



Revised October 1st, 2024

Indiana' State Weatherization Assistance Program uses EIS WAPLink which utilizes an API with the Oakridge National Laboratory Weatherization Assistant User Manual ([version 10](#)) with the following clarifications and tools:

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Definitions

Ancillary Items – Items necessary for the proper installation of weatherization measures as required by the material manufacturers, general construction, and/or WAP standards in order to achieve a finished product in a typical installation where no unusual or extensive repairs are needed. Ancillary items typically refer to *small* items such as hardware, fasteners, adhesive, sealant, etc. The costs of ancillary items and their installation shall be included within the cost of an individual ECM when calculating the SIR for the individual ECM. For questions related to material standards for ancillary items, see the most recent Department of Energy guidance: [WPN 22-7](#), Attachment 7 (at the time of this writing)

Energy Conservation Measure (ECM) – Installation procedure performed for its anticipated energy savings. ECM costs must include all material, labor, and ancillary items and must meet a Savings to Investment Ratio (SIR) of 1.0 or greater to be installed with WAP funds with the exception of airsealing, which does not require an SIR of 1 or greater.

Health and Safety (H&S) Measure – The actions taken to eliminate a health and safety hazard, the elimination of which is necessary to effectively perform weatherization work, or the actions are necessary as a result of weatherization work. H&S measures are **not** required to be cost-justified (SIR of 1 or greater) and are not considered in the SIR calculation or the Average Cost Per Unit (ACPU). For questions related to specific H&S issues and allowable costs/measures, refer to the current IHEDA DOE approved Health and Safety Plan as developed from DOE WPN 17-7.

Incidental Repair Measure (IRM) – A repair necessary for the effective performance or preservation of newly installed weatherization materials, but not part of a standard installation. IRM installations must be associated with a specific ECM or group of ECMs. IRM costs must be included the SIR calculation of the total package of weatherization measures. IRMs solely to protect existing materials in the dwelling is not an allowable cost. IRMs *must* be attached to an ECM.

- Justification for the cost of each IRM and why it is necessary for the effective performance or preservation of an ECM must be documented in the client file with photos and written explanation.
- The total cost of the package of weatherization measures including any IRMs must have a calculated SIR of 1.0 or greater.

IRM costs for any measures that **do not** meet the definitions set forth in the regulating language and WPN 19-5 are subject to investigation and could be determined to be a disallowed cost.

Package of Weatherization Measures – The cost of all ECMs and their associated IRMs included in an audit. The cost of each ECM includes the cost of its ancillary items. The cost of all IRMs is added to the cost of the package of weatherization measures

when calculating the total package SIR for the whole project. H&S measures are exempt from cost-justification by the audit and are not considered in the SIR calculation or the ACPU of Department of Energy funds.

Savings to Investment Ratio (SIR) – Result of dividing the present worth of the lifetime energy cost savings by the total present worth cost of the installed measure, including the discounted rate of the savings and fuel escalation rates. Each ECM must yield an SIR ratio of 1.0 or greater to be included in the package of weatherization measures, and the total package of weatherization measures must yield a cumulative SIR of 1.0 or greater to be allowable expenditures of WAP funds.

EIS WAPLink and Weatherization Assistant 10-API (ORNL)

Indiana Housing Community Development Authority has partnered with EIS to integrate the Weatherization Assistant's (WAv10) API with their reporting and auditing software. The libraries in WAv10 are identical to the stipulations of this manual and the DOE-approved Energy Audit Memo. Any reference to NEAT/ MHEA indicates the build out of libraries in WAv10 that are also copied through EIS's API. For utilization of EIS WAPLink's audit capability, please refer to the EIS WAPLink Guidebook. **WAPLink's API with WAv10 is commonly referred to as the DOE-approved energy auditing tool in the Policy and Procedure Manual.**

Key Parameters Guidance

Ensure all key parameters are correct. Subgrantees must have only 2 Key parameter libraries: 1 library for NEAT and 1 library for MHEA. Any addition to the libraries must result in expanding either existing NEAT or MHEA library.

- Economics
 - Real discount rate 2% (including SCC-SIRs in the grantee fuel cost library)
 - Minimum acceptable SIR is 1
- Set-points
 - Heating set-point (daytime) 68° F
 - Heating set-point (nighttime) 68° F
 - Cooling set-point (daytime) 78° F
 - Cooling set-point (nighttime) 78° F
 - Night Setback 3° F
- Insulation values must meet SWS standards
 - **Each Duct Insulation added should be R-8 in the Duct Section of their NEAT run as pictured below:**

- Water heater wrap added R-value R-11
- In MHEA ensure the bag size and density are set per the manufacture recommendations
- Equipment
 - Ensure equipment values align with what is planned to be installed
 - For example, heat pump default is 15.2 SEER 2.
 - Low flow shower heads are 2.50 gal/ min
- Window U-values
 - When evaluating windows, ensure the U-values are correct (this value is obtained from the specification of the window being installed.)
 - **Note: If replacing a window, the file must contain photographs of the existing window in place

Economic Parameters

IHCDA must implement economic parameters consistent with outputs from the Fuel Price Indices Social Cost of Carbon Calculator for Electricity, Natural Gas, and Propane. Subgrantees must deactivate or delete all out-of-date or unused economic parameters. Each economic parameter fuel price indices will be derived from the costs entered into the FPI-SCC Calculator.

Fuel Costs

Fuel costs must be updated annually by IHCD. IHCD will provide annual statewide fuel cost averages for propane (LPG), kerosene, fuel oil, and coal from EIA. LPG, kerosene and fuel oil will be calculated by averaging the heating months of state weekly averages. Indiana' Weatherization Assistance Program will no longer calculate averages based on 3 years of fuel cost data for statewide fuel types. Wood costs will be provided by the most recent economic averages provided by ORNL in WAv10. **IHCD will provide to each subgrantee a single fuel cost for natural gas and electricity derived from the vendor servicing the majority of their territory. Fuel Costs will be derived as follows:**

Vendor (name)	Rate (\$)	Service Population (%)
Duke	\$0.13	43%
AEP	\$0.15	34%

In the example above, Duke would be selected as the electric fuel cost at the start of a program year because it services the majority population in the subgrantee territory. **IHCD must include the Social Cost of Carbon in all fuel costs.** These fuel costs include a cost adjusted to the Social Cost of Carbon (SCC) per [WPN 22-10 following option 2](#). Fuel price indices to account for SCC over a 30-year lifetime can be calculated via the ["Fuel Price Index SCC Calculator."](#) IHCD must utilize the following approach to fuel-costs:

- **SCC Modified Subgrantee Fuel Costs:** IHCD, annually, must use one fuel cost library for all fuel types for each subgrantee, providing statewide annual fuel costs. These rates for subgrantees must be adjusted for the SCC as well as corresponding fuel price indices for the escalation rate to be inputted to the economic parameters library. Updated libraries for input of new rates with the adjusted SCC modifier must follow WPN 22-10's option 2 for SCC. In utilizing this option, the naming convention must include the date and utility providers included in the average. IHCD will monitor the implementation of the fuel cost libraries.

Each one of the electric and natural gas rates (Table A) on page 7 are the yearly averages (electricity from the IURC survey for the year of 2023, the year leading up to PY24; for NG the survey is done monthly so the annual average is based on the months from March 2023 to April 2024). Should fuel rates provided by IHCD not

reflect reality and harm the potential for client's to receive weatherization services, then the subgrantee may submit a request for exception to utilize an alternate fuel rate.

All other fuel types (Table B) on page 8 (propane, kerosene, fuel oil, coal, and wood) are derived during the heating months of October to the end of March from the EIA, if monthly data is available. Their fuel rate is provided by EIA, except for wood (provided by ORNL US Averages). The sources by which fuel costs are derived is also provided below:

Sources:
NG Sources
Electric Sources
Discern from CP Vectren and South
EIA State Propane
Conversion source
Electric Service Territories
Gas Service Territories
Electric Service Territories
EIA State Fuel Oil Source
EIA Coal Average for Indiana 2022
EIA US Kerosene 2022

Table A - Agency Specific Fuel Cost Breakdown

Agency	ELECTRIC	Rate/ kWh	SCC Rate	NG	Rate/ MCF	SCC Rate
AREA IV	DUKE	\$ 0.13	\$0.15	CP (Vectren)	\$ 8.857	\$11.76
BP-CANI	AEP	\$ 0.15	\$0.17	NIPSCO	\$ 9.321	\$12.23
CAGI	AES	\$ 0.13	\$0.15	CITIZENS	\$ 8.671	\$11.58
CAPE	CP	\$ 0.17	\$0.19	CP (South)	\$ 11.592	\$14.50
CAPWI	DUKE	\$ 0.13	\$0.15	CP (Vectren)	\$ 8.857	\$11.76
CASI	DUKE	\$ 0.13	\$0.15	CP (Vectren)	\$ 8.857	\$11.76
HUEDC	DUKE	\$ 0.13	\$0.15	CP (Vectren)	\$ 8.857	\$11.76
ICAP	DUKE	\$ 0.13	\$0.15	CP (Vectren)	\$ 8.857	\$11.76
JS-CICAP	DUKE	\$ 0.13	\$0.15	CP (Vectren)	\$ 8.857	\$11.76
LHDC	CP	\$ 0.17	\$0.19	CP (South)	\$ 11.592	\$14.50
NCCA	NIPSCO	\$ 0.16	\$0.18	NIPSCO	\$ 9.321	\$12.23
NWICA	NIPSCO	\$ 0.16	\$0.18	NIPSCO	\$ 9.321	\$12.23
OVO	DUKE	\$ 0.13	\$0.15	CP (Vectren)	\$ 8.857	\$11.76
PACE	DUKE	\$ 0.13	\$0.15	CP (South)	\$ 11.592	\$14.50
REAL	AEP	\$ 0.15	\$0.17	NIPSCO	\$ 9.321	\$12.23
SCCAP	DUKE	\$ 0.13	\$0.15	CP (Vectren)	\$ 8.857	\$11.76
SIEOC	DUKE	\$ 0.13	\$0.15	Sycamore	\$ 12.072	\$14.98
TRI-CAP	CP	\$ 0.17	\$0.19	CP (South)	\$ 11.592	\$14.50
WICAA	DUKE	\$ 0.13	\$0.15	CP (Vectren)	\$ 8.857	\$11.76

Table B - State Fuel Costs Breakdown

Other Fuels (SCC)	Cost	SCC	Unit
Propane	\$ 2.39	\$2.69	Gal.
Kerosene	\$ 3.84	\$4.38	Gal.
Coal	\$ 56.67	\$56.67	Ton
Fuel Oil	\$ 3.71	\$4.25	Gal.
Wood	\$ 350.00	\$450.52	Cord

Fuel Switching

Fuel-switching with DOE WAP funds must be approved by DOE on a case-by-case basis. To accept or deny fuel switch analyses, the following is in effect: Each fuel switch request must include an analysis determining that the site-specific energy audit demonstrates cost-effectiveness of the fuel-switch over the life of the measure as indicated by the SIR. If to obtain approval for a fuel-switch, then subgrantees must provide analysis of the heating/cooling annual cost for each potential fuel type, including any cooling costs that did not previously exist in the home due to the addition of cooling via installation of heat pump systems. The following documentation is needed as part of each fuel-switch request:

- Supporting documentation must include a copy of the client utility bill(s) which list all charges for the pre-weatherization energy source(s). Cost information must include but is not limited to; the costs charged for the current energy commodity, base and service charges, taxes, supply and transmission charges and renewable energy or energy conservation adjustments.

Library Measures

Library measures including pricing shall be updated annually.

Sub-grantees may only install LED lighting. CFL lighting is not an allowable cost. Costs should reflect LED lighting prices with wattage as close as possible. Please note in the comment area that the lighting installed is LED lighting and cost and not CFL cost.

Active Measures

All measures shall remain active in NEAT except the following:

- White roof coating
- Window shading (awning)
- Sunscreen fabric
- Sunscreen louvered
- Window film
- Thermal vent damper
- IID

- Electric vent damper IID
- Flame retention burner
- Evaporative cooler

All measures shall remain active in MHEA except the following:

- Wall cellulose insulation
- Wall cellulose insulation in addition
- Floor cellulose loose insulation
- Roof cellulose loose insulation
- Roof cellulose loose insulation in addition
- White coat roof
- White coat roof in addition
- Add awnings
- Add awnings in addition
- Add shade screens
- Add shade screens in addition
- Evaporative cooling

Please note: All sub-grantees currently (11/2020) have A/C tune up and A/C replacements turned off in the software. As of 11/2020, sub-grantees will need to turn on A/C tune ups and A/C replacement in the software

All measures must be consistently marked as Active or Inactive and that the same lifetimes are used. When labelling each Measure Cost library, they should be sufficiently descriptive to avoid confusion.

Itemized cost

Do not use itemized costs to model **major** energy conservation measures. Determining energy savings for a specific measure in a building can be challenging without the assistance of an energy modeling tool. Additionally, any energy savings entered in the itemized cost section is not interacted with the rest of the building components, so an overestimate of energy savings is likely.

Aerators:

The savings are based on 1 gallon of water saved per day and the energy required to heat 365 gallons of water from an inlet temp of 55^o F to 120^o F with an energy factor of 0.6 for gas heaters and an energy factor of 0.9 for electric heaters. Do not replace a lower flow aerators with a higher flow aerator!

Energy saved by appliance:

- Gas - 0.328 MBtu
- Electric - 0.218 MBtu

Insulation types

Ensure all insulation types utilized are added to the appropriate tab and that costs are accurate in the library.

Air conditioning information

Air conditioning information is required to be entered into NEAT/MHEA; this includes window units. Air conditioning replacements and tune ups are only allowed when cost justified by NEAT/MHEA.

Derating Heating/Cooling Systems

Unlike combustion appliances, air conditioners and heat pumps cannot be accurately measured for efficiency while on-site. When addressing a system that utilizes a compressed refrigerant cycle to provide heating or cooling (does not apply to evaporative coolers), the following derating formula may be used.

$$\text{Degraded Efficiency} = (\text{Base EFF}) * 0.99^{\text{age}}$$

Where:

- Base EFF = Typical efficiency of Pre-Retrofit equipment when new (Seasonal Energy Efficiency Ratio (SEER), Energy Efficiency Ratio (EER), or Heating Seasonal Performance Factor (HSPF))
- Age = Age of equipment in years.

For example: An existing HVAC unit that is 20 years old, was originally rated at 10 SEER.

$$\text{Degraded SEER} = 10 * 0.99^{20}$$

$$\text{Degraded SEER} = 8.18$$

To Calculate this, you will need to use the algebra function x^y

On a calculator you will enter 10 x .99 then the x^y button and then 20 (or however old the age of the furnace is) This will give you the answer 8.17906 and you will round up to 8.18.

Evaluate Duct Sealing

Subgrantees must follow IHEDA's instruction in this manual when measuring duct seal leakage in single-family site-built and manufactured homes by selecting the check box "Evaluate Duct Sealing" under Ducts and Infiltration Section of statewide auditing tool. Further instructions for each housing type is found on page 13 of this manual. The goal of addressing duct leakage should be to aim for a 300 cfm reduction of leakage. The option that is encouraged to be used to evaluate duct seal leakage is the "Whole House Blower Door Method" (WAPLink pictured below):

Located in "Housing Items" > "Infiltration"

The screenshot shows the WAPLink Job interface for 'Area IV - Area IV-24-350 - Duck, Daisy'. The interface includes a top navigation bar with 'Save', 'Cancel', and 'Delete' options. Below this, there are several input fields and dropdown menus for 'Job Number', 'Assigned Auditor', 'Assigned Inspector', 'Base Funding', 'Current Stage', 'Event Type', and 'Agency Code'. There are also checkboxes for 'NEAT', 'MHEA', 'Other', 'Deferral', and 'Priority List', along with a 'Lock' button. On the right side, there are buttons for 'Work Orders', 'Inspection', 'QCI', 'Job Economics', and 'Funding'. Below these are buttons for 'WA 10 Settings', 'Health & Safety', 'ASHRAE 62.2', 'Missing Items', 'Run WA 10 Engine', '+ Housing Items', 'Notes', 'Deferral Issues', 'Stage History', and '+ WA 10 Reports'. The 'Housing Items' section is expanded, showing a grid of buttons for 'WALL', 'WINDOW', 'DOOR', 'UNFINISHED ATTIC', 'FINISHED ATTIC', 'FOUNDATION', 'HVAC', 'DUCTS', 'INFILTRATION', 'WATER HEATER', 'REFRIGERATOR', and 'LIGHTING'. The 'INFILTRATION' button is circled in red. To the right of the grid is a table with the header 'Records Found' and a single row containing the number '2'.

Select "Duct Leakage Method"

Air/Duct Leakage / Area IV - Area IV-24-350 - Duck , Daisy

Save Cancel

Evaluate Duct Sealing

Duct Leakage Method

Selection

Blower Door Subtraction Measu...

Duct Blower Measurements

None

Whole House Blower Door Mea...

Costs

Infiltration Reduction (\$)

Duct Sealing (\$)

Duct Operating Pressures

Before Duct Sealing After Duct Sealing

Supply (Pa)

Return (Pa)

Measurements

	Before Weatherization (Existing)	After Duct Sealing and Before Other Weatherization (Target or Actual)	After Weatherization (Target or Actual)
(cfm)			
at House Pressure Difference (Pa)			
With Registers/Grills Sealed			
Air Leakage Rate (cfm)			
at House Pressure Difference (Pa)			
Duct to House Pressure Difference (Pa)			

Duct Blower Measurements

Before Duct Sealing (Existing)	After Duct Sealing (Target or Actual)			
	Total	Outside *	Total	Outside *
Fan Flow (cfm)				
at Duct Pressure (Pa)				
House Pressure WRT Outside (Pa)				

Comments

Step	1. Before Weatherization (Existing)	2. After Duct Sealing and Before Other Weatherization (Actual or Target)	3. After Weatherization (Target or Actual)
Step to make in the field:	Attach blower door to main door and take Pa measurement.	Seal each duct and measure the take blower door measurement (target or actual)-.	After Weatherization services and ducts are unseal a final Pa measurement must be entered (target or actual).

When evaluating duct operating pressures, use the respective following testing method:

Site built homes: Using a static pressure probe and a manometer, measure the pressure before the filter on the return side and after the coil on the supply side with the air handler on. If the air handler is in an attic, crawl space, or enclosed room, take the pressure with reference to the house or pressure relieve that space.

Manufactured home: Using a static pressure probe and a manometer, take the pressure to the closest supply on either side of the air handler and average the two. There are no returns in mobile homes.

It is required to input the duct pressures into WAV10/WAPlink on the infiltration screen. Target pressures should add at least 5 Pascals to the initial measurement. This step is a crucial part of the evaluation process when choosing to use the whole-house Blower door method.

Proper Work Orders

The NEAT/MHEA “Measure Report” is not a proper “Work Order”. A proper Work Order must be in the file and provided to the Weatherization Professionals performing the work. Work Orders must provide crews and contractors with sufficient information to clearly understand the scope of work and the materials required to perform that work. The Work Order may be generated from NEAT or another mechanism the sub-grantee has in place.

Actual Costs and Estimated Costs

Ensure that actual costs are close to estimated library costs. If they are not close, you assume the risk of measures going from cost effective to not being cost effective, thus disallowing a measure that was completed. A disallowed measure may result in a payback. As an auditor, pay close attention to measures that are close to 1 to ensure costs do not exceed library costs. If they do, use the additional cost windows to correct

for the difference in costs.

Incidental Repairs

Ensure that all incidental repairs are modeled as itemized costs without energy savings but that they are included in SIR. Per WPN 19-5, “all incidental repair measures must be modeled separately and related to a specific energy conservation measure (ECM)”. These incidental repairs will appear as the first measures on the recommended measures report when modeled correctly. If they do not appear as the first measures, recheck your inputs as this is signaling you that something is not correct on the inputs.

Lifetime of Measures

Water heaters have a lifetime of 13 years per WPN 19-4, this is defaulted to 15 years under the hot water equipment supply tab, sub-grantees will need to correct this. **Please refer to table 9.2 in attachment 9 from [WPN 23-6](#) for all other allowed lifetimes.**

Sub-grantees may increase the lifetime measures following the table below

Measure	Lifetime
Attic insulation—see 1 below	30
Wall Insulation—see 2 below	30
Floor Insulation—see 3 below	**
Kneewall Insulation—see 3 below	30
Fossil Fuel Furnaces & Boilers—see 4 below	20
Heating system replacement (NEAT): all other heating systems (except heat pumps)	18
Heat pump replacement	15

Notes:

1. Applies only to blown-in (e.g., cellulose, fiberglass) and batt insulation
2. Applies only to dense pack insulation, rigid insulation and full-cavity batt insulation in fully enclosed air-tight cavities
3. As WAweb does not allow a different measure lifetime dependent on which floor insulation is installed, the Grantee must use a 20-year lifetime for floor insulation. If a Subgrantee will never use fiberglass batt to insulate floors, then they may be allowed to use a 30-year lifetime.
 - Batt insulation for floors is not required to be installed in an airtight cavity per Indiana’s Field Guide Section 6.3.3.
 - Loose insulation must be (required) installed in an airtight cavity per Indiana’s Field Guide Section 6.3.2.
4. Applies to standard and condensing fossil fuel fired units

- In the DOE-approved energy auditing tool, this lifetime will default to 15 years.
- If replacing fossil fuel fired furnaces and boilers, standard and condensing units on a single-family home (NEAT), then subgrantees must increase the lifetime to 20 when in the audit.
- If replacing fossil fuel fired furnaces and boilers, standard and condensing units on a manufactured home (MHEA), then subgrantees must keep the lifetime at 15 when in the audit.

Updated lifetime measures and how to correctly adjust these in your database can be found on the www.intelligentweatherization.org website.

Appendix D

Link to AFU information for water and space heating equipment

<https://www.ahrirectory.org/Search/SearchHome?ReturnUrl=%2f>