SWS)

**October**  
Industry  
Review

**Spring 2012**  
Public  
Comment  
Period #1

**Fall 2012**  
Public  
Comment  
Period #2

**Winter  
2012-  
2013**  
Issue Final  
Guidelines





## Webinars for Specific Audiences—All at 3 p.m. EST

Thu Aug. 18: **For the Weatherization Assistance Program** (register: <https://www3.gotomeeting.com/register/992747630>)

Tue Aug. 30: **For multifamily building operators** (register: <https://www3.gotomeeting.com/register/879697470>)

Thu Sept. 1: **For multifamily developers, members of the multifamily finance community, and affordable housing organizations** (register: <https://www3.gotomeeting.com/register/756258950>)

Tue Sept. 13: **For home energy upgrades industry professionals and organizations** (register: <https://www3.gotomeeting.com/register/434637022>)

Thu Sept. 29: **Information about the multifamily standard work specifications' technical review by healthy homes experts** (register: <https://www3.gotomeeting.com/register/538110878>)

Thu Oct. 6: **Information about the multifamily standard work specifications technical review by worker safety experts** (register: <https://www3.gotomeeting.com/register/271655622>)

## Webinars for General Audiences—All at 3 p.m. EST

Thu Sept. 8: Register: <https://www3.gotomeeting.com/register/352148230>)

Tue Sept. 27: Register: <https://www3.gotomeeting.com/register/535705206>

# Weatherization Training Centers

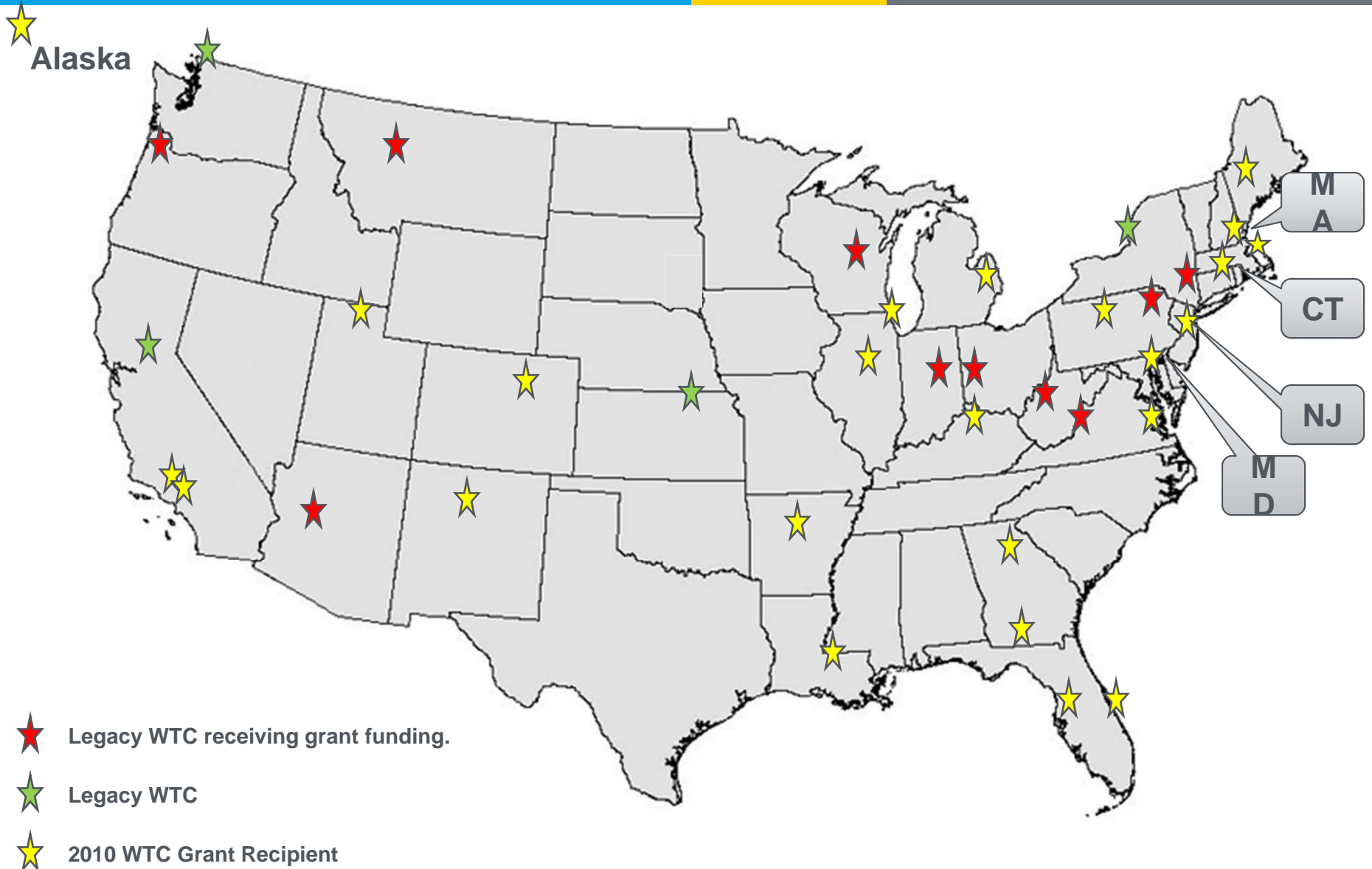
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# Weatherization Training Centers At a Glance:

- 39 Centers Nationwide in 29 States
- Hands-on, skills based training to workers, auditors, inspectors and program administrators
- Coursework built on the Weatherization Assistance Program's Standardized Training Curriculum and Core Competencies
- Supported by a network of over 1000 local agencies
- Backed by Training and Technical Assistance support from the national Weatherization Assistance Program
- Third-party accreditation and worker certification coming-soon.

# Weatherization Assistance Program Training Resources



## 10 Modules Completed:

- Weatherization Installer/Technician Fundamentals
- Weatherization Installer/Technician Intermediate
- Weatherization Installer – Mobile Homes
- Crew Chief
- Energy Auditor – Single Family
- Energy Auditor – Multifamily
- Technical Monitor/ Inspector
- Heating Systems for Energy Auditors – Single Family
- Multifamily – HVAC
- Train the Trainer

## In Development:

- Weatherization Program Manager

**Available for Download at:**  
[www.waptac.org/Training-Tools](http://www.waptac.org/Training-Tools)

## Priority Areas:

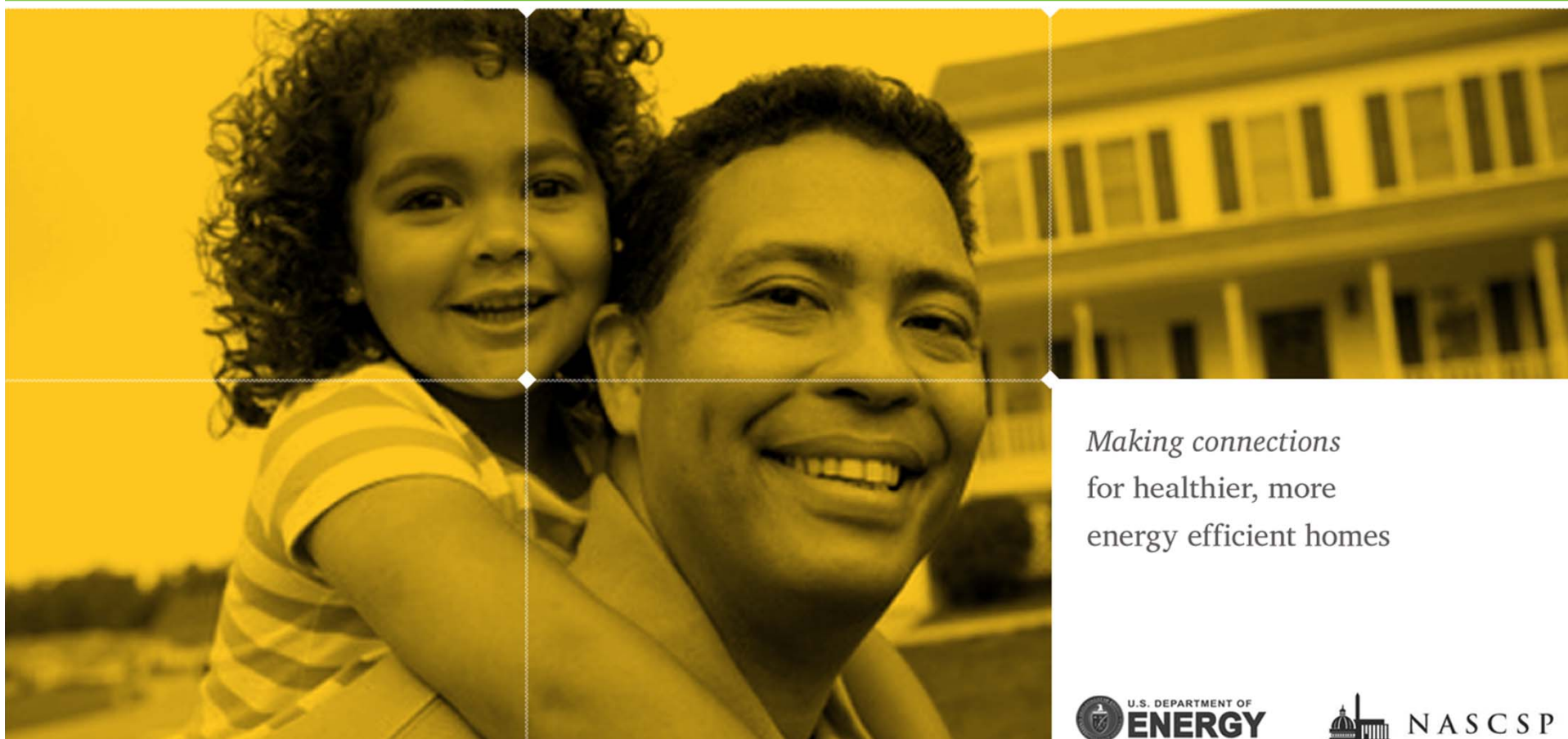
- ASHRAE
- OSHA
- Mold & Moisture
- Asbestos
- Radon
- Lead Based Paint
- Replacements
- Codes & Structures
- Combustion Safety & Heating Systems
- Occupant Wellness

## H&S Two Part Webinar:

- WPN 11-6 Health & Safety Guidance

# Weatherization Plus Health

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*Making connections  
for healthier, more  
energy efficient homes*



NASCSP

The Department of Energy's Weatherization Plus Health Initiative is a national effort to enable the comprehensive, strategic coordination of resources for energy, health, and safety in low-income homes.

- Create and manage an online map and directory of WAP and healthy homes programs nationwide
- Produce individual reports on WAP and healthy homes activities in every state and territory
- Host regional conferences for WAP and healthy homes providers to identify gaps between existing partnerships and encourage new partnerships
- Collect and share best practices for referral systems between WAP and healthy homes programs
- Provide training and technical assistance for WAP and healthy homes practitioners
- Implemented through NASCSP



# 2011 Conference Dates and Sites

**MAY 23-25**

Portland, Maine

**AUGUST 24-26**

Bozeman, Montana

**SEPTEMBER 13-15**

Atlanta, Georgia

**OCTOBER 4-6**

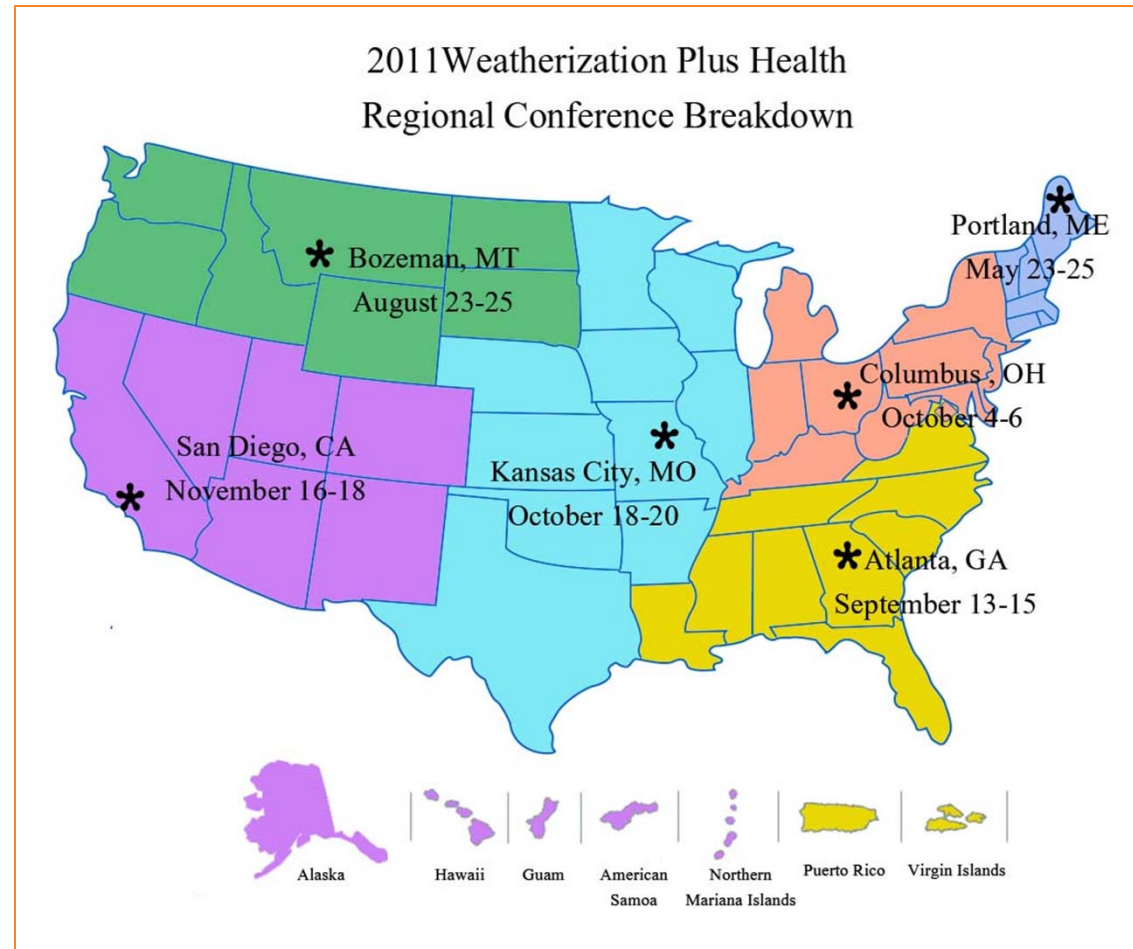
Columbus, Ohio

**OCTOBER 18-20**

Kansas City, Missouri

**NOVEMBER 16-18**

San Diego, California



- Objectives of the report:
  1. Obtain information “from the field” on the challenges and obstacles in addressing health and safety issues (e.g., deferral rates and reasons). Intent was to “go broad” rather than “go deep”.
  2. Obtain feedback and recommendations on how the identified barriers could be addressed by DOE
- Gathering information for the report:
  - NCHH and Tohn Environmental Strategies spoke with 40+ Weatherization services providers (local agencies) and 50 State grantees

# National Evaluation

- The National Evaluation is the opportunity to provide a robust data set of pre-weatherization, post-weatherization, measures installed and energy impact.
- Currently, Oak Ridge National Laboratory, at the direction of DOE, is undertaking two components of the National Evaluation:
  1. **Retrospective**, evaluates results from Program Years 2007 & 2008:
    - Includes additional studies on:
      - Large multifamily buildings
      - Bulk fuels (namely oil)
      - The indoor air quality (IAQ) field study is part of a larger assessment of non-energy impacts of the weatherization program
  2. **ARRA-Period**, covers Program Years 2009, 2010, and 2011:
    - Answer additional questions about ARRA management and oversight

# National Evaluation Indoor Air Quality Study

- Looks at radon, carbon monoxide, formaldehyde, moisture, in conjunction with blower door tests
- Approximately 550 homes
- Measuring pre- and post-weatherization levels
- Over-sample of high-radon areas
- High-radon homes receiving additional low-cost measures for decreasing radon levels (remediation conducted if necessary)

# Audit Tools

- Designed by ORNL in collaboration with HUD & DOE
- Performs whole-house health and safety audits including:
  - Site built single family
  - Mobile homes
  - Individual multifamily units
- Comprehensive checklist to identify potential H&S issues and recommend preventative and corrective measures
- Attempts to ensure health and safety of occupant and workers during and after weatherization
- Includes all the WAP health and safety and more
- Stand-alone module with potential for future efficiency audit integration
- Demo at <http://hyperion.ornl.gov/hud>

# Multi-Family Audit Tool: ORNL and LBL Collaboration



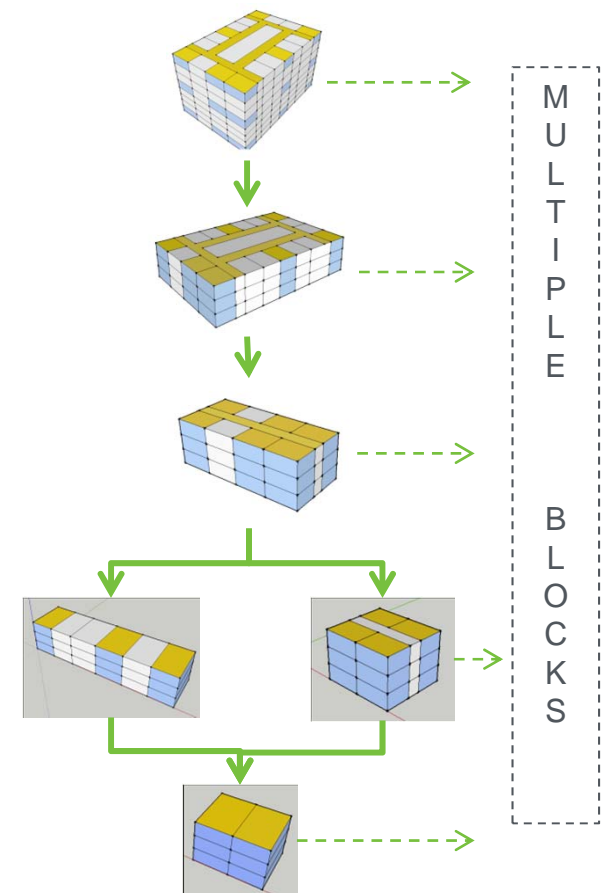
Develop Small Multi-Family and Large Multi-Family Audit Tool and Programmatic Elements for the WAP

Add Multifamily HES Consumer (Home Owners) & HES Pro



## Version 1 (Winter, 2012) Version 2 (2012)

- Two-step development planned with extensive front load of software development to implement initial version
- Version 1 - simpler buildings & systems, few extras
  - Low-rise walk ups
  - Individual dwelling unit space conditioning systems
  - Both dwelling unit and central plant domestic hot water systems
- Version 2 - more complex buildings & systems, additional capabilities
  - High-rise with core services
  - Central plant space conditioning systems



# The Multifamily Audit Tool will:

- Provide energy auditors with an improved energy simulation and weatherization measure selection tool for multifamily buildings
- Expand and enhance the energy auditing capabilities of auditors in multifamily buildings
- Provide a DOE-sponsored multifamily energy audit instrument to complement the single-family (NEAT) and mobile home (MHEA) energy audits already supported by DOE under the Weatherization Assistance
- Help improve retrofit work quality and provide a foundation for quality assurance
- Assist training providers in developing better training materials
- Increase workforce mobility up career ladders and across career lattices
- Build confidence among consumers, building owners, and the energy efficiency finance community

# WAP Training and Technical Assistance

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## Jennifer Somers

Team Lead Training and Technical Assistance/Senior Policy Advisor

Office of Weatherization and Intergovernmental Program

[Jennifer.Somers@ee.doe.gov](mailto:Jennifer.Somers@ee.doe.gov)

202.287.1740

## Ryan Middleton

Training and Technical Assistance Liaison/Project Officer

Office of Weatherization and Intergovernmental Program

[Ryan.Middleton@ee.doe.gov](mailto:Ryan.Middleton@ee.doe.gov)

202.287.1863

## Josh Olsen

Training and Technical Assistance Liaison/Project Officer

Office of Weatherization and Intergovernmental Program

[Joshua.Olsen@ee.doe.gov](mailto:Joshua.Olsen@ee.doe.gov)

202.287.1813

## Erica Burrin

Training and Technical Assistance Liaison/Project Officer

Office of Weatherization and Intergovernmental Program

[Erica.Burrin@ee.doe.gov](mailto:Erica.Burrin@ee.doe.gov)

202.287.1721