

# BRIEFING SLIDES FOR JULY 15, 2020 EEAC MEETING

► July 9, 2020



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# ENERGY OPTIMIZATION

# REFRESHER: WHAT IS ENERGY OPTIMIZATION? 1 OF 2

October 31, 2018

Massachusetts Joint Statewide Electric and Gas

## Three-Year Energy Efficiency Plan

2019–2021

Page 8

***“Under the Energy Optimization philosophy the Program Administrators will provide a more holistic and integrated approach to helping customers address their energy use and associated costs based on their individual needs and goals, while aligning with the broader Commonwealth energy and greenhouse gas emissions reduction goals.”***

# REFRESHER: WHAT IS ENERGY OPTIMIZATION? 2 OF 2

Continued on p. 8 of 2019-2021 Plan:

***“The Energy Optimization approach builds on the successful integrated gas and electric program delivery, and will include strategies that target customers’ overall energy costs, as well as provide broader energy and economic benefits both for participating customers as well as all ratepayers. The approach will include providing fuel neutral educational materials and assistance on all options for heating and cooling. In some instances, for example, this may mean helping customers utilize energy more efficiently and reduce greenhouse gas emissions by increasing electric usage through the adoption of state-of-the-art cold climate air source heat pumps.”***

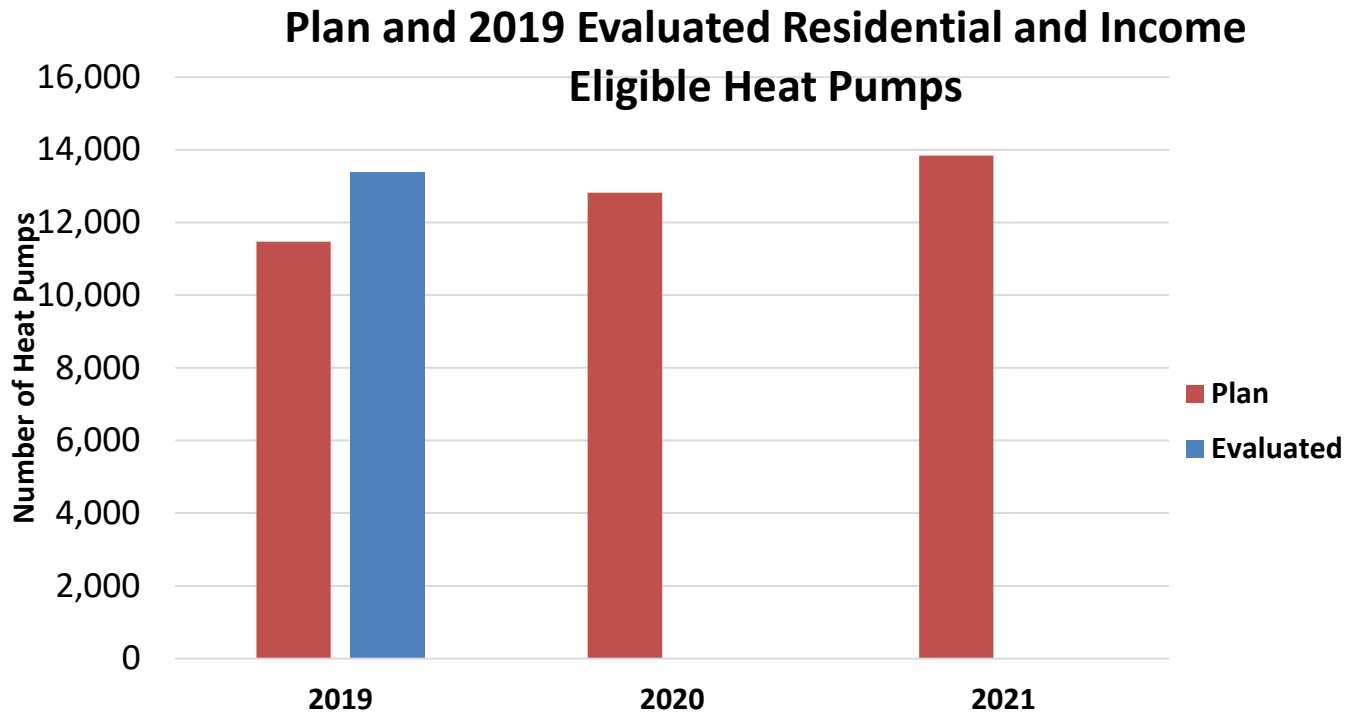


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# **EO: Residential and Income Eligible**

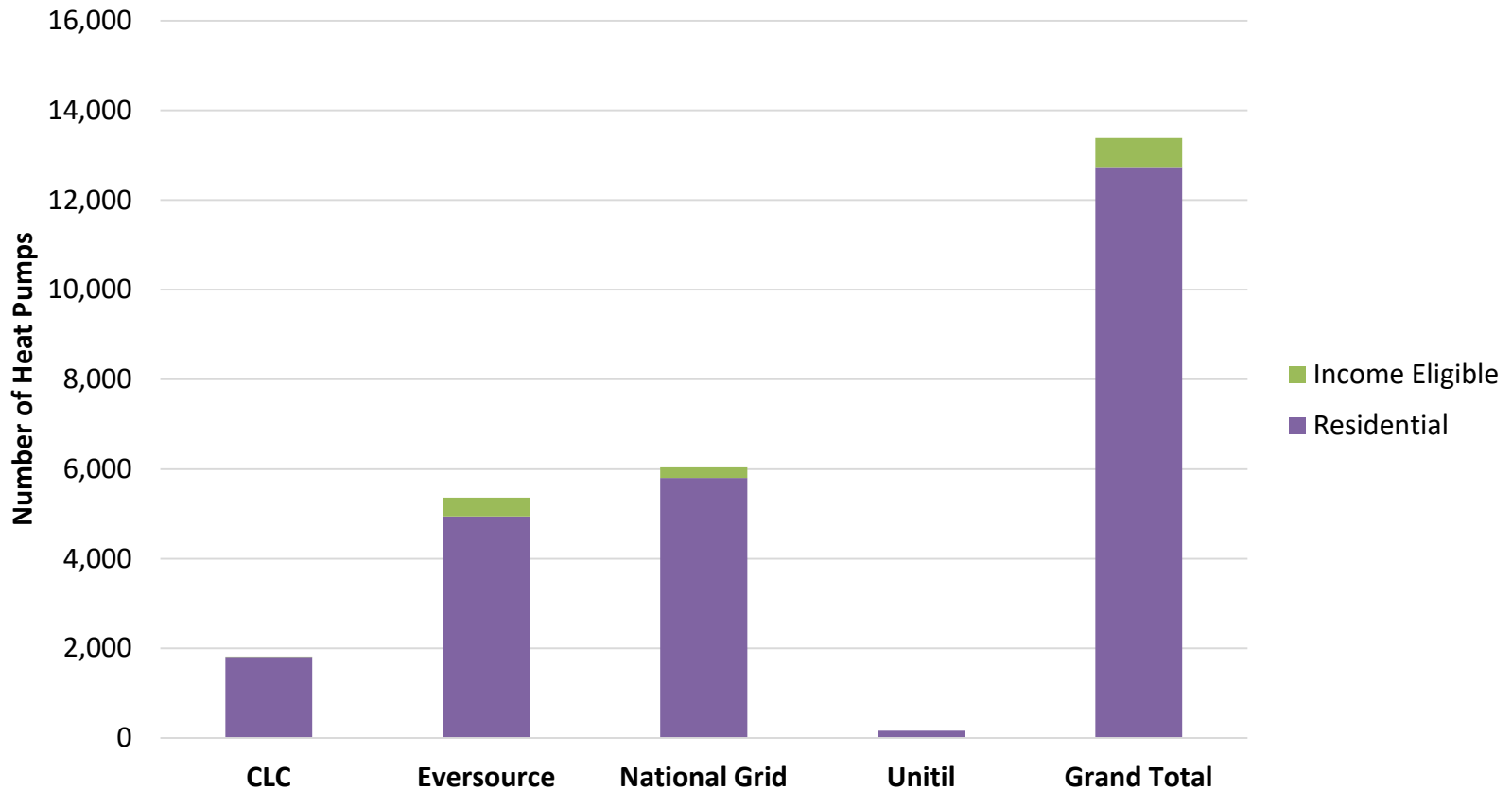
# THREE-YEAR HEAT PUMP GOALS AND 2019 PERFORMANCE

- ▶ **3-year Term Sheet heat pump goals (including heat pump water heaters):**
  - 37,994 Residential
  - 6,082 Income Eligible



# HEAT PUMP INSTALLATIONS BY PA

2019 Heat Pumps by PA



# HEAT PUMP ACTIVITY IS STRONG

2019 Heat Pump Units	Description	2019 Plan	2019 Q4	2019 Evaluated
<b>Residential</b>				
Lost opportunity	Efficiency upgrade of assumed baseline heat pump	7,904	5,216	8,276
Energy optimization	Displacement of electric resistance space heat	365	765	1,001
Fuel switching	Displacement of oil or propane	1,163	2,076	2,372
<b>TOTAL</b>		<b>9,432</b>	<b>8,057</b>	<b>11,649</b>
<b>Income Eligible</b>				
Lost opportunity	Efficiency upgrade of assumed baseline heat pump	0	0	0
Energy optimization	Displacement of electric resistance space heat	546	668	658
Fuel switching	Displacement of oil or propane	106	2	2
<b>TOTAL</b>		<b>652</b>	<b>670</b>	<b>660</b>



# KPI #3 DATA SUPPORT ASSESSMENT OF PAS' NEW ENERGY OPTIMIZATION FRAMEWORK

## Q1 2020 Recommended Heating Systems Statewide (minus Eversource)

	Gas Furnace	Gas Boiler	Oil Furnace	Oil Boiler	Propane Furnace	Propane Boiler	Electric Res.	DMSHP	Central HP	Central AC	Total	HEA Count
<b>Biomass</b>	-	-	-	1	-	1	-	5	2	-	9	31
<b>Electric resistance</b>	24	22	2	1	3	5	-	368	38	9	472	932
<b>Gas boiler</b>	31	1,994	-	-	-	-	-	218	34	168	2,453	6,729
<b>Gas furnace</b>	1,311	22	-	-	-	-	-	58	66	399	1,858	4,791
<b>Heat pump</b>	6	1	-	2	-	-	-	20	41	5	75	245
<b>Oil boiler</b>	6	244	7	1,057	2	39	-	685	210	113	2,363	4,818
<b>Oil furnace</b>	63	3	382	2	12	1	-	93	179	78	813	1,437
<b>Other</b>	3	5	-	-	-	-	-	32	15	46	101	189
<b>Propane boiler</b>	1	6	-	1	1	55	-	31	11	7	113	255
<b>Propane furnace</b>	8	1	1	-	58	6	-	36	41	20	171	495
<b>Grand Total</b>	<b>1,453</b>	<b>2,298</b>	<b>392</b>	<b>1,064</b>	<b>76</b>	<b>107</b>	<b>-</b>	<b>1,546</b>	<b>637</b>	<b>845</b>	<b>8,428</b>	<b>19,922</b>

\*Eversource data for KPI#3 have been omitted due to use of a tracking method that is inconsistent with the other PAs. The inconsistency was resolved in February and the data will be included in our analyses starting in Q2.

# STATUS OF ENERGY OPTIMIZATION FOR GAS CUSTOMERS

## Existing Gas Boiler, Q1

System Recommended	Gas Boiler	Ductless Minisplit HP	Central HP	Central AC
National Grid	861	181	33	136
Eversource*				
Unitil	20	-	-	-
CMA	597	-	-	19
Berkshire	2	-	-	-
Liberty	91	-	-	3

## Existing Gas Furnace, Q1

System Recommended	Gas Furnace	Ductless Minisplit HP	Central HP	Central AC
National Grid	568	39	47	285
Eversource*				
Unitil	7	-	-	-
CMA	411	-	-	-
Berkshire	1	-	-	-
Liberty	40	-	-	2

\*Eversource data for KPI#3 have been omitted due to use of a tracking method that is inconsistent with the other PAs. The inconsistency was resolved in February and the data will be included in our analyses starting in Q2.

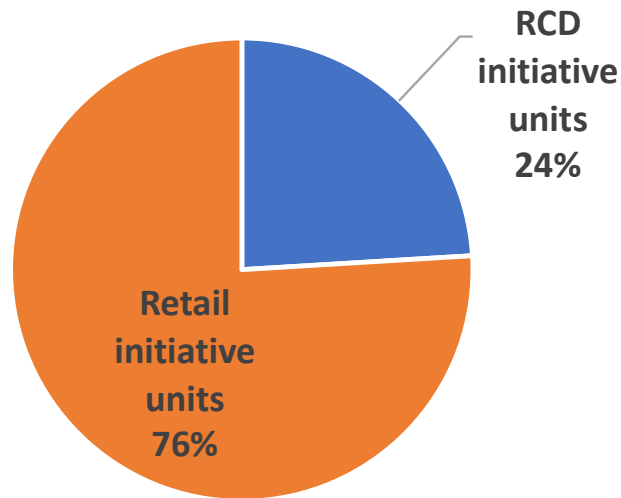
# KPI #3: INCREMENTAL VIEW OF DATA ALLOWS REVIEW OF PROGRESS OVER TIME

► It is not clear that Energy Specialist and HPC training in the Energy Optimization framework in late 2019 has boosted heat pump recommendation numbers—Statewide results to date minus Eversource

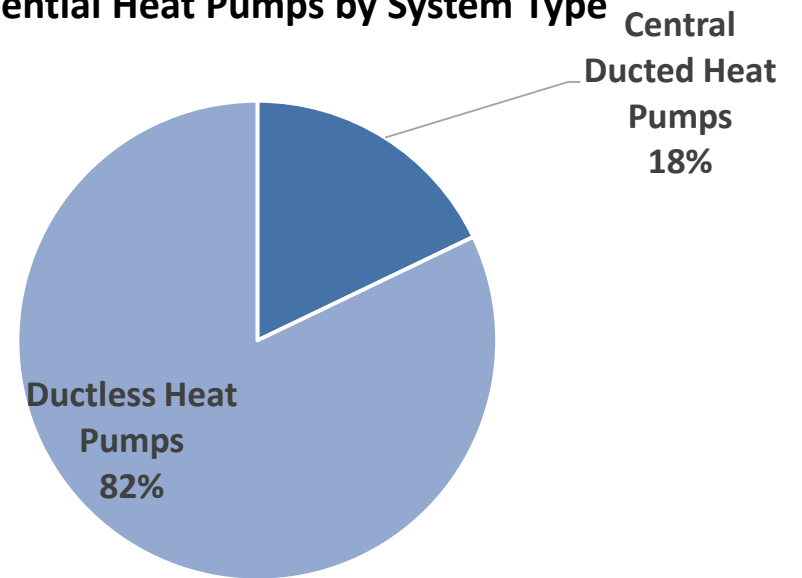
	Ductless Minisplit Heat Pump				Central HP				HEA Count			
	2019 Q1/2	2019 Q3	2019 Q4	2020 Q1	2019 Q1/2	2019 Q3	2019 Q4	2020 Q1	2019 Q1/2	2019 Q3	2019 Q4	2020 Q1
<b>Biomass</b>	1	3	11	3	0	0	1	0	70	34	29	22
<b>Electric resistance</b>	452	407	431	270	28	14	8	27	1830	1822	-94	697
<b>Gas boiler</b>	560	326	202	182	41	22	29	33	15750	6833	6973	5695
<b>Gas furnace</b>	105	63	43	40	38	40	37	47	10709	4818	4996	4036
<b>Heat pump</b>	13	3	9	15	55	54	34	25	384	197	151	180
<b>Oil boiler</b>	936	671	711	450	135	111	103	119	9384	4844	3910	3414
<b>Oil furnace</b>	144	69	95	71	86	77	153	95	2658	1244	1178	977
<b>Other</b>	0	10	5	14	0	3	3	2	169	134	111	123
<b>Propane boiler</b>	47	25	36	24	3	19	9	5	496	259	201	170
<b>Propane furnace</b>	45	-18	72	25	20	2	55	19	898	411	447	383
<b>Grand Total</b>	<b>2303</b>	<b>1559</b>	<b>1615</b>	<b>1094</b>	<b>406</b>	<b>342</b>	<b>432</b>	<b>372</b>	<b>42348</b>	<b>-1603</b>	<b>38154</b>	<b>15697</b>

# ADDITIONAL INSIGHTS ON RES HEAT PUMP UNIT ACTIVITY IN 2019


### Heat Pump Measures by Residential Initiative



### Residential Heat Pumps by System Type



# SUPPORTING EDUCATIONAL FRAMEWORK FOR ENERGY OPTIMIZATION IS BEHIND SCHEDULE

**Timing** 

Activity	Status	Target Completion
Online Calculator	Under Development	Q4 2019
Energy Specialist & Contractor Training	In Process	Ongoing
Heat Pump Incentives	Finalized	Complete
Contractor Communications	In Process	Ongoing
Customer Educational Materials	Under Development	Q3 2019
Website Updates	Under Development	Ongoing

■ PAs targeting broad scale roll out integrating all components in Q4 2019

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From PAs' March 2019 presentation to EEAC



These components are not yet complete

# THERE IS A STRONG OPPORTUNITY TO PURSUE ENERGY OPTIMIZATION IN NEW CONSTRUCTION

## 2019 Incentives by Fuel Type

Primary Heating Fuel Type	Sum of PFS Incentive	Project Count	Average of PFS Incentive
Electric	\$1,668,194.96	696	\$2,396.83
Natural Gas	\$6,306,054.46	3591	\$1,756.07
Oil	\$235,989.43	73	\$3,232.73
Propane	\$3,624,357.93	1951	\$1,857.69
Wood	\$2,799.04	2	\$1,399.52
<b>Grand Total</b>	<b>\$11,837,395.82</b>	<b>6313</b>	<b>\$1,875.08</b>

PFS=Pay for Savings, which is the incentive structure the PAs use for the New Homes Program

94% of these new propane projects were single family homes



## EO: C&I

# C&I ENERGY OPTIMIZATION – REPORTED PROGRESS TO-DATE

Measure Name	Total	Notes
Mini Split HP - Upstream	92	Replacing less efficient Mini Split HP
Central HP - Upstream	1,179	Replacing less efficient Central HP
Fuel Switching - Retrofit	4	Mix of oil and propane displacement Unclear if full or partial displacement All delivered by Eversource
<b>Total</b>	<b>1,275</b>	

*From: Bi-annual KPI #2 Q4 2019*





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# NEW REPORTING ON UNDERSERVED POPULATIONS

# LANGUAGE

Language	Mass Save Phone Hotline Language Selection		MassSave.com Page views	
	#	%	#	%
English	137,156	97%	5,154,923	99%
Mandarin	158	0.1%		
Portuguese	313	0.2%	9,603	0.18%
Russian	212	0.15%		
Spanish	2,900	2%	44,195	0.85%
<b>Total</b>	<b>140,739</b>		<b>5,208,721</b>	

LANGUAGE	ESTIMATE	% IN MA	% SPEAK ENGLISH "VERY WELL"	% SPEAK ENGLISH "< VERY WELL"
Spanish	564,401	9%	59%	41%
Portuguese	184,962	3%	57%	43%
Chinese (incl. Mandarin, Cantonese)	129,412	2%	50%	50%
Haitian	77,930	1%	56%	44%
French (incl. Cajun)	54,399	1%	81%	19%
Vietnamese	40,633	1%	38%	62%
Russian	39,182	1%	61%	39%
Arabic	33,313	1%	61%	39%
Italian	32,968	1%	73%	27%
Khmer	22,950	0%	50%	50%

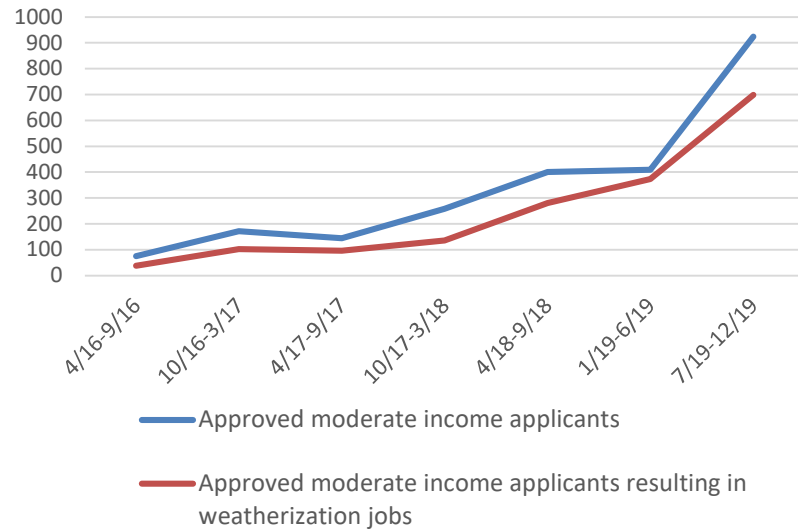
# RENTERS



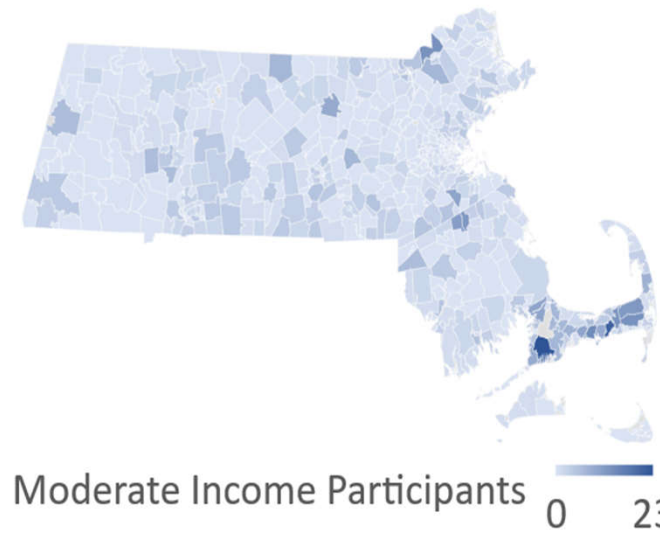
Reporting Category	National Grid		Eversource		Unitil		CLC	Berkshire	CMA	Liberty
	Electric	Gas	Electric	Gas	Electric	Gas	Electric	Gas	Gas	Gas
Residential Coordinated Delivery	6,655	3,500	1,222	616	46	42	254	175	795	100
Energy Savings Packages	5	3								
Income Eligible Coordinated Delivery	4,601	2,419	9,151	2,675	287	214	1,202	13	2,967	203
C&I - Res End Use - Rental Units	4,607	3,563	Not Available	652	6	288	58	126	1,224	410
C&I - Res End Use - C&I Accounts	140	46	104	16	1	1	3	2	69	9

# MODERATE INCOME

### Statewide Moderate Income Results 2016-2019



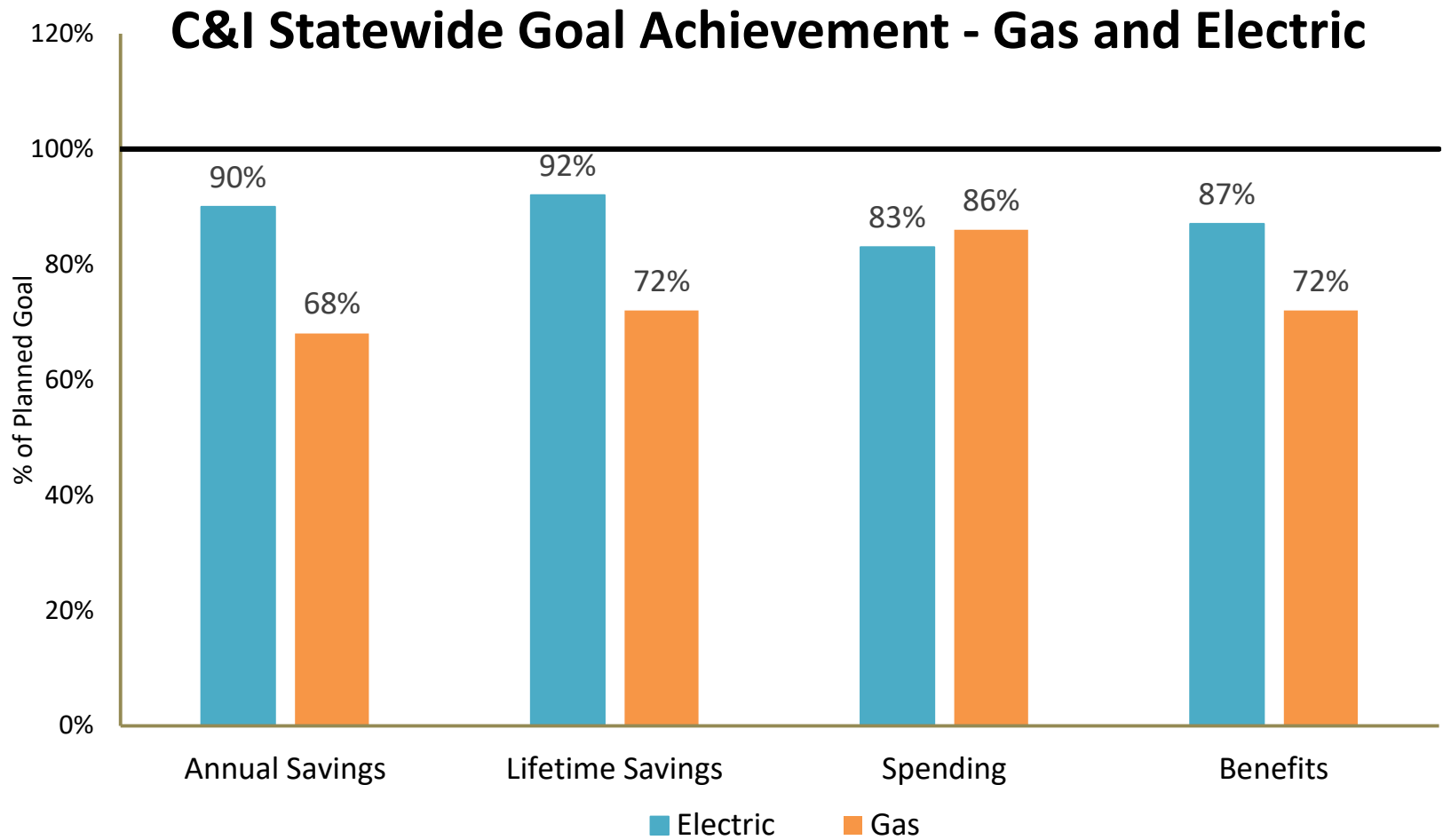
### Moderate Income Participation in Gas and Electric Programs





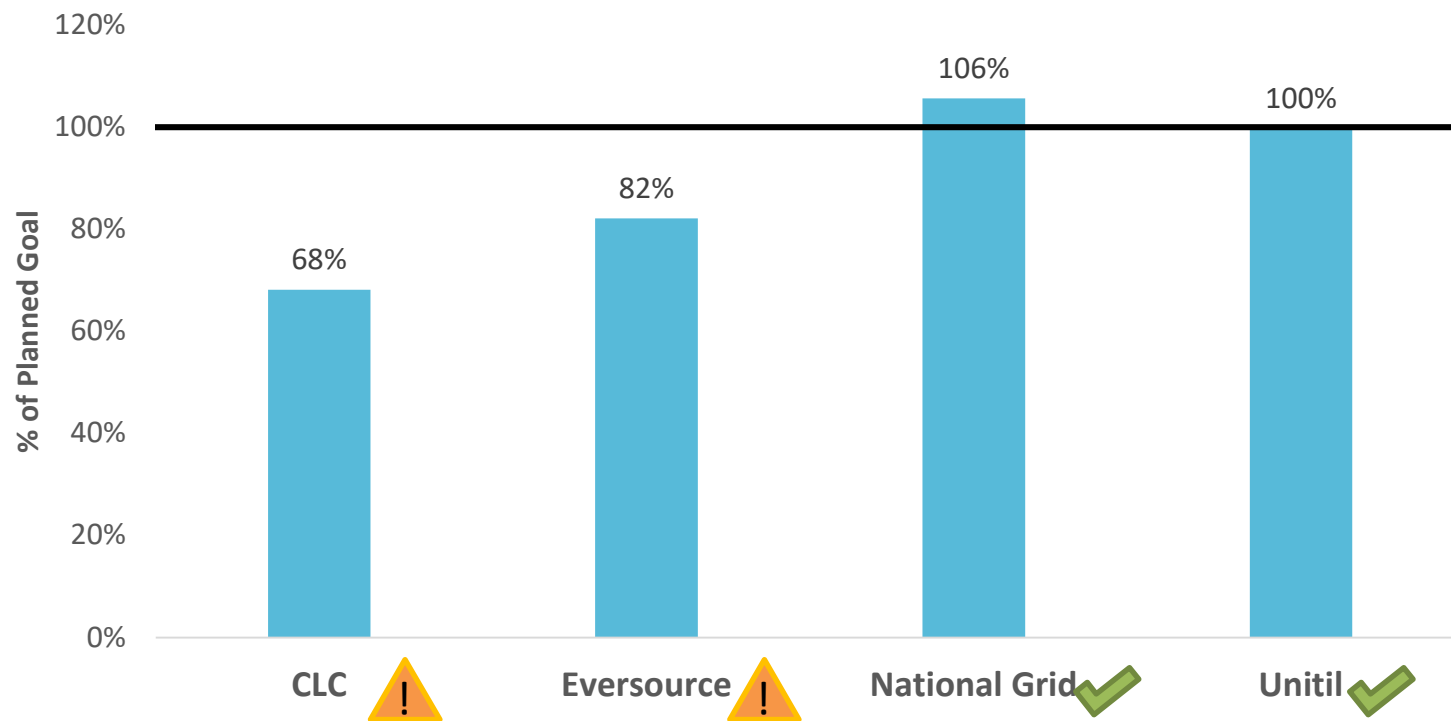
# COMMERCIAL & INDUSTRIAL 2019 RESULTS

# C&I STATEWIDE GOAL ACHIEVEMENT 2019



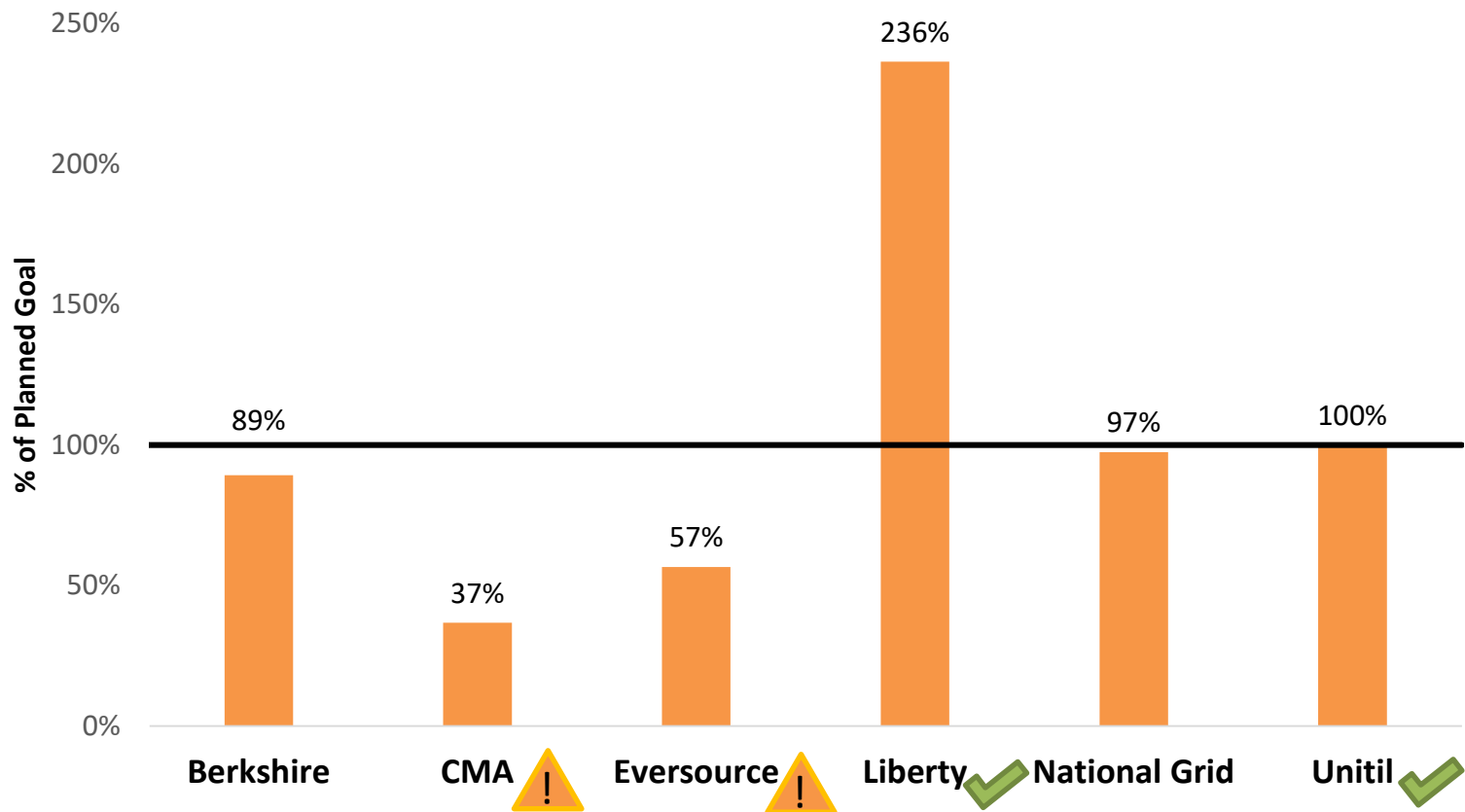
# C&I ACHIEVEMENT BY PA - ELECTRIC

## C&I Lifetime Electric Savings Goal Achievement



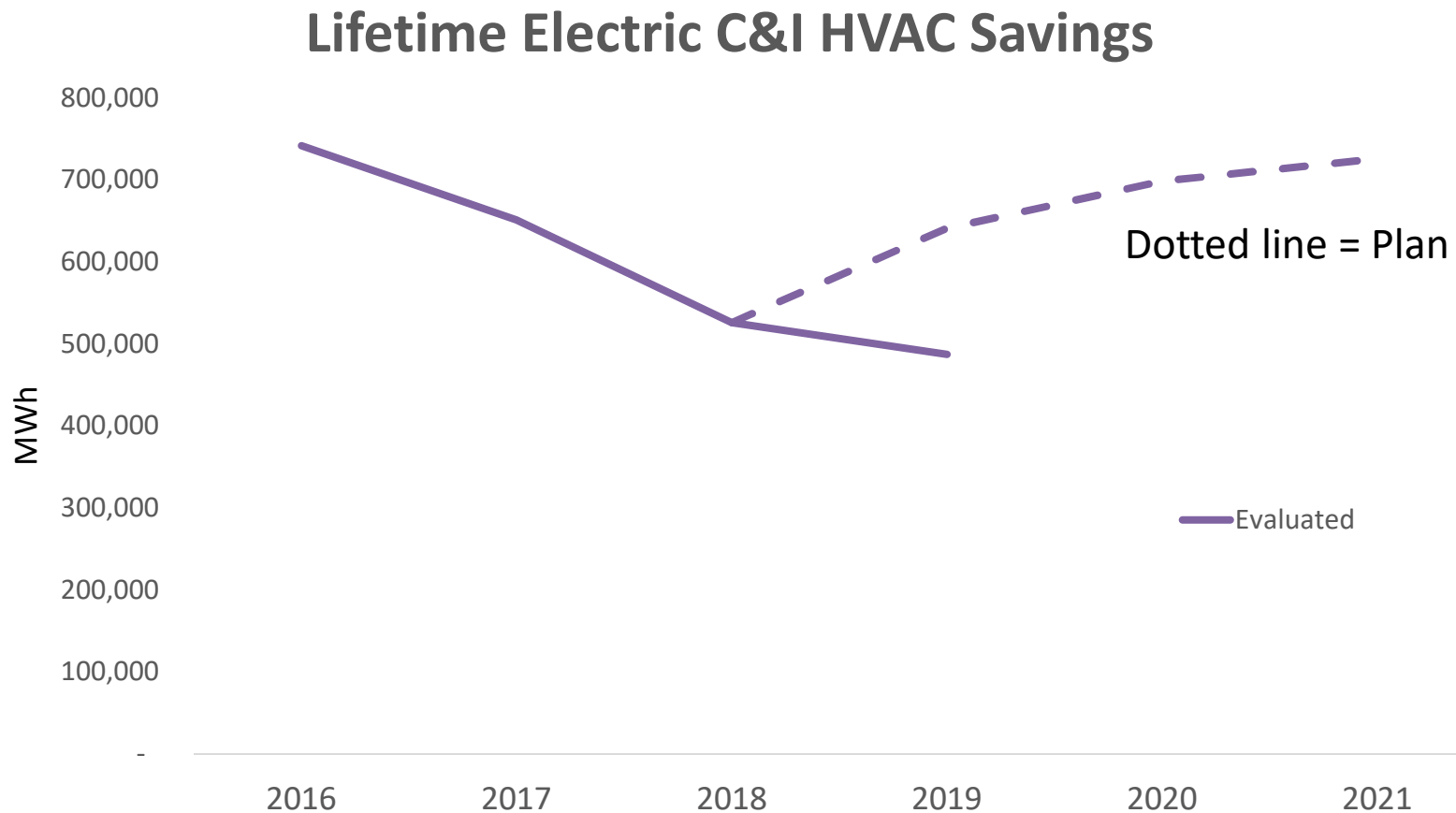
# C&I ACHIEVEMENT BY PA - GAS

## C&I Lifetime Gas Savings Goal Achievement



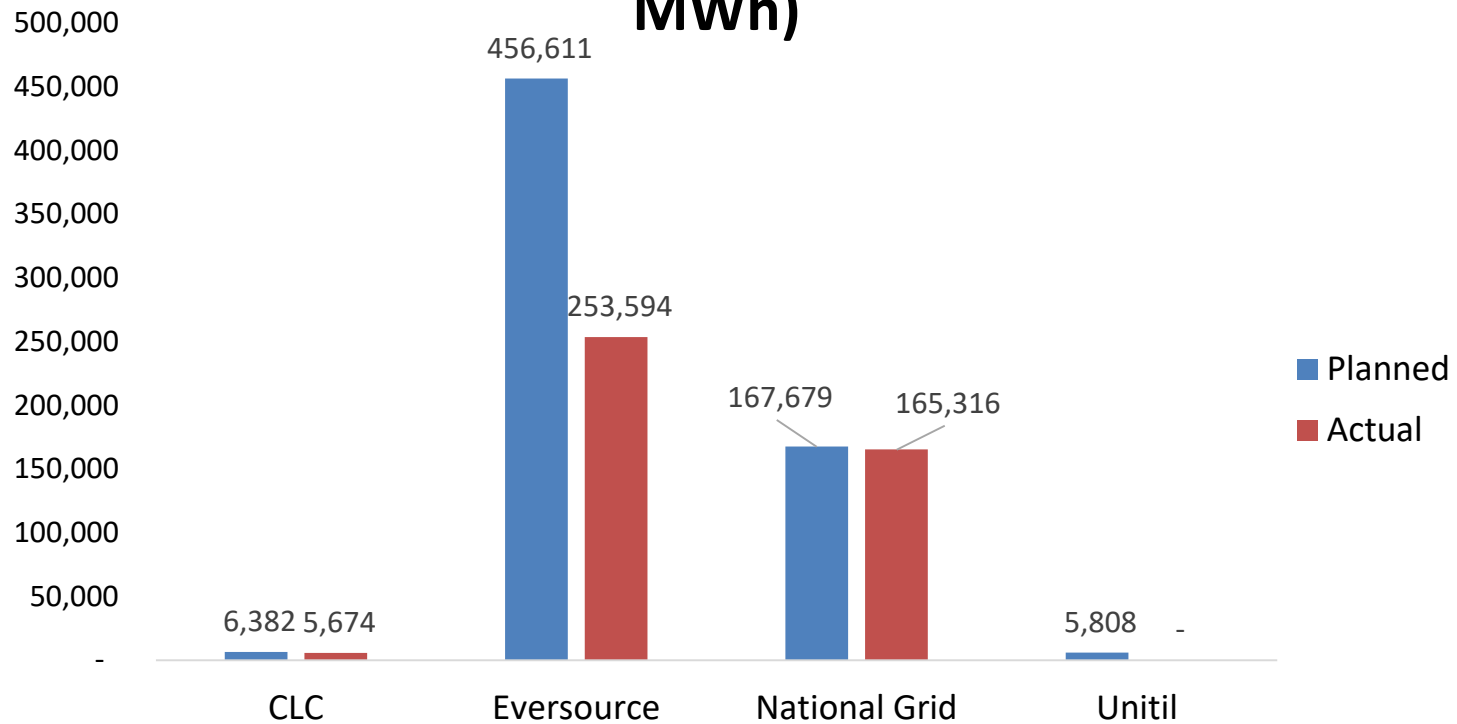


# PROGRAM ENHANCEMENTS FROM PLAN FOR HVAC SLOW TO DELIVER SAVINGS

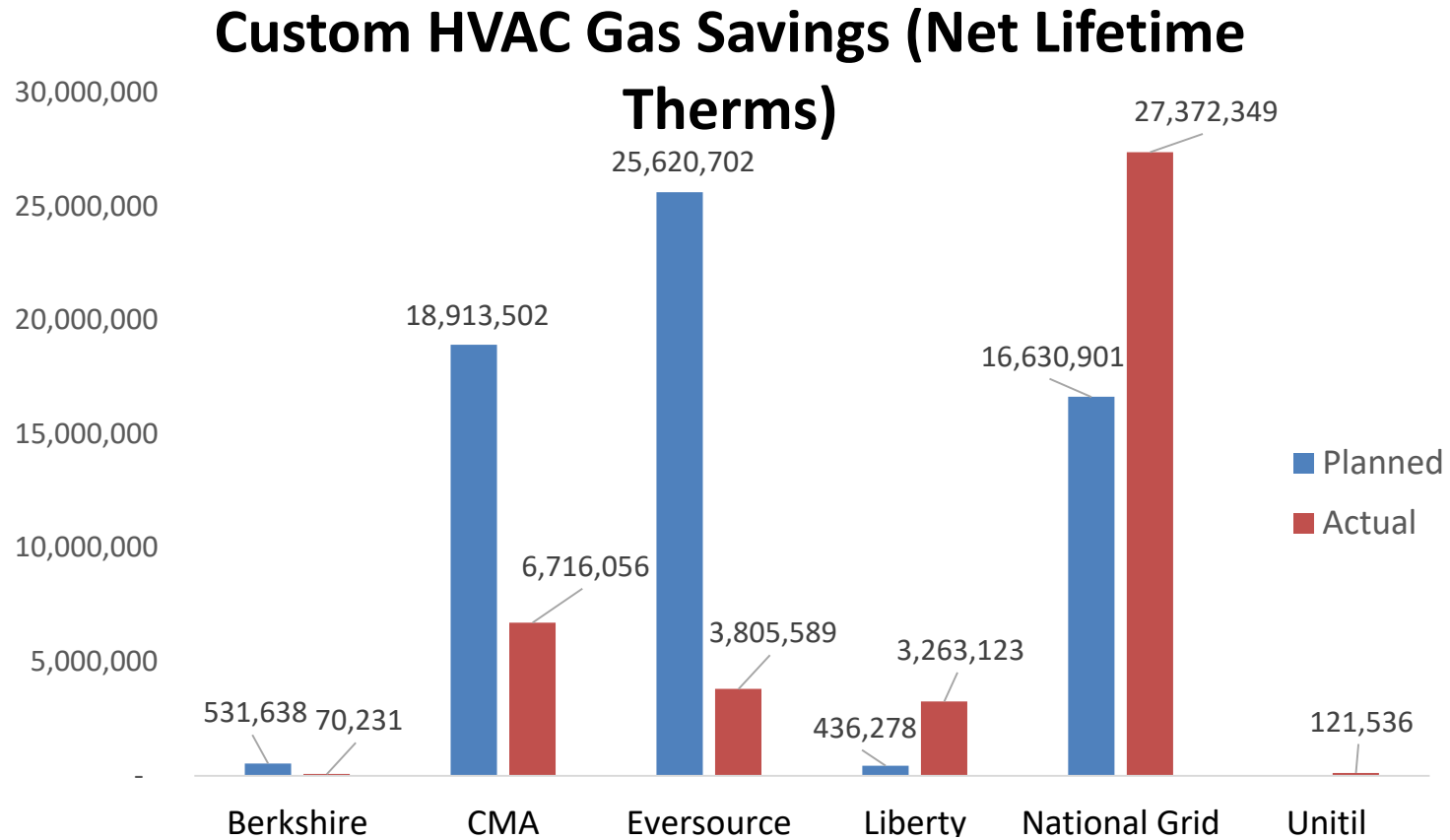


# PROGRAM ENHANCEMENTS FROM PLAN FOR HVAC SLOW TO DELIVER SAVINGS

## Custom HVAC Electric Savings (Net Lifetime MWh)



# PROGRAM ENHANCEMENTS FROM PLAN FOR HVAC SLOW TO DELIVER SAVINGS



# C&I ENERGY OPTIMIZATION – OPPORTUNITIES TO EXPLORE

- ▶ **Replace end of life RTUs with VRF/DOAS**



- ▶ **Incremental fossil fuel savings by optimized controls for existing HPs**



# HVAC EFFICIENCY OPPORTUNITIES TO SUPPORT RE-OPENING BUSINESSES AND PUBLIC BUILDINGS

- ▶ **Tune-ups for existing systems in small biz and public buildings**



- ▶ **Replace failed systems with ones that efficiently provide better indoor air quality**

