

### 3. ENERGY AUDIT SOFTWARE MODELING

#### 3.1. INTRODUCTION

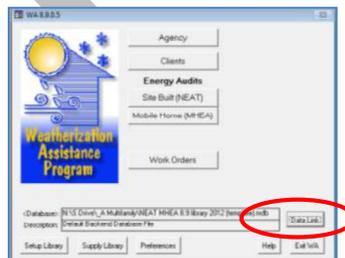
- 3.1.1. Oklahoma has been DOE approved for Site Built and Mobile Home using Weatherization Assistant 8.9.
- 3.1.2. Oklahoma is approved for Multi Family weatherization audits using the NEAT audit on buildings with **4 or less** units. This will be covered in a future WPN and trainings provided by ODOC.

#### 3.2. GENERAL RULES FOR USE OF WEATHERIZATION ASSISTANT 8.9 (NEAT/MHEA)

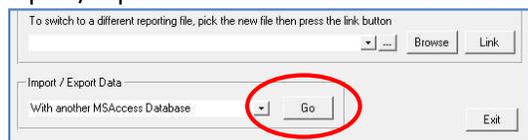
- 3.2.1. Cost of a measure must include the total estimated cost of both the labor and material for that measure.
- 3.2.2. Agencies with in-house crews must calculate estimated labor costs based on a consideration of the cost, time and number of staff involved with any particular measure.
- 3.2.3. Choose EVALUATE ALL for all measures.
- 3.2.4. Mandatory Replacements as an ECM ("Include in SIR" checked) is allowed only with written State approval.
- 3.2.5. Mandatory H&S measures are allowed ("Include in SIR" NOT checked) so long as the measure satisfies the requirements of a Health and Safety measure.
- 3.2.6. Choosing NONE is also a Mandatory choice. Do **NOT** choose NONE.
- 3.2.7. If for any reason a non-major measure is not possible to install, the reasons for not installing an ECM measure must be clearly explained in the NEAT/MHEA comments and noted on Form 44.
- 3.2.8. If for any reason a major measure is not possible to install, contact ODOC for guidance. A major measure cannot be skipped or otherwise deactivated in the software program unless you have ODOC written approval to do so.

#### 3.3. DATA LINK - CREATE A NEW WDJZ FILE FOR EXPORT:

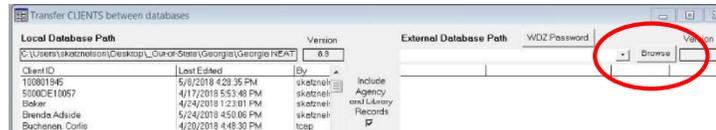
- 1. Hit the **Data Link** button



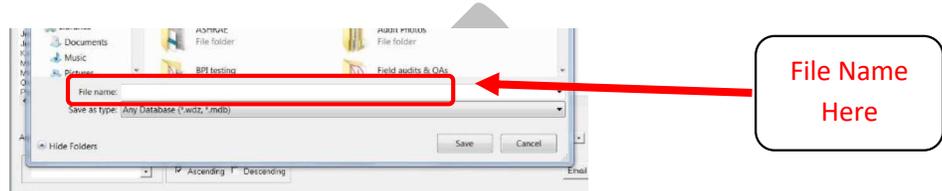
- 2. Press **GO** at bottom of page (Import/Export Data with another MS Access Database)



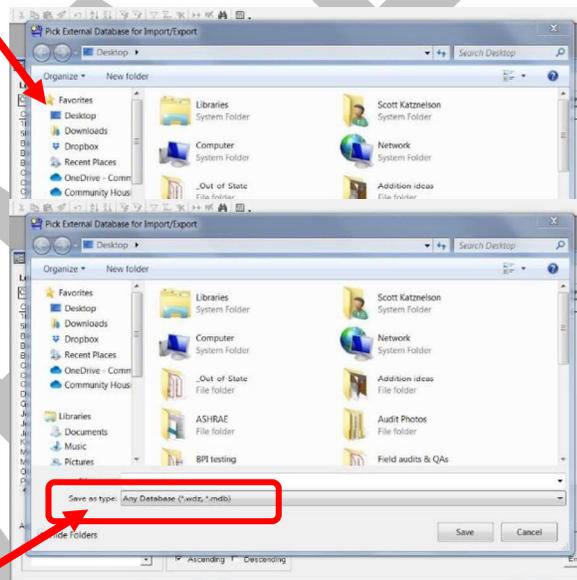
3. Press **BROWSE** (near top right of page)



4. A new window will pop up. Type in a file name near the bottom of that window

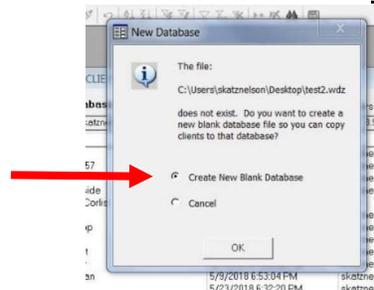


5. Choose Desktop in the top left column as the location to save this new WDW file so that it is easy to find. (you may have to scroll up or down to find Desktop)

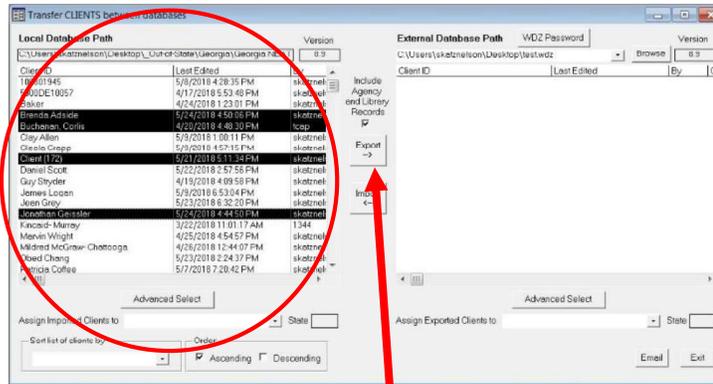


6. Under **SAVE AS TYPE**, choose 'ZIPPED WEATHERIZATION DATABASES (WDZ)'. Press **SAVE** (bottom right of window)

7. A box will pop up asking you if you want to create this file. Click on: Create New Database File. Press **OK**

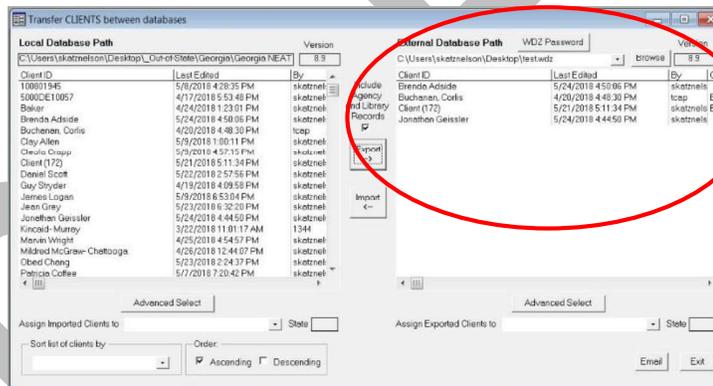


- Choose client or clients you wish to export from the list on the left (multiple clients can be chosen by holding down the control button while you choose all clients you wish copied).



- With chosen client(s) highlighted in black, press **EXPORT** button in middle of page.

- Once you have exported, the screen will look like this, with the one or more clients you chose in the box on the right:



- Find file you have created and send by email or copy it on to a memory stick. The WDX file will have an icon that looks like a white piece of paper with one folded corner.

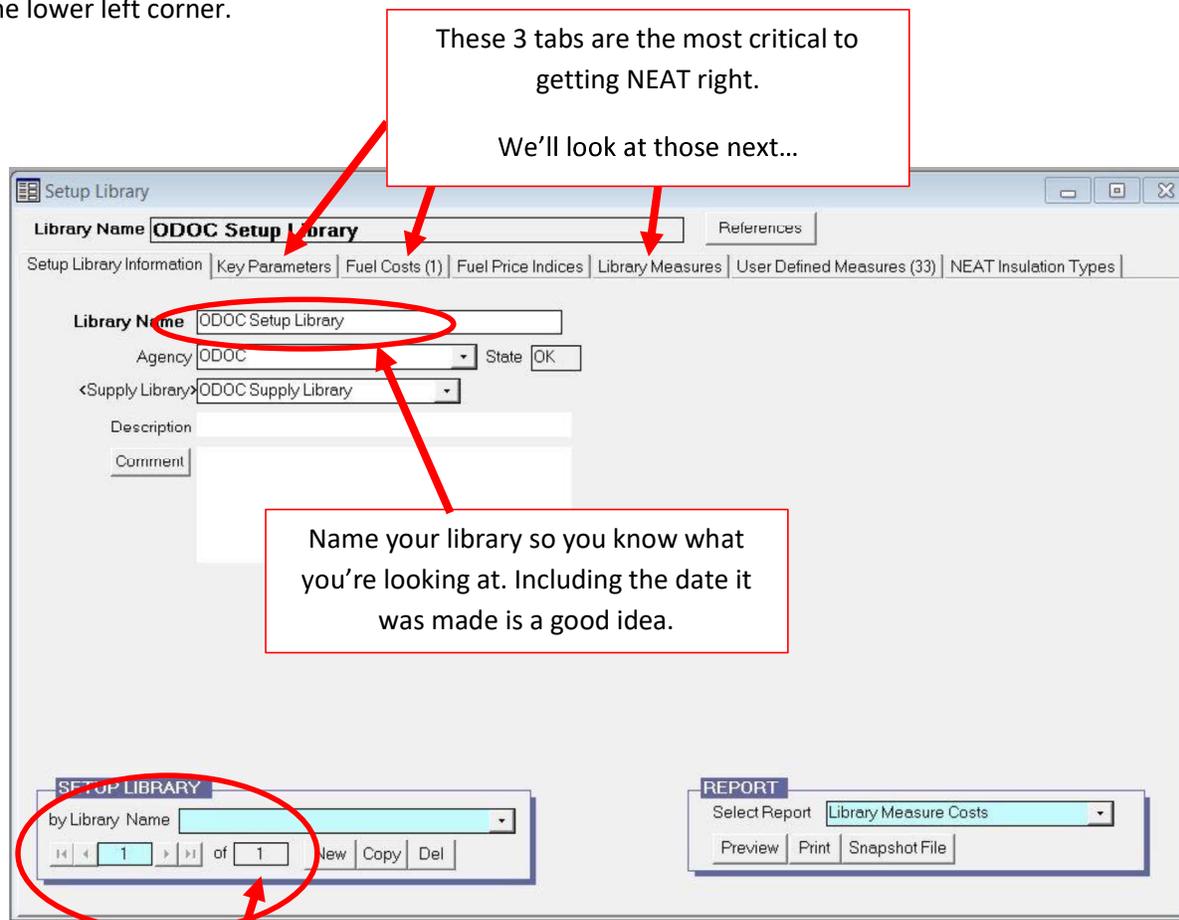
### 3.4. TO LOAD A NEW DATABASE/LIBRARY

**TO LOAD A NEW DATABASE:**

- Once in the Data Link section, press **BROWSE** button near top of page
- Find the new database file you want to link to. Select and press 'Open'.
- Press **LINK** button (to right of **BROWSE** button)
- Click **OK** twice, when asked.

### 3.5. SETUP LIBRARY

1. Most Setup Library Tabs have both NEAT and MHEA options. Changes have to be made in both manually. Look in the lower left corner.



These 3 tabs are the most critical to getting NEAT right.  
We'll look at those next...

Name your library so you know what you're looking at. Including the date it was made is a good idea.

How many Setup Libraries do you have?  
The fewer the better. 1 is best.  
But sometimes it's worth having more than 1, like if you use different contractors with very different prices

### 3.6. KEY PARAMETERS

1. The three tabs to keep updated are Insulation, Equipment and Windows.

a. Insulation

Name	Value	Units
▶ Avg annual outside film coeff	2.25	BTU/hr-sqft-F
Uninsulated R-value for 'Other' wall type	4.42	F-sqft-hr/Btu
R-value for 'Other' exterior siding type"	0.6	F-sqft-hr/Btu
R-value per Inch for the 'Other' existing ceiling insulation type	3.09	F-sqft-hr/Btu-in
Added duct insulation R value	8	F-sqft-hr/Btu
Water heater wrap added R value	10	F-sqft-hr/Btu
Base value of free heat from internals	2600	BTU/hr

These two need to be updated based on the minimum R-Value you are installing.

b. Equipment

Name	Value	Units
▶ Window A/C replacement SEER	11	Btu/wh
Central A/C replacement SEER	14	Btu/wh
Heat pump replacement SEER (Cooling)	14	Btu/wh
SEER used to impute cooling savings	14	na
Low flow shower head flow rate	2.5	gal/min
Refrigerator defrost cycle energy	0.08	kWh

All these need to be updated based what you are typically installing.

c. Windows

Name	Value	Units
▶ Replacement Window U-Value	1.48	Btu/F-sqft-hr
Replacement Window Solar Heat Gain Coefficient	0.62	na
Replacement LowE Window U-Value	0.34	Btu/F-sqft-hr
Replacement LowE Window Solar Heat Gain Coefficient	0.42	na
Retrofit Storm Window Emittance	0.82	na
Retrofit Storm Window Solar Heat Gain Coefficient	0.895	na
Retrofit Window Film Surface Emittance	0.84	na
Retrofit Window Film Solar Heat Gain Coefficient (incl frame)	0.49	na

These two need to be updated based on what you are typically installing.

### 3.7. FUEL COSTS

Fuel Cost Table Name: Default Costs  
 Comment: Average National Fuel Costs

Fuel Type	In Units of	Unit Cost	Heat Content (MMBtu)
Natural Gas	Mcf	14.230	1.000000
Oil	Gallon	3.710	0.140000
Electricity	kWh	0.110	0.003413
Propane	Gallon	2.600	0.090000
Wood	Cord	133.000	20.200000
Coal	Ton	160.000	21.000000
Kerosene	Gallon	3.710	0.130000
Other	MMBtu	6.250	1.000000

FUEL COSTS  
 by Name [dropdown]  
 1 of 1 Copy Del

Usually one Fuel Cost Library is enough. More than one may be useful if an agency serves an area in which significantly different fuel costs are encountered.

If so, press **COPY** and change only the cost(s) that are different. Each Fuel Cost Library should be carefully named for the county and/or utility provider so that the auditor knows which library to choose for any given audit.

1. Correct fuel costs are essential for correct NEAT results. It is with these costs that NEAT converts its heat loss calculations into dollars, from which the SIR is calculated.
2. These costs must be updated with application at beginning of program year.
3. Costs can best be determined from utility bills. Add all per unit fees and surcharges (i.e., per KWH or per CCF, etc....) and add the appropriate tax to get the most accurate fuel costs. Do not include fixed monthly charges.
4. Note that Natural Gas must be input as Mcf.
  - a. Convert cost per CCF to Mcf: multiply CCF by 10
  - b. Convert cost per therm to Mcf: multiply therm by 10.25
5. State average fuel costs will be used by all agencies.
  - a. For program year 2020, use fuel prices from [Appendix G](#).
  - b. Agencies wishing to modify state fuel prices based on local costs must request permission from ODOC before any changes are allowed.

### 3.8. LIBRARY MEASURES

Uncheck measures in this column for any measure that should **NOT** be considered.  
Follow state rules.

Life Expectancy of a measure should be adjusted based on current State rules only

#	Measure Type	Measure Name	Active	Default Contractor	Default Cost Center	Life (yr)	Costs
1	Building Insulation	Attic insulation R11	<input checked="" type="checkbox"/>			25	Costs
2	Building Insulation	Attic insulation R19	<input checked="" type="checkbox"/>			25	Costs
3	Building Insulation	Attic insulation R30	<input checked="" type="checkbox"/>			25	Costs
4	Building Insulation	Attic insulation R38	<input checked="" type="checkbox"/>			25	Costs
5	Building Insulation	Attic insulation R49	<input type="checkbox"/>			25	Costs
6	Building Insulation	Fill ceiling cavity	<input checked="" type="checkbox"/>			25	Costs
7	Building Insulation	Sillbox insulation	<input checked="" type="checkbox"/>			20	Costs
8	Building Insulation	White roof coating	<input type="checkbox"/>			7	Costs
9	Building Insulation	Foundation wall insulation	<input checked="" type="checkbox"/>			20	Costs
10	Building Insulation	Floor insulation R11	<input checked="" type="checkbox"/>			20	Costs
11	Building Insulation	Floor insulation R19	<input checked="" type="checkbox"/>			20	Costs
12	Building Insulation	Floor insulation R30	<input checked="" type="checkbox"/>			20	Costs
13	Building Insulation	Floor insulation R38	<input checked="" type="checkbox"/>			20	Costs

Unit Costs for Measure: 11) Floor insulation R19				
	Description	Type	Units	Unit\$
▶	Floor Insulation -Fiberglass Batts - R-19	Insulation	SqFt	0.38
		Labor	SqFt	0.50
		Other	Each Floor	0.00

- For every (active) measure in the Library Measures list, you must input:
  - Material cost and Labor cost: These can be separated or combined. If combined, you must input a zero (0) in one of the boxes and the total cost in the other.
  - All measures must include both labor and material cost, whether combined or separated.
  - Other Cost: this is a flat per job cost. Basically, a setup cost that is constant regardless of the size of the job. Optional.
- When a new material is created in the NEAT Insulation Types section that material will appear in the Unit Cost list for the appropriate measure. It will show up with a default cost of **\$9999** and will not be an option until a more reasonable price is calculated and input.
- All typical costs for a measure should be included when calculating the measure cost. For example, rulers and flags for attic insulation are added to every job and should be included.
- The following measures must be de-activated (unchecked).

**NEAT Turned off measures:**

- 8 - White Coat Roofing
- 17 - Window Sealing
- 20 - Window Replacement
- 22 - Window shading (awning)
- 23 & 24 - Sun Screen Fabric or Sun Screen Louvered
- 25 - Window Film
- 26 - Thermal Vent Damper
- 27 - Electric Vent Damper

- 29 - Electric Vent Damper IID
- 30 - Flame Retention Burner
- 34 - High Efficiency Boiler (unless pre-existing)
- 35 - Smart Thermostat
- 38 - Evaporative Cooler (unless pre-existing)

**MHEA turned off measures:**

- 26 & 27 - Window sealing (unless pre-existing)
- 30 & 31 - Plastic Storms (unless pre-existing)
- 34 & 35 - Awnings
- 36 & 37 - Shade Screen
- 38 – Setback Thermostat
- 40 - Evaporative Cooling (unless pre-existing)

### 3.9. NEAT INSULATION TYPES

1. NEAT Insulation Types must be set up as follows<sup>13</sup>:

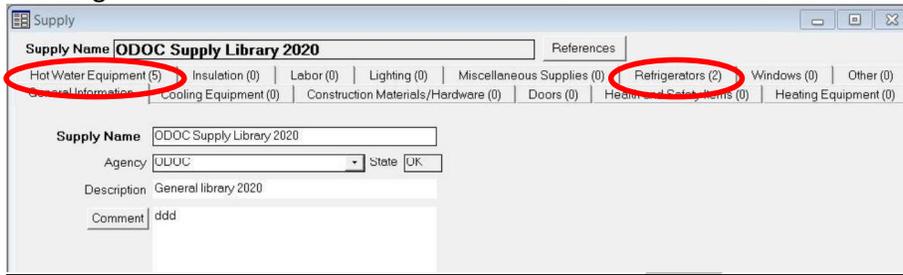
Attic		Knee Wall		Wall		
Name	Rs/Inch	Name	R-Value	Name	Value	Units
Type 1	Blown Cellulose	3.75	Fiberglass Batts	13	Blown Cellulose	3.71 R/in
Type 2	Blown Fiberglass	3.09	Fiberglass Batts/R19	19	Fiberglass Batts/R13	13 R
Type 3	EPS Rigid Foam	3.8	EPS Foam Board/R13	13	Fiberglass Batts/R19	19 R
Type 4	XPS Rigid Foam	4.8	EPS Foam Board/R19	19	Blown Fiberglass	4 R/in
Type 5	Fiberglass Batts	3.2	XPS Foam Board/R13	13		
Type 6	2 Part Spary (Frothpak)	6.6	XPS Foam Board/R19	19		
Floor		Sill		Foundation Wall		
Name	Rs/Inch	Name	R-Value	Name	R-Value	
Type 1	Fiberglass Batts	3.2	Fiberglass Batts	19	Rigid Foam Board	5
Type 2			EPS Rigid Foam	19	XPS Rigid Foam	5
Type 3			XPS Rigid Foam	19	2 Part Spray (Frothpak)/R13	13
Type 4			2 Part Spary (Frothpak)	13		
Type 5						
Type 6						

2. Note that there are two changes from ODOC WPN 19-2. The R-value for blown fiberglass in walls is changed from R10 to R4 per inch, and R-49 is now an allowable measure. Future WPN will address this.
3. Boxed Insulation types cannot be altered except to change their insulation value.
4. All other blanks are designed to allow the introduction of new insulation materials into the NEAT. This does not work on MHEA.
5. Note that none of the above added insulation types will be active until their price is changed in the COSTS of Library Measures from the default \$9999 to something more reasonable.
6. After costs are adjusted, the new insulation materials will show up as part of the dropdown choices for each appropriate shell measure.

<sup>13</sup> ODOC WPN 19-2

### 3.10. SUPPLY LIBRARY

- Typically used for only 2 things. The details input here provide the choices for replacement options in NEAT/MHEA for Refrigerators and DHW:



- Only 1 Supply Library should be required.
- Energy details of each replacement must be accurate otherwise NEAT will make incorrect choices. Prices can be adjusted in the audit, if needed, but not energy details.
- Most important details are the Energy Factor for water heaters and the KWH per Year for refrigerators. You can find correct details by checking hardware or appliance store websites for relevant appliances or talk to your purchasing agent.
- Typical Water heater details (use exact details for audit, these are examples):
  - Electric: Energy Factor 0.93, Recovery Efficiency 99%, Input 4.5 KWh
  - Gas: Energy Factor 0.64, Recovery Efficiency 75%, Input varies (roughly 30-100 KBTU)
- Typical refrigerator details (use exact details for audit, these are examples):
  - 18 Cu Ft: approximately 350 KW/yr.
  - 21 Cu Ft: approximately 475 KW/yr.

