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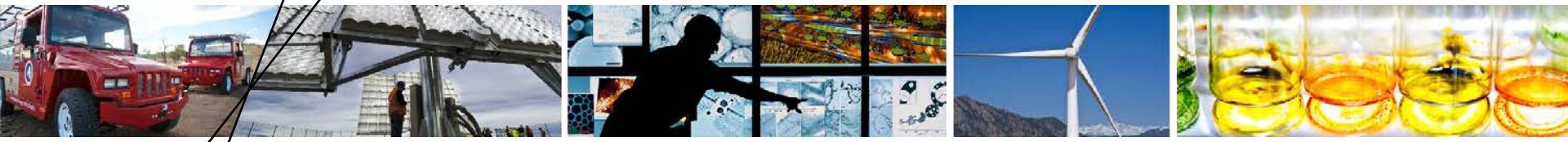
Update on the Standard Work Specifications for Multifamily Energy Upgrades



Jennifer Somers, U.S. Department of Energy (DOE)

Dave Hepinstall, Association of Energy Affordability (AEA)

Nick Dirr, Association of Energy Affordability (AEA)

Chuck Kurnik, National Renewable Energy Laboratory (NREL)

Tuesday, November 20, 2012

Introduction and Agenda

- Project Context: Jennifer Somers, DOE
- Project Process: Dave Hepinstall, AEA
- What is an SWS: Nick Dirr, AEA
- How to use Comment Tool: Chuck Kurnik, NREL

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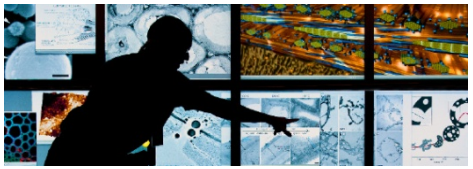


Project Context: Jennifer Somers, DOE

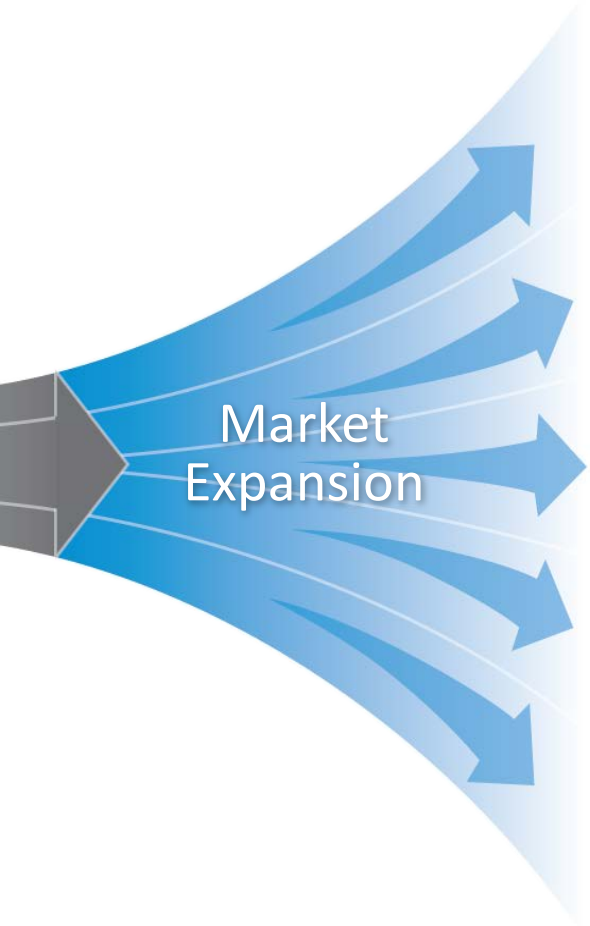
Foundation of Success

Creating a Benchmark for Quality:

The Guidelines for Home Energy Professionals Project

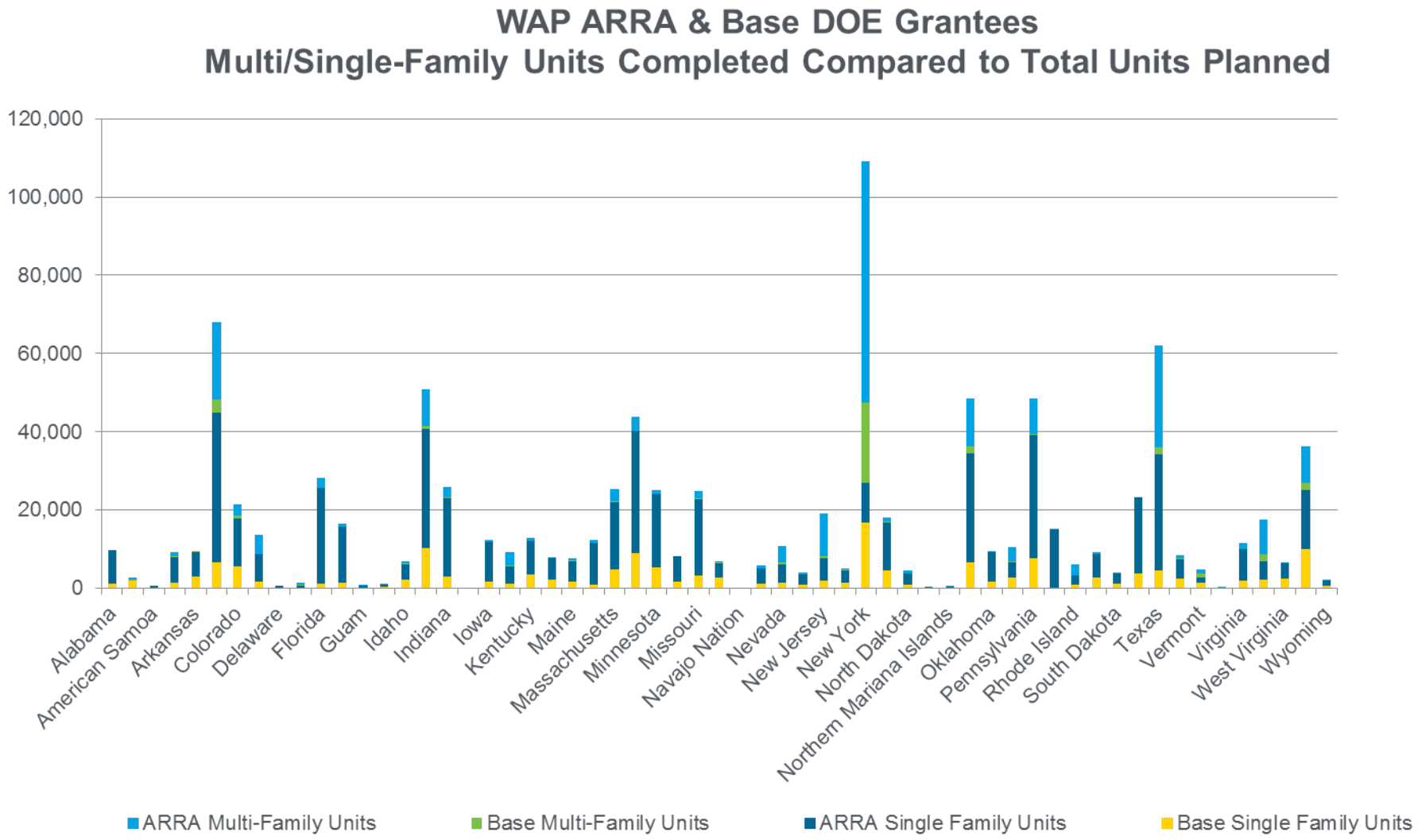
- **The Standard Work Specifications (SWS):**
  Doing the work right
- **Accreditation of Energy Efficiency Training Programs:**
  Training folks to do the work right
- **Home Energy Professional Certifications:**
  Proving that you can do the work right

Building the Future: Market Expansion



Multifamily	• Multifamily Tool for Energy Audits (MulTEA) • Standard Work Specifications (SWS) • Weatherization Innovation Pilot Program • Technical Guidelines for MF Energy Audits
Private Market Integration	• Better Buildings Neighborhood Program • Building America • HPwES • Utilities
Healthy Homes	• Wx Plus Health
Federal Partners	• HUD, EPA, CDC, HHS, CEQ, DOL, NIH, USDA
National Evaluation	• Non-Energy Benefits Study • Indoor Environmental Quality Study

Multifamily



Multifamily: Building an Industry

Overall Need: Data

- National WAP Evaluation Multifamily Building Study

Step 1: Data Gathering

- Technical Guidelines for Multifamily Building Energy Audits

Step 2: Energy Audit

- Multifamily Tool for Energy Audits (MulTEA)

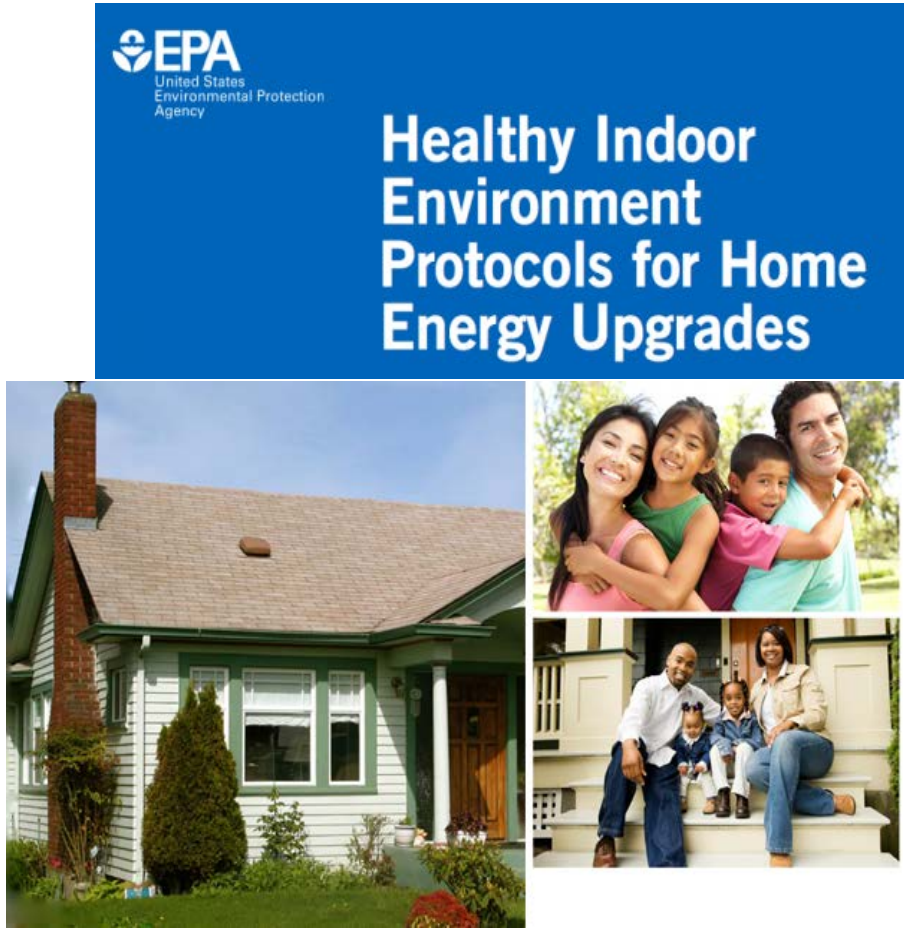
Step 3: Quality Work

- Standard Work Specifications (SWS) for Multifamily Energy Upgrades

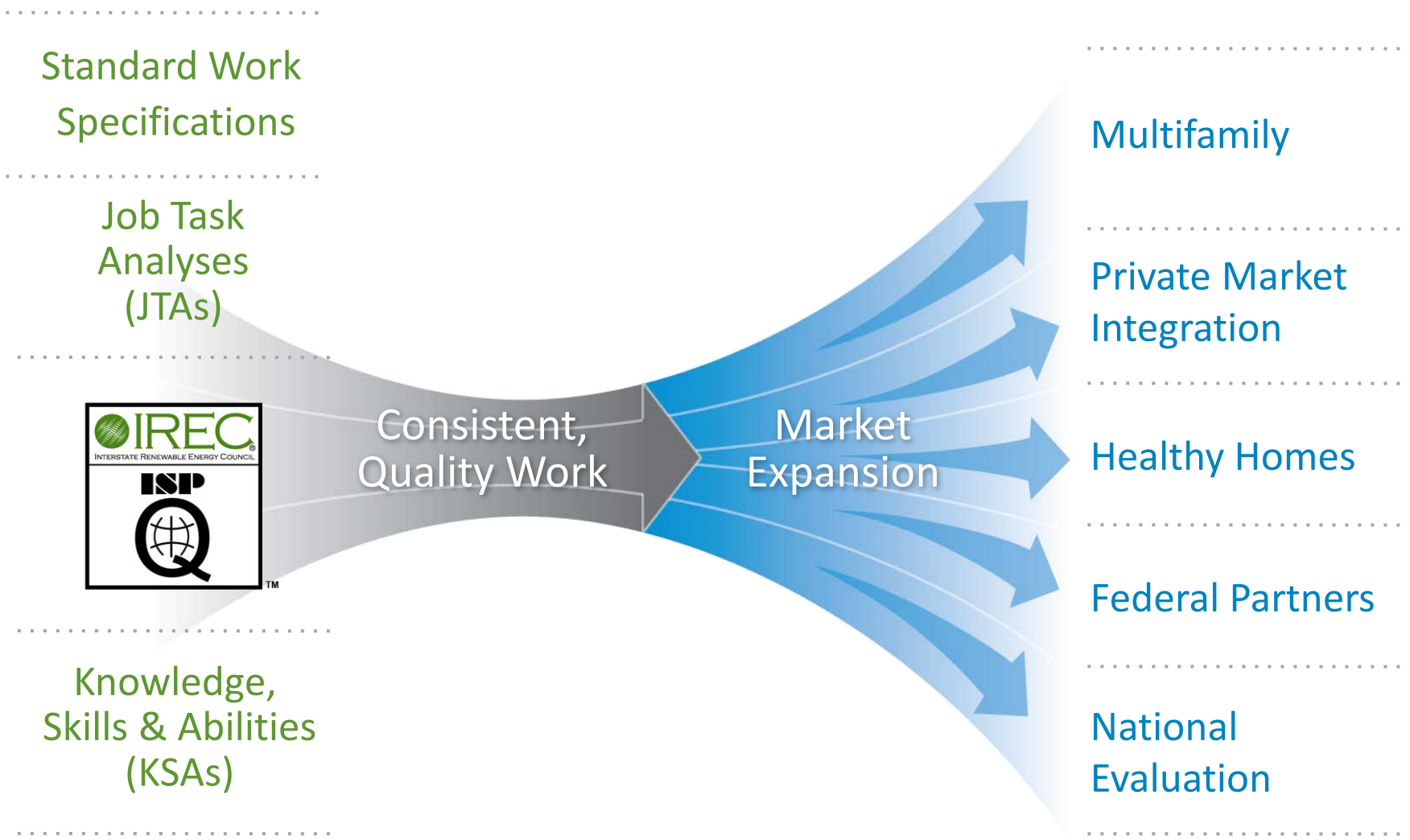
Guidelines: Interagency Partnerships

WAP Training and Technical Assistance Team working with the EPA Indoor Environments Division on the creation of:

EPA Healthy Indoor Environment Protocols for *Multifamily* Energy Upgrades



Building the Future: Market Expansion



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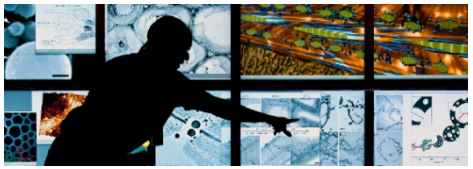

Project Process: Dave Hepinstall, AEA

Project Process Overview

- Collaboration between DOE, NREL, Advanced Energy, and AEA
- Multifamily Market Lead and Market Committee established to:
  - Build on results from single-family SWS, especially for low-rise multifamily
  - Define multifamily buildings (e.g., low-rise, mid-rise, high-rise)
  - Confirm six categories of work:
    - Hydronic, Forced Air, Water Heating and Conservation
    - Ventilation, Envelope, Baseload and Lighting
- Subject matter experts recruited for five-day development event in July 2011

Multifamily: Building an Industry

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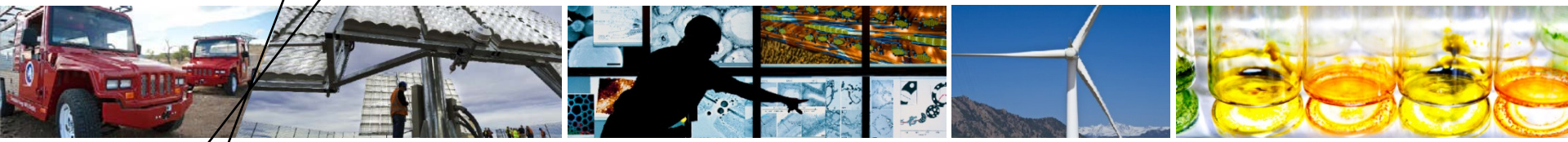
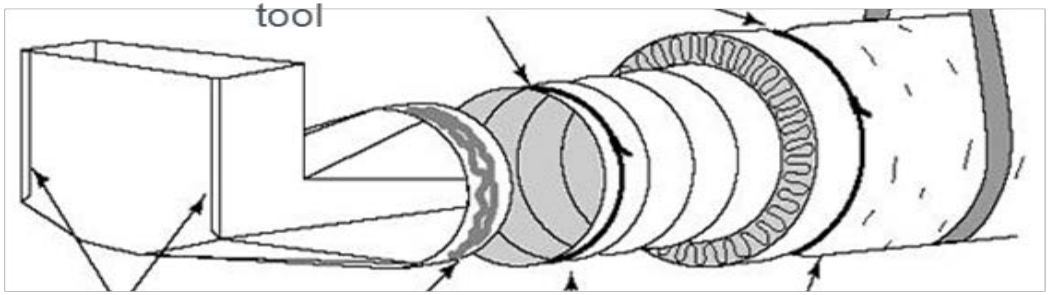


What is an SWS: Nick Dirr, AEA

Define the Work

Standard Work Specifications (SWS) For Multifamily Energy Upgrades



A National Baseline for Work Quality

Standard Work Specifications

2.10 Above Roof Deck Air Sealing
Topic: Air Sealing
Subtopic: Roof
2.10 Detail Name: Above Roof Deck Air Sealing
Desired Outcome: Continuous air, thermal and moisture barrier at roof

The ***Objective*** defines the required outcomes of the work.

Row	Title	Specification(s)	Objective(s)
2.10.1	Worker safety	Worker safety specifications will be in accordance with Global Worker Safety SWS	Ensure worker safety, especi… in regard to fall protection considerati…ns and contaminants found in demolition, such as asbestos, lead, PCBs, etc.
2.10.2	Occupant safety	An occupant safety plan will be prepared, reviewed with and approved by building operators and implemented throughout production	Ensure occupant safety
2.10.3	Pre-inspection	Existing roof water management system will be identified Plans will be made for future water management system Existing roof system will be evaluat… …o determine suitable materials and techniques th… …ot compromise the integrity of the roofing system … …t adversely impact warranty or … work has been performed. …f the roof will be determined … will be anchored at the	Ensure adequate water management system Ensure adequate roof adherence Prevent air infiltration between roof system and the perimeter of the building

The ***Specification*** defines the minimum level of action required to meet the ***Objective.***

How are the SWS Intended to be Used?

- To help **Energy Auditors**, **Program Administrators**, and **Program Managers** better define and understand necessary work involved in installing energy efficiency measures

- To guide **On-Site Construction Managers**, **Building Owner Representatives**, and **Program Stakeholders** in defining a quality installation, which will ensure energy savings and safe and durable operation of multifamily retrofits

Relation to Existing Codes

- Intended to ensure measures are installed to **local code requirements** and **manufacturer requirements**
- Some instances occur where **no existing codes or standards cover all components** of multifamily retrofit installations
- Have been reviewed by code experts to ensure that installation recommendations are **not in conflict with international/ universal codes**

Relation to Trades

- Not meant to replace existing industry codes, standards and practices
  - Intended to be complimentary and supplemental
- Used to:
  - Provide guidance on installations specific to retrofit work not covered by existing codes, specs, and standards
  - Ensure that existing codes, specs, and standards are referenced appropriately when developing a scope of work
- Not related to worker certification
  - Licensed and certified professionals will continue to work under the existing credentials for their trade

Conformance with Existing Codes

- Draft SWS were reviewed for conformance with the following international and national codes:
  - **IMC** (International Mechanical Code)
  - **UMC** (Uniform Mechanical Code)
  - **UPC** (Uniform Plumbing Code)
  - **IECC** (International Energy Conservation Code)
  - **IBC** (International Building Code)
  - **IFGC** (International Fuel Gas Code)
  - **NFPA 54** (National Fuel Gas Code)
  - **NFPA 70** (National Electrical Code)
  - **NPFA 31** (Standard for the Installation of Oil-Burning Equipment)

Existing Industry Standards

- Draft SWS were reviewed for conformance with the following standards, often in conjunction with review comments provided by industry:
  - **ACCA Standard 5** (HVAC Quality Installation Specification)
  - **ACCA Manual J, D, & S** (HVAC Equipment Sizing and Selection)
  - **ASHRAE Standard 111** (Measurement, Testing, Adjusting And Balancing)
  - **ASHRAE 62.2** (Ventilation and Acceptable Indoor Air Quality in Low Rise Residential Buildings)
  - **ASHRAE 62.1** (Ventilation for Acceptable Indoor Air Quality)
  - **ASHRAE 90.1** (Energy Standard for Buildings)

Review and Comment Integration

- **Accepted**: Accepted as recommended
- **Accepted with Modification**: Agreed with the intent of comment, but made a modification to the recommended change
- **Rejected**: Recommended change was not incorporated, see response in tool for more detail

Code/Standard Integration – Step 1

- Primary specification for installations is to follow local code requirements and manufacturers' requirements; if there is a conflict between the two, the more stringent requirement should be followed

**Please note: specific local codes were not reviewed as part of the SWS creation process*

Code/Standard Integration – Step 2

- If there is a nationally and/or internationally recognized code or standard that should be followed—in absence of a specific local code or manufacturer requirement—it was included specifically in the specification text language (e.g. NFPA 54, NFPA 70, NFPA 31, IFGC, ASHRAE 62.2)

- Additionally, if the local code or manufacturer does not have a requirement for that specification—*and* there is an industry-recognized standard that should be followed—it was directly included in the text of the specification. This includes ACCA Equipment Sizing Standards, ACCA Standard 5, and ASHRAE Standard 111

Code/Standard Integration – Step 3

- Complimentary standards that either closely matched language already in the SWS, or were more general in nature, were included in the cross-reference appendix.

5.1.2	ANSI/ACCA Manual J	Residential Load Calculation	
5.1.2	ANSI/ACCA Manual N	Commercial Load Calculation for Small Commercial Buildings	
5.1.2	ASHRAE	General	
5.1.2	ASHRAE Standard 183	Peak Cooling and Heating Load Calculations in Buildings Except Low-Rise Residential Buildings	
5.1.8	ANSI/ACCA 5 - 2010 QI	HVAC Quality Installation Specification	
5.2.2	ANSI/ACCA Manual J	Residential Load Calculation	
5.2.2	ANSI/ACCA Manual N	Commercial Load Calculation for Small Commercial Buildings	
5.2.2	ASHRAE	General	
5.2.2	ASHRAE Standard 183	Peak Cooling and Heating Load Calculations in Buildings Except Low-Rise Residential Buildings	
5.2.9	IPC	International Plumbing Code	101.3
5.2.9	IPC	International Plumbing Code	101.4
5.2.9	IPC	International Plumbing Code	301.7
5.2.9	UPC	Universal Plumbing Code	101.2
5.3.1	ANSI/ACCA 4 -- 2007	Maintenance of Residential HVAC Systems in One- and Two-Family Dwellings Less Than Three Stories, 2007	
5.3.1	ANSI/ASHRAE/ACCA Standard 180 - 2008	Standard Practice for Inspection and Maintenance of Commercial Building HVAC Systems	
5.3.2	ANSI/ACCA 4 -- 2007	Maintenance of Residential HVAC Systems in One- and Two-Family Dwellings Less Than Three Stories, 2007	
5.3.2	ANSI/ASHRAE/ACCA Standard 180 - 2008	Standard Practice for Inspection and Maintenance of Commercial Building HVAC Systems	
5.3.6	NFPA 31	Standard for the Installation of Oil-Burning Equipment	3.3.50
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5.6.2	NFPA 31	Standard for the Installation of Oil-Burning Equipment	3.3.50
5.7.4	EPA	General	
5.9.1	IFGC	International Fuel Gas Code	
5.9.1	NFPA 31	Standard for the Installation of Oil-Burning Equipment	

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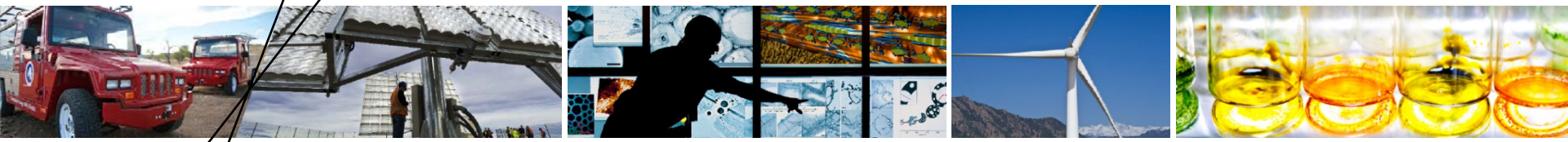

SWS Example: Nick Dirr, AEA

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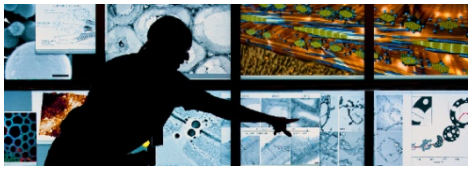
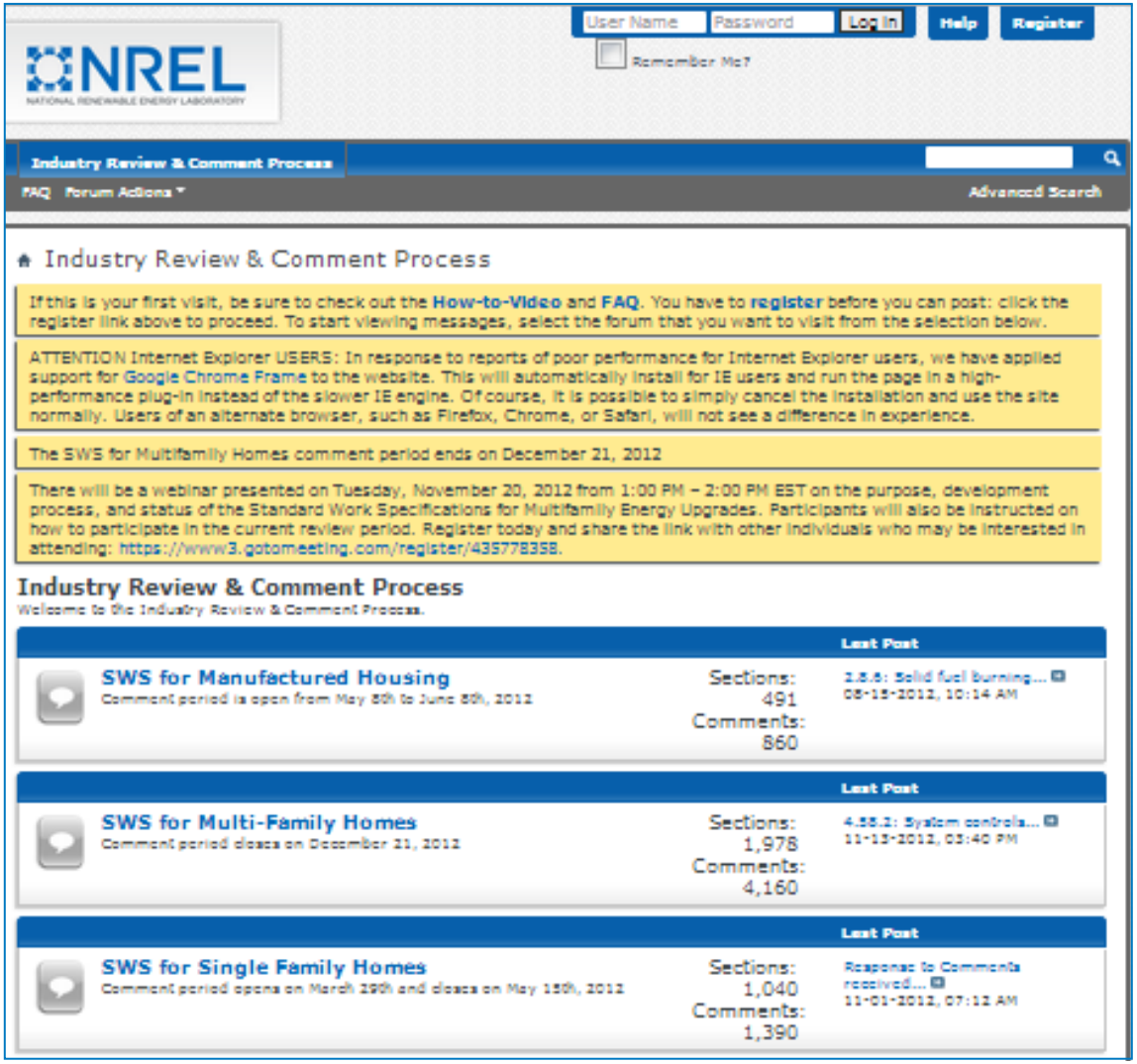


Comment Tool Demo: Chuck Kurnik, NREL

Comment Tool Demo



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Resources and Questions

- Guidelines Project Contact
  workforce_guidelines@nrel.gov
- Guidelines Website
  www.wip.energy.gov/retrofit_guidelines.html
- SWS Comment Tool
  http://nrel.pnnl.gov