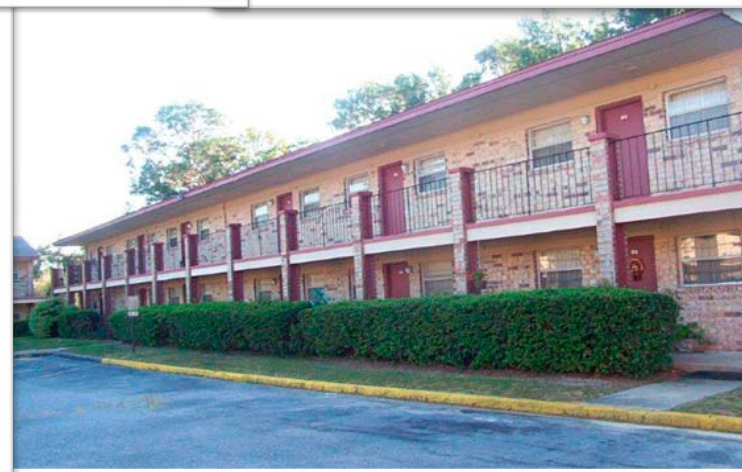


Guidelines for Home Energy Professionals: Update on the SWS for Multifamily Housing

U.S. DEPARTMENT OF
ENERGY

Energy Efficiency &
Renewable Energy



Jennifer Somers
Terry Brennan
Ellen Tohn

October 6, 2011
Healthy Homes

\$ 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%)
Total*	11.5	8.3 (71%)

*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

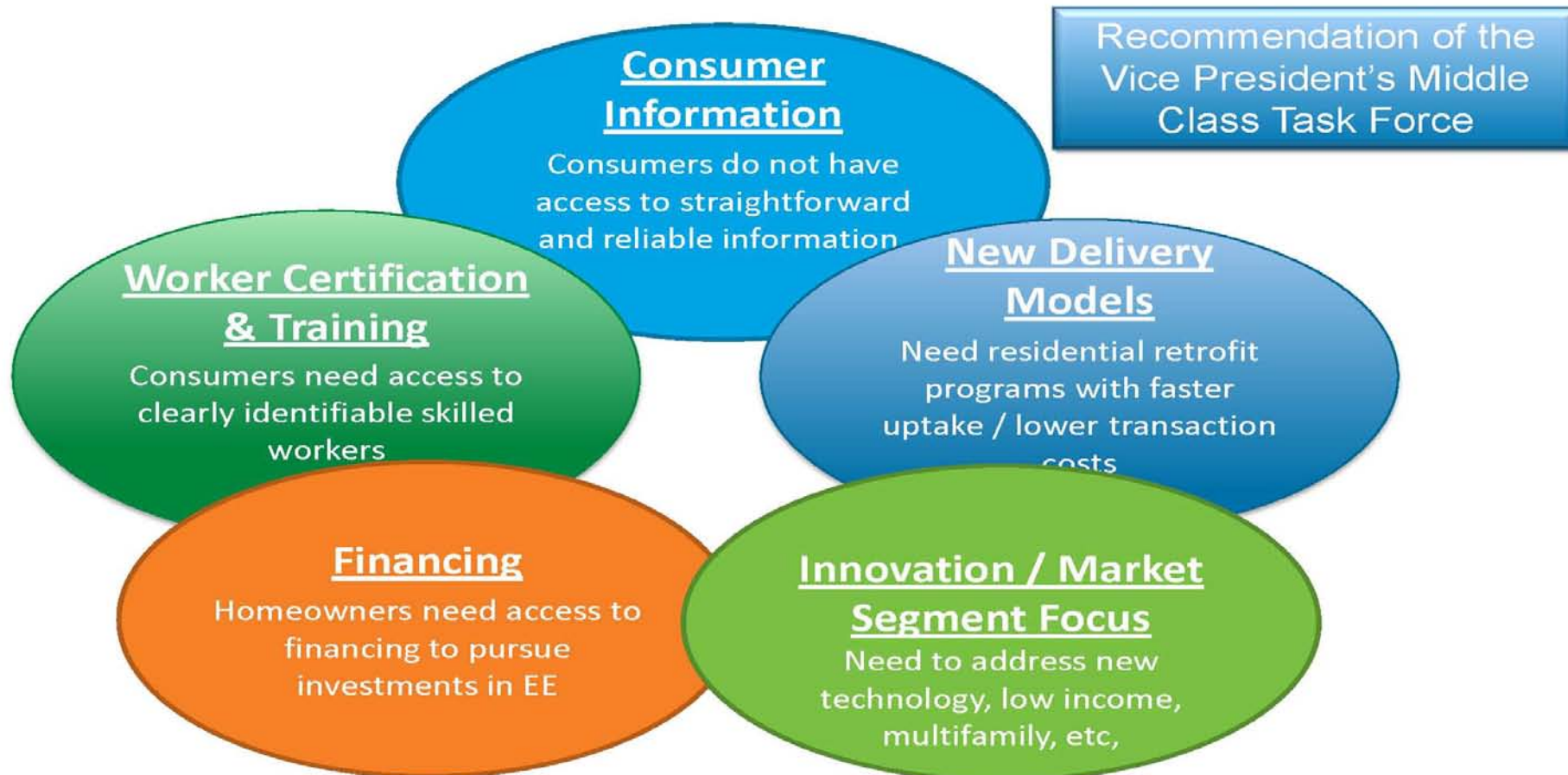
Created 15,400 new jobs

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

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



Weatherization Assistance Program

National Weatherization Training & Technical Assistance Plan



December 2009



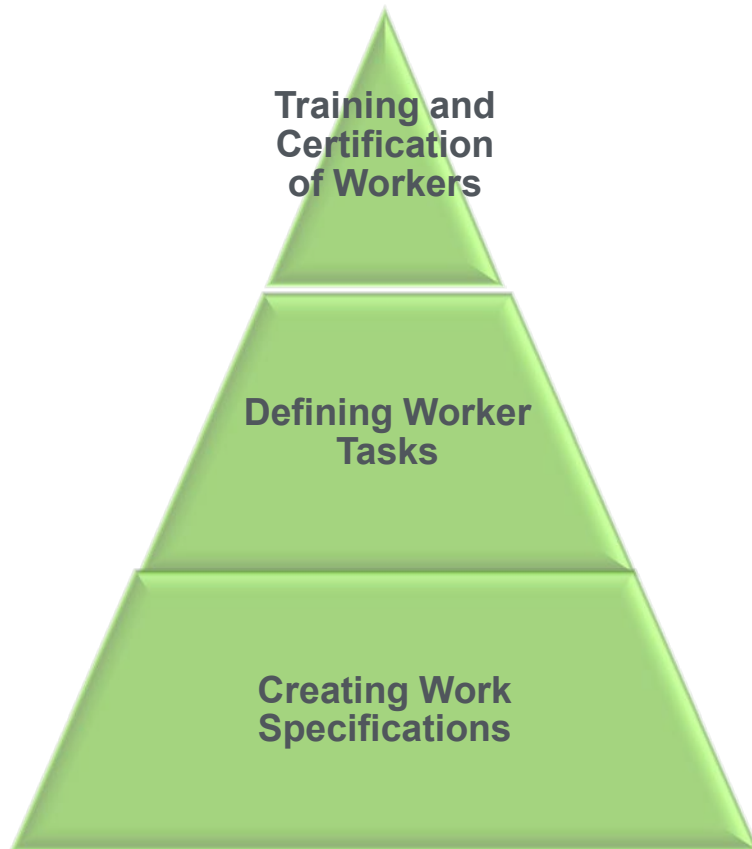
Prepared by the U.S. Department of Energy, Office of Weatherization & Intergovernmental Program
for the Weatherization Assistance Program

- 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.
- The Weatherization Assistance Program has 30 years of building science expertise and energy retrofit work behind it. It is the largest group of experts in home energy upgrades in the country.
- By utilizing the expertise of the WAP program, the DOE is seeking to lay the foundation for a robust private market for home energy upgrades.

Professional Workers/ Quality Work



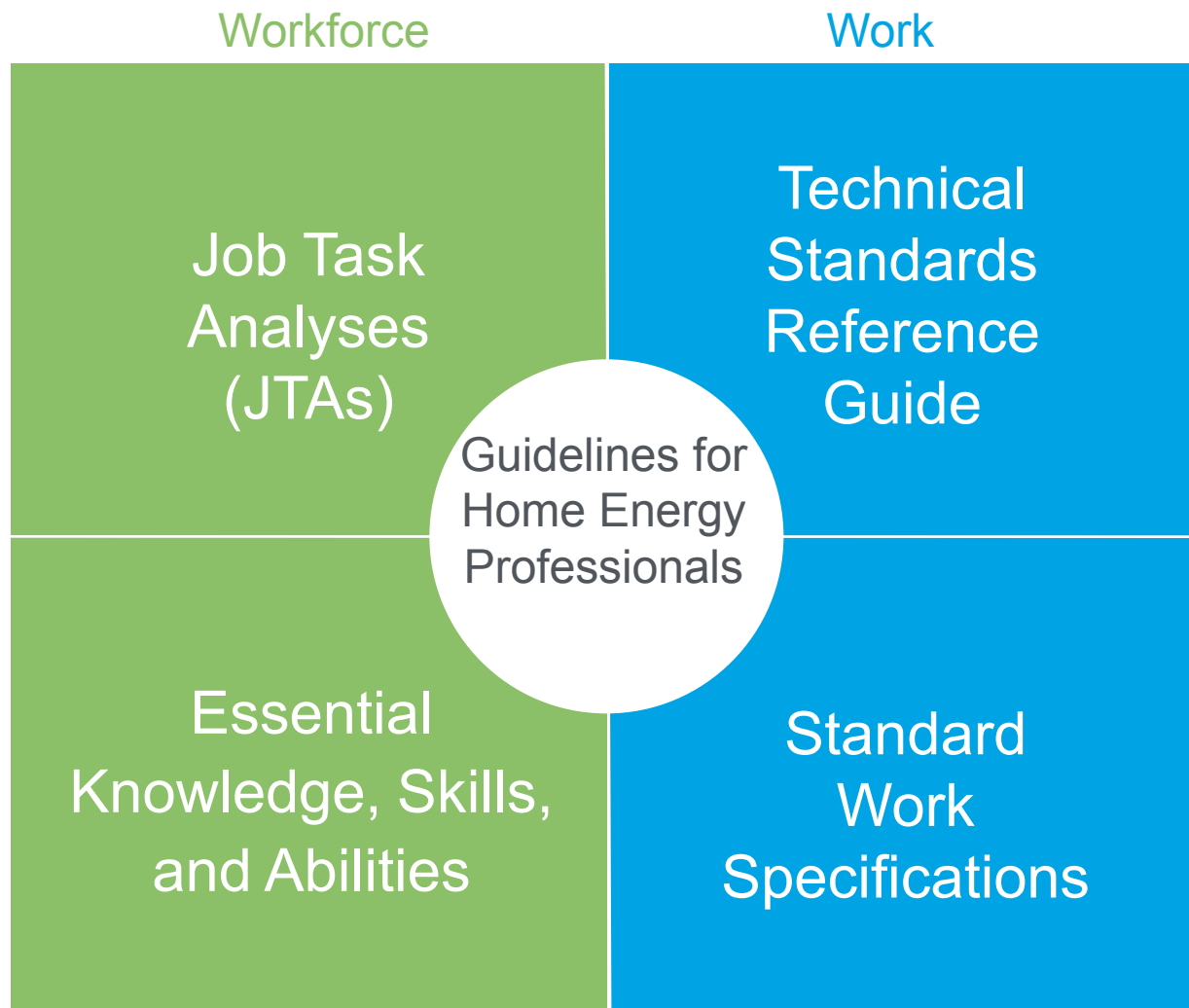
Market Expansion

- 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

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

- Facilitated by NREL
- Collaboration between DOE and home performance industry

Combined DOE/Weatherization Assistance Program (WAP) 30-year history with 2,000 industry members



- 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 (SWS) 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)
- The Standard Work Specifications 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

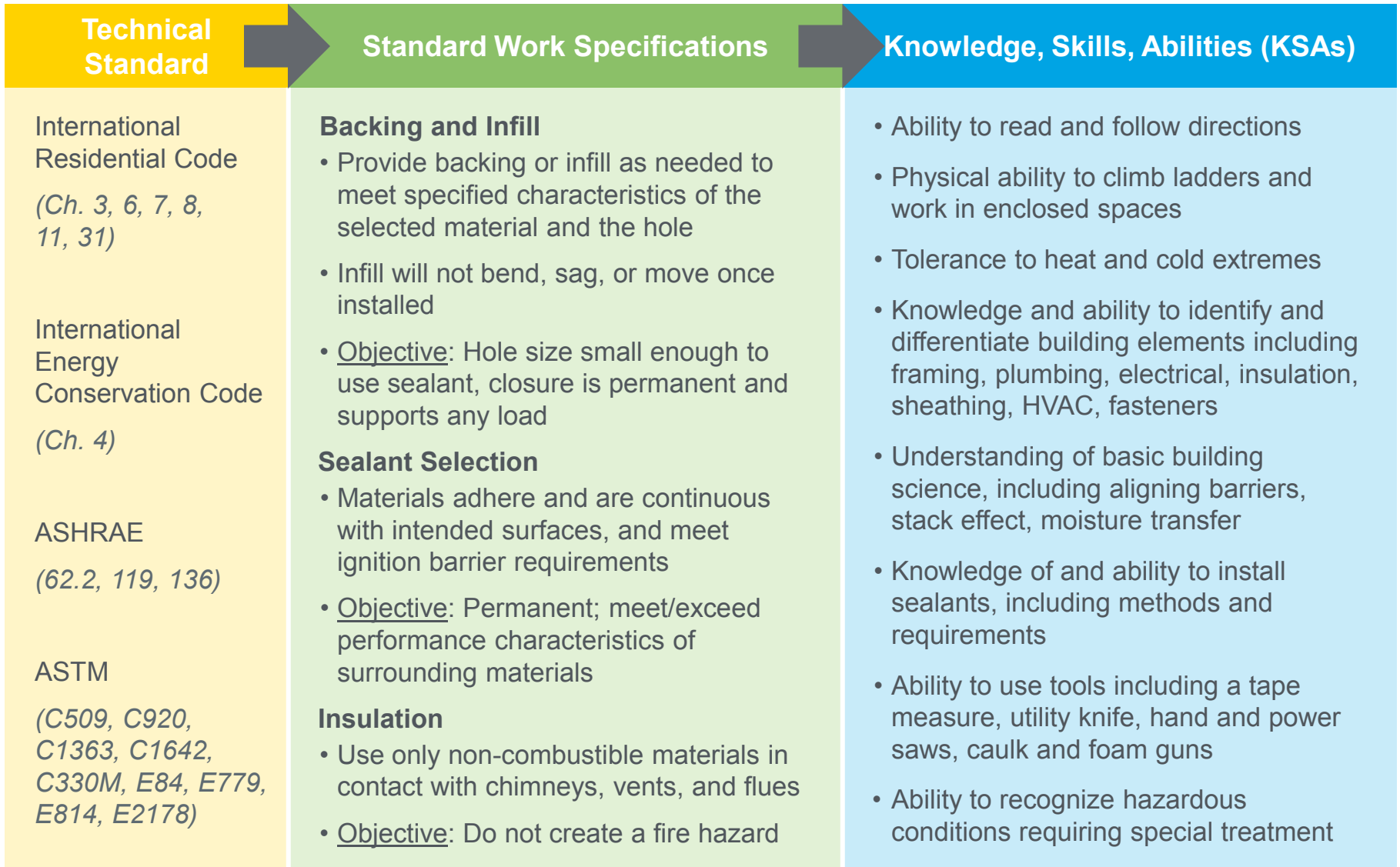
Desired Outcome:

- 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 or move result Prevent
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

³³ 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 ³³
Insulation will be installed using one of the following	Create an air barrier



- 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*)

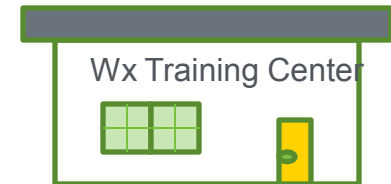
Standard Work Specifications = setting the bar for quality work

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



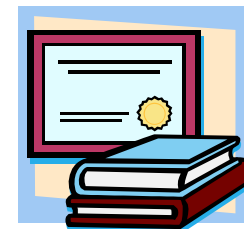
- Is given to individuals (**worker**)
- Certifies that an individual has the knowledge, skills, and abilities to perform a certain job.
- Is issued by an independent third party



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

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 (3rd 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
- irecusa.org

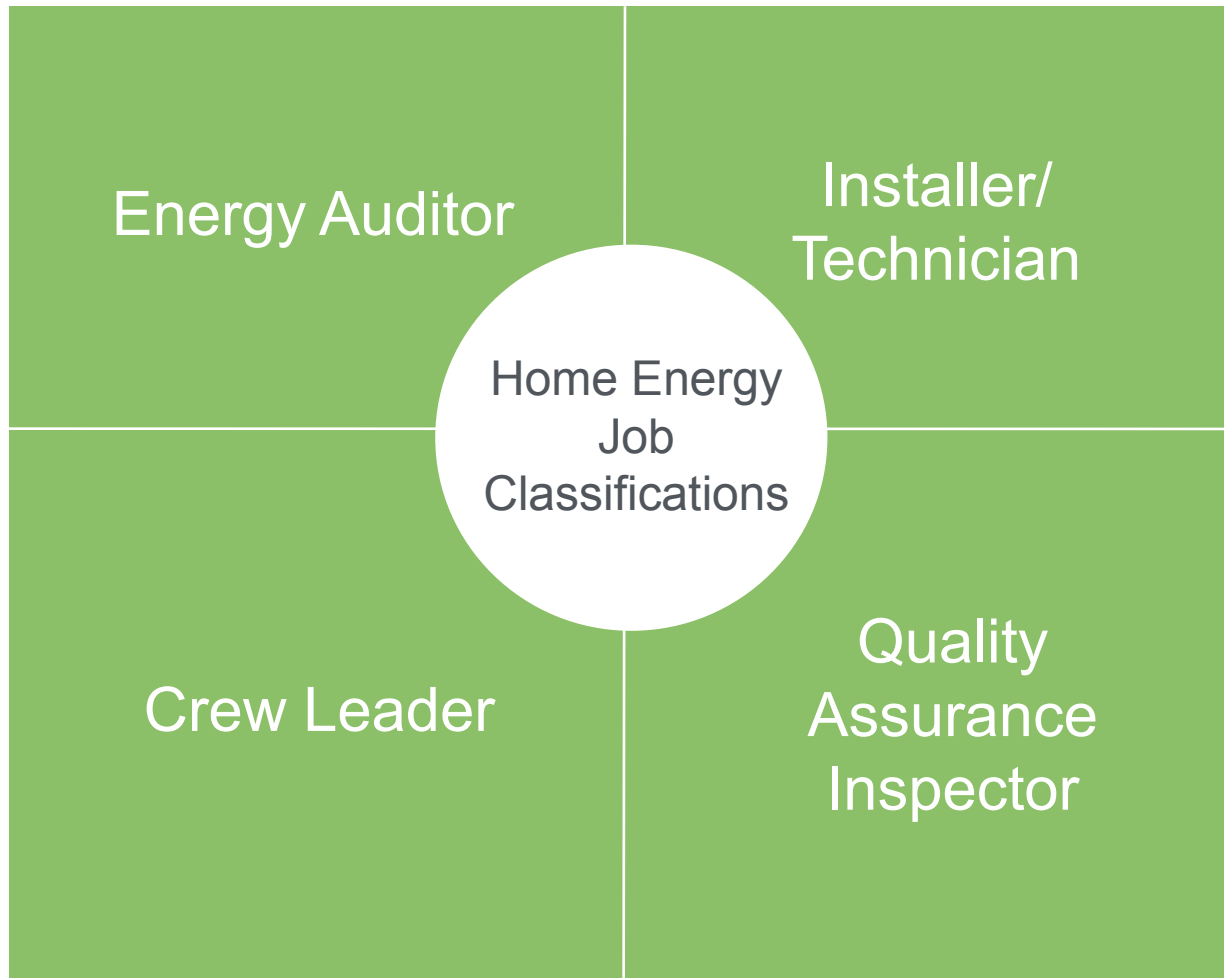
Job Task Analysis

- 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 Job Classifications



Expanding The Market

Guidelines for Home Energy Professionals: Update SWS for Multifamily Buildings

U.S. DEPARTMENT OF
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Energy Efficiency &
Renewable Energy



- 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 Professionals: Single Family
- Market Lead:
 - Define Multifamily building types
 - Assess existing standard and resources for inclusion and reference in the SWS
- Fill gaps in existing materials through collaboration of market players

- Baseload and Lighting
- Forced Air
- Hydronic 1
- Hydronic 2
- Ventilation
- Envelope 1
- Envelope 2
- Water Heating and Conservation

- 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”

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.

Future Timeline:

Webinars for Specific Audiences:

August, September, October 2011

Webinars for General Audiences:

September, 2011

Industry Review:

Start date: October 10th

Guidelines Completion:

Winter 2012 - 2013

Multifamily SWS Timeline

July 2011

1st 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

Revision

Revision

Revision

Revision

**August-
September 2011**

Technical
Review:
•Additional
Detail
Development
•Healthy Homes
•Worker Safety

**Winter 2011-
2012**

OMB and
Agency
Review

Summer 2012

Incorporate
Public
Comments

- Overall Ventilation Strategies
 - ASHRAE 62-2 and 62-1
- Environmental Tobacco Smoke
- Pest Exclusion
- Radon
- Interaction with Owner on Property Maintenance

- Ventilation
- Building Transport
- Compartmentalization
- Health & Safety for Workers
- Issues for Smaller Multifamily Projects
- OSHA Training



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
- Worker certification coming soon

10 Modules Completed:

- Weatherization Installer/Technician Fundamentals
- Weatherization Installer/Technician Intermediate
- Weatherization Installer – Manufactured Housing
- 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:

<http://www.waptac.org/Training-Tools/WAP-Standardized-Curricula.aspx>

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

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

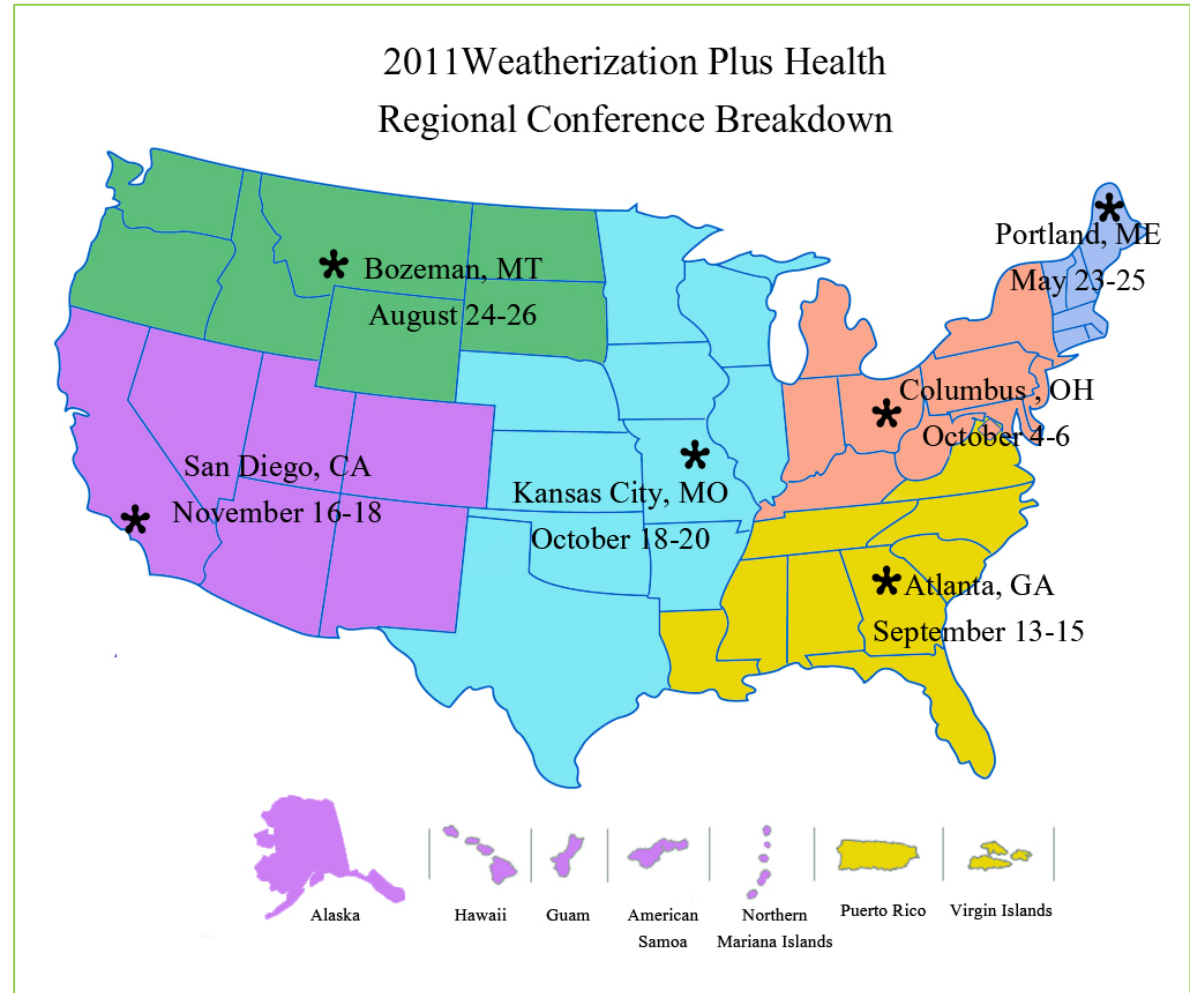
Columbus, Ohio

OCTOBER 18-20

Kansas City, Missouri

NOVEMBER 16-18

San Diego, California



Audit Tools

Multifamily Audit Tool: ORNL and LBL Collaboration



Develop Small Multifamily and Large Multifamily Audit Tool and Programmatic Elements for the WAP



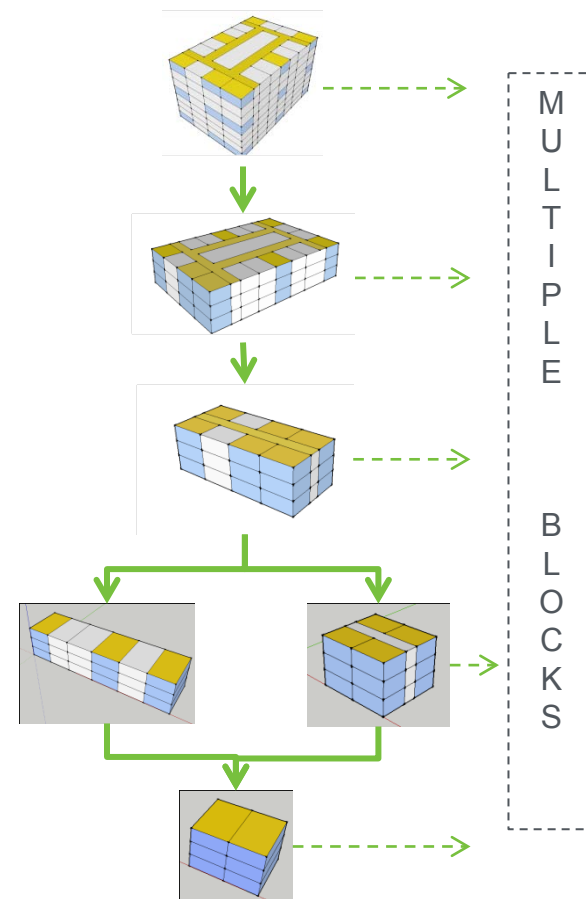
Add Multifamily HES Consumer (Home Owners) & HES Pro

Primary Needs Tool will Address

- Multiple zones and heating systems
- Improved methods of handling distribution systems
- Improved methods of handling impact of sensor location and controls
- Better handling of ventilation systems

Version 1 (December, 2011) 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 manufactured housing (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

- Designed by ORNL in collaboration with HUD & DOE
- Performs whole-house health and safety audits including:
 - Site built single family
 - Manufactured Housing
 - 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>

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