



# Results from CY2020 DNREC Evaluation

EEAC Meeting – January 12, 2022



# Evaluation Team Introduction

- **EcoMetric** conducted the CY2020 evaluation of DNREC's energy efficiency and renewable energy programs:
  - Energy Efficiency Investment Fund (EEIF)
  - Weatherization Assistance Program (WAP)
  - Green Energy Program (GEP)
  - Energy Efficiency Industrial (E2I)
- Today's Speakers:
  - Salil Gogte, President, EcoMetric
  - Kyle McKenna, Managing Consultant, EcoMetric
- Project Team Leads:
  - Kyle McKenna, EcoMetric
  - Kiersten von Trapp, NMR Group Inc.

# Agenda

1. Evaluation Activities

2. Portfolio Results

3. Cross-Cutting Activities

4. EEIF

5. GEP

6. WAP

7. E2I

# 1. Evaluation Activities

Program	Program Year	Impact Evaluation	Targeted Process Research	Cost-Effectiveness Calculation	Commercial NEBs Research	Greenhouse Gas Estimation
<b>EEIF</b>	2019	✓	✓	✓	✓	✓
<b>WAP</b>	2018	✓	✓	✓		✓
<b>GEP</b>	2019	✓		✓		✓
<b>E2I</b>	2021	✓				

## 2. Portfolio Level Summary - Gross Verified Savings

Electric Results					
Program	Reported Energy Savings (MWh)	Reported Peak Demand Savings (MW)	Verified Energy Savings (MWh)	Verified Peak Demand Savings (MW)	Energy Savings RR (%)
EEIF	28,013	0	28,134	3.89	100%
GEP	NR	NR	3,280	2.11	NA
WAP	235	0.04	167	0.00	71%
E2I	30,322	3.79	30,322	3.79	100%
<b>Total</b>	<b>58,570</b>	<b>3.83</b>	<b>61,903</b>	<b>9.79</b>	<b>106%</b>

Fossil Fuel Results			
Program	Reported Fossil Fuel Savings (MMBtu)	Verified Fossil Fuel Savings (MMBtu)	Fossil Fuel Savings RR (%)
EEIF	12,214	-353	-3%
WAP	2,444	1,347	55%
E2I	19,047	18,386	97%
<b>Total</b>	<b>33,705</b>	<b>19,380</b>	<b>57%</b>

## 2. Portfolio Level Summary - Net Verified Savings

Electric and Fossil Fuel Results			
Program	Net Verified Energy Savings (MWh)	Net Verified Peak Demand Savings (MW)	Net Verified Fossil Fuel Savings (MMBtu)
EEIF	21,830	3.08	-247
GEP	3,280	2.11	0
WAP	167	0.00	1,347
<b>Total</b>	<b>25,277</b>	<b>5.20</b>	<b>1,100</b>

## 2. Portfolio Level Summary - Cost-effectiveness Results

Program	NPV of Program Benefits	NPV of Program Costs	TRC Benefit-Cost Ratio
EEIF	\$34,676,980	\$14,598,050	2.38
GEP	\$10,838,332	\$8,269,519	1.31
WAP	\$1,301,340	\$3,084,076	0.42
<b>Total</b>	<b>\$46,816,652</b>	<b>\$25,951,644</b>	<b>1.80</b>

Net Present Value (NPV) = today's value of the lifetime saving

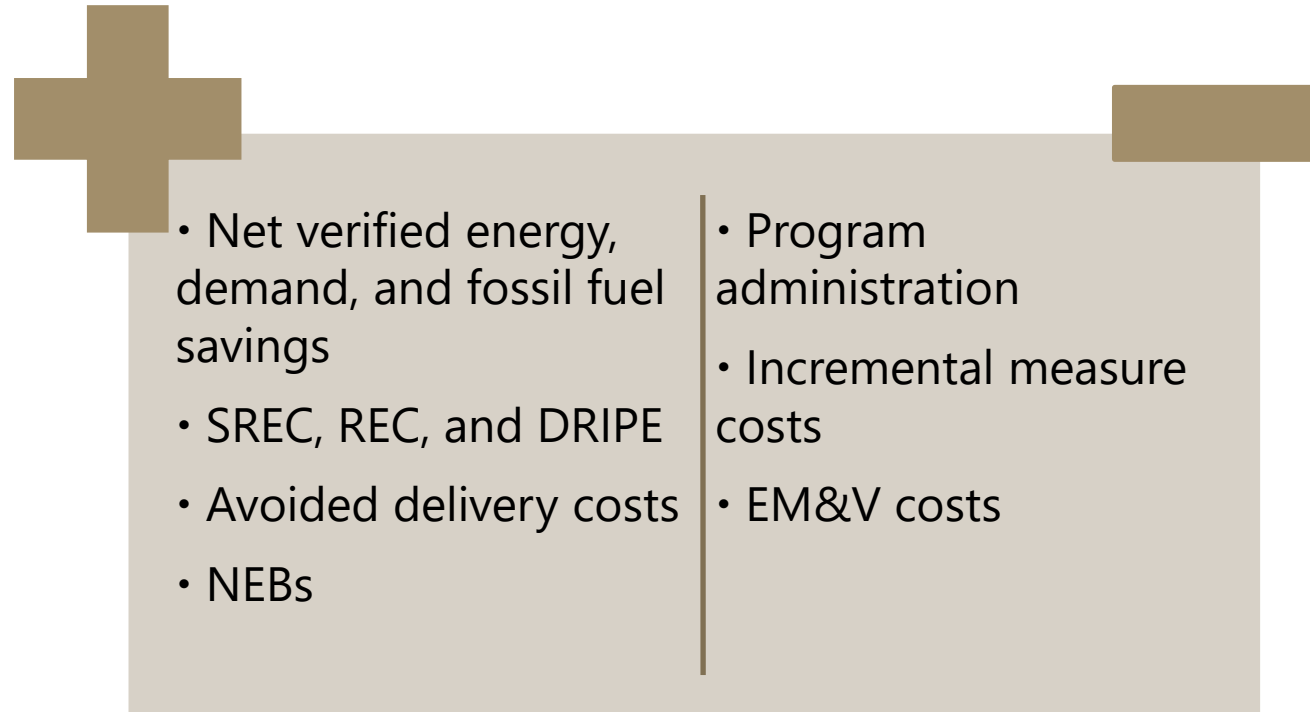
### 3. Cross-Cutting Activities - Greenhouse Gas (GHG) Approach





# 3. Cross-Cutting Activities - Cost-Effectiveness

$$TRC \text{ Benefit Cost Ratio} = \frac{NPV \text{ of Benefits}}{NPV \text{ of Costs}}$$



# 4. EEIF: Gross Verified Savings

Measure Type	Number of Projects	Electric Realization Rate	Gross Verified Energy Savings (MWh)	Relative Electric Precision at 90% Confidence	Gross Verified Peak Demand Reduction (MW)	Gross Verified Gas Savings (MMBtu)
Prescriptive	72	99%	21,360	9.1%	3.56	0
Custom – Electric	2	99%	6,242	NA	0.26	-12,567
Custom – Gas	1	100%	532	NA	0.07	12,214
<b>Total</b>	<b>75</b>	<b>101%</b>	<b>28,134</b>		<b>3.89</b>	<b>-353</b>

- Reported savings calculations for lighting projects did not utilize waste heat factors. Implementation contractor is actively addressing the findings from the evaluation
- More than 81% of the sampled projects have an electric realization rate within  $\pm 10\%$  of 100%
- Ensure energy penalties are accounted for in reported savings

# 4. EEIF: Commercial NEBs Research

## Objective:

- Quantify preliminary commercial NEBs from CY2020 **prescriptive lighting** projects

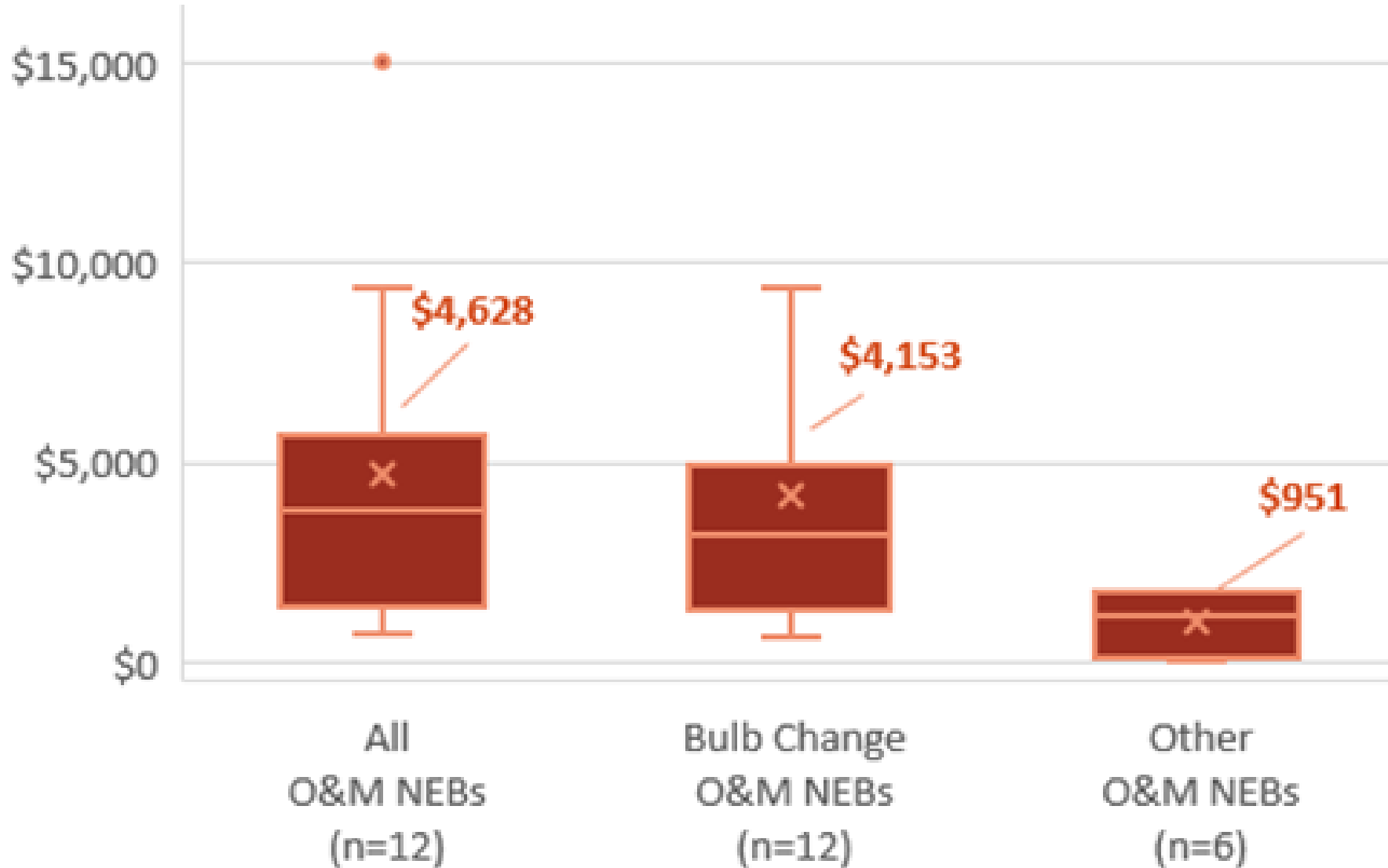
## Methods:

- Literature review of four prior NEB studies
- In-depth interviews with 12 grantee sites from CY2020

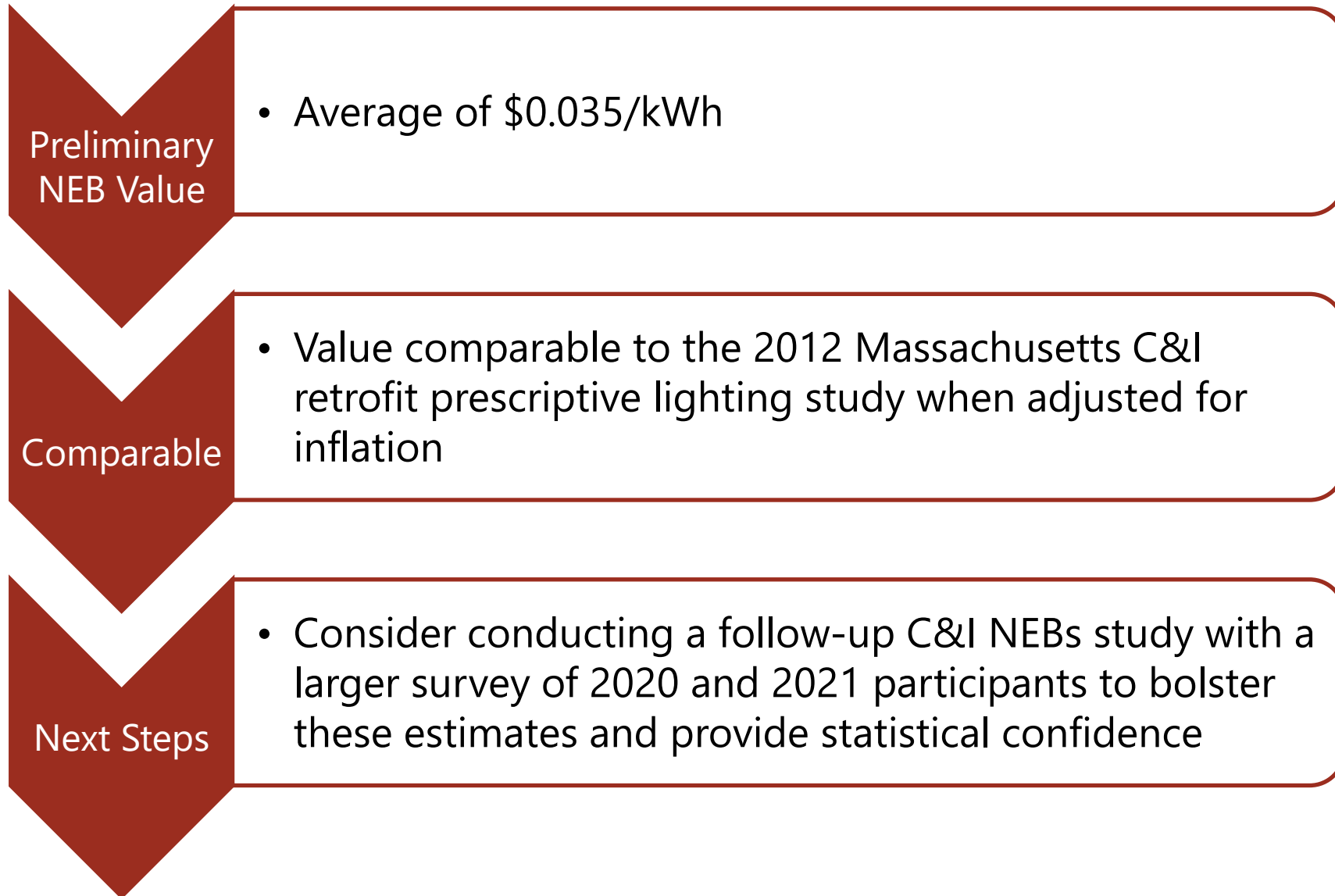
## Commercial NEBs:



# 4. EEIF: Commercial NEBs Research



# 4. EEIF: Commercial NEBs Research



# 4. EEIF: Targeted Process Study

## Objectives

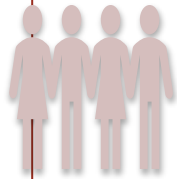
- Understand roles of implementation delivery team
- Investigate marketing and outreach efforts to develop recommendations to improve participation
- Collect feedback from participating contractors

## Methods

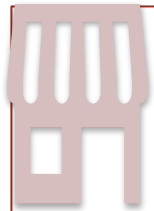
- Program materials & tracking data review
- In-depth interviews
  - Implementation team to discuss the change to the program delivery
  - Seven contractors to assess their experience with the program
- Usability testing of online application portal

# 4. EEIF: Targeted Process Study

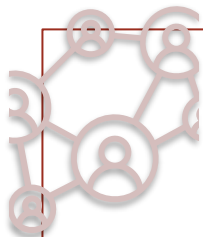
## Findings



Clear and defined roles on implementation team



Program focus on small and medium sized businesses

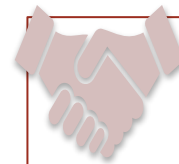


Implementing "on-the-ground" approach

## Recommendations



Increase grant cap to \$500k per participant



Invest further in the outreach approach to drive participation

# 4. EEIF: Targeted Process Study – Application Portal



DNREC made several important updates since the last evaluation



Contractors agree the portal is a positive aspect of the program



Add instructions for select portal features



Consider input requirements for select data fields



# 5. GEP: Program Summary

Program Year	Measure	Project Count	Capacity (MW)	Realization Rate (MW)	Capacity (Tons)	Realization Rate (Tons)
2020	Solar PV	227	2.34	100%	NA	NA
	Geothermal	28	NA	NA	139.5	100%
Total		255	2.34	100%	139.5	100%

- More projects were completed in 2020 when compared to the number of projects completed from 2019 (212)
- Most of the projects completed through the program are solar PV which is consistent with projects completed between 2016 – 2019
- Verified capacities consistent with project documentation
- 3,280 MWh and 2.11 MW in verified energy generation

# 6. WAP: Gross Verified Savings

Heating Type	Number of Homes	Reported Energy Savings (MWh)	Electric Realization Rate	Gross Verified Energy Savings (MWh)	Reported Fossil Fuel Savings (MMBtu)	MMBtu Realization Rate	Gross Verified Fossil Fuel Savings (MMBtu)
Electric	38	56	141%	78	NA	NA	NA
Natural Gas	43	45	29%	13	452	73%	332
Other Fuel	131	134	56%	75	1,992	51%	1,014
<b>Total</b>	<b>212</b>	<b>235</b>	<b>71%</b>	<b>167</b>	<b>2,444</b>	<b>55%</b>	<b>1,347</b>

# 6. WAP: Per Home Savings Matrix

Heating Type	Home Type	Per Unit Energy Savings (kWh)	Per Unit Peak Demand Reduction (kW)	Per Unit Energy Savings (MMBtu)
Electric	Single family	2,043	0.40	NA
	Manufactured home	1,191	0.09	NA
Natural Gas	Single family	825	0.13	9.9
	Manufactured home	672	0.14	14.3
Other fuel	Single family	1,196	0.17	10.6
	Manufactured home	771	0.17	14.6

# 6. WAP: Administrative Research

## Objectives:

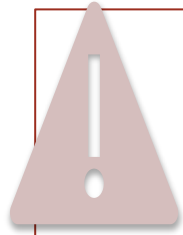
- Investigate the challenges the program faces in reaching its participation goals

## Methods:

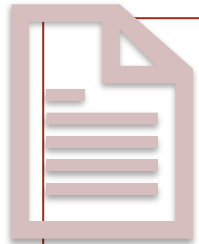
- In-depth Interviews
  - WAP Grantee
  - WAP Subgrantee
- Literature Review of surrounding WAPs
- Jurisdictional Scan of WAPs in Pennsylvania, Colorado, and New Mexico

# 6. WAP: Process Research - Takeaways

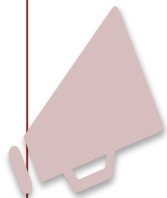
## Findings



Lack performance framework



Application leads

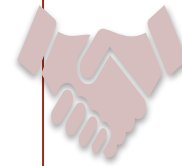


Community Action Agencies (CAA)

## Recommendations



Performance based on monthly targets

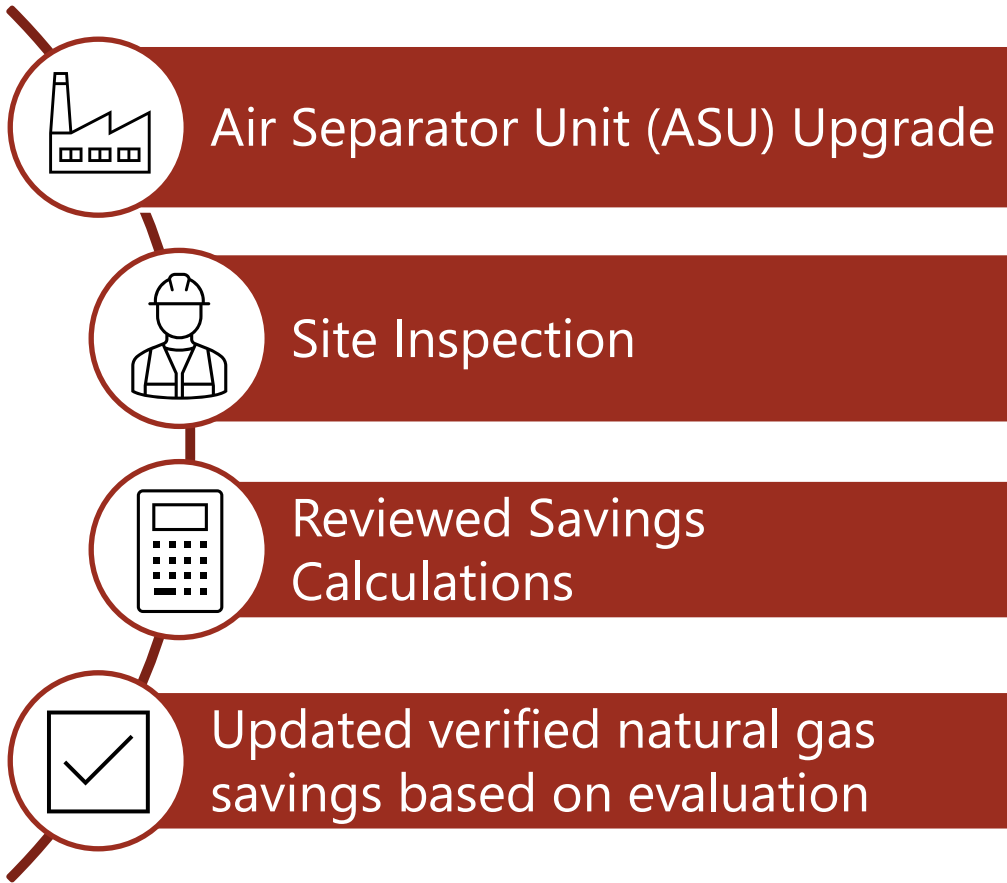


Coordination with LIHEAP



Network of CAAs to help subgrantee

# 7. E2I: Evaluation Results



Picture 1: [https://www.google.com/search?q=messer+us&xsrf=AOaemvJHnPtDbEGl5nn1SP8o2aHejrnYQ:1641567395337&source=Inms&tbm=isch&sa=X&ved=2ahUKewjT6OSL85\\_1AhVYaM0KHgqCJQQ\\_AUoAnoECAEQBA&biw=1920&bih=937&dpri=1#imgrc=U\\_F:CoAKCMKLnM](https://www.google.com/search?q=messer+us&xsrf=AOaemvJHnPtDbEGl5nn1SP8o2aHejrnYQ:1641567395337&source=Inms&tbm=isch&sa=X&ved=2ahUKewjT6OSL85_1AhVYaM0KHgqCJQQ_AUoAnoECAEQBA&biw=1920&bih=937&dpri=1#imgrc=U_F:CoAKCMKLnM)  
Picture 2: <https://www.chemanager-online.com/en/news-opinions/headlines/messer-wins-hungarian-gases-deal>

# 7. E2I: Evaluation Results

## Energy (kWh)

- Completed two independent analyses
- Reported savings likely conservative

## Peak Demand (kW)

- Utilized data from performance tests to evaluate reported savings
- Reported savings reasonable, but should be considered average demand savings

## Natural Gas (MMBtu)

- Adjusted baseline energy consumption to account for non-routine event
- Baseline adjustment reduced the evaluated savings

Savings Source	Energy Savings (MWh)	Peak Demand Savings (MW)	Natural Gas Savings (MMBtu)
Reported	30,322	3.79	19,047
Evaluated	30,322	3.79	18,386
Realization Rate	100%	100%	97%

# Questions?

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