

# Technical Management Areas

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# Session Goals

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- Know what you need to know (even if you don't know it yet),
- Be able to find relevant resources, and
- Have a sense of timelines for developing pieces.

# Session Format

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- **5 minute overview on each topic:**
  - Energy Audits and Priority Lists
  - Field Guides
  - Training
  - Certifications
  - Inspections & Monitoring
- **Open to questions and discussion – We are here for you**

# Session Outline

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- **Energy Audits and Priority Lists**
- Field Guides
- Training
- Certifications
- Inspections & Monitoring

# Energy Audits and Priority Lists

- WPN 19-4: Revised Energy Audit Approval Procedures
- Required to submit to DOE for reapproval every 5 years (or less)
- Must have Single Family & Manufactured Homes approved audits or priority lists

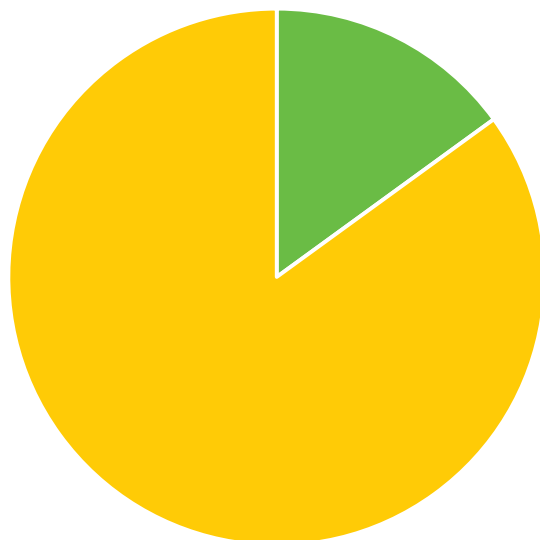


# Energy Audits and Priority Lists - Requirements

**< 20% production –  
submit projects as  
needed**

**> 20% production – need  
approval**

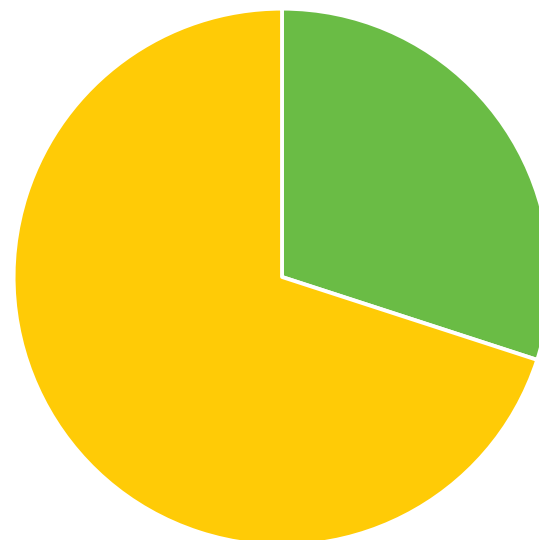
Housing Weatherized



■ Multifamily (5+ units) ■ Other



Housing Weatherized



■ Multifamily (5+ units) ■ Other

# Energy Audits and Priority Lists - Requirements

## Multifamily - General

- conditioned on maintaining technical expertise



# Energy Audits – Submittals Basics

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The Grantee must submit a formal request letter to DOE for approval of the specific audit tool for use in the WAP program.

A complete list of measures considered by the audit for installation as Energy Conservation Measures (ECMs) including:

- Lifespan of installed measure
- Accurate material and labor costs
- Statement of compliance with 10-CFR 440 Appendix A



# Energy Audits – Submittals Basics

Fuel cost for all fuel types considered by the audit.

A list of items to be installed as General Heat Waste (GHW) measures (if any).



# Energy Audits – Submittals Basics

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**Sample audits (10 for each housing stock), including:**

- Final energy savings report (recommended measures) and work order
- Field data collection forms and notes from actual Subgrantee energy audits
- Audit tool input report or database
- Photos of all four exterior sides of dwelling
- Target ASHRAE 62.2 calculations

# Energy Audits – Submittals Basics

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Grantee specific Audit Procedures and Field Protocols for data collection and audit tool entry including:

- Field data collection forms and combustion safety protocols
- Written guidance for field data collection, audit software data entry, measure installations.

# Energy Audits – Submittals Basics

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**Non-expedited tools also require:**

- Energy estimating methodology
- Measure interaction description
- Cost-effectiveness clarification, including:
  - User-defined measures
  - IRM treatment

# Energy Audits – Where to Learn More

- **WPN 19-4 and Attachments**

- Attachment 1 describes the information Grantees must submit and evaluation criteria
- Attachment 2 describes what information the Grantee must submit for priority list, and evaluation criteria DOE will use to approve priority lists.
- Attachments 3 and 4 list nationally approved and single-Grantee approved energy audit tools, respectively, and for which building types.
- Attachment 5 provides guidance on fuel switching.
- Attachment 6 explains how to request special approval of energy conservation materials not listed in Appendix A
- Attachment 7 lists Appendix A-approved materials
- Attachment 8 provides clarification on measure skipping
- Attachment 9 updates allowed maximum lifetimes of weatherization measures

# Energy Audits – Summary

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- Resubmit every 5 years
- Need 10 sample audits of each housing type
- WPN 19-4 includes everything you need to include

# Session Outline

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- Energy Audits and Priority Lists
- **Field Guides**
- Training
- Certifications
- Inspections & Monitoring

# Field Guides

Get everyone on the same page





# Field Guides - What you need to know

- Update schedule
- Basic requirements
- Variance Requests



# Field Guides – Update Schedule

Reapproval required every 3 years  
(In late PY2020, this moves to 5 years).

- When is yours due?
- How long will it take?



# Field Guides – Basic Requirements

- Align with SWS
- Notify network



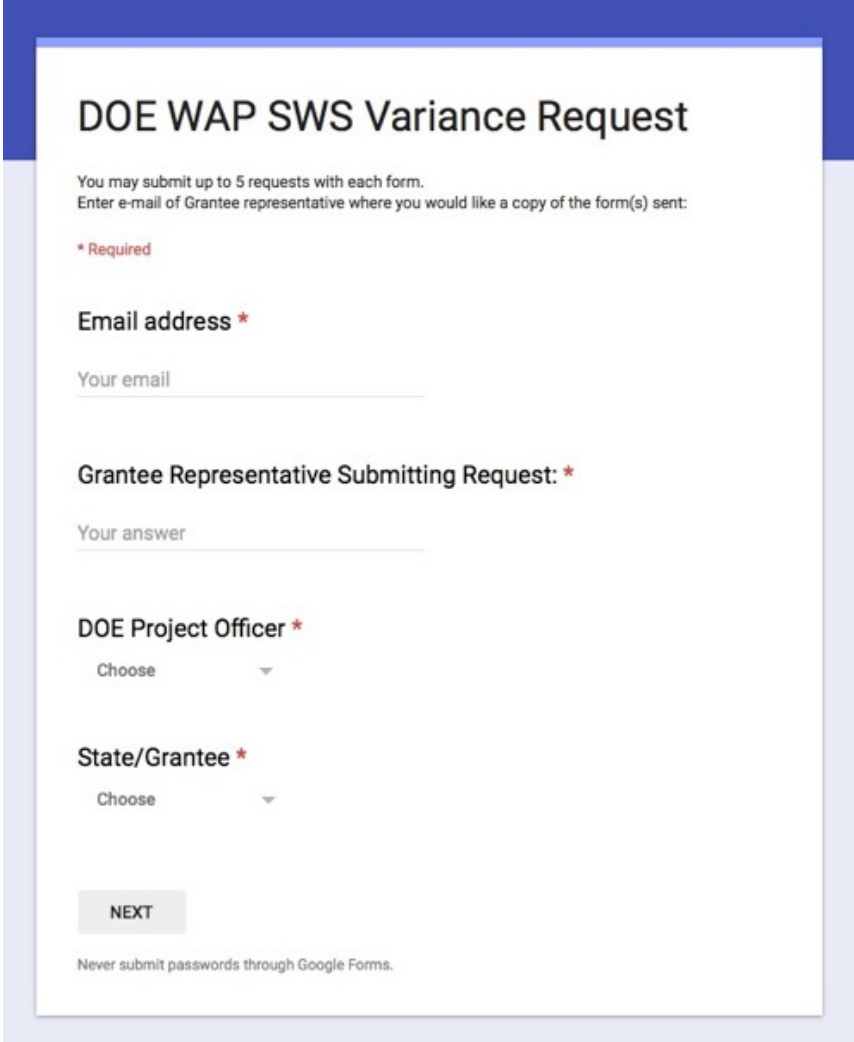
# Field Guides – SWS and Variance Requests

## A Conundrum:

- Field guides must align with the SWS (per WPN 15-4).
- Sometimes the SWS don't work for you.

## The solution:

- Submit a Variance Request



**DOE WAP SWS Variance Request**

You may submit up to 5 requests with each form.  
Enter e-mail of Grantee representative where you would like a copy of the form(s) sent:

*\* Required*

Email address *\**

Your email

Grantee Representative Submitting Request: *\**

Your answer

DOE Project Officer *\**

Choose

State/Grantee *\**

Choose

**NEXT**

Never submit passwords through Google Forms.

# Variance Requests – Tips for Approval

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- Get the justification right.
- Double check the details.
- Be clear and concise.
- Be specific.

New form available here:

<https://goo.gl/forms/GeLNgwYWEgK2aNup2>

# Field Guides – Where to Learn More

- **WPN 15-4, Sections 1 & 2** – Describe SWS alignment and distribution requirements
- **State Plan Section V.5.1** – Technical Guides and Materials
- **WAP Website – Training Resources:**  
<https://energy.gov/eere/wipo/downloads/training-resources>
  - SWS tool navigation training
  - Field Guide and Variance Request Review Process webinars
- **SWS** - <https://sws.nrel.gov>
- **Variance Request Form:**
  - <https://goo.gl/forms/GeLNgwYWEgK2aNup2>

# Field Guides - Summary

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- 3 year update cycle
- Must align with SWS, unless you have an approved variance Request.
  - Webinar provides tips.
- Must be available to your entire network

# Session Outline

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- Energy Audits and Priority Lists
- Field Guides
- **Training**
- **Certifications**
- **Inspections & Monitoring**



# Training

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- Timeline
- Basic Requirements
- T&TA Planning and Reporting Template

# Training - Timeline

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Training Plans must ensure that **all Weatherization field staff receives regular Comprehensive (Tier 1) training.**

**Each Grantee will decide on the regularity of training**  
based on workforce needs and availability of funds.

# Training – Basic Requirements

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- Analysis of training needs
- Plan to meet those needs
- Comprehensive training on Grantee-determined schedule
- Comprehensive (Tier 1) - Accredited training providers

# T&TA Planning and Reporting Template

[illegible]

<https://www.energy.gov/eere/wipo/downloads/training-resources>

# Training – Where to Learn More

- WPN 15-4, Sections 3 & 4 – Describe training plan requirements
- State Plan section V.7.4 – Training & Technical Assistance
- Sortable list of accredited centers:
  - <https://irecusa.org/credentialing/credential-holders/>
- Learn more about accreditation:
  - <https://irecusa.org/credentialing/accreditation/training-providers/>
- JTAs that accredited plans must align with:
  - <https://energy.gov/eere/wipo/guidelines-home-energy-professionals-accredited-training#jta>

# Session Outline

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- Energy Audits and Priority Lists
- Field Guides
- Training
- **Certifications**
- **Inspections & Monitoring**

# Certifications

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- Why we require QCI
- Basic requirements
- Difference between certification and accreditation

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# **The Little Dutch Boy**





Seawater

Dike

Croplands



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What does this have to do with QCI?

Bad Press

WAP





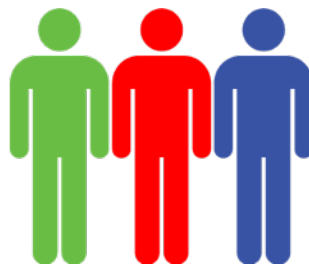
# Certifications

- **4 HEP Certifications available:**
  - Energy Auditor (EA)
    - Micro-Credential Quality Control inspector (QCI)
  - Retrofit Installer/Technician (RIT)
    - DOE no longer maintains
  - Crew Leader (CL)
    - DOE no longer maintains
- **1 HEP Certification federally required:**
  - Quality Control Inspector (QCI)



# Certification vs. Accreditation

Certification is for people:



Accreditation is for Programs or Providers:



**You CAN have one without the other.**

# HEP Certifications – Where to Learn More

- **BPI - <http://bpi.org/certified-professionals>**
  - Includes application forms, prerequisites, exam fees, certification scheme handbooks, exam prep tips, and more, for each certification.
- **JTAs that certifications are built on:**
  - <https://energy.gov/eere/wipo/guidelines-home-energy-professionals-accredited-training#jta>
- **DOE WAP Standardized Training Curricula aligned with JTAs (2.0 versions):**
  - <http://www.waptac.org/Training-Tools/WAP-Standardized-Curricula.aspx>



# Training and Certification Summary

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- Training is expensive, accreditation is 3<sup>rd</sup> party approval.
- Certification is for people. Accreditation is for programs, and you *can* have 1 without the other.

# Session Outline

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- Energy Audits and Priority Lists
- Field Guides
- Training
- Certifications
- **Inspections & Monitoring**

# Inspections & Monitoring

**We've defined the work, now hold everyone to it.**



# Purposes of Monitoring

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- Analyze whether best possible program services are being delivered to low-income population.
- Determine program compliance and accountability.
- Analyze program performance.
- Analyze quality of work.

# Purposes of Monitoring

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- Identify problems, deficiencies, and areas that need improvement and advise on how to correct.
- Assist agencies in their program operations and compliance with DOE and State regulations.
- Assess T&TA needs.
- Be a major tool for program improvement.

# Monitoring - Requirements

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From WPN 20-4:

- The Grantee **must**:
  - Conduct **comprehensive** monitoring of each Subgrantee **at least once a year**,
  - Provide a written report to the Subgrantee and
  - Maintain a file related to monitoring which is
  - Accessible by DOE during its monitoring visits.

# Inspection & Monitoring Forms

- Do they align with your DOE approved field guides?
- Do they align with work orders?
- Do they account for missed opportunities?
- How often are they updated?
  - By whom?



# Inspection...then what? – Policies

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- **What's the policy for when monitors find:**
  - Subpar work?
  - Subpar final inspections?
  - Incomplete work in units reported as complete?
  - Inaccurate energy audits?
- **What is the policy when an agency just isn't performing?**



# Inspection...then what?

Avoid “heat of the moment” decisions.



# Inspections & Monitoring – Where to Learn More

- WPN 20-4 – Monitoring Guidance
- WPN 15-4, Section 3 – Inspection & Monitoring
- WPN 13-4 – Clarifies regulations around property acquired by Grant \$
- State Plan Section V.5.3 – Inspections
- State Plan Section V.8.3 – Monitoring
- Annual Grant Guidance (XX-1)
- DOE WAP Standardized Curricula module: Quality Control Inspector 2.0:
  - <https://www.energy.gov/eere/wipo/weatherization-standardized-curricula>

# Inspections & Monitoring Summary

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- Hold people to the defined standards.
- Have written policies in place for worst-case scenarios.
- Avoid heat of the moment decisions.

# Thank you!

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Questions?

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# Priority Lists – Submittal Requirements - 1

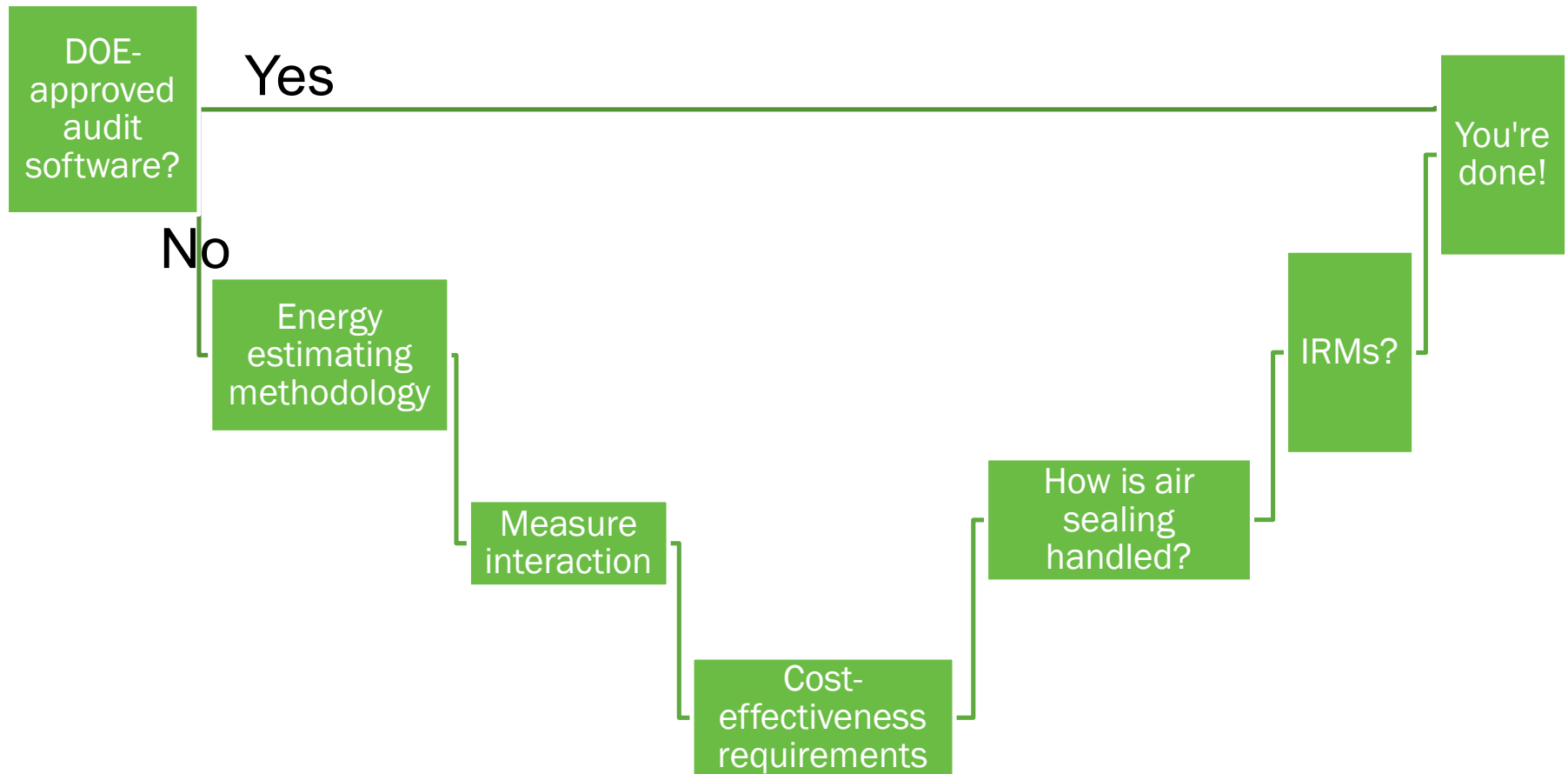
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- Description of the home type that the priority list applies to
- Complete list of the weatherization measures typically “enabled” for evaluation,
  - material and labor costs for each measure, and
  - the expected lifetime of each measure used in the SIR calculation.
- Fuel prices

# Priority Lists – Submittal Requirements - 2

- Description of when fuel and/or materials price changes invalidate the priority list.
- Complete field data collection forms for the sample dwelling units, any auditor notes, and printouts of the data entry into the energy audit tool.
- Recommended measures report from the audit tool showing the entire measure cost, first-year savings, SIR for each measure, total job cost and overall (cumulative) SIR.
- Total incidental repair cost limit that triggers a site-specific audit.

# Energy Audits: Standard vs. Expedited



# WPN 19-4: Measures Considered

- **List of ECMs + H&S Measures “enabled” in audit**
- **Material and Labor Costs for each measure**
  - For typical subgrantee that is representative of state/territory
  - Averaged for state is acceptable
- **Lifetime of each measure**
  - NEAT/MHEA defaults – good place to start
  - Longer lifetimes are good if justified





# WPN 19-4: Sample Audits

- **10 audits of each type of building**
  - 10 SF + 10 MH (+ 10 MF)
  - Substitute a couple 1-4 unit buildings for SF if applicable
- **Input data & Assumptions**
  - Field assessments including notes and diagnostic test results
  - Audit Input Report or equivalent
- **Recommended Measures**
  - w/SIRs, listed in order of decreasing SIR + total job SIR
  - Incidental repair costs

# Sample Audit Non-Starters

$$SIR \geq 1.0.$$

If anything violates that...



You got some  
'splainin' to do!

# Sample Audit Non-Starters - 1

- SIR above 10 for anything besides General Heat Waste (GHW) measures...
- SIR = 0.999 or lower. No, SIR = 1 is generous
- HVAC replacement SIR > 4+
- Window replacement SIR > 2.5 in SF or MH
  - Replacement of double-glazed window
  - Any window replacement as H&S
- No – or incomplete – blower door testing
- 2-part audits, e.g. separate audit just for HVAC
- No HVAC diagnostics

You got  
some  
'splainin'  
to do!



# Sample Audit Non-Starters - 2

- No or incomplete combustion safety testing
- Audit model missing windows or other significant building feature
- Not specifying wall type
- Not checking 'Evaluate All' almost always!
- Inadequate air sealing

Rules of thumb:

- Generally good post-wx blower door reading:
  - [conditioned area + 400] cfm50
- Bad post-wx blower door reading:
  - [2x conditioned area] cfm50 or more

You got  
some  
'splainin'  
to do!



# Sample Audit Non-Starters - 3

Won't pass a reality check, i.e., only work in alternate universe...

- Recommended measures will save more energy than the house used the previous year. True example: predicted

You got some 'splainin' to do!

– Predicted savings of \$13,800 per year on a 985sf house where previous energy bills were \$1,050 per year

– Example: Insulate 1 door, save \$11,335 per year!

– Energy savings of 40% without replacing HVAC and without significant air sealing.

- Need (per ASHRAE 62.2?) to add 2 bath fans to a 1,000sf house that already has a range hood



# Sample Audit Non-Starters - Insulation

- No – or minimal – existing insulation in ceiling but not evaluating added insulation
- No – or minimal – existing insulation in walls but not evaluating added insulation
- Inputting existing 4” insulation in 2x4 walls...c
- Input existing R-10 when you mean 10” (R-35) existing insulation
- Specified level of insulation in an open attic. Why not let the audit optimize the R-value?
- Not evaluating floor insulation, esp. in MHs

You got  
some  
'splainin'  
to do!



# WPN 19-4: Field Procedures

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- **Audit procedures and field protocols**
  - Copy of Field Guide and Installation or Technical Standards, or auditor's or field operations manual...varies by Grantee
- **Weatherization Measures installed**
  - Statement that only materials that meet or exceed the standards in Appendix A will be installed

## 10 CFR 440.21(g) – General Heat Waste (GHW) reduction

- **WAP Guidance lists materials that DOE has determined to be generally cost-effective**
  - Water heater wrap
  - DHW pipe insulation
  - Low-flow shower heads
  - Faucet aerators
  - Limited caulk and weather-stripping
  - Furnace/AC filters



# WPN 19-4: Priority List Allowance

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**Priority Lists are allowed Per 10 CFR 440.21(f)**

- **For similar dwelling units without unusual energy-consumption characteristics**
- **Developed by conducting site-specific energy audits of a representative subset**

# More on Priority Lists

- **How was priority list developed?**
  - Specifically, what buildings do the priority lists apply to?
  - What circumstances will require site-specific audits rather than the priority list?
  - Don't forget to include allowable Incidental Repair \$ limits
- **ECMs and ECM ranking on a PL are determined by the cost of energy and cost to provide and install the ECMs. Those costs change.**

WPN 19-4 advises Grantees to “at least annually review and as necessary the measure costs and fuel prices that the energy audit software or manual methods use to estimate cost-effectiveness.”

# Field Guide Review Process



# Training – How pieces fit together



# Training: Some questions for you:

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- Why do you provide training?
- How do you determine what training to provide?
- How do you determine if that training was effective?

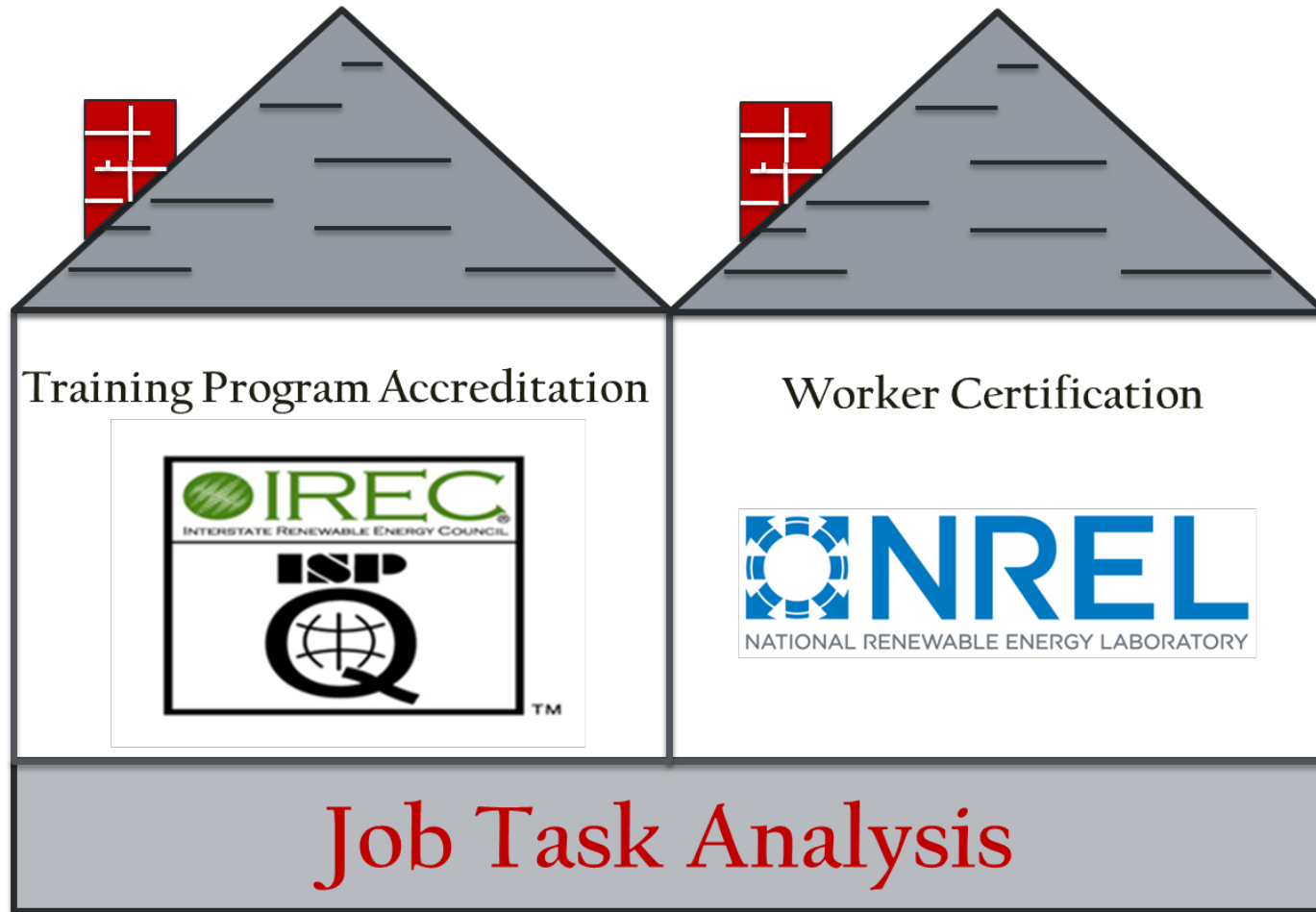
# Training – Value of Accredited Centers

- Facilities
- Trainer qualifications
- Curriculum review
- Continual improvement
- Course evaluations
- And much more





# JTA if Foundation of it all





# Technical Monitoring Exercises

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# Technical Monitoring

Baffles are meant to prevent insulation from reaching the vented soffits. These do not span the rafter bays, and are installed backwards, so are ineffective.



# Technical Monitoring

## Audit Readout

Measure	SIR
Infiltration Reduction	0.3
Low Flow Showerheads	48.7
DWH Pipe Insulation	31.9
Lighting Retrofits	7.4
DWH Tank Insulation	6.8
Refrigerator Replacement	2.9
Attic Insulation R – 49	1.2
HVAC Replacement	0.9



# Audit Inputs

## Basement / Crawlspace:

☒ Accessible

☐ NOT ACCESSIBLE

Foundation Type:    Conditioned    Non-Conditioned    Insulated Slab    Uninsulated Slab

Floor:    Area (sq ft) ?    Existing R-Value 11    Add Insulation: None / Batts

Sill:    Joist Size:    4"    6"    8"    Perimeter        "    Add Insulation: None / Batts

Foundation Wall:    Height NA    Height Exposed (%) NA    Perimeter NA    Existing R-Value           Add Insulation: None / Batts

# Programmatic Monitoring

First Name	Last Name	Date of Birth	Gender
Martin	Newcomb	03/05/1965	Male
Jayden	Smith	08/02/2009	Female
Julia	Smith	11/07/2014	Female
Julie	Smith	11/07/2014	Female
Jenny	Smith	06/15/2011	Female
Jayden	Smith	08/02/2009	Male
Jason	Smith	01/01/2013	Male
Annual Income: \$65,980			

2017 Poverty Income Guidelines		
Size of Family Unit	Threshold	200%
2	\$16,240	\$32,480
3	\$20,420	\$40,840
4	\$24,600	\$49,200
5	\$28,780	\$57,560
6	\$32,960	\$65,920
7	\$37,140	\$74,280
8	\$41,320	\$82,640

# Resource Review

- All WPNs (Guidance) referenced is available here:
- <https://energy.gov/eere/wipo/weatherization-program-guidance>
  - Sortable by topic
  - Active vs. Inactive

The screenshot shows the 'Weatherization Program Guidance' page on the Energy.gov website. The page features a search bar and a list of documents categorized by type and topic. The table below represents the data shown in the screenshot.

DESCRIPTION	EFFECTIVE DATE	TOPIC	TYPE
WAP Memorandum 031: Allowable Use of Training Funds for the 2018 National Home Performance Conference and Trade Show. The 2018 National Home Performance Conference and Trade Show is being held April 12-16, 2018, in Las Vegas, NV. The national conference, featuring the nation's top experts in home performance and weatherization consulting, education, and training, will provide an excellent opportunity for all sectors of the residential and commercial energy efficiency industry to advance the professionalism and impact of DOE Weatherization Assistance Program (WAP) weatherization assistance (WTA) funds by WAP network organizations.	2/2/2018	Unclassified	Active Memorandums
WAP Memorandum 030: Allowable Use of Training Funds for Energy Outreach 2018. The 2018 Energy Outreach 2018 Conference is being held May 21-23, 2018, at the Arizona Grand Hotel in Phoenix, Arizona.	2/6/2018	Unclassified	Active Memorandums
WPN 18-1: Program Year 2018 Weatherization Grant Guidance. To issue grant guidance and management information for the weatherization assistance program for Program Year 2018 based on the following documents.	12/8/2017	Unclassified	Active Program Notices
WAP Memorandum 029: Field Guide Expiration Reminder for WAP Grantees. The U.S. Department of Energy (DOE) implemented the weatherization assistance program (WAP) field guide requirements for weatherization assistance grants under 104-240001, dated 1/1/2017, and the DOE will work with grantees to ensure the work is done to comply with WAP with the Standard Work Specifications (SWS).	12/5/2017	Unclassified	Active Memorandums
WAP Memorandum 028: Allowable Use of Training Funds for the 2018 NACSP 19th Winter Conference. The U.S. Department of Energy's weatherization assistance program (WAP) weatherization assistance (WTA) funds by WAP network organizations to attend the 2018 National Association for State Community Service Engineers (NACSE) Winter Conference, scheduled for Feb. 28 - March 2, 2018, in Arlington, VA.	12/5/2017	Unclassified	Active Memorandums
WAP Memorandum 027: FY 2018 Weatherization Assistance Program Grant Guidance. To assist grantees in development and submission of FY 2018 state plans.	10/26/2017	Unclassified	Active Memorandums
WPN 17-2: Weatherization Health and Safety Guidance. To provide additional information regarding the installation and installation of health and safety measures as part of WAP.	8/9/2017	Health & Safety	Active Program Notices
WPN Notice 17-4: Property Acquired Under the weatherization assistance program including vehicle and equipment purchases. To provide grantees with guidance on property acquisitions, including purchasing vehicles and equipment, for use in the WAP.	3/27/2017	Unclassified	Active Program Notices
WPN Notice 17-6: Closeout Procedures for Grants Under the weatherization assistance program. To provide guidance to grantees for closeout of grants funded under WAP.	7/27/2017	Unclassified	Active Program Notices
WPN 17-24: Program Year 2017 Grantee Allocations - Review. To provide revised grantee allocations for the preparation and submission of applications for funding of WAP for Program Year 2017.	10/3/2017	Funding Grants	Active program notices

# Resource Review

## Energy Audits

- [WPN 19-4 and Attachments](#)

## Field Guides

- WPN 15-4, Sections 1 & 2
- State Plan section V.5.1
- <https://energy.gov/eere/wipo/downloads/training-resources>
  - SWS tool navigation training
  - Field Guide and Variance Request Process
- SWS on-line tool: <https://sws.nrel.gov>
- New Variance Request form:
  - <https://goo.gl/forms/GeLNgwYWEgK2aNup2>

## Training Accreditation:

- WPN 15-4, Sections 3 & 4
- State Plan section V.8.4
- Sortable list of accredited centers:
  - <https://irecusa.org/credentialing/credential-holders/>
- Learn more about accreditation:
  - <https://irecusa.org/credentialing/accreditation/training-providers/>
- JTAs <https://energy.gov/eere/wipo/guidelines-home-energy-professionals-accredited-training#ita>

# Resource Review

## HEP Certifications

- BPI - <http://bpi.org/certified-professionals>
- JTAs <https://energy.gov/eere/wipo/guidelines-home-energy-professionals-accredited-training#jta>
- DOE WAP Standardized Training Curricula  
<http://www.waptac.org/Training-Tools/WAP-Standardized-Curricula.aspx>

## Inspections and Monitoring:

- WPN 20-4
- WPN 15-4, Section 3
- WPN 13-4
- State Plan section V.5.3
- State Plan section V.8.3
- Annual Grant Guidance (XX-1)
- DOE WAP Standardized Curricula module: Quality Control Inspector 2.0:
  - <http://waptac.org/WAP-Standardized-Curricula/Quality-Control-Inspector-2.0.aspx>