WRAP Assessment Form PPL Electric Utilities

OVERVIEW

Case # *	Name of Auditor *	Date of Audit *

* required fields

1 **Can the audit be completed? *** Yes | No

(If no, please select one)

☐ Moved ☐ No Response
☐ No Show in Field ☐ Contractor Safety
☐ Health & Safety (must also complete Health & Safety Findings Form)

Health & Safety reason * -> _____

2 **Are combustion devices present in the home?** Yes | No

3 **Will the job type remain the same?** Yes | No

☐ Job type is currently **Full Cost**; should be **Baseload**

reason * ->
☐ Home doesn't have more than 50% installed electric heat
☐ Home doesn't need Full Cost measures
☐ Full Cost measures installed through other Wx program
☐ Health & Safety deferral

☐ Job type is currently **Baseload**; should be **Full Cost**

reason * ->
☐ Home has > 50% installed electric heat
☐ De facto heat
☐ High cooling usage

Think this job is Low Cost? Continue completing the assessment form even if you think this job should be changed to a Low Cost job type. More details will be covered in the water heating section.

4 **Has the water heating section been completed?** Yes | No

☐ Job type is now **Low Cost**; should be **Full Cost**

5 **List reasons for electric usage:**

# 1 *	
# 2	optional
# 3	optional

6 **What is the approximate heated square footage of the home? ***

Sq. Ft.

7 **Is job done in conjunction with another Wx program?** Yes | No

Type of weatherization program: *

- ☐ DCED WAP
- ☐ CRISES
- ☐ Gas Utility Wx
- ☐ County Wx

8 **Name of weatherization contractor company**

9 **Projected or completed weatherization date**

(future or past dates acceptable; optional)

10 **Referrals to other programs**

(check all that apply)

☐ DCED WAP	☐ CRISES	☐ Gas Utility Wx
☐ County Wx	☐ LIHEAP	☐ OnTrack
☐ Operation HELP	☐ Act 129 E-PowerWise	☐ Act 129 Appliance Rebate

☐ Other *list* ->

11 **Referrals to pilot programs**

☐ Pilot #1 ☐ Pilot #2 ☐ Pilot #3

12 **After weatherization work is complete, do you expect customer's usage to decrease** Yes | No

*If no, select a reason** ->

- ☐ Measures installed as part of WRAP will increase usage
- ☐ Expected increase in customer's usage of electric heat (eg. getting rid of kerosene heater)
- ☐ Expected increase in conditioned living space (eg. adding rooms, finishing basement)
- ☐ Expected increase in household occupants
- ☐ Expected increase in electric appliances (eg. adding a window air conditioner)

☐ Other *reason* * ->

13 **Additional Comments**

Customer Interview

Ask the customer to identify any of the following:

1 Heating Systems
including unvented space heaters

2 Air Conditioning / Cooling Systems

3 Drafts

4 Excessively Cold Rooms

5 Moisture Problems

6 Special Health Needs or Problems of Customer that Could be Impacted by Weatherization
Disabilities, illness, allergies, sensitivities, etc

7 Other Notes

Lighting

1	**Are LEDs recommended ***	Yes	No

Total LEDs recommended:

Brand #1*:

Supplier #1*:

Brand #2:

Supplier #2:

*If no, select a reason * ->*
☐ CFLs installed by customer
☐ CFLs installed by other weatherization program
☐ Customer refused
☐ Other *reason * ->*

Appliances

1	**Primary refrigerator assessment ***		☐ Yes – Monitored (*must complete refrigerator testing data form) ☐ Yes - Database ☐ No – Refrigerator less than 5 years old ☐ No – Landlord refused ☐ No – Customer refused ☐ No – Refrigerator assessed through other weatherization program ☐ No – WRAP work deferred
1a	**Does the primary refrigerator qualify for a replacement? ***	Yes	No
2	**Secondary refrigerator assessment ***		☐ Yes – Monitored (*must complete refrigerator testing data form) ☐ Yes - Database ☐ No – Refrigerator less than 5 years old ☐ No – Landlord refused ☐ No – Customer refused ☐ No – Refrigerator assessed through other weatherization program ☐ No – WRAP work deferred ☐ N/A
2a	**Does the secondary refrigerator qualify for a replacement? ***	Yes	No | NA

BASELOAD SECTION

Summary of Baseload Audit Work: C=Completed R=Referred N/A=Not Applicable NR=Not Recommended

Refrigerator Tested	☐ C	☐ R	☐ N/A	☐ NR	Dryer Vent Measures	☐ C	☐ R	☐ N/A
Refrigerator Tested (Second)	☐ C	☐ R	☐ N/A	☐ NR	Describe: _____			
Freezer Tested	☐ C	☐ R	☐ N/A	☐ NR	Heating Filter Changed	☐ C	☐ R	☐ N/A
Refrigerator Coils Cleaned	☐ C	☐ R	☐ N/A	☐ NR	Heating Filter Cleaned	☐ C	☐ R	☐ N/A
AC Filter Changed	☐ C	☐ R	☐ N/A	☐ NR	Power Strip # _____			
AC Filter Cleaned	☐ C	☐ R	☐ N/A	☐ NR	CO Detector # _____			
AC(s) Replaced	☐ C	☐ R	☐ N/A	☐ NR	Other: _____			

AC Location(s): _____

LIGHTING ASSESSMENT (Replace incandescent bulbs used a minimum of 1 hour per day.)

Location	# CFLs Installed USP ONLY	# LEDs Installed	LED Wattage	LED Bulb Brand	Location Details / Comments
1. Living Room					
2. Family Room					
3. Kitchen					
4. Dining Room					
5. Bedroom 1					
6. Bedroom 2					
7. Bedroom 3					
8. Bath 1					
9. Bath 2					
10. Hallway					
11. Outdoors					
12. Other					
Total Bulbs					

Waterbed Mattress Replacement (Sizes are inside frame dimensions)

☐ King (70" x 82")
☐ Queen (58" x 82")
☐ Super Single (46" x 82")
Describe insulated mattress pads requested: _____

List Main Reasons for Electric Usage:

_____

_____

_____

Water Heater

1	**Is the water heater accessible ***	Yes	No (if no, stop here)
2	**What type of water heating fuel is used? ***		☐ Electric ☐ Natural Gas ☐ Propane ☐ Oil ☐ Solar If Electric is selected, continue to question 2a* If anything other than electric is selected, stop here.
2a	Is the water heater more than 6 years old? *	Yes	No
2b	Is the water heater leaking or corroded? *	Yes	No
2c	Does the water heater have a faulty thermostat or bad element? *	Yes	No
	If you answered No to questions 2a, 2b and 2c, continue to ONLY answer question 3 (skip questions 4-5)		
3	**Does the home need any of the following? ***		(check all that apply) ☐ Faucet aerator ☐ Faucet repair/replacement ☐ Low flow showerhead ☐ Water pipe insulation ☐ Plumbing repair ☐ Test/replace element ☐ Water heater jacket ☐ None of the above If any of the above are selected and the job type is currently Baseload, the job type needs to be changed to Low Cost.
4	**Which of the following applies?**		(check all that apply) ☐ Ambient air temperature of water heater is more than 44° ☐ There is adequate space for a heat pump water heater (HPWH) ☐ Area near water heater has condensate drain/contractor can add condensate pump ☐ The home has good plumbing/electrical systems ☐ The customer is able and willing to change HPWH filter and settings If none, 1, 2, 3, or 4 of the options above are selected, continue to question 4a. If all 5 are selected, continue to question 4b.

4a Is standard water heater recommended?* Yes | No

If yes, does the water heater need the following?

(check all that apply)
- ☐ Expansion tank
- ☐ Check valve (municipal water only)
- ☐ 30 amp breaker
- ☐ 10/2 wire
- ☐ Other ->

If you select Yes, the campaign will remain the same and the job type must be changed to Low Cost.

If no, what is the reason for the standard water heater not recommended?

4b Is a heat pump water heater recommended? * Yes | No

If yes, does the heat pump water heater need the following?

(check all that apply)
- ☐ Condensate pump
- ☐ Expansion tank
- ☐ 30 amp breaker
- ☐ 10/2 wire
- ☐ Other ->

If you select Yes, the campaign will remain the same and the job type must be changed to Low Cost.

If no, what is the reason for the heat pump water heater not recommended? *

5 **If heat pump water heater is not recommended, should the standard water heater be recommended? *** Yes | No

If yes, does the water heater need the following?

(check all that apply)
- ☐ Expansion tank
- ☐ Check valve (municipal water only)
- ☐ 30 amp breaker
- ☐ 10/2 wire
- ☐ Other ->

If no, what is the reason for the standard water heater not recommended?

Additional Comments

EXISTING REFRIGERATOR TESTING DATA

Refrigerator Tested: ☐ Yes ☐ No If No, reason: _____

KWH Guidelines for Replacement: In order to meet the daily minimum guidelines for replacement, the KWH's must reach the KWH/Hour Minimum listed below by the end of one hour of monitoring. If at any time during the first hour of monitoring the Brultech reaches the KW/Hour Minimum, the tester will know that the refrigerator is likely to qualify for replacement.

Size	Daily Minimum		KW / Hour Minimum	Replacement Guideline
15 cu. ft. or less	2.78 KWH / day	=	.116 KWH	14 cu. ft.
16.- 19 cu. ft.	3.48 KWH / day	=	.145 KWH	18 cu. ft.
20 - 24 cu. ft.	3.65 KWH / day	=	.152 KWH	20 cu. ft.
25 cu. ft. side-by-side or larger	5.30 KWH / day	=	.221 KWH	20-25 cu. ft.

To get KW / Hour test result:

Divide total KWH's recorded by the monitor, by the number of minutes that the monitor has been on. Your answer will be the number of KWH's consumed per minute. Multiply this by 60 minutes to get the KWH's used for one hour.

This is shown by the formula below:

$$\frac{\text{Total KWH's recorded by monitor}}{\text{Number of minutes monitored}} = \text{KWh's per minute x 60 minutes} = \text{KWH's per one hour}$$

Or, use the factors below to get KW / Hour test result:

If monitoring time is:	Multiply KWH's from monitor by:	If monitoring time is:	Multiply KWH's from monitor by:	If monitoring time is:	Multiply KWH's from monitor by:
65 minutes	0.9231	95 minutes	0.6316	125 minutes	0.4800
75 minutes	0.8000	105 minutes	0.5714	135 minutes	0.4444
90 minutes	0.6667	120 minutes	0.5000	150 minutes	0.4000

Primary Refrigerator:

Start Time:	End Time:	Total Time Monitored:	
Refrigerator Temperature:	Freezer Temperature:	Ambient Room Temperature:	
Peak Wattage While Running		Total KWH Monitored	
KWH / 1 Hour	KWH / 24 Hours	KWH / Month	$ / Month
Is this refrigerator eligible for replacement? ☐ Yes ☐ No			

Second Refrigerator/Freezer:

Start Time:	End Time:	Total Time Monitored:	
Refrigerator Temperature:	Freezer Temperature:	Ambient Room Temperature:	
Peak Wattage While Running		Total KWH Monitored	
KWH / 1 Hour	KWH / 24 Hours	KWH / Month	$ / Month
Is this refrigerator eligible for replacement? ☐ Yes ☐ No			

FULL COST SECTION

Full Cost Measures: Assessment Summary Form

Testing	Yes	No	Explanation
Health & Safety/Combustion Testing	o	o	
Blower Door Depressurization (Standard)	o	o	
Blower Door Pressurization (Contaminates)	o	o	
Zonal Pressure Diagnostics	o	o	
Ductwork Test	o	o	
Final Combustion Test	o	o	

Measures – (Listed by Priority)	Yes	No	Explanation
Health & Safety	o	o	
Major Repairs (e.g. broken glass)	o	o	
Electric Heat Repairs	o	o	
Attic Insulation	o	o	
Seal Attic Bypasses & Chaseways	o	o	
Wall Insulation	o	o	
Floor Insulation	o	o	
Windows & Door Measures	o	o	
Heating Measures	o	o	
Cooling Measures	o	o	
Other	o	o	

Blower Door Testing Information Form

Target MVG:	CFM 50	Temperature
Pre-weatherization reading:	CFM 50, basement door open	Indoor
Pre-weatherization reading:	CFM 50, basement door open	Outdoor
Post-weatherization reading:	CFM 50 basement ☐ Open ☐ Close	
Total Reduction:		

***5 Point Test Optional Method**

Notes: Consider areas that are heated and used daily as intentionally heated and should be inside the thermal (insulation) and pressure (air sealed) area. The thermal and pressure boundaries must be at the same place. When testing, use house to outside (H/OO pressures near 50 Pa if possible. Use same gauge for all tests. The ceiling leakage Ratio is the (House/Zone divided by the House/Outside) times 100%. 90% or better passes. If the ratio is less than 90% (.9), the home must receive air sealing treatment for both bypasses and convective loops. A zone is any area that might be connected to the house and you want to determine if there are leaks to the outside or leaks to the house. Ducts that are considered zones should be tested using the Duct Testing, Repair and Sealing Sheet. If the ceilings and rood deck are on a common rafter, such as flat roofs or cathedral ceilings, there is no attic and therefore no attic pressure tests need to be taken. "Outside" means out of the entire structure.

PRESSURES

	What was blower door test set at? House/Outside		House/Zone		Zone/Outside	
ZONES	Pre-Treat	Final	Pre-Treat	Final	Pre-Treat	Final
Example: Attic	-50	-50	-40	-50	-10 (attic is connected to the house and needs to be separated by air sealing the attic floor)	0
Basement						
Vented Crawlspace						
Attic A						
Attic B						
Kneewall A						
Kneewall B						
Garage						
Garage Attic						
Cantilever Overhang						
Cantilever Overhang						
Other						
Other						
Other						

Combustion Appliances Pre-Test

Are there any combustion appliances in the home? ☐ Y ☒ N

If yes, Combustible Equipment Safety Testing must have been done by the contractor if any air sealing was done. Are there any UNVENTEDcombustion heating applicances? ☐ Y ☐ N

If yes, no air sealing may be performed that tightens structure below 3000 CFM-50Pa, & Wx release form signed.

Step 1:Record the outside temperature and zero the analyzer.	Step 7:Turn on the water heater first.
Step 2:Record house ambient CO & CO in CAZ-nothing is on.	Step 8:Check for spillage.
Step 3:Look for signs of roll out of back drafting-nothing is on.	Step 9:Measure undiluted Co.
Step 4:Perform a gas leak test.	Step 10:Record if the draft was established at one minute.
Step 5:Drill hole for the draft measurement.	Step 11:Repeat spillage, CO & draft test for boiler or furnace.

Step 6:Start the worst case depressurization test procedure - appliances off; measure base pressure; pressure in the CAZ under worst case condition; **THEN**

Outdoor Temperature

Appliances	CO		Backdraft Y/N		Draft (1 min.) Established Y/N		Draft Pressure Pa.		Draft Pass Y/N		Undil. CO Flue	Gas Leak Det. Y/N/NA	Percent Eff.
	AMB	CAZ	W/C	NAT	W/C	NAT	W/C	NAT	W/C	NAT			
Water Heater													
Furnace Boiler													
Other													
Other													

Stove and Oven CO		Check Appliances at Worst Case Test
Rear Left Burner	○ ○ Rear Right Burner	Dryer ☐ Y ☐ N Whole House Fan ☐ Y ☐ N
Front Left Burner	○ ○ Front Right Burner	BathFan ☐ Y ☐ N Kitchen Fan ☐ Y ☐ N
Oven CO Data		
CO Ambient	CO At oven vent	**HVAC Air Handler** ☐ Y ☐ N

CAZ WC/D **Nat:** **W/C:** **Diff:** **Pass:**

CO alarms installed in these locations:

Emergency Situation: Gas company called to fix gas leak or other. ☐ Y ☐ N

Work cannot continue due to one or more failed test over Action Level ☐ Y ☐ N

AMB=Ambient CAZ=Cumbustible Appliance Zone W/C=Worst Case NAT=Natural Pa.=Pascals EFF=Efficiency Diff=Difference

CO Test Results	And / Or	Spillage & Draft Test Results	Retrofit Action	CAZ Depressurization Limits: Venting Conditions	Limit (Pa.)
0-25 PPM	And	Passes	Proceed with work	Orphan natural draft water heater (including outside chimney)	-2
26-100 PPM	And	Passes	Recommend that CO problem be fixed	Natural draft boiler or furnace commonly vented with water heater	-3
26-100 PPM	And	Fails at worst case only	Recommend a service call for the appliance and/or repairs to the home to correct the problem	Natural draft boiler or furnace with damper commonly vented with water heater	-5
100-400 PPM	Or	Fails under natural conditions	Stop work; work may not proceed until the system is serviced and the problem is corrected	Individual natural draft boiler or furnace	-5
>400 PPM	And	Passes	Stop work; work may not proceed until the system is serviced and the problem is corrected	Individual natural draft boiler or furnace commonly vented with water heater	-5
>400 PPM	And	Fails under any condition	Emergency: Shut off fuel to the appliances and have the homeowner call for service immediately	Power vented or induce draft boiler or furnace alone , or fan assisted DWH alone	-15
				Chimney-top draft induce; exhaust type or equivalent; high static pressure flame renention head oil burner; Direct vented appliances; Sealed combustion appliances	-50

Minimum Worst Case Draft, Acceptable Ranges
Outdoor Temperature(F)

Appliances	<10	20	30	40	50	60	70	80	>90
Gas-Fired furnace boiler or water heater w/ atmospheric chimney	-2.5 Pa. -0.01 IWC	-2.00 Pa. -0.009 IWC	-2.00 Pa. -0.008 IWC	-1.75 Pa. -0.007 IWC	-1.50 Pa. -0.006 IWC	-1.25 Pa. -0.005 IWC	-1.00 Pa. -0.004 IWC	-0.75 Pa. -0.003 IWC	-0.50 Pa. -0.002 IWC
Oil-Fired furnace boiler or water heater w/ atmospheric chimney	-15 Pa. -0.06 IWC	-13 Pa. -0.053 IWC		-11 Pa. -0.045 IWC			-9 Pa. -0.039 IWC		-7 Pa. -0.03 IWC

Combustion Appliances Post-Test

Are there any combustion appliances in the home? ☐ Y ☒ N

If yes, Combustible Equipment Safety Testing must have been done by the contractor if any air sealing was done. Are there any UNVENTEDcombustion heating applicances? ☐ Y ☐ N

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Appliances	CO		Backdraft Y/N		Draft (1 min.) Established Y/N		Draft Pressure Pa.		Draft Pass Y/N		Undil. CO Flue	Gas Leak Det. Y/N/NA	Percent Eff.
	AMB	CAZ	W/C	NAT	W/C	NAT	W/C	NAT	W/C	NAT			
Water Heater													
Furnace Boiler													
Outher													
Outher													

Stove and Oven CO	Check Appliances at Worst Case Test
Rear Left Burner ○ ○ Rear Right Burner	Dryer ☐ Y ☐ N Whole House Fan ☐ Y ☐ N
Front Left Burner ○ ○ Front Right Burner	BathFan ☐ Y ☐ N Kitchen Fan ☐ Y ☐ N
Oven CO Data CO Ambient CO At oven vent	**HVAC Air Handler** ☐ Y ☐ N

CAZ WC/D **Nat:** **W/C:** **Diff:** **Pass:**

CO alarms installed in these locations:

Emergency Situation: Gas company called to fix gas leak or other. ☐ Y ☐ N

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AMB=Ambient **CAZ=Cumbustible Appliance Zone** **W/C=Worst Case** **NAT=Natural Pa.=Pascals EFF=Efficiency Diff=Difference**

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Oil-Fired furnace boiler or water heater w/ atmospheric chimney	-15 Pa. -0.06 IWC	-13 Pa. -0.053 IWC		-11 Pa. -0.045 IWC			-9 Pa. -0.039 IWC		-7 Pa. -0.03 IWC

DUCT TESTING, REPAIR & SEALING FORM

System Type	Heat Pump: ☐	Central Air Only ☐	Elec. Furnace ☐
	Other ☐		

Supply Duct Locations	Basement / Walls %	Attic %	Garage %	Vented Crawl %

Air Handler Location

Duct Materials	Metal ☐	Duct Board ☐	Flex ☐

Filter Locations	In Cabinet ☐	Ext. Slot ☐	**Return Register Slot Covered** ☐ Yes	☐ No

Situation I: Ducts are all in basement or walls and there is a single or no return register

- Re-connect accessible disconnected ducts
- Support sagging ducts with wire or strap
- Run the air handler fan and seal ***large*** supply and return leaks
- If there is no return, either create one or vent basement to living space

Situation II: Ducts are all in basement or walls and there are multiple return registers

- Open basement door and depressurize house to 25 Pascals
- Pressure pan all return registers and enter pressures in table
- For all registers with pressure > 1 Pascal, seal accessible leaks between the building cavity containing the register and exterior zones. To locate leaks, run the air handler fan and use smoke
- Enter final pressure pan reading in table
- Do ***NOT*** seal leaks in basement returns unless they are big enough to depressurize the basement at least 2 Pascals with the air handler fan

Situation III: There is duct work in exterior zones

- If there is ductwork in the basement, open the basement door
- Depressurize house to 25 Pascals abd oressure pan all supply and return registers. Enter the pressure in the table
- Seal leaks between ducts/building cavities and exterior zones until all pressure pan readings are below 1 Pascal or no further sealing is practical. If leakage is sever, some drywall demolition/replacement may be justified
- Enter pressure pan readings in table

Register Number	#1		#2		#3		#4		#5		#6		#7		#8	
Room																
Read	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Supply																
Return																
Register Number	#9		#10		#11		#12		#13		#14		#15		#16	
Room																
Read	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Supply																
Return																

Note: Number registers by floor going away from Air Handler Unit (AHU). Register # will always be the one closest to AHU.